Did any of the responses (individual cells) you entered in this tab contain CBI?	
If yes, be sure to shade the CBI-containing cells red and follow the instructions in CBI worksheet of the survey overview document for submitting CBI.	

PART V. EMISSIONS MONITORING AND SOURCE TEST DATA

In this section, emissions test data are requested. Please satisfy this request as completely as possible from existing information. No additional monitoring or emission testing is required by your company to respond to the data request in this section. Four types of existing emissions data are requested: 1) source test data, 2) qualified CEMS data, 3) biological treatment units data, and 4) ambient or remote sensing data. The emissions test data collected will provide valuable information on current emissions levels and will allow EPA to consider variability in emissions from refinery to refinery (and over time for a given emission unit and pollutant) in reviewing and setting emission standards. When submitting test data, EPA is requesting full test reports with field and lab data sheets and example calculations, not just summary reports. If any of the data requested in this part is considered CBI, follow the instructions in the section "Submitting CBI" under the heading "How to Submit Your Survey Response" in the introduction to this enclosure.

1. Source Tests: Provide any existing emissions test reports from emissions tests conducted on any of the processes or emission points included in Part II, Sections 3 through 17 on or after January 1, 2005. Electronic (pdf) or hard copies are acceptable. Include the summary portion of the report and any appendices showing run-by-run test parameters, method detection limits, laboratory data, production data, example calculations, etc. If you have multiple tests for one pollutant from one process unit, submit only the most recent tests for that pollutant and process unit. (We are only requesting a maximum of the three most recent tests per unit for one pollutant, but you may submit more than three, particularly if additional tests reflect the effect of different operating conditions or equipment configurations.)
In addition, complete the source test log shown in Attachment 1 for each source test you submit. (Electronic copies of this table can be downloaded from the ICR website (https://refineryicr.rti.org).) Note that the information requested in the summary table includes:

(A) APCD type (if not clear from the test report),
(B) a description of how the configuration of the emission unit, combustion controls, collection system, or APCD has changed since the test was conducted, if applicable,
(C) any notes specific to that emissions test (optional), and
(D) how often you are required to test the emission unit (optional).

Attachment 1 Log of Source Tests Provided

Assign a test ID or number to each test report that you provide so that EPA can match your responses in this log to the correct test report.			If the configuration of the emission unit, combustion controls, collection system, or APCD changed since the test was conducted, describe the changes. If there are no configuration changes, enter "N/A."	Use this column for notes or if helpful to specify the emission points tested (e.g., for equipment with multiple emission points, where only selected emission points/vents were tested).		
Test Number	**Unit ID(s)**	**If the APCD type(s) is not clear from the test report, enter the APCD type(s)**	**Configuration changes**	**OPTIONAL: Process testing notes**	**OPTIONAL: How often are you required to perform testing of this emission unit for the pollutants listed?**	**OPTIONAL: Approximate cost per test, $**
1	FCC (4/21/11)	Wet Gas Scrubber			Annual	
2	Flare 2 (6/15/07)				N/A	
3	SRU (12/11/09)	SRU ThOx			N/A	
4	Boiler 10 (9/18/08)	Low NOx Burners			N/A	
5	Boiler 9 (5/15/09)	Low NOx Burners			N/A	
6	Boiler 402 (6/16/09)	Low NOx Burners			N/A	
7	#1 Ref (5/11/05)				N/A	
8	#3 Ref (3/12/05)				N/A	

Test Number	Unit ID(s)	If the APCD type(s) is not clear from the test report, enter the APCD type(s)	Configuration changes	OPTIONAL: Process testing notes	OPTIONAL: How often are you required to perform testing of this emission unit for the pollutants listed?	OPTIONAL: Approximate cost per test, $

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 281-1212

November 17, 2008

CERTIFIED MAIL (7007 0710 0003 0019 8706) RETURN RECEIPT REQUESTED

Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

RECEIVED
NOV 25, 08
LDEQ/OEA/AQAD
Engineering Support

NOTICE OF COMPLIANCE AND INITIAL PERFORMANCE TEST REPORT
BOILER NO. 10 UNIT
ACTIVITY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C.

ENG20080005

Dear Ms. Garwood:

Chalmette Refining, L.L.C. (CRLLC) submits this performance testing report to demonstrate compliance status for Boiler No. 10 pursuant to Permit 2500-00005-V1 Specific Requirement 59. Performance testing was performed as required using the methods specified in 40 CFR 60 Appendix A. The testing was performed on September 18, 2008 by Emission Testing Services, Inc.

Should you have any questions concerning this submittal, please contact Ms. Rebecca Bourg at (504) 281-1330 or by e-mail at rebecca.j.bourg@exxonmobil.com.

Very truly yours,

Charles Kominas
Environmental Group Leader

JDB

cc: EPA Region VI
LDEQ Southeast Regional Office

CHALMETTE REFINING, LLC
CHALMETTE REFINERY

P.O. BOX 1007

CHALMETTE, LOUISIANA 70044

EMISSION COMPLIANCE TESTS

BOILER 10 (EQT022)

SEPTEMBER 18, 2008

STATE PERMIT NUMBER: 2500-00005-V1

ETS®
Emission Testing Services, Inc.
P.O. BOX 15075
BATON ROUGE, LOUISIANA 70895

Phone 225-925-8405 Fax 225-925-2343
Email: reporting@emissiontesting.com
www.emissiontesting.com

LELAP Certificate Number 02059 issued to ETS by LDEQ

ETS Project Number: 28099A

Final Report: 14-Nov-2008, 102 Pages
Draft Report: 14-Oct-2008, 99 Pages

CRLLC-CHAL-000004

CERTIFICATION of TEST REPORT

CHALMETTE REFINING LLC
CHALMETTE REFINING

EMISSION COMPLIANCE TESTS

BOILER 10 (EQT022)

SEPTEMBER 18, 2008

Testing Conducted by:

EMISSION TESTING SERVICES, INC.

Emission Testing Services, Inc. (ETS) is certified by the Louisiana Department of Environmental Quality (LDEQ), certificate number 02059, as a qualified environmental testing laboratory under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information; I believe the submitted information is true, accurate, and complete.

Rebecca J. Bourg
Chalmette Refining LLC
Plant Representative

Ronald McCabe
Emission Testing Services, Inc.
Project Leader

Barry Gipson
Emission Testing Services, Inc.
Manager

CRLLC-CHAL-000005

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CRLLC-CHAL-000006

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STANDARD RESULT NOTATIONS

< None detected (less than or equal to). Result is the minimum detection limit. Actual result value may be less including the value zero (0).

! Result is the sum or average of multiple results where one or more of the results have a positive detection and one or more results are None Detected. The magnitude of the None Detected result(s) is significant (>30%) in comparison to the positive detection results. Actual result may be less; however, does not include the value zero (0) and is not less than the result calculated using the positive detection results with the None Detected as zero (0).

CRLLC-CHAL-000007

I. INTRODUCTION

Emission Testing Services, Inc. (ETS) was contracted by Chalmette Refining, LLC (Chalmette Refining) to conduct emission tests at the Chalmette Refinery located in St. Bernard Parish, Louisiana. Emissions from Boiler 10 (EQT022) were tested to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Tests were conducted in order to demonstrate compliance with emission permit limits. The sources tested operate under permit number 2500-00005-V1 issued by the Louisiana Department of Environmental Quality (LDEQ).

All tests were conducted following EPA test methods. The emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined using EPA Methods 6C, 7E, and 10. EPA Method 19 was used to calculate stack gas flow rate based on fuel firing rate, fuel composition, and stack gas oxygen concentration.

The ETS emission test team consisted of Project Leader Ronald McCabe and test crewmembers Keith Delk and Wilbert Soule. Rebecca Bourg represented Chalmette Refining and coordinated testing with plant operations. The LDEQ was not represented on-site during the tests.

CRLLC-CHAL-000008

II. SUMMARY

Discussion of Tests

On September 18, 2008, emission tests were conducted at the Chalmette Refinery. Tests were conducted on Boiler 10 to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Three, 1-hour duration test runs were conducted.

Boiler 10 Test Results

Results of tests on Boiler 10 indicate that emissions of sulfur dioxide, oxides of nitrogen, and carbon monoxide are in compliance with emission permit limits. Sulfur dioxide emissions averaged 1.784 lb/hr, which is less than the 13.30 lb/hr permitted maximum limit. Oxides of nitrogen emissions averaged 7.835 lb/hr, which is less than the 144.40 lb/hr permitted maximum limit. Carbon monoxide emissions averaged 1.174 lb/hr, which is less than the 133.00 lb/hr permitted maximum limit. During the tests the unit was fired at an average 194.7773 MMBTU/hr.

CRLLC-CHAL-000009

Notations and Conclusions

Test Method Modifications, Deviations, and Unusual Conditions

All tests were conducted using EPA test methods without modification. During the tests, there were no deviations from these methods. All unusual conditions encountered during the tests have been noted above.

Test Conclusions

Quality assurance and quality control procedures meeting EPA and LDEQ requirements were used during the emission tests. All quality indicators were within the range of acceptable results demonstrating that these test data are accurate, complete, and representative of emissions conditions. Overall, the quality of data obtained during the tests are acceptable to meet project objectives.

CRLLC-CHAL-000010

TABLE I
EMISSION TEST RESULTS

CHALMETTE REFINING, LLC
CHALMETTE REFINERY

BOILER 10 (EQT022)

		PERMIT LIMITS MAXIMUM	RUN 1	RUN 2	RUN 2	AVERAGE
DATE			18-Sep-08	18-Sep-08	18-Sep-08	
TIME			1104-1203	1216-1315	1356-1455	
SULFUR DIOXIDE	PPMv dry		5.1	5.1	5.9	5.3
	lb/hr	13.30	1.700	1.690	1.961	1.784
OXIDES OF NITROGEN	PPMv dry		32.6	31.8	33.9	32.8
	lb/hr	144.40	7.775	7.599	8.131	7.835
	lb/MMBtu	0.056	0.04006	0.03885	0.04178	0.04023
CARBON MONOXIDE	PPMv dry		7.3	8.6	8.4	8.1
	lb/hr	133.00	1.055	1.248	1.220	1.174
OXYGEN	Vol% dry		3.53	3.43	3.59	3.52
STACK GAS DATA	Flow Rate, dscfm		33303	33367	33510	33394
HEATER OPERATING DATA						
Fuel Firing Rate	MMscfd		4.12652	4.10235	4.07375	4.10087
Fuel Heat of Combustion	Btu/ft3		1128.90	1144.29	1146.67	1139.95
Heat Input Rate	MMBtu/hr		194.1015	195.5955	194.6348	194.7773

CRLLC-CHAL-000011

III. PROCEDURE

Emission tests were conducted using EPA test methods documented in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A. A brief description of each method used during the tests follows.

LOCATION of SAMPLE POINTS

Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined on samples collected from a single sample point located near the center of the stack.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1. Results from the analyzer were used to verify the absence of sample line leaks, as a stack gas oxygen reference, and as a basis for gaseous component concentration corrections to specific oxygen basis when required. Oxygen data obtained using this method were not used to determine stack gas molecular weight.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the stack gas was continuously determined. A sample of the stack gas was extracted using a stainless steel sample probe. Sample was transferred from the probe through a heated Teflon sample line to a sample-conditioning unit. The sample-conditioning unit removed particulate and water vapor from the sample. Sample gas exiting the conditioning unit was routed directly to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000012

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE EMISSIONS from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated, Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 19
DETERMINATION of SULFUR DIOXIDE REMOVAL EFFICIENCY and PARTICULATE MATTER, SULFUR DIOXIDE, and NITROGEN OXIDES EMISSION RATES

Pollutant emission rates were determined based on measured pollutant concentration data and stack gas flow rate data that was calculated based on the fuel composition, fuel heat of combustion, fuel-firing rate, and stack gas oxygen concentration. A fuel Fd factor was calculated that relates the combustion gas volume to heat input.

CRLLC-CHAL-000013

IV. ANALYTICAL TECHNIQUE

All samples collected during the emission tests were analyzed using EPA or EPA approved test methods. A brief description of each method used during the tests follows.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined using a test analyzer that utilizes an electrochemical cell detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the gas sample was continuously determined using a test analyzer that utilizes an ultraviolet absorbance detection principle. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined using a test analyzer that utilizes a chemiluminescence detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined using a nondispersive infrared test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000014

V. QUALITY ASSURANCE/ QUALITY CONTROL

Test results were validated using rigorous quality assurance (QA) and quality control (QC) procedures documented in ETS' Standard Operating Procedures (SOP). Each SOP meets or exceeds EPA requirements and has been reviewed by the LDEQ under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

The QA/QC programs ensure that the test data are representative of the source conditions by verifying the completeness, accuracy, and precision of the test data. QA/QC functions cover all aspects of the test including field-testing, sampling, sample analysis, sample storage and transport, and data processing and reporting.

Emission testing at Chalmette Refining included a series of QA/QC functions that were completed satisfactorily within the required limits. Therefore, data collected during testing should be considered accurate, precise, complete, and representative of stack conditions.

CRLLC-CHAL-000015

VI. TEST DATA and CALCULATIONS

Data Processing and Calculation Methods

All emission test data, laboratory analytical data, and unit operation data are presented in this section along with the associated data reduction calculations.

Data from the field data forms were manually input into a computer for data processing and calculation. Integrity of manual data input is maintained by using a double entry system. Accuracy of computer calculations is verified by processing a known set of data developed using manual calculation. Additional control of data input and processing is conducted through review of results by more than one individual.

CRLLC-CHAL-000016

Boiler 10

Emission tests were conducted on Boiler 10 to determine the concentration of oxygen and the concentration and emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide.

Oxygen concentration was determined using EPA Method 3A. Sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions were determined using EPA Methods 6C, 7E, and 10 respectively. EPA Method 19 was used to calculate stack gas flow rate based on the fuel gas firing rate, fuel gas composition, and excess air.

Prior to the emission tests, the concentrations of oxygen, sulfur dioxide, oxide of nitrogen, and carbon monoxide were determined at a series of three sample traverse points, Figure I, selected per EPA Method 7E, in order to verify the absence of stratification of component concentrations across the stack. Since no stratification was noted, all samples used to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were collected from a single sample point, Figure II, located near the center of the stack.

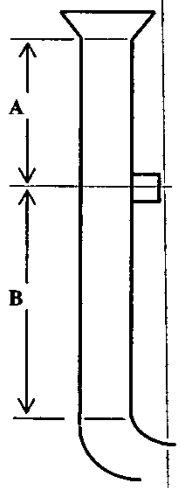
CRLLC-CHAL-000017

ETS

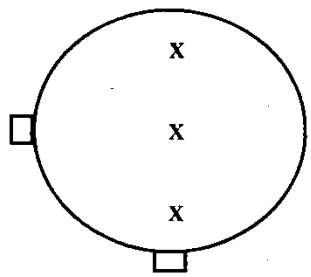
EMISSION TESTING SERVICES INC.

TRAVERSE POINT LAYOUT

STRATIFICATION CHECK



CLIENT:	EXXONMOBIL CHALMETTE
DATE:	09/18/08
UNIT TESTED:	BOILER #10
LOCATION:	CHALMETTE, LA
UPSTREAM DIST. (A):	72
DOWNSTREAM DIST. (B):	168
INSIDE DIAMETER (INCHES):	83.75
COUPLING LENGTH (INCHES):	14
COUPLING TYPE:	4" 8 BOLT FLANGES



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 3

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.167	83.75	14	27.99
2	0.500	83.75	14	55.88
3	0.833	83.75	14	83.76

SIGNATURE: Ronald McCabe

ETS-001

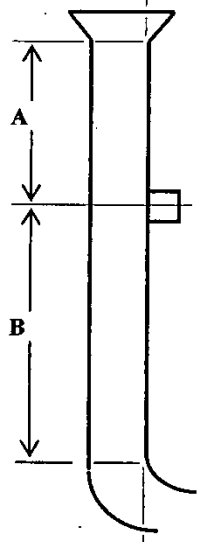
FIGURE I
6.2.2

ETS

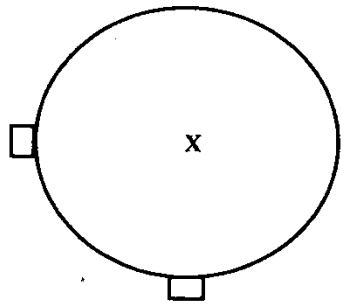
EMISSION TESTING SERVICES INC.

TRAVERSE POINT LAYOUT

METHODS 3A, 6C, 7E, 10, AND 19



CLIENT:	EXXONMOBIL CHALMETTE
DATE:	09/18/08
UNIT TESTED:	BOILER #10
LOCATION:	CHALMETTE, LA
UPSTREAM DIST. (A):	72
DOWNSTREAM DIST. (B):	168
INSIDE DIAMETER (INCHES):	83.75
COUPLING LENGTH (INCHES):	14
COUPLING TYPE:	4" 8 BOLT FLANGES



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 1

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.500	83.75	14	55.88

SIGNATURE: Ronald McCabe

ETS-001

FIGURE II
6.2.3

Boiler 10
EPA Method 19 (stack gas flow rate)

Flow rate of the stack gas during the emission test was calculated based on the fuel firing rate, fuel composition, and excess air. The Boiler is fired on refinery fuel gas (RFG) having an average Fd value of 8555.805 dscf/MMBtu. Fuel gas heat of combustion was measured continuously with the average value for each test used in the calculations. Calculation of the stack gas flow rates are presented on the following page.

CRLLC-CHAL-000020

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : Boiler 10

EPA METHOD 19, DETERMINATION of STACK GAS VOLUMETRIC FLOW RATE

F1	Conversion Factor, 1.00E-06 MMBtu/Btu	Hc	Fuel heat of combustion, Btu/ft3
Fd	Dry F factor, dscf/MMBtu (at 0% oxygen)	O2	Stack gas oxygen concentration, vol% dry
Fire	Fuel firing rate, ft3/hr	Qsd	Stack gas flow rate, dscf/hr (68 F, 29.92 in.Hg)

$$Qsd = (Fd)(Hc)(Fire)(F1)\left\{\frac{20.9}{(20.9 - O2)}\right\}$$

---RUN 1 18-Sep-08 ---

$$Qsd = (8555.805)(1128.902)(171938.3)(1.00E-06)\left\{\frac{(20.9 - 0.00)}{(20.9 - 3.53)}\right\} = 1998187.2 \text{ dscf/hr}$$
33303.1 dscf/min

---RUN 2 18-Sep-08 ---

$$Qsd = (8555.805)(1144.294)(170931.1)(1.00E-06)\left\{\frac{(20.9 - 0.00)}{(20.9 - 3.43)}\right\} = 2002041.6 \text{ dscf/hr}$$
33367.4 dscf/min

---RUN 3 18-Sep-08 ---

$$Qsd = (8555.805)(1146.667)(169739.6)(1.00E-06)\left\{\frac{(20.9 - 0.00)}{(20.9 - 3.59)}\right\} = 2010622.5 \text{ dscf/hr}$$
33510.4 dscf/min

CRLLC-CHAL-000021

Boiler 10
EPA Methods 3A, 6C, 7E, and 10
(oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide)

Test Data and Calculations

During the emission tests, a sample of the stack gas was continuously drawn from the stack and analyzed to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide using EPA Methods 3A, 6C, 7E, and 10 respectively. Results of the tests are summarized on the following pages along with calculation of emission rates.

Test analyzer response was recorded using a computer data acquisition system. One minute average data were recorded on magnetic media and then printed in a format that aids interpretation of the data without editing or processing of the data. These data are presented following the data summary and calculations.

Each test analyzer was calibrated before and after each test run by challenging the analyzer with a set of certified calibration gas standards. Analyzer response was recorded using the computer data acquisition system. Calibration data are presented on each page of applicable test data.

CRLLC-CHAL-000022

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : Boiler 10

EPA METHOD 6C, DETERMINATION of SULFUR DIOXIDE EMISSION RATE

CSO2	SO2 concentration, PPMv actual O2
ESO2	SO2 emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of SO2, 64.065 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

— Run 1 18-Sep-08 ———

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(5.12)(64.065)(1998187.2)}{(385.546)(1.00E+06)} \right\} = 1.7000$$

— Run 2 18-Sep-08 ———

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(5.08)(64.065)(2002041.6)}{(385.546)(1.00E+06)} \right\} = 1.6900$$

— Run 3 18-Sep-08 ———

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(5.87)(64.065)(2010622.5)}{(385.546)(1.00E+06)} \right\} = 1.9612$$

CRLLC-CHAL-000023

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : Boiler 10

EPA METHOD 7E, DETERMINATION of OXIDES of NITROGEN EMISSION RATE

CNOx	NOx concentration, PPMv actual O2
ENOx	NOx emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of NO2, 46.006 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

— Run 1 18-Sep-08 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(32.61)(46.006)(1998187.2)}{(385.546)(1.00E+06)} \right\} = 7.7754$$

— Run 2 18-Sep-08 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(31.81)(46.006)(2002041.6)}{(385.546)(1.00E+06)} \right\} = 7.5993$$

— Run 3 18-Sep-08 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(33.89)(46.006)(2010622.5)}{(385.546)(1.00E+06)} \right\} = 8.1309$$

CRLLC-CHAL-000024

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : Boiler 10

EPA METHOD 10, DETERMINATION of CARBON MONOXIDE EMISSION RATE

CCO	CO concentration, PPMv actual O2
ECO	CO emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of CO, 28.011 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

— Run 1 18-Sep-08 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(7.27)(28.011)(1998187.2)}{(385.546)(1.00E+06)} \right\} = 1.0554$$

— Run 2 18-Sep-08 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(8.58)(28.011)(2002041.6)}{(385.546)(1.00E+06)} \right\} = 1.2480$$

— Run 3 18-Sep-08 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(8.35)(28.011)(2010622.5)}{(385.546)(1.00E+06)} \right\} = 1.2197$$

CRLLC-CHAL-000025

ETS

EMISSION TESTING SERVICES INC.

NOX CONVERTER EFFICIENCY TEST

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**SLOPE:**	11.213879
DATE:	9/18/2008	**INTERCEPT:**	-0.2273
		CORRELATION:	0.9999
		SPAN RANGE:	111.9115

CALIBRATION STATISTICS

	CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR < 2%	FINAL VOLT	CONC %	SPAN DRIFT < 3%
ZERO	0.00	-0.01	-0.39	0.35	-0.01	-0.39	0.00
MID	47.80	4.35	48.56	0.68	4.35	48.56	0.00
HIGH	101.00	8.99	100.63	0.33	8.99	100.63	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS < 5%	FINAL VOLT	CONC PPM	RESP BIAS < 5%	SPAN DRIFT < 3%
ZERO	0.00	-0.01	-0.39	0.00	-0.01	-0.39	0.00	0.00
HIGH	101.00	8.99	100.63	0.00	8.99	100.63	0.00	0.00

TIME	NOX-PPM	CHALLENGE CONCENTRATION
9:45:56	51.18	54.50
9:46:57	51.84	
9:47:57	52.11	
9:48:57	52.28	
9:49:57	52.39	% EFFICIENCY
AVG	51.96	95.34

Acceptable efficiency is greater than or equal to 90%

This NO2 to NO converter efficiency test is a modified version of that specified in EPA Method 7E. This modified methodology has been approved and accepted by the LDEQ as the preferred methodology. The gas standard used in this test is not required to be certified per EPA Protocol No. 1.

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000026

ETS®

EMISSION TESTING SERVICES, INC.

RESPONSE TIME SHEET

Source:	Boiler #10	Date:	9/18/2008
Monitor:	MODEL 42i-HL	Location:	Chalmette, La.
Serial Number:	ETSNOX1B	Client:	ExxonMobil

High Level Gas Concentration: 101.0 PPM

TEST RUN

ACTUAL TIME BEGIN	ACTUAL TIME END	UPSCALE SECONDS	ACTUAL TIME BEGIN	ACTUAL TIME END	DOWNSCAL SECONDS
0.00	40.33	40.33	0.00	42.42	42.42
0.00	41.50	41.50	0.00	42.50	42.50
0.00	41.08	41.08	0.00	43.17	43.17
	AVERAGE	40.97		AVERAGE	42.70

System Response Time (slower of A or B) = 42.70 SEC.

COMMENTS:

ETS REFERENCE SOPS-007,020

CRLLC-CHAL-000027

ETS.

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXYGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	STRATIFICATION CHECK	**SLOPE:**	24.9754
ANALYZER ID :	ETS-O2-1	**INTERCEPT:**	-0.0072
		CORRELATION:	1.00000
		SPAN RANGE:	24.9682

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	-0.01	0.03	0.00	-0.01	0.00
ALM019515	LOW	10.10	0.41	10.11	0.06	0.41	10.11	0.00
ALM051449	HIGH	20.00	0.80	19.99	0.03	0.80	19.99	0.00

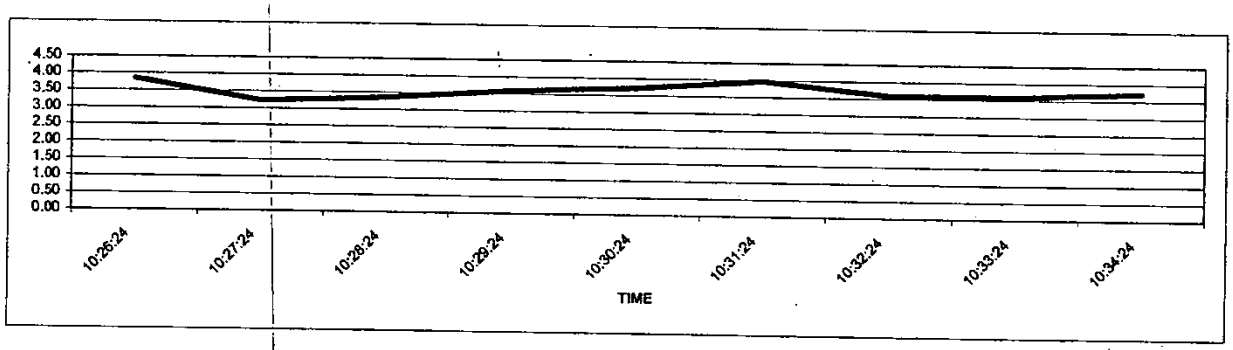
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.11	0.49	0.00	0.11	0.49	0.00
BIAS HIGH	20.00	0.79	19.75	0.98	0.79	19.75	0.98	0.00

OXYGEN

TIME	O2-%		
10:26:24	3.85	PT. 1 AVG	3.48
10:27:24	3.23		
10:28:24	3.35		
10:29:24	3.60	PT. 2 AVG	3.77
10:30:24	3.73		
10:31:24	3.98		
10:32:24	3.60	PT. 3 AVG	3.64
10:33:24	3.60		
10:34:24	3.73		
		AVG	3.63

POINTS	%-DEVIATION
1	4.18
2	3.80
3	0.38



ETS REFERENCE SOP-007

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000028

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	SULFUR DIOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	STRATIFICATION CHECK	**SLOPE:**	5.9449
ANALYZER ID :	ETSSO2-1	**INTERCEPT:**	-0.1504
		CORRELATION:	0.99938
		SPAN RANGE:	59.2986

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.06	-0.53	0.89	-0.06	-0.53	0.00
ALM060848	LOW	26.90	4.74	28.01	1.87	4.74	28.01	0.00
ALM053681	HIGH	54.60	9.11	54.02	0.98	9.11	54.02	0.00

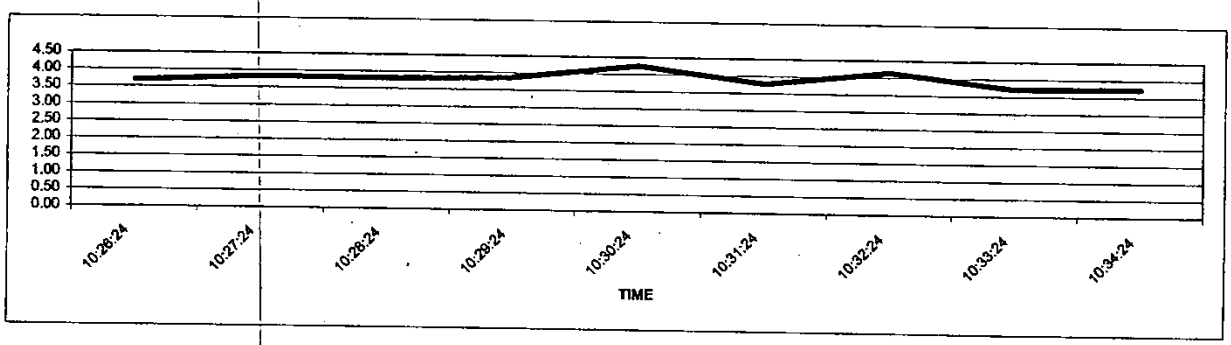
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.15	0.64	0.00	-0.15	0.64	0.00
BIAS HIGH	54.60	8.90	52.76	2.13	8.90	52.76	2.13	0.00

SULFUR DIOXIDE

TIME	SO2-PPM		
10:26:24	3.68	PT. 1 AVG	3.77
10:27:24	3.83		
10:28:24	3.80		
10:29:24	3.86	PT. 2 AVG	3.96
10:30:24	4.25		
10:31:24	3.77		
10:32:24	4.15	PT. 3 AVG	3.87
10:33:24	3.71		
10:34:24	3.74		
		AVG	3.87

POINTS	%-DEVIATION
1	2.47
2	2.46
3	0.01



ETS REFERENCE SOP-007

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000029

ETS.

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	STRATIFICATION CHECK	**SLOPE:**	11.1655
ANALYZER ID :	ETSNOX1B	**INTERCEPT:**	-0.2303
		CORRELATION:	0.99991
		SPAN RANGE:	111.4244

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	-0.39	0.35	-0.01	-0.39	0.00
ALM033653	LOW	47.80	4.37	48.56	0.69	4.37	48.56	0.00
ALM017982	HIGH	101.00	9.03	100.63	0.33	9.03	100.63	0.00

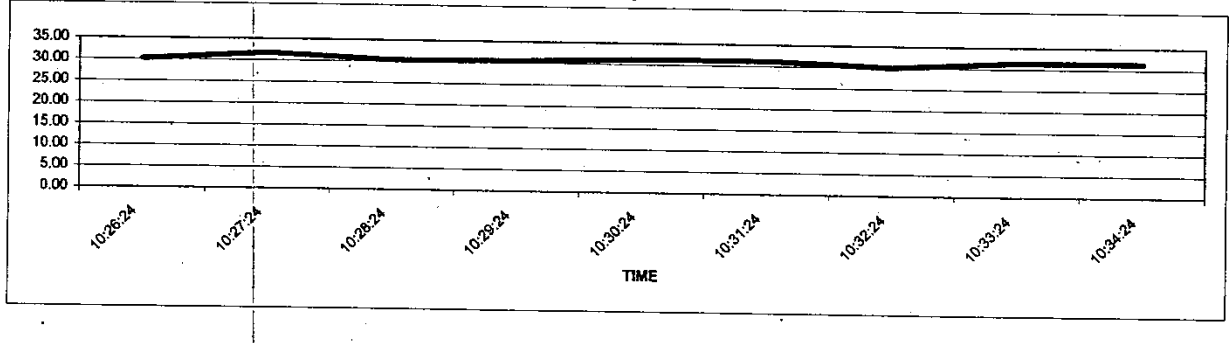
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.23	0.15	0.00	-0.23	0.15	0.00
BIAS HIGH	101.00	8.92	99.32	1.17	8.92	99.32	1.17	0.00

OXIDES OF NITROGEN

TIME	NOX-PPM		
10:26:24	30.15	PT. 1 AVG	30.75
10:27:24	31.80		
10:28:24	30.31		
10:29:24	30.53	PT. 2 AVG	30.99
10:30:24	31.20		
10:31:24	31.25		
10:32:24	30.09	PT. 3 AVG	30.96
10:33:24	31.42		
10:34:24	31.36		
		AVG	30.90

POINTS	%-DEVIATION
1	0.48
2	0.30
3	0.18



ETS REFERENCE SOP-007

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000030

ETS.

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	CARBON MONOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	STRATIFICATION CHECK	**SLOPE:**	9.9827
ANALYZER ID :	ETSCO1B	**INTERCEPT:**	-0.1124
		CORRELATION:	0.99993
		SPAN RANGE:	99.7151

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	-0.26	0.26	-0.01	-0.26	0.00
ALM031361	LOW	55.70	5.65	56.33	0.63	5.65	56.33	0.00
ALM002244	HIGH	95.80	9.57	95.43	0.38	9.57	95.43	0.00

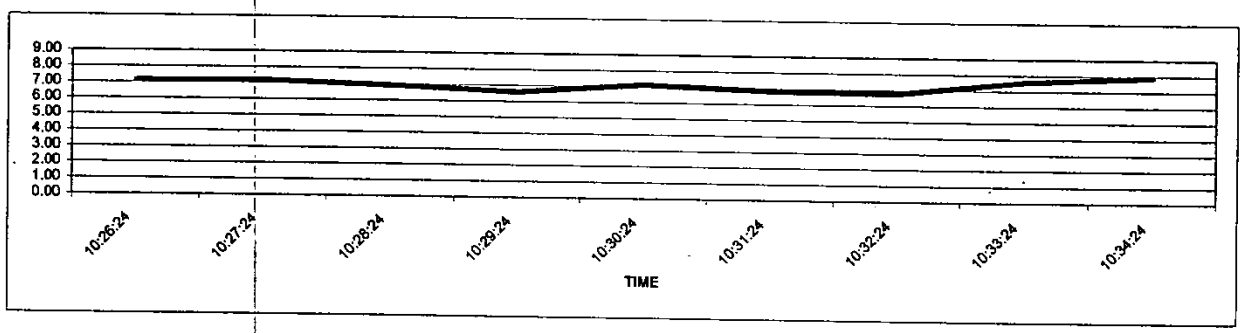
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.11	0.15	0.00	-0.11	0.15	0.00
BIAS HIGH	95.80	9.53	94.99	0.44	9.53	94.99	0.44	0.00

CARBON MONOXIDE

TIME	CO-PPM		
10:26:24	7.12	PT. 1 AVG	7.07
10:27:24	7.17		
10:28:24	6.92		
10:29:24	6.58	PT. 2 AVG	6.84
10:30:24	7.12		
10:31:24	6.83		
10:32:24	6.78	PT. 3 AVG	7.41
10:33:24	7.56		
10:34:24	7.91		
		AVG	7.11

POINTS	%-DEVIATION
1	0.54
2	3.76
3	4.30



ETS REFERENCE SOP-007

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000031

ETS.

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXYGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	1	**SLOPE:**	24.9754
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	-0.0072
		CORRELATION:	1.00000
		SPAN RANGE:	24.9682

CALIBRATION STATISTICS

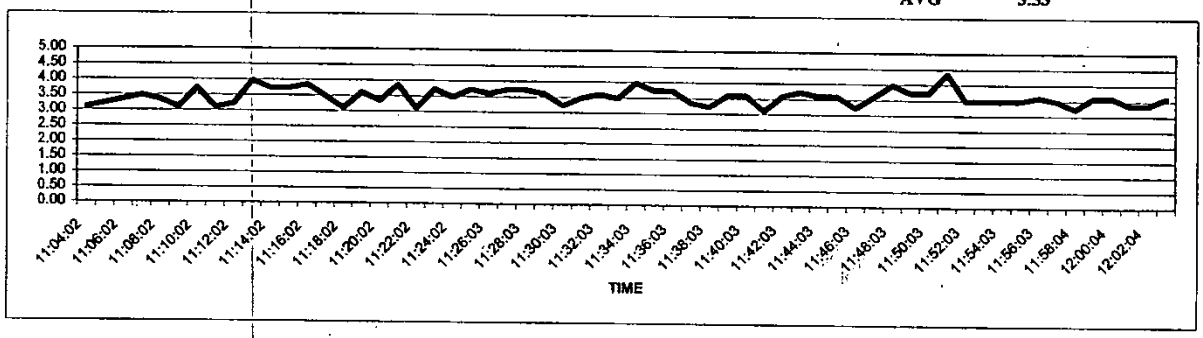
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	-0.01	0.03	0.00	-0.01	0.00
ALM019515	LOW	10.10	0.41	10.11	0.06	0.41	10.11	0.00
ALM051449	HIGH	20.00	0.80	19.99	0.03	0.80	19.99	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.11	0.49	0.00	0.11	0.49	0.00
BIAS HIGH	20.00	0.79	19.75	0.98	0.79	19.75	0.98	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
11:04:02	3.11	11:19:02	3.60	11:34:03	3.98	11:49:03	3.73
11:05:02	3.23	11:20:02	3.35	11:35:03	3.73	11:50:03	3.73
11:06:02	3.35	11:21:02	3.85	11:36:03	3.73	11:51:03	4.35
11:07:02	3.48	11:22:02	3.11	11:37:03	3.35	11:52:03	3.48
11:08:02	3.35	11:23:02	3.73	11:38:03	3.23	11:53:03	3.48
11:09:02	3.11	11:24:02	3.48	11:39:03	3.60	11:54:03	3.48
11:10:02	3.73	11:25:02	3.73	11:40:03	3.60	11:55:03	3.48
11:11:02	3.11	11:26:03	3.60	11:41:03	3.11	11:56:03	3.60
11:12:02	3.23	11:27:03	3.73	11:42:03	3.60	11:57:03	3.48
11:13:02	3.98	11:28:03	3.73	11:43:03	3.73	11:58:04	3.23
11:14:02	3.73	11:29:03	3.60	11:44:03	3.60	11:59:04	3.60
11:15:02	3.73	11:30:03	3.23	11:45:03	3.60	12:00:04	3.60
11:16:02	3.85	11:31:03	3.48	11:46:03	3.23	12:01:04	3.35
11:17:02	3.48	11:32:03	3.60	11:47:03	3.60	12:02:04	3.35
11:18:02	3.11	11:33:03	3.48	11:48:03	3.98	12:03:04	3.60
						AVG	**3.53**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000032

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	SULFUR DIOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	1	**SLOPE:**	5.9504
ANALYZER ID:	ETSSO2-1	**INTERCEPT:**	0.2211
		CORRELATION:	0.99995
		SPAN RANGE:	59.7249

CALIBRATION STATISTICS

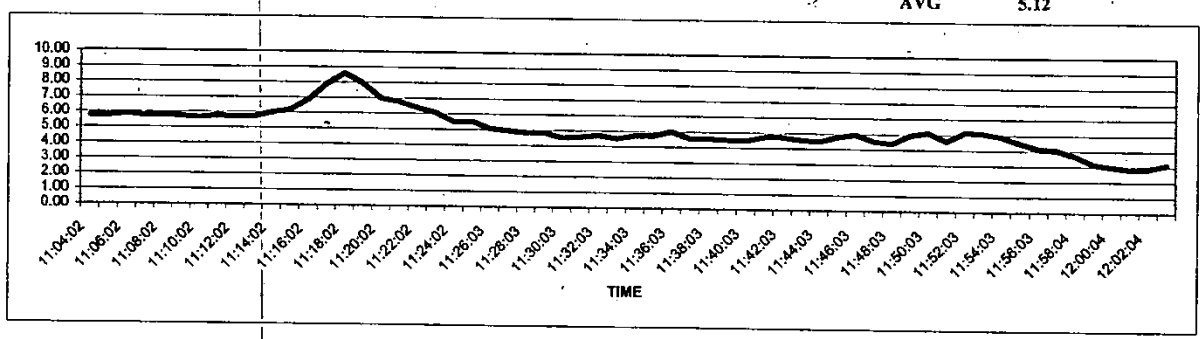
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.06	-0.16	0.26	-0.07	-0.21	0.10
ALM060848	LOW	26.90	4.54	27.21	0.53	4.56	27.33	0.19
ALM053681	HIGH	54.60	9.11	54.44	0.26	9.18	54.84	0.67

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.22	0.63	0.01	0.28	0.83	0.10
BIAS HIGH	54.60	8.96	53.54	1.52	9.02	53.91	1.57	0.62

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
11:04:02	5.73	11:19:02	7.95	11:34:03	4.72	11:49:03	4.92
11:05:02	5.73	11:20:02	6.97	11:35:03	4.72	11:50:03	5.13
11:06:02	5.87	11:21:02	6.76	11:36:03	5.01	11:51:03	4.57
11:07:02	5.75	11:22:02	6.38	11:37:03	4.57	11:52:03	5.16
11:08:02	5.78	11:23:02	6.08	11:38:03	4.57	11:53:03	5.10
11:09:02	5.73	11:24:02	5.49	11:39:03	4.51	11:54:03	4.89
11:10:02	5.67	11:25:02	5.52	11:40:03	4.48	11:55:03	4.48
11:11:02	5.75	11:26:03	5.07	11:41:03	4.72	11:56:03	4.12
11:12:02	5.70	11:27:03	4.95	11:42:03	4.72	11:57:03	4.03
11:13:02	5.70	11:28:03	4.84	11:43:03	4.57	11:58:04	3.68
11:14:02	5.99	11:29:03	4.86	11:44:03	4.48	11:59:04	3.14
11:15:02	6.17	11:30:03	4.54	11:45:03	4.78	12:00:04	2.97
11:16:02	6.88	11:31:03	4.60	11:46:03	4.95	12:01:04	2.85
11:17:02	7.89	11:32:03	4.72	11:47:03	4.54	12:02:04	2.88
11:18:02	8.57	11:33:03	4.51	11:48:03	4.39	12:03:04	3.11
						AVG	5.12



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000033

ETS.

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	1	**SLOPE:**	11.1655
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	-0.2303
		CORRELATION:	0.99991
		SPAN RANGE:	111.4244

CALIBRATION STATISTICS

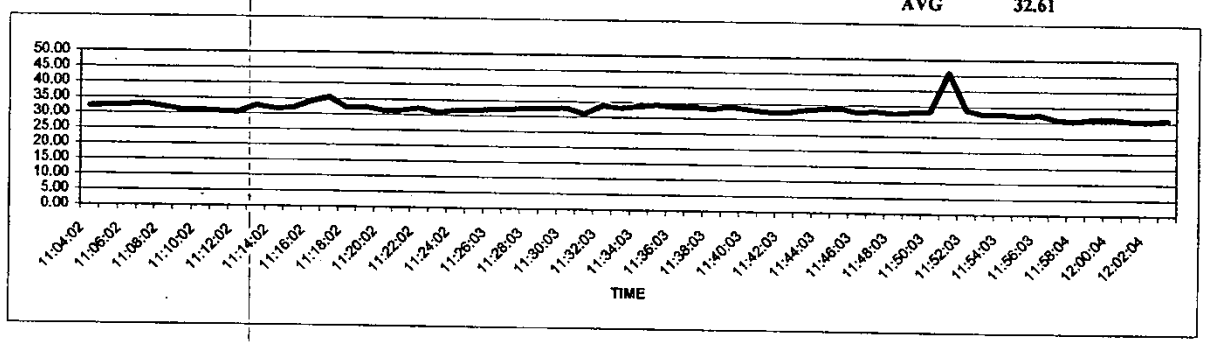
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	-0.39	0.35	-0.01	-0.39	0.00
ALM033653	LOW	47.80	4.37	48.56	0.69	4.38	48.62	0.05
ALM017982	HIGH	101.00	9.03	100.63	0.33	9.04	100.68	0.05

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.23	0.15	0.00	-0.23	0.15	0.00
BIAS HIGH	101.00	8.92	99.32	1.17	8.92	99.32	1.22	0.00

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
11:04:02	32.14	11:19:02	32.47	11:34:03	33.69	11:49:03	32.97
11:05:02	32.36	11:20:02	31.36	11:35:03	34.24	11:50:03	33.24
11:06:02	32.58	11:21:02	31.47	11:36:03	33.63	11:51:03	45.85
11:07:02	33.02	11:22:02	32.30	11:37:03	33.85	11:52:03	33.80
11:08:02	32.14	11:23:02	30.92	11:38:03	33.19	11:53:03	32.36
11:09:02	31.03	11:24:02	31.64	11:39:03	34.02	11:54:03	32.58
11:10:02	31.09	11:25:02	31.75	11:40:03	33.24	11:55:03	31.97
11:11:02	30.81	11:26:03	32.14	11:41:03	32.52	11:56:03	32.41
11:12:02	30.48	11:27:03	32.30	11:42:03	32.19	11:57:03	30.75
11:13:02	32.80	11:28:03	32.63	11:43:03	33.13	11:58:04	30.42
11:14:02	31.75	11:29:03	32.69	11:44:03	33.57	11:59:04	31.25
11:15:02	31.86	11:30:03	32.91	11:45:03	33.96	12:00:04	31.25
11:16:02	34.18	11:31:03	31.09	11:46:03	32.63	12:01:04	30.53
11:17:02	35.57	11:32:03	33.80	11:47:03	33.13	12:02:04	30.37
11:18:02	32.14	11:33:03	33.19	11:48:03	32.47	12:03:04	30.92
						AVG	**32.61**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000034

ETS.

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	CARBON MONOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	1	**SLOPE:**	9.9827
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.1124
		CORRELATION:	0.99993
		SPAN RANGE:	99.7151

CALIBRATION STATISTICS

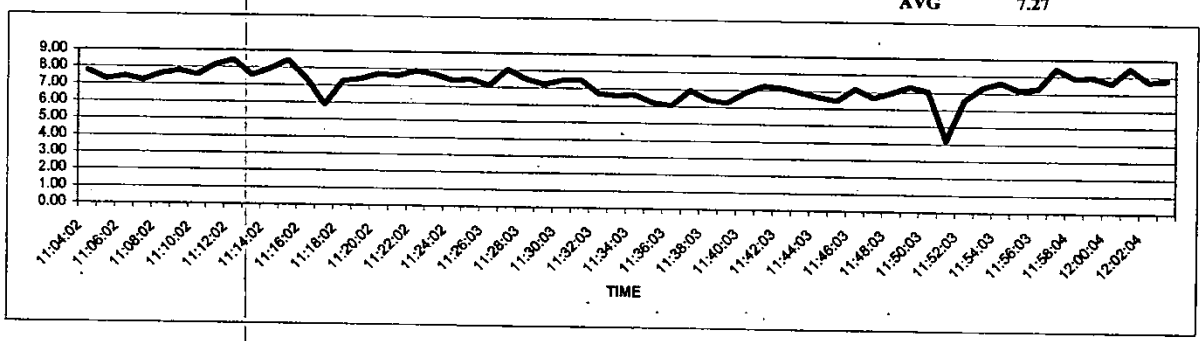
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	-0.26	0.26	-0.06	-0.70	0.44
ALM031361	LOW	55.70	5.65	56.33	0.63	5.53	55.11	1.22
ALM002244	HIGH	95.80	9.57	95.43	0.38	9.39	93.59	1.85

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.11	0.15	-0.06	-0.70	0.00	0.59
BIAS HIGH	95.80	9.53	94.99	0.44	9.35	93.18	0.40	1.81

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
11:04:02	7.76	11:19:02	7.41	11:34:03	6.67	11:49:03	7.31
11:05:02	7.26	11:20:02	7.71	11:35:03	6.23	11:50:03	7.07
11:06:02	7.46	11:21:02	7.61	11:36:03	6.08	11:51:03	4.20
11:07:02	7.22	11:22:02	7.91	11:37:03	6.97	11:52:03	6.57
11:08:02	7.61	11:23:02	7.71	11:38:03	6.42	11:53:03	7.31
11:09:02	7.81	11:24:02	7.36	11:39:03	6.28	11:54:03	7.61
11:10:02	7.56	11:25:02	7.46	11:40:03	6.87	11:55:03	7.17
11:11:02	8.15	11:26:03	7.12	11:41:03	7.26	11:56:03	7.26
11:12:02	8.45	11:27:03	8.06	11:42:03	7.17	11:57:03	8.45
11:13:02	7.56	11:28:03	7.51	11:43:03	6.92	11:58:04	7.91
11:14:02	7.96	11:29:03	7.22	11:44:03	6.67	11:59:04	7.96
11:15:02	8.45	11:30:03	7.46	11:45:03	6.47	12:00:04	7.61
11:16:02	7.41	11:31:03	7.51	11:46:03	7.17	12:01:04	8.50
11:17:02	5.88	11:32:03	6.72	11:47:03	6.67	12:02:04	7.71
11:18:02	7.26	11:33:03	6.62	11:48:03	6.97	12:03:04	7.81
						AVG	**7.27**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000035

ETS.

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXYGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	2	**SLOPE:**	24.9754
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	-0.0072
		CORRELATION:	1.00000
		SPAN RANGE:	24.9682

CALIBRATION STATISTICS

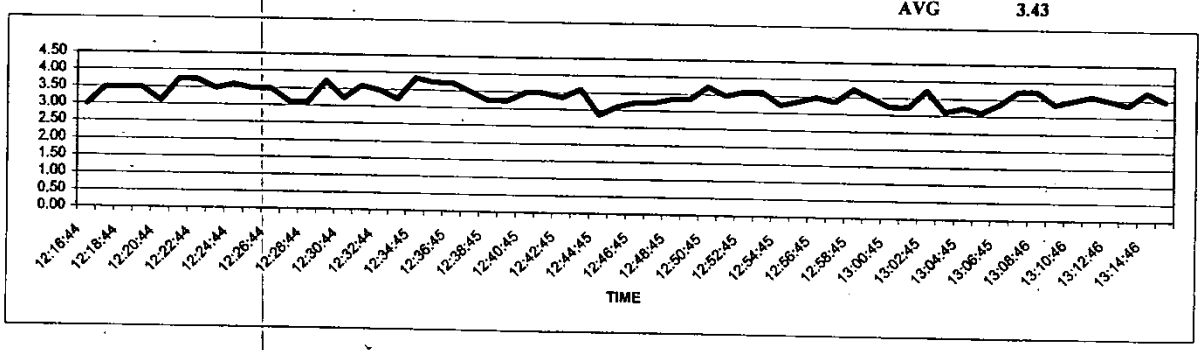
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	-0.01	0.03	0.00	-0.01	0.00
ALM019515	LOW	10.10	0.41	10.11	0.06	0.41	10.11	0.00
ALM051449	HIGH	20.00	0.80	19.99	0.03	0.80	19.99	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.11	0.49	0.00	0.11	0.49	0.00
BIAS HIGH	20.00	0.79	19.75	0.98	0.79	19.75	0.98	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
12:16:44	2.98	12:31:44	3.60	12:46:45	3.23	13:01:45	3.23
12:17:44	3.48	12:32:44	3.48	12:47:45	3.23	13:02:45	3.73
12:18:44	3.48	12:33:44	3.23	12:48:45	3.35	13:03:45	3.11
12:19:44	3.48	12:34:45	3.85	12:49:45	3.35	13:04:45	3.23
12:20:44	3.11	12:35:45	3.73	12:50:45	3.73	13:05:45	3.11
12:21:44	3.73	12:36:45	3.73	12:51:45	3.48	13:06:45	3.35
12:22:44	3.73	12:37:45	3.48	12:52:45	3.60	13:07:46	3.73
12:23:44	3.48	12:38:45	3.23	12:53:45	3.60	13:08:46	3.73
12:24:44	3.60	12:39:45	3.23	12:54:45	3.23	13:09:46	3.35
12:25:44	3.48	12:40:45	3.48	12:55:45	3.35	13:10:46	3.48
12:26:44	3.48	12:41:45	3.48	12:56:45	3.48	13:11:46	3.60
12:27:44	3.11	12:42:45	3.35	12:57:45	3.35	13:12:46	3.48
12:28:44	3.11	12:43:45	3.60	12:58:45	3.73	13:13:46	3.35
12:29:44	3.73	12:44:45	2.86	12:59:45	3.48	13:14:46	3.73
12:30:44	3.23	12:45:45	3.11	13:00:45	3.23	13:15:46	3.48
						AVG	**3.43**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000036

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	SULFUR DIOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	2	**SLOPE:**	5.9008
ANALYZER ID:	ETSSO2-1	**INTERCEPT:**	0.2941
		CORRELATION:	0.99996
		SPAN RANGE:	59.3023

CALIBRATION STATISTICS

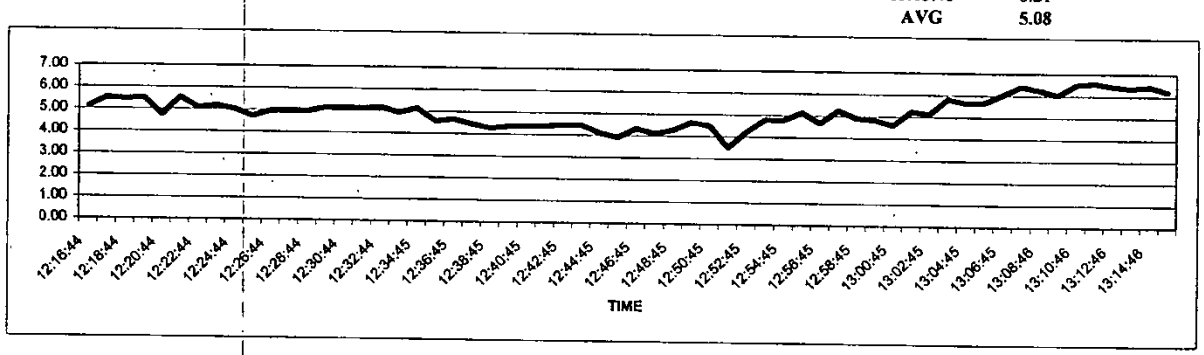
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.07	-0.14	0.23	0.05	0.58	1.21
ALM060848	LOW	26.90	4.56	27.18	0.47	4.64	27.68	0.85
ALM053681	HIGH	54.60	9.18	54.46	0.23	9.19	54.55	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.01	0.35	0.83	0.10	0.90	0.54	0.93
BIAS HIGH	54.60	9.02	53.53	1.57	9.08	53.89	1.12	0.60

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
12:16:44	5.11	12:31:44	5.11	12:46:45	4.34	13:01:45	5.23
12:17:44	5.52	12:32:44	5.17	12:47:45	4.10	13:02:45	5.14
12:18:44	5.46	12:33:44	4.93	12:48:45	4.28	13:03:45	5.82
12:19:44	5.52	12:34:45	5.14	12:49:45	4.64	13:04:45	5.64
12:20:44	4.75	12:35:45	4.58	12:50:45	4.49	13:05:45	5.67
12:21:44	5.55	12:36:45	4.66	12:51:45	3.51	13:06:45	6.03
12:22:44	5.08	12:37:45	4.46	12:52:45	4.22	13:07:46	6.41
12:23:44	5.18	12:38:45	4.28	12:53:45	4.78	13:08:46	6.24
12:24:44	5.02	12:39:45	4.37	12:54:45	4.78	13:09:46	6.02
12:25:44	4.72	12:40:45	4.37	12:55:45	5.14	13:10:46	6.51
12:26:44	4.96	12:41:45	4.40	12:56:45	4.66	13:11:46	6.59
12:27:44	4.96	12:42:45	4.46	12:57:45	5.26	13:12:46	6.44
12:28:44	4.96	12:43:45	4.46	12:58:45	4.90	13:13:46	6.35
12:29:44	5.14	12:44:45	4.10	12:59:45	4.84	13:14:46	6.44
12:30:44	5.14	12:45:45	3.92	13:00:45	4.61	13:15:46	6.21
						AVG	**5.08**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000037

ETS.

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	2	**SLOPE:**	11.1595
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	-0.2398
		CORRELATION:	0.99991
		SPAN RANGE:	111.3548

CALIBRATION STATISTICS

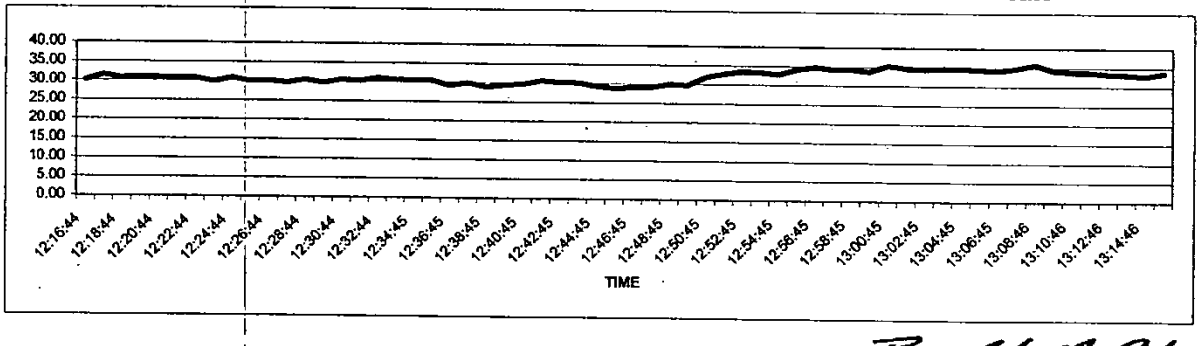
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	-0.40	0.36	-0.03	-0.57	0.15
ALM033653	LOW	47.80	4.38	48.58	0.70	4.40	48.91	0.29
ALM017982	HIGH	101.00	9.04	100.62	0.34	9.09	101.22	0.54

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	-0.24	0.15	-0.01	-0.40	0.15	0.15
BIAS HIGH	101.00	8.92	99.26	1.22	8.97	99.82	1.26	0.50

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
12:16:44	30.06	12:31:44	30.23	12:46:45	29.07	13:01:45	34.64
12:17:44	31.44	12:32:44	31.11	12:47:45	29.07	13:02:45	34.47
12:18:44	30.67	12:33:44	30.61	12:48:45	30.01	13:03:45	34.69
12:19:44	31.00	12:34:45	30.45	12:49:45	29.68	13:04:45	34.64
12:20:44	30.89	12:35:45	30.56	12:50:45	31.94	13:05:45	34.47
12:21:44	30.67	12:36:45	29.18	12:51:45	32.87	13:06:45	34.20
12:22:44	30.78	12:37:45	29.95	12:52:45	33.54	13:07:46	34.80
12:23:44	29.90	12:38:45	28.85	12:53:45	33.37	13:08:46	35.74
12:24:44	30.84	12:39:45	29.40	12:54:45	32.87	13:09:46	34.25
12:25:44	30.01	12:40:45	29.68	12:55:45	34.14	13:10:46	33.92
12:26:44	30.17	12:41:45	30.61	12:56:45	34.80	13:11:46	33.87
12:27:44	29.73	12:42:45	30.23	12:57:45	34.31	13:12:46	33.48
12:28:44	30.50	12:43:45	30.17	12:58:45	34.31	13:13:46	33.26
12:29:44	29.73	12:44:45	29.35	12:59:45	33.76	13:14:46	32.93
12:30:44	30.56	12:45:45	28.80	13:00:45	35.35	13:15:46	33.76
						AVG	**31.81**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000038

ETS.

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	CARBON MONOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	2	**SLOPE:**	10.1305
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	0.3219
		CORRELATION:	0.99993
		SPAN RANGE:	101.6265

CALIBRATION STATISTICS

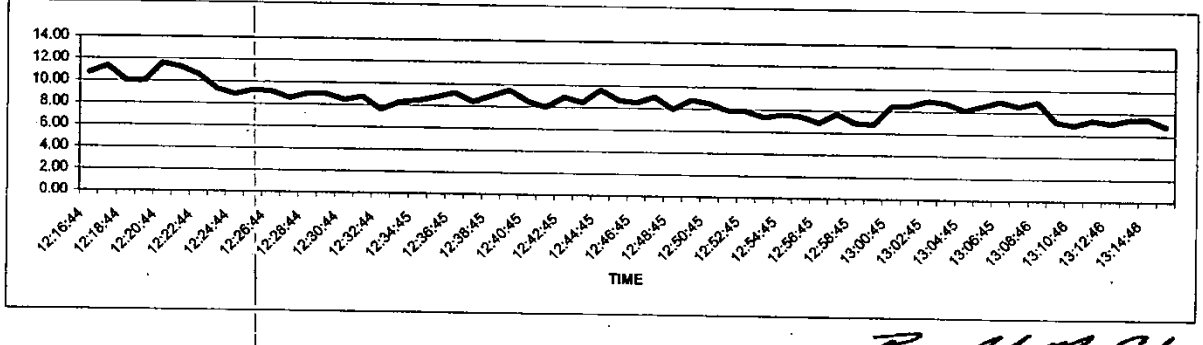
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.06	-0.27	0.27	-0.06	-0.27	0.00
ALM031361	LOW	55.70	5.53	56.37	0.66	5.51	56.17	0.19
ALM002244	HIGH	95.80	9.39	95.41	0.39	9.34	94.95	0.45

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	-0.06	-0.27	0.00	-0.04	-0.12	0.15	0.15
BIAS HIGH	95.80	9.35	95.00	0.40	9.32	94.75	0.19	0.24

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
12:16:44	10.69	12:31:44	8.75	12:46:45	8.50	13:01:45	8.50
12:17:44	11.34	12:32:44	7.60	12:47:45	9.05	13:02:45	9.00
12:18:44	10.04	12:33:44	8.30	12:48:45	7.95	13:03:45	8.80
12:19:44	9.99	12:34:45	8.45	12:49:45	8.80	13:04:45	8.15
12:20:44	11.64	12:35:45	8.80	12:50:45	8.50	13:05:45	8.55
12:21:44	11.29	12:36:45	9.20	12:51:45	7.90	13:06:45	9.00
12:22:44	10.59	12:37:45	8.40	12:52:45	7.85	13:07:46	8.55
12:23:44	9.35	12:38:45	8.95	12:53:45	7.30	13:08:46	8.95
12:24:44	8.85	12:39:45	9.50	12:54:45	7.60	13:09:46	7.20
12:25:44	9.25	12:40:45	8.50	12:55:45	7.45	13:10:46	6.90
12:26:44	9.15	12:41:45	8.00	12:56:45	6.90	13:11:46	7.35
12:27:44	8.55	12:42:45	8.90	12:57:45	7.70	13:12:46	7.10
12:28:44	9.00	12:43:45	8.45	12:58:45	6.90	13:13:46	7.45
12:29:44	8.95	12:44:45	9.59	12:59:45	6.80	13:14:46	7.50
12:30:44	8.45	12:45:45	8.70	13:00:45	8.45	13:15:46	6.85
						AVG	**8.58**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000039

ETS.

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXYGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	3	**SLOPE:**	24.9754
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	-0.0072
		CORRELATION:	1.00000
		SPAN RANGE:	24.9682

CALIBRATION STATISTICS

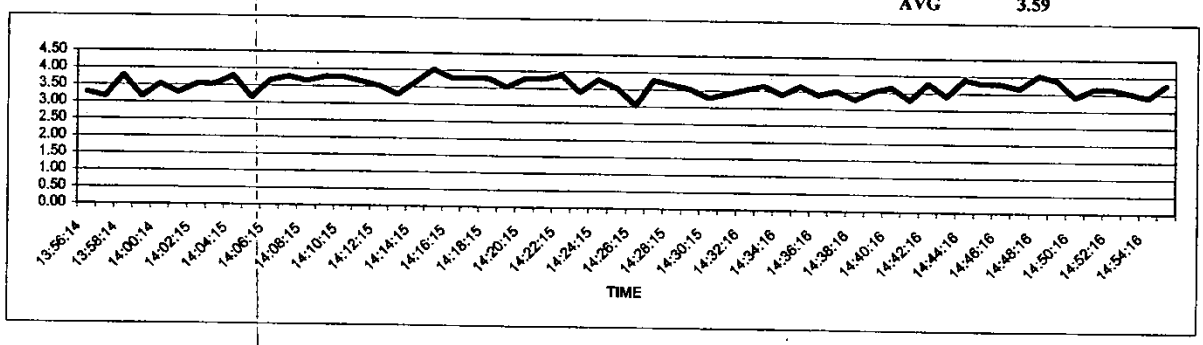
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	-0.01	0.03	0.00	-0.01	0.00
ALM019515	LOW	10.10	0.41	10.11	0.06	0.41	10.24	0.49
ALM051449	HIGH	20.00	0.80	19.99	0.03	0.80	19.99	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.11	0.49	0.00	-0.01	0.00	0.49
BIAS HIGH	20.00	0.79	19.75	0.98	0.79	19.75	0.98	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
13:56:14	3.28	14:11:15	3.65	14:26:15	3.03	14:41:16	3.28
13:57:14	3.16	14:12:15	3.53	14:27:15	3.78	14:42:16	3.78
13:58:14	3.78	14:13:15	3.28	14:28:15	3.65	14:43:16	3.41
13:59:14	3.16	14:14:15	3.65	14:29:15	3.53	14:44:16	3.90
14:00:14	3.53	14:15:15	4.02	14:30:15	3.28	14:45:16	3.78
14:01:15	3.28	14:16:15	3.78	14:31:16	3.41	14:46:16	3.78
14:02:15	3.53	14:17:15	3.78	14:32:16	3.53	14:47:16	3.65
14:03:15	3.53	14:18:15	3.78	14:33:16	3.65	14:48:16	4.02
14:04:15	3.78	14:19:15	3.53	14:34:16	3.41	14:49:16	3.90
14:05:15	3.16	14:20:15	3.78	14:35:16	3.65	14:50:16	3.41
14:06:15	3.65	14:21:15	3.78	14:36:16	3.41	14:51:16	3.65
14:07:15	3.78	14:22:15	3.90	14:37:16	3.53	14:52:16	3.65
14:08:15	3.65	14:23:15	3.41	14:38:16	3.28	14:53:16	3.53
14:09:15	3.78	14:24:15	3.78	14:39:16	3.53	14:54:16	3.41
14:10:15	3.78	14:25:15	3.53	14:40:16	3.65	14:55:16	3.78
						AVG	3.59



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000040

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	SULFUR DIOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	3	**SLOPE:**	5.9700
ANALYZER ID:	ETSSO2-1	**INTERCEPT:**	-0.4632
		CORRELATION:	0.99994
		SPAN RANGE:	59.2367

CALIBRATION STATISTICS

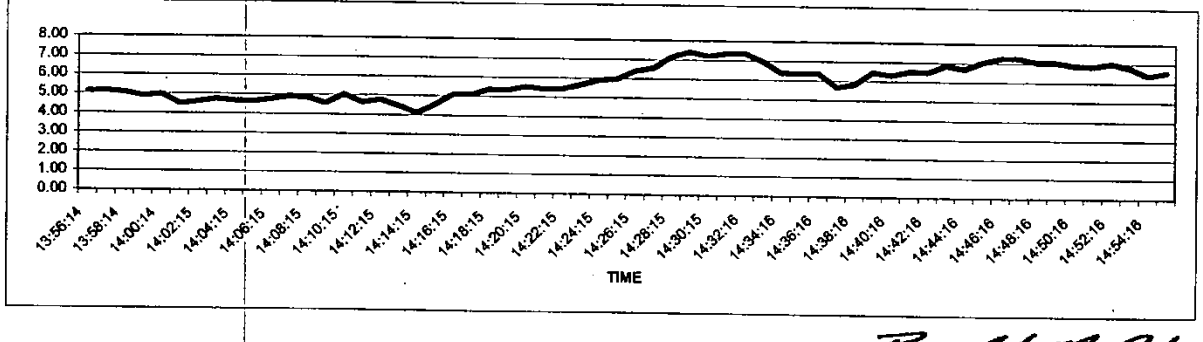
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.05	-0.17	0.29	0.07	-0.06	0.20
ALM060848	LOW	26.90	4.64	27.24	0.58	4.68	27.48	0.40
ALM053681	HIGH	54.60	9.19	54.43	0.29	9.22	54.60	0.30

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.10	0.15	0.55	0.11	0.18	0.39	0.04
BIAS HIGH	54.60	9.08	53.76	1.13	9.11	53.94	1.12	0.30

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
13:56:14	5.11	14:11:15	4.64	14:26:15	6.42	14:41:16	6.54
13:57:14	5.14	14:12:15	4.79	14:27:15	6.57	14:42:16	6.51
13:58:14	5.05	14:13:15	4.46	14:28:15	7.16	14:43:16	6.86
13:59:14	4.88	14:14:15	4.10	14:29:15	7.42	14:44:16	6.68
14:00:14	4.96	14:15:15	4.58	14:30:15	7.22	14:45:16	7.04
14:01:15	4.49	14:16:15	5.08	14:31:16	7.37	14:46:16	7.25
14:02:15	4.61	14:17:15	5.08	14:32:16	7.40	14:47:16	7.25
14:03:15	4.76	14:18:15	5.38	14:33:16	6.95	14:48:16	7.04
14:04:15	4.67	14:19:15	5.35	14:34:16	6.39	14:49:16	7.04
14:05:15	4.64	14:20:15	5.53	14:35:16	6.39	14:50:16	6.89
14:06:15	4.76	14:21:15	5.41	14:36:16	6.39	14:51:16	6.86
14:07:15	4.90	14:22:15	5.44	14:37:16	5.68	14:52:16	7.01
14:08:15	4.85	14:23:15	5.65	14:38:16	5.82	14:53:16	6.80
14:09:15	4.58	14:24:15	5.91	14:39:16	6.48	14:54:16	6.39
14:10:15	5.02	14:25:15	5.97	14:40:16	6.33	14:55:16	6.57
						AVG	**5.87**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000041

ETS.

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	3	**SLOPE:**	11.0756
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	-0.1184
		CORRELATION:	0.99989
		SPAN RANGE:	110.6374

CALIBRATION STATISTICS

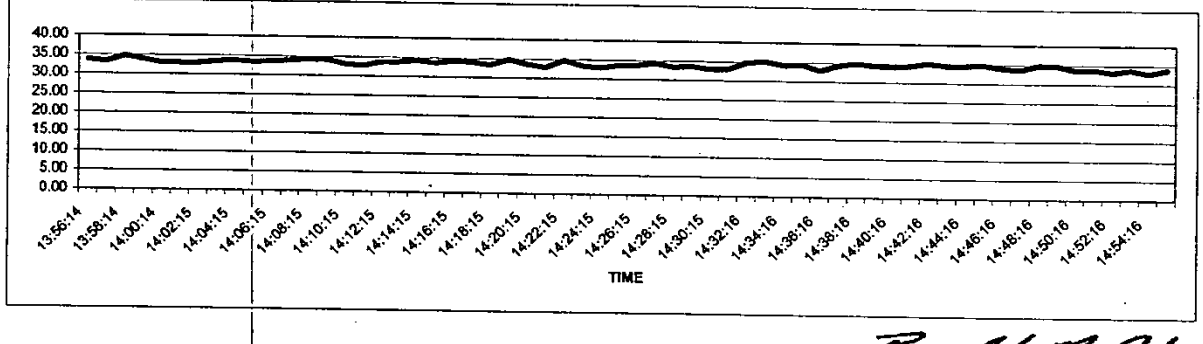
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.03	-0.44	0.40	0.01	0.03	0.43
ALM033653	LOW	47.80	4.40	48.66	0.78	4.41	48.77	0.10
ALM017982	HIGH	101.00	9.09	100.58	0.38	9.08	100.42	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	-0.01	-0.28	0.15	0.02	0.09	0.05	0.33
BIAS HIGH	101.00	8.97	99.19	1.26	8.97	99.19	1.11	0.00

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
13:56:14	33.76	14:11:15	32.77	14:26:15	33.76	14:41:16	34.47
13:57:14	33.26	14:12:15	33.76	14:27:15	34.25	14:42:16	35.13
13:58:14	34.75	14:13:15	33.81	14:28:15	33.43	14:43:16	34.53
13:59:14	33.87	14:14:15	34.25	14:29:15	33.70	14:44:16	34.58
14:00:14	32.99	14:15:15	33.65	14:30:15	32.93	14:45:16	34.80
14:01:15	32.99	14:16:15	34.25	14:31:16	33.04	14:46:16	34.03
14:02:15	33.10	14:17:15	34.03	14:32:16	34.80	14:47:16	33.65
14:03:15	33.54	14:18:15	33.37	14:33:16	35.13	14:48:16	34.91
14:04:15	33.81	14:19:15	34.80	14:34:16	34.20	14:49:16	34.75
14:05:15	33.43	14:20:15	33.65	14:35:16	34.47	14:50:16	33.65
14:06:15	33.65	14:21:15	32.93	14:36:16	32.93	14:51:16	33.81
14:07:15	33.87	14:22:15	34.75	14:37:16	34.25	14:52:16	33.15
14:08:15	34.25	14:23:15	33.48	14:38:16	34.91	14:53:16	33.81
14:09:15	34.20	14:24:15	32.99	14:39:16	34.36	14:54:16	32.93
14:10:15	33.15	14:25:15	33.65	14:40:16	34.14	14:55:16	33.92
						AVG	**33.89**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000042

ETS.

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON McCABE
SOURCE:	BOILER #10	**PARAMETER:**	CARBON MONOXIDE
DATE:	9/18/2008	**LOAD %:**	PERCENT LOAD
RUN # :	3	**SLOPE:**	10.1780
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	0.3056
		CORRELATION:	0.99992
		SPAN RANGE:	102.0860

CALIBRATION STATISTICS

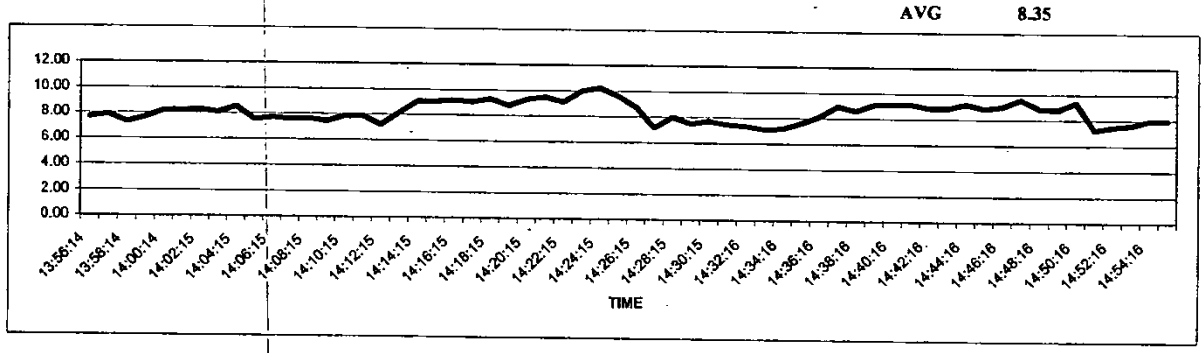
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.06	-0.29	0.28	-0.06	-0.29	0.00
ALM031361	LOW	55.70	5.51	56.41	0.70	5.51	56.41	0.00
ALM002244	HIGH	95.80	9.34	95.38	0.41	9.33	95.28	0.10

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	-0.04	-0.14	0.15	-0.05	-0.24	0.05	0.10
BIAS HIGH	95.80	9.32	95.18	0.19	9.30	94.96	0.31	0.21

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
13:56:14	7.65	14:11:15	7.90	14:26:15	8.75	14:41:16	9.15
13:57:14	7.90	14:12:15	7.20	14:27:15	7.15	14:42:16	8.85
13:58:14	7.30	14:13:15	8.15	14:28:15	8.00	14:43:16	8.85
13:59:14	7.65	14:14:15	9.05	14:29:15	7.50	14:44:16	9.20
14:00:14	8.20	14:15:15	9.05	14:30:15	7.70	14:45:16	8.85
14:01:15	8.20	14:16:15	9.20	14:31:16	7.45	14:46:16	9.00
14:02:15	8.30	14:17:15	9.05	14:32:16	7.35	14:47:16	9.55
14:03:15	8.10	14:18:15	9.30	14:33:16	7.10	14:48:16	8.85
14:04:15	8.55	14:19:15	8.80	14:34:16	7.15	14:49:16	8.80
14:05:15	7.55	14:20:15	9.30	14:35:16	7.60	14:50:16	9.35
14:06:15	7.70	14:21:15	9.50	14:36:16	8.15	14:51:16	7.20
14:07:15	7.60	14:22:15	9.10	14:37:16	8.95	14:52:16	7.45
14:08:15	7.65	14:23:15	10.00	14:38:16	8.60	14:53:16	7.60
14:09:15	7.45	14:24:15	10.25	14:39:16	9.10	14:54:16	7.95
14:10:15	7.85	14:25:15	9.60	14:40:16	9.15	14:55:16	7.95
						AVG	**8.35**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000043

Boiler 10
Unit Operating Data

During the emission tests, Chalmette Refining recorded operating data for the boiler. These data are presented on the following pages.

CRLLC-CHAL-000044

Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS:BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
RATA 1									
9/18/2008 11:04	225.6102371	22.51795244	11.08678293	2.640577197	1.579354286	1.127972126	4.070499221	1147.399951	3.49441901
9/18/2008 11:05	224.3271255	22.1827774	10.99992085	2.636573911	1.569931626	1.121363044	4.05890154	1153.305933	3.550782704
9/18/2008 11:06	224.652153	22.33478642	11.211411	2.652058005	1.570932448	1.122118354	4.068119891	1154.993311	3.46609664
9/18/2008 11:07	224.6916351	22.53085613	11.28316641	2.67131865	1.572461993	1.123251319	4.056262565	1153.755835	3.575525228
9/18/2008 11:08	223.633503	22.42227745	11.10818338	2.693751693	1.565343052	1.118266165	4.077877998	1146.331177	3.711802125
9/18/2008 11:09	225.4810867	22.70741177	10.93949485	2.720036864	1.578372359	1.127405554	4.087078142	1140.25647	3.697026753
9/18/2008 11:10	222.7250099	22.16641235	11.02761602	2.759389102	1.559621423	1.114262879	4.082096577	1139.131519	3.550607387
9/18/2008 11:11	221.3405304	21.94201946	11.09433627	2.760824203	1.552502453	1.110939443	4.104059951	1135.644189	3.655157598
9/18/2008 11:12	221.2801552	21.81109619	10.86710978	2.755385876	1.549500108	1.110033095	4.102356482	1138.431641	3.504702004
9/18/2008 11:13	221.5401955	21.75570583	11.04398108	2.749947548	1.550878584	1.108182549	4.065383077	1140.875146	3.350736968
9/18/2008 11:14	220.5016022	21.7799387	10.83626699	2.732650697	1.543098748	1.102234393	4.107299153	1139.46897	3.590405973
9/18/2008 11:15	221.3566895	22.15036154	10.56466627	2.658553779	1.546611011	1.104745805	4.120582136	1137.781567	3.801401591
9/18/2008 11:16	221.5786858	22.17302227	10.38559198	2.653115392	1.550500929	1.107521683	4.085431671	1137.444116	3.620658326
9/18/2008 11:17	221.2074776	21.89040565	10.3412168	2.636498272	1.548385948	1.106105387	4.054738744	1146.724927	3.612551284
9/18/2008 11:18	224.4222107	22.67468166	10.83752632	2.65251112	1.570932388	1.12170288	4.031576729	1158.536938	3.716364574
9/18/2008 11:19	224.678627	22.53368855	10.54295087	2.627812028	1.572631896	1.120305598	4.080777645	1155.105859	3.66565121
9/18/2008 11:20	223.4158821	22.24162912	10.80857205	2.654474854	1.563832343	1.116642207	4.086250703	1145.375024	3.498139246
9/18/2008 11:21	223.3444023	22.11448336	10.73681664	2.682044268	1.563416958	1.116717696	4.082791861	1141.156445	3.506527074
9/18/2008 11:22	220.4913635	21.69402122	11.23595905	2.664294243	1.543551952	1.102517605	4.125945807	1135.925391	3.544816478
9/18/2008 11:23	221.8338928	21.93572426	10.84948611	2.692618787	1.552880198	1.108777314	4.116648682	1132.213062	3.702782464
9/18/2008 11:24	221.9904823	22.08175325	10.64177227	2.688313365	1.553824365	1.108144701	4.099269462	1126.925757	3.537025285
9/18/2008 11:25	221.0272141	21.81801939	10.8394146	2.68264842	1.547064185	1.105652273	4.129943283	1128.219482	3.467430345
9/18/2008 11:26	221.2734528	21.94894266	10.82116079	2.703570962	1.548876911	1.103159606	4.128325486	1130.019434	3.783292079
9/18/2008 11:27	220.4457092	21.84382725	10.72108126	2.680458188	1.542636096	1.10134691	4.138095212	1131.144336	3.717908716
9/18/2008 11:28	220.996994	22.03989553	10.44916487	2.653387249	1.545024812	1.10361284	4.132189949	1133.787964	3.784380023
9/18/2008 11:29	220.9497871	21.97223186	10.40195704	2.652420402	1.549179077	1.106558621	4.115609956	1129.400684	3.538147881
9/18/2008 11:30	221.6460484	21.90897274	10.65498972	2.655804276	1.553333342	1.109504402	4.144125168	1130.975659	3.642979368
9/18/2008 11:31	222.2194824	22.10189486	10.83060265	2.659188151	1.555759817	1.111213297	4.113145105	1129.175708	3.679970272
9/18/2008 11:32	221.1081619	21.77836514	10.41076946	2.662572026	1.547819436	1.105501115	4.089558578	1131.313086	3.479538409
9/18/2008 11:33	220.3387337	21.75255919	10.62792444	2.669913709	1.542494386	1.101648957	4.099300369	1124.844653	3.677583694

6.2.29

Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS:BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
9/18/2008 11:34	222.5512085	22.21959972	10.70471573	2.695111334	1.557940841	1.11263898	4.098847993	1126.13833	3.610901705
9/18/2008 11:35	221.5067978	22.00055599	10.69842196	2.688917756	1.55050087	1.107464999	4.141688538	1125.23833	3.820669015
9/18/2008 11:36	222.6988678	22.38010645	11.04838753	2.676832557	1.558998287	1.113507628	4.142440812	1125.013379	3.734965261
9/18/2008 11:37	220.0404129	21.74185896	10.73052263	2.664747357	1.540379584	1.100251675	4.145985333	1123.438452	6.821777137
9/18/2008 11:38	219.7440987	21.6531086	10.38873935	2.660668671	1.538226902	1.098665476	4.168772864	1122.875952	12.90632772
9/18/2008 11:39	223.4824409	22.31653309	40.52734423	2.69465822	1.564361095	1.117359787	4.138736049	1121.526001	0.021203166
9/18/2008 11:40	222.9770279	22.12266636	220.0831146	2.683630407	1.560811043	1.11486721	4.147239192	1120.569824	0.005655748
9/18/2008 11:41	222.0659256	22.05279875	250.0014191	2.703419805	1.554428548	1.110335261	4.18287015	1122.651025	0.010709536
9/18/2008 11:42	223.121727	22.31653166	250.0014191	2.723058224	1.561830759	1.115584731	4.163878322	1121.2448	0.781973761
9/18/2008 11:43	221.5770798	21.92376471	250.0014191	2.706063509	1.550972909	1.107937068	4.141860437	1116.576196	3.394045234
9/18/2008 11:44	222.3863449	22.11070728	220.1322098	2.712483764	1.556732237	1.111996949	4.172782024	1121.07605	3.574332094
9/18/2008 11:45	222.9749603	22.24540615	40.8974514	2.718601882	1.560943276	1.114923835	4.1563567	1121.919775	3.647576809
9/18/2008 11:46	220.0799408	21.58009338	10.93949485	2.696621954	1.540606111	1.100364923	4.157396714	1114.94502	3.820002278
9/18/2008 11:47	220.7326584	21.96341991	11.00621533	2.693751693	1.545685649	1.10404712	4.162531447	1121.469751	3.659228587
9/18/2008 11:48	219.7836914	21.58135223	10.58449411	2.694960237	1.541625798	1.101120234	4.15353953	1120.063599	3.605988336
9/18/2008 11:49	220.1106873	21.87278128	10.78339553	2.704930425	1.541267008	1.100836992	4.190551408	1107.407886	3.817510494
9/18/2008 11:50	224.2530022	22.70048857	10.61974239	2.754479527	1.569553912	1.121098638	4.193868343	1106.45166	3.850500488
9/18/2008 11:51	222.2832451	22.16106129	10.4113996	2.734841228	1.554919541	1.110637367	4.177455751	1113.482666	3.593389002
9/18/2008 11:52	220.0078278	21.61156511	10.48819065	2.713843346	1.539945155	1.099949509	4.186106205	1123.382227	3.86127491
9/18/2008 11:53	223.5198212	22.22904158	10.82556748	2.747681737	1.564587682	1.117699683	4.181849424	1114.438843	4.23820312
9/18/2008 11:54	222.2953033	21.76137066	10.68835044	2.71278584	1.55650568	1.11188364	4.180216352	1110.107813	3.539271442
9/18/2008 11:55	223.0547791	22.0622406	11.00306821	2.719130397	1.564134419	1.117284238	4.184936841	1110.670264	3.515301061
9/18/2008 11:56	224.1343536	22.20701122	10.90487647	2.723662376	1.56930846	1.120947599	4.158031782	1111.45769	3.552923695
9/18/2008 11:57	220.8968658	21.66003132	11.00243855	2.683177233	1.546308815	1.104557008	4.156768767	1112.920142	3.790978138
9/18/2008 11:58	224.131073	22.48396254	11.02446842	2.748210549	1.568855256	1.12130633	4.129901671	1115.33877	3.663545505
9/18/2008 11:59	223.6730728	22.11637259	10.52910304	2.741488099	1.565758437	1.121967256	4.12201852	1118.319897	3.356843646
9/18/2008 12:00	224.3186798	22.27121353	11.23092294	2.727514565	1.570139319	1.122174978	4.154638394	1122.369727	3.542219385
9/18/2008 12:01	227.4128342	23.13416958	11.71369982	2.755159438	1.59185493	1.137187004	4.148637072	1124.450879	3.535656548
9/18/2008 12:02	225.0240097	22.48270464	11.03894815	2.739071131	1.575199991	1.125252843	4.136779618	1122.369702	3.592230908
9/18/2008 12:03	225.1654854	22.49781036	11.13902617	2.720565736	1.57606864	1.125894904	4.160217746	1122.538452	3.57970163
Averages	222.4352459	22.10443403	30.75580762	2.695713037	1.557153405	1.112285861	4.126519086	1128.901956	3.609455285

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Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS:BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
RATA 2									
9/18/2008 12:16	225.5788879	22.82071018	11.35429263	2.737258196	1.579127669	1.131031098	4.149811244	1135.925415	3.335049216
9/18/2008 12:17	226.9075661	22.97492218	10.91652083	2.748436868	1.588267088	1.135128736	4.135109385	1141.437622	3.370109868
9/18/2008 12:18	224.8755455	22.38828897	10.97474337	2.731517673	1.574274689	1.124573112	4.165536396	1141.662598	3.435071993
9/18/2008 12:19	226.0330276	22.55634737	11.1135335	2.741185844	1.58362186	1.131182253	4.13758231	1145.824927	3.484908017
9/18/2008 12:20	227.6163216	22.89875984	11.09055948	2.722756028	1.593459994	1.138168931	4.110713243	1139.52522	3.437318269
9/18/2008 12:21	226.0747948	22.71685314	11.25358295	2.70447731	1.582413375	1.130351305	4.135170142	1144.193774	3.487083975
9/18/2008 12:22	227.1838417	22.94785547	11.13210201	2.715051889	1.590155452	1.135827422	4.106471229	1149.59353	3.382358233
9/18/2008 12:23	226.3708839	22.78892422	11.25358295	2.70070076	1.584830433	1.132145226	4.08328526	1148.693555	3.266577363
9/18/2008 12:24	226.8551521	22.97932816	11.06538248	2.728798628	1.589815557	1.135563076	4.105928397	1147.118628	3.556398042
9/18/2008 12:25	227.5198898	23.07909346	11.22588825	2.755536914	1.593025655	1.137696892	4.116091665	1148.074854	3.626729957
9/18/2008 12:26	225.3158493	22.41409492	11.16735029	2.731140018	1.577239394	1.126461387	4.129298043	1150.43728	3.444898939
9/18/2008 12:27	226.5948334	22.82889223	11.67530417	2.733028412	1.585736811	1.132541716	4.107897766	1147.793677	3.341541878
9/18/2008 12:28	226.1542664	22.81756258	11.20511651	2.735067844	1.580449522	1.128765047	4.08881499	1154.205884	3.261628858
9/18/2008 12:29	224.8669739	22.31212664	11.11636591	2.709537983	1.573613852	1.123893261	4.133273911	1146.893652	3.426964982
9/18/2008 12:30	225.5659943	22.64572668	11.77601361	2.722151875	1.578976691	1.127783179	4.117118915	1141.550122	3.519372121
9/18/2008 12:31	227.8270721	22.83455706	11.39394665	2.737333834	1.594800711	1.139075339	4.080647508	1139.918945	3.457287685
9/18/2008 12:32	226.14991	22.57397175	11.56137633	2.742243409	1.583130896	1.130804539	4.114966559	1143.968774	3.479608655
9/18/2008 12:33	227.2972488	23.12850332	11.92015457	2.828501165	1.59109965	1.136507213	4.096098328	1138.906494	3.391658624
9/18/2008 12:34	223.9409637	22.49151516	11.07104683	2.802140415	1.567684561	1.119625747	4.100156323	1134.012964	3.488698403
9/18/2008 12:35	223.9080276	22.66964826	10.73555803	2.815207362	1.567382395	1.119550169	4.115374271	1137.556567	3.603250909
9/18/2008 12:36	226.075264	22.84840488	10.61155939	2.818455338	1.582602173	1.130351365	4.107201552	1135.306689	3.482416288
9/18/2008 12:37	222.3968124	22.13399601	10.96341348	2.717166662	1.556845635	1.112072498	4.131921879	1126.757056	3.635609229
9/18/2008 12:38	222.6236267	22.21833992	11.0011797	2.699794292	1.558564007	1.113205433	4.115208244	1131.650635	3.477327418
9/18/2008 12:39	221.961853	21.95020151	10.59015846	2.699794292	1.554919541	1.110637367	4.106406164	1128.107007	3.502631394
9/18/2008 12:40	221.9467812	22.0546875	11.33540988	2.703873038	1.553918749	1.109957606	4.125149528	1127.881982	3.450900261
9/18/2008 12:41	224.3740387	22.55886555	11.24099445	2.719281673	1.57074365	1.121853918	4.124396078	1131.425586	3.474800531
9/18/2008 12:42	220.3865089	21.71668148	11.28348088	2.670638919	1.542834312	1.101913393	4.135439754	1130.188135	3.600478395
9/18/2008 12:43	222.2026482	22.25673628	11.11070108	2.673206925	1.555486023	1.111052871	4.118139418	1130.525659	3.513791847
9/18/2008 12:44	222.2657585	22.2743597	10.90770841	2.681666493	1.555863738	1.111354977	4.095757588	1134.912939	3.37639207
9/18/2008 12:45	221.0037079	22.07419968	10.82556725	2.671243131	1.547101915	1.105010182	4.122091802	1137.162866	3.584334366

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Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC, lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS:BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
9/18/2008 12:46	223.3322754	22.47200298	10.88347483	2.705534697	1.563303649	1.116604447	4.08871638	1137.106641	3.347192303
9/18/2008 12:47	221.4129028	22.00622177	10.86144495	2.689295352	1.549858868	1.107049584	4.087788828	1142.562646	3.341647251
9/18/2008 12:48	223.3612061	22.52613544	11.00432682	2.700398564	1.563492477	1.116831034	4.117017221	1142.843872	3.481574027
9/18/2008 12:49	224.2930145	22.66775799	10.98733234	2.711199641	1.570063829	1.121948332	4.070171356	1147.512378	3.434756279
9/18/2008 12:50	223.5493851	22.42164898	10.76891851	2.688993216	1.564814329	1.121060908	4.083710265	1153.024634	3.442372052
9/18/2008 12:51	224.4743881	22.63502693	11.27813125	2.704024076	1.571234584	1.122892559	4.100122404	1156.399487	3.469606304
9/18/2008 12:52	227.6769409	23.14298058	11.16546178	2.717242122	1.593667686	1.138471127	4.085362379	1156.736987	3.470237962
9/18/2008 12:53	224.0601959	22.56327057	11.27057743	2.689975023	1.568326533	1.120305538	4.113162533	1152.687134	3.552116474
9/18/2008 12:54	225.8107758	23.14172173	10.88410473	2.731366754	1.580676109	1.128632993	4.088902593	1149.031055	3.788591592
9/18/2008 12:55	226.1569443	23.08633184	10.76136541	2.737258196	1.583206475	1.12770772	4.067530227	1152.518384	3.462306484
9/18/2008 12:56	225.1909218	22.72881222	10.85326266	2.734841228	1.576446295	1.125422865	4.097826815	1150.662231	3.53688488
9/18/2008 12:57	225.2899284	22.55760574	11.15853834	2.728345513	1.577012777	1.126499206	4.085479689	1151.056006	3.563101379
9/18/2008 12:58	221.9347343	21.81927919	11.40527678	2.705610216	1.554050922	1.110127538	4.093111785	1160.561841	3.440266196
9/18/2008 12:59	222.3478813	21.94957256	11.15476179	2.728194356	1.559602559	1.114111841	4.074071153	1159.21189	3.47897679
9/18/2008 13:00	223.9765892	22.17428064	11.15664959	2.755612552	1.568364322	1.120400012	4.042852036	1156.905737	3.347157184
9/18/2008 13:01	223.6295052	22.08427048	11.58655405	2.762637019	1.565305263	1.118266165	4.089861735	1152.855908	3.735561872
9/18/2008 13:02	224.3665161	22.41975975	11.91323113	2.762485921	1.570592552	1.121929467	4.072038778	1157.018262	4.074621948
9/18/2008 13:03	221.7092667	21.7648325	11.29071999	2.746170998	1.552181482	1.108597934	4.071176608	1151.843481	3.25418853
9/18/2008 13:04	222.9483414	22.13840199	10.91683578	2.765054107	1.561868548	1.115471423	4.092171748	1150.999731	3.42317454
9/18/2008 13:05	224.6182213	22.55036831	11.15035605	2.78439039	1.573085159	1.123477906	4.072084467	1148.356128	3.33132898
9/18/2008 13:06	222.4086571	22.01692104	11.10881305	2.767471194	1.560055792	1.114262938	4.071585623	1145.76875	3.479222512
9/18/2008 13:07	221.0246124	21.8683753	11.39835334	2.751458168	1.54780063	1.105614483	4.104532035	1145.2625	3.670424263
9/18/2008 13:08	222.9314575	22.36877584	11.02604222	2.77238065	1.560471207	1.114716172	4.095071642	1138.456519	3.666809257
9/18/2008 13:09	222.3042641	22.20229053	10.95963669	2.771700859	1.556581229	1.111789286	4.084832001	1139.975195	3.470273066
9/18/2008 13:10	222.9167137	22.38010597	10.9341445	2.767727852	1.563228071	1.116528928	4.102045433	1146.612427	3.559065429
9/18/2008 13:11	224.0445709	22.55225611	10.75507045	2.772546768	1.568817466	1.12055102	4.075794133	1148.299854	3.456234797
9/18/2008 13:12	222.4521294	22.29009581	10.81108999	2.778831005	1.557109922	1.112752259	4.098970779	1147.287354	3.602689449
9/18/2008 13:13	223.5174446	22.51921082	10.87812471	2.78511548	1.564625442	1.120607674	4.101492548	1146.274902	3.592301083
9/18/2008 13:14	225.8077469	22.96925688	10.74311113	2.791399717	1.580676109	1.129558295	4.092137806	1141.831372	3.660105983
9/18/2008 13:15	225.3914566	22.67279339	10.6464932	2.794330359	1.577730358	1.12695235	4.110168481	1136.769141	3.761883656
Averages	224.346884	22.49407527	11.10974663	2.73664642	1.570703944	1.122053788	4.102347456	1144.294091	3.496497838

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Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS;BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
RATA 3									
9/18/2008 13:56	221.8054352	22.05028152	11.22777605	2.74007833	1.553106785	1.109334379	4.09840668	1134.519165	3.424473174
9/18/2008 13:57	222.286541	22.18749857	11.00810337	2.736855388	1.555977017	1.111468256	4.07274576	1138.825342	3.38025252
9/18/2008 13:58	222.0694122	21.98733759	10.89165831	2.738869727	1.554390788	1.110448569	4.077734288	1143.068848	3.502666465
9/18/2008 13:59	224.4118919	22.37129354	11.0804882	2.762939274	1.570932388	1.122118294	4.055044166	1147.737378	3.385306303
9/18/2008 14:00	222.2716217	22.0118866	11.49465656	2.742318869	1.555467188	1.111014962	4.064344263	1148.412354	3.497718008
9/18/2008 14:01	223.0991592	22.19631004	11.13587856	2.749947667	1.559149444	1.113658607	4.09294583	1150.268481	3.403801799
9/18/2008 14:02	223.603447	22.26932526	11.25924826	2.758029699	1.564870954	1.117737472	4.104836909	1141.212646	3.336733754
9/18/2008 14:03	222.8610535	21.97663736	11.30079079	2.741034925	1.560093462	1.11418736	4.111168798	1138.400317	3.432369765
9/18/2008 14:04	224.2397499	22.43045998	11.45689082	2.771264493	1.569610536	1.121551812	4.086059022	1135.419214	3.385902953
9/18/2008 14:05	223.9357758	22.39930296	11.04901648	2.776064873	1.568043262	1.12242049	4.0779785	1140.70647	3.448899746
9/18/2008 14:06	224.5050621	22.65202236	11.24351239	2.774990797	1.57455796	1.122986913	4.092501275	1145.993701	3.505544408
9/18/2008 14:07	225.3422623	22.80906582	11.03139257	2.773916483	1.577786982	1.126612484	4.08656671	1141.100195	3.491962361
9/18/2008 14:08	222.2657814	22.16672802	10.96656084	2.772842169	1.555788159	1.111354917	4.105969723	1139.918994	3.525233173
9/18/2008 14:09	222.6478844	22.33226871	11.09685397	2.771767855	1.558866084	1.113583118	4.083921973	1141.606396	3.514213053
9/18/2008 14:10	222.3646584	22.17428064	10.84067392	2.770693779	1.559149325	1.113658726	4.07913998	1144.025073	3.50940489
9/18/2008 14:11	222.8887062	22.2472949	10.75507045	2.769619465	1.560754389	1.114678383	4.126207113	1146.949902	3.645716715
9/18/2008 14:12	224.9309082	22.6016674	10.91242933	2.768545389	1.57459572	1.124063253	4.119180783	1142.956323	3.581596867
9/18/2008 14:13	223.8824425	22.24666595	10.93194199	2.761713862	1.567231327	1.116226733	4.090249228	1141.606421	3.458516081
9/18/2008 14:14	221.739399	21.89166451	10.89460543	2.733632684	1.552275866	1.108088106	4.106561899	1140.706445	3.675267434
9/18/2008 14:15	223.0530853	22.18875694	10.75821781	2.770643473	1.561415344	1.115131497	4.084153756	1138.793994	3.659860365
9/18/2008 14:16	222.4533005	21.96719646	10.9224999	2.767471194	1.557185471	1.112147987	4.073882405	1140.593945	3.70864346
9/18/2008 14:17	221.8787766	22.06035328	10.87592173	2.761277378	1.553144544	1.109315544	4.090895875	1133.787988	3.656350708
9/18/2008 14:18	223.3099213	22.40465355	10.89795232	2.781520069	1.563152641	1.116566658	4.071274694	1136.094116	3.59538939
9/18/2008 14:19	221.3874054	22.03517532	10.81990218	2.760219932	1.549632311	1.106898487	4.088677931	1143.012598	3.616938233
9/18/2008 14:20	222.9429054	22.19756889	10.95837808	2.76626265	1.560697794	1.114640623	4.09915758	1137.612817	3.60479513
9/18/2008 14:21	225.9610214	22.78483295	10.91117024	2.771549821	1.581846923	1.129747123	4.073935159	1138.625244	3.651963822
9/18/2008 14:22	221.8937721	22.01818085	11.08489442	2.742303729	1.553257853	1.109466612	4.080615926	1138.231519	3.533620985
9/18/2008 14:23	223.0047302	22.31904984	10.86899805	2.74378407	1.561566383	1.115320355	4.117598287	1142.562573	3.575384863
9/18/2008 14:24	223.3685608	22.35303879	11.00243855	2.751518607	1.568249371	1.118794858	4.109603532	1136.319116	3.624975181
9/18/2008 14:25	223.7191315	22.38639927	10.89134359	2.759253144	1.566362649	1.118983716	4.084595784	1137.556592	3.531585336

6.2.33

Chalmette Refining LLC
Chalmette Refinery

Boiler 10

F-0810 September 18, 2008	CHL F0810Q BOILER#10 DUTY CALC MMBtu/hr	CHL F0810N1 BOILER#10 NOX CALC lb/hr	CHL F0810C1 BOILER#10 CO CALC lb/hr	CHL F0810S1 BOILER#10 SO2 CALC lb/hr	CHL F0810P1 BOILER#10 PM CALC lb/hr	CHL F0810V1 BOILER#10 VOC CALC lb/hr	CHL 01FC734 BOILR-10 FUEL GAS (MMscf/day)	CHL 46AI816 FUEL GAS:BTU/SCF (HHV) Btu	CHL 01AI760b BOILER-10 CEMS O2 vol% dry
9/18/2008 14:26	222.0545235	22.13714409	10.92942476	2.766987681	1.554352999	1.110184163	4.104199735	1144.531323	3.585492412
9/18/2008 14:27	222.6362572	22.30362988	10.95932198	2.771564901	1.559054911	1.113602012	4.081275161	1146.106226	3.582684875
9/18/2008 14:28	221.9345055	22.14847374	10.78905964	2.757198691	1.556732237	1.111996949	4.064513556	1150.549756	3.483363899
9/18/2008 14:29	222.2322731	22.03611946	10.92690611	2.745189071	1.55614695	1.111600399	4.060318995	1143.068823	3.679338487
9/18/2008 14:30	224.3458138	22.43486691	11.12328959	2.75886035	1.570365965	1.121665061	4.052830648	1142.731323	3.4197704
9/18/2008 14:31	222.2077141	22.08930683	11.34107423	2.739222109	1.555448264	1.110977203	4.075054336	1150.887207	3.406398948
9/18/2008 14:32	222.5955582	22.12392521	11.56830049	2.739373088	1.558242917	1.112903327	4.070522785	1157.186938	3.448092723
9/18/2008 14:33	222.3911171	22.0471344	11.19315767	2.718677282	1.556807816	1.112034678	4.061012022	1157.524414	3.280650838
9/18/2008 14:34	224.2037582	22.5500536	11.16168571	2.752062619	1.569421768	1.121098608	4.038507843	1159.04314	3.530567551
9/18/2008 14:35	223.8633003	22.34171104	10.87655163	2.746322155	1.567118049	1.119248033	4.040293153	1157.749487	3.476590292
9/18/2008 14:36	224.9925003	22.5878191	11.16860938	2.763845563	1.575030059	1.125202507	4.033310159	1148.074902	3.499367444
9/18/2008 14:37	224.4518051	22.48836803	11.25232458	2.777743459	1.571234584	1.12443459	4.010234833	1150.099829	3.356176861
9/18/2008 14:38	223.7095985	22.3750701	11.6564219	2.745340168	1.566022873	1.122218966	4.039065576	1155.949581	3.345086527
9/18/2008 14:39	223.8136139	22.56201267	11.23281169	2.752364755	1.566702664	1.119877458	4.056855639	1153.530884	3.501824172
9/18/2008 14:40	223.8589592	22.39206553	11.27183676	2.765179873	1.567288041	1.116780639	4.050344618	1149.706055	3.521232112
9/18/2008 14:41	222.7965469	22.33163881	11.23973584	2.764248252	1.561415374	1.113557935	4.025167171	1154.430884	3.455989202
9/18/2008 14:42	222.455925	22.00433254	11.05405259	2.761025786	1.557638735	1.112380892	4.048862688	1161.124341	3.594371684
9/18/2008 14:43	224.5329742	22.6035552	11.47577381	2.762133479	1.572896302	1.123477876	4.049178569	1161.011816	3.619781073
9/18/2008 14:44	226.6261368	22.94282103	11.10440683	2.779707313	1.586605459	1.133240461	4.033681814	1159.493115	3.568892209
9/18/2008 14:45	224.8888779	22.400877	11.18875122	2.75206244	1.574331403	1.124422014	4.063981565	1161.349292	3.603356187
9/18/2008 14:46	224.059906	22.34674454	11.54690027	2.751458287	1.56851536	1.120343268	4.064074437	1151.337231	3.599004412
9/18/2008 14:47	221.5822525	21.94201803	11.35240436	2.712987185	1.551067352	1.107842684	4.071721673	1151.393481	3.563452419
9/18/2008 14:48	221.7585449	22.10315371	10.971596	2.708656788	1.552275836	1.108749092	4.060848196	1150.887231	3.585597769
9/18/2008 14:49	223.3090363	22.46130276	10.96309876	2.711476684	1.563114762	1.11645335	4.042018453	1152.518384	3.376777959
9/18/2008 14:50	220.9190178	22.03139877	10.73304033	2.718098342	1.546346605	1.104009449	4.072576674	1161.124292	3.782449602
9/18/2008 14:51	222.1613197	22.2819128	10.48913431	2.747530699	1.555032849	1.107465088	4.06292545	1164.161694	3.718680803
9/18/2008 14:52	222.4451027	22.34548569	10.49007845	2.772833943	1.557185531	1.111751467	4.06247712	1149.59353	3.440476815
9/18/2008 14:53	220.903759	21.96782494	10.68205595	2.757803023	1.546308815	1.104443699	4.093727684	1141.718872	3.754022328
9/18/2008 14:54	222.7229614	22.31212616	10.66632032	2.773362577	1.559073865	1.113583148	4.073713048	1145.149976	3.729420169
9/18/2008 14:55	222.530674	22.11007786	10.45734811	2.759011388	1.557827532	1.112714529	4.055808822	1143.350024	3.577420402
Averages	223.1184689	22.27533614	11.04058231	2.755387629	1.562112747	1.115674431	4.073750938	1146.666803	3.532523629

6.2.34

CRLLC-CHAL-000050

VII. APPENDIX

The following appendices are presented as supporting documentation to this test report.

A. Resumes of Test Personnel
B. Test Analyzer Calibration Gas Certifications
C. Test Analyzer Descriptions and Specifications
D. Permit Number 2500-00005-V1 Excerpts
E. Correspondence, Chalmette Refining and LDEQ

CRLLC-CHAL-000051

ETS®
Emission Testing Services, Inc.

Resume

RONALD L. McCABE, II
Assistant Manager
Senior Sampling Specialist

EDUCATION

Louisiana State University, B.S. Environmental Engineering
(1994 – 1998)

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record
EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

11/03/04 to Present Emission Testing Services, Inc. Assistant Office Manager

Responsibilities include planning and overseeing of performance source testing projects. Being responsible for the training of sampling technicians. Being the ETS liaison for clients. Keeping current with all state and federal regulations. Writing proposals for ETS projects as requested by clients. Discussing the proper methods of testing with clients in the performance of emission testing. Answering questions regarding the emission testing, prior to and after report is issued.

08/98 to 11/03/04 Emission Testing Services, Inc. Senior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to conduct and provide project management for all manual emission test methods including 40 CFR 60, Methods 5, 6, 7, 8, 11, 12, 18, 26 and 29. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

CRLLC-CHAL-000052

ETS®
Emission Testing Services, Inc.

Resume

R. KEITH DELK, JR.
Junior Sampling Specialist

EDUCATION

High School Graduate

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record
EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

02/08 to Present Emission Testing Services, Inc. Junior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

CRLLC-CHAL-000053

ETS®
Emission Testing Services, Inc.

Resume

WILBERT L. SOULE
Testing Trainee Technician

EDUCATION

High School Graduate

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record

EXPERIENCE

04/08 to Present Emission Testing Services, Inc. Testing Trainee Technician

Supports in performing EPA approved reference methods for compliance testing as-well-as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and maintenance.

APPENDIX A
7.2.3

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

Shipped From:
9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

C E R T I F I C A T E O F A N A L Y S I S

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE

BATON ROUGE LA 70814

PROJECT #: 04-61403-020
PO#: 20080121-RM01
ITEM #: 0401813 AL
DATE: 18Feb2008

CYLINDER #: ALM017958
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9

GRADE: ZERO GAS

PURITY: 99.998%

IMPURITY	MAXIMUM CONCENTRATIONS
THC	0.5 PPM

CRLLC-CHAL-000055

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-013

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM019515 Certification Date: 18Feb2008 Exp. Date: 18Feb2011
Cylinder Pressure***: 1950 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	10.1 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	01Jan2010	K025996	10.03 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	04Feb2008	PARAMAGNETIC

ANALYZER READINGS

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

OXYGEN

First Triad Analysis		
Date: 18Feb2008	Response Unit:VOLTS	
Z1=0.00000	R1=1.00480	T1=1.00700
R2=1.00480	Z2=0.00020	T2=1.00690
Z3=0.00140	T3=1.00390	R3=1.00200
Avg. Concentration:	10.07	%

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.9999904
Constants: A=.004162074
B=10.00386942 C=
D= E=

APPROVED BY: DAVID KELLY

APPENDIX B
7.3.2

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 20071012-RM01
Project No.: 04-58642-002

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM051449 Certification Date: 06Nov2007 Exp. Date: 06Nov2010
Cylinder Pressure***: 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	20.0 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2350	01May2009	K003567	23.48 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	24Oct2007	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis

OXYGEN

Date: 06Nov2007	Response Unit:VOLTS	
Z1=0.00000	R1=0.98520	T1=0.84110
R2=0.98530	Z2=0.00000	T2=0.84130
Z3=0.00000	T3=0.84120	R3=0.98520
Avg. Concentration:	20.04	%

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.9999998

Constants:	A = .003347709
B = 23.82226956	C =
D =	E =

APPROVED BY: DAVID KELLY

APPENDIX B
7.3.3

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 012108R-RM01
Project No.: 04-61627-007

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM060848 Certification Date: 06Feb2008 Exp. Date: 06Feb2010
Cylinder Pressure***: 1702 PSIG Prev Certification Date: 21Jun2007

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	26.9	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Prot

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	01Nov2010	ALM034319	50.18 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	07Jan2008	FTIR

ANALYZER READINGS

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

SULFUR DIOXIDE *

First Triad Analysis

Date: 21Jun2007 Response Unit:PPM

Z1=0.00000	R1=0.00000	T1=0.00000
R2=0.00000	Z2=0.00000	T2=0.00000
Z3=0.00000	T3=0.00000	R3=0.00000

Avg. Concentration: 27.00 PPM

Second Triad Analysis

Date: 06Feb2008 Response Unit: PPM

Z1=-0.01151	R1=50.22892	T1=26.83116
R2=50.26837	Z2=0.02807	T2=26.84626
Z3=0.02821	T3=26.87325	R3=50.32396

Avg. Concentration: 26.79 PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99991E-1

Constants:	
A=0.00000E+0	
B=1.03089E+0	C=-1.75000E-4
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
RAMIEN JR

APPENDIX B
7.3.4

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 050107-RM01
Project No.: 04-55206-003

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM053681 Certification Date: 20Jun2007 Exp. Date: 20Jun2009
Cylinder Pressure***: 1342 PSIG Prev Certification Date: 12Apr2004

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	54.6	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	15Aug2009	ALM040297	50.79 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	08Jun2007	FTIR

ANALYZER READINGS

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

SULFUR DIOXIDE *

First Triad Analysis

Date: 13Jun2007	Response Unit:PPM	
Z1 = 0.00998	R1 = 50.68487	T1 = 54.55170
R2 = 50.77602	Z2 = 0.04820	T2 = 54.57414
Z3 = 0.05385	T3 = 54.58256	R3 = 50.78152
Avg. Concentration:	54.62	PPM

Second Triad Analysis

Date: 20Jun2007	Response Unit: PPM	
Z1 = 0.01192	R1 = 50.71747	T1 = 54.43691
R2 = 50.72628	Z2 = 0.03776	T2 = 54.46040
Z3 = 0.05023	T3 = 54.48965	R3 = 50.73764
Avg. Concentration:	54.53	PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = 9.99998E-1	
Constants:	A = 0.00000E+0
B = 1.03288E+0	C = -1.99000E-4
D = 0.00000E+0	E = 0.00000E+0

APPROVED BY: RAMIEN JR

SUPERVISOR: SUSAN BRANDON

APPENDIX B
7.3.5

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 20061003-RM01
Project No.: 04-48614-002

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM033653 Certification Date: 25Oct2006 Exp. Date: 24Oct2008

Cylinder Pressure***: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	47.8	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	47.8	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1683	15Aug2009	AAL070185	49.82 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	12Oct2006	FTIR

ANALYZER READINGS

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

NITRIC OXIDE

First Triad Analysis

Date: 17Oct2006	Response Unit:PPM	
Z1=-0.07962	R1=50.46437	T1=48.19839
R2=50.50977	Z2=0.06468	T2=48.19918
Z3=0.09189	T3=48.30777	R3=50.57636
Avg. Concentration:	47.57	PPM

Second Triad Analysis

Date: 25Oct2006	Response Unit: PPM	
Z1=-0.06453	R1=50.19153	T1=48.30912
R2=50.24290	Z2=-0.04341	T2=48.39505
Z3=0.12432	T3=48.49670	R3=50.36882
Avg. Concentration:	47.97	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99984E-1	
Constants:	A=0.00000E+0
B=9.51308E-1	C=1.95000E-4
D=0.00000E+0	E=0.00000E+0

Special Notes: ITEM # NO 2

APPROVED BY: Lara Nash

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-585

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 20061203-RM01
Project No.: 04-50101-001

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM017982 **Certification Date:** 26Dec2006 **Exp. Date:** 25Dec2008

Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	101	PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	101	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1685	01Jan2010	AAL071076	246.1 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	07Dec2006	FTIR

ANALYZER READINGS

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

First Triad Analysis — Second Triad Analysis — Calibration Curve

NITRIC OXIDE

Date: 18Dec2006	Response	Unit:PPM
Z1=-0.39410	R1=97.61960	T1=101.0342
R2=97.84169	Z2=-0.05597	T2=101.1948
Z3=0.08950	T3=101.2084	R3=98.13910
Avg. Concentration:	101.7	PPM

Date: 26Dec2006	Response	Unit: PPM
Z1=-0.03778	R1=246.8176	T1=101.4563
R2=247.5892	Z2=0.12974	T2=101.6288
Z3=0.21711	T3=102.1452	R3=248.7775
Avg. Concentration:	101.0	PPM

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=1.00000E+0	
Constants:	A=0.00000E+0
B=9.82467E-1	C=2.08000E-4
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
Lara Nash

APPENDIX B
7.3.7

CRLLC-CHAL-000061

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT, CO 80501

P.O. No.: 20080619-RM01
Project No.: 08-64645-005

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: AAL7863 **Certification Date:** 21Jul2008 **Exp. Date:** 19Jan2009
Cylinder Pressure*:** 1950 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITROGEN DIOXIDE	54.5	PPM	+/- 2%	GMIS
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
GMIS NO2/N2	16Apr2009	ALM038339	25.10 PPM	NITROGEN DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
NONOX/CLA-220/41528750062	02Jul2008	CHEMILUMINESCENT

APPROVED BY: JW
JON WITZAK

APPENDIX B
7.3.8

CRLLC-CHAL-000062

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-002

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM031361 Certification Date: 14Feb2008 Exp. Date: 14Feb2011
Cylinder Pressure***: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	55.7	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2635	02Oct2010	KAL003167	25.21 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	08Feb2008	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 06Feb2008	Response Unit:PPM	
Z1=0.00432	R1=25.24969	T1=55.84692
R2=25.31409	Z2=0.04393	T2=55.92991
Z3=0.07750	T3=55.96750	R3=25.32974
Avg. Concentration:	55.77	PPM

Second Triad Analysis

Date: 14Feb2008	Response Unit: PPM	
Z1=-0.03364	R1=25.12123	T1=55.53817
R2=25.15710	Z2=0.03653	T2=55.61026
Z3=0.06659	T3=55.64416	R3=25.23942
Avg. Concentration:	55.71	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99998E-1

Constants:	
A=0.00000E+0	
B=9.96927E-1	C=2.92000E-4
D=2.00000E-6	E=0.00000E+0

APPROVED BY: RAMIEN JR

CRLLC-CHAL-000063

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-004

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM002244 Certification Date: 14Feb2008 Exp. Date: 14Feb2011
Cylinder Pressure***: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	95.8	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1679	01May2011	ALM007279	94.90 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	08Feb2008	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 07Feb2008	Response Unit:PPM	
Z1=-0.00431	R1=101.7026	T1=96.74009
R2=101.9221	Z2=0.08187	T2=96.74306
Z3=0.09412	T3=96.78831	R3=101.9586
Avg. Concentration:	95.94	PPM

Second Triad Analysis

Date: 14Feb2008	Response Unit: PPM	
Z1=-0.01126	R1=95.17712	T1=95.92258
R2=95.29609	Z2=0.11102	T2=95.99919
Z3=0.11449	T3=96.13007	R3=95.29877
Avg. Concentration:	95.66	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99998E-1	
Constants:	A=0.00000E+0
B=6.41204E-1	C=1.15000E-4
D=1.00000E-6	E=0.00000E+0

APPROVED BY: _____
RAMIEN JR

OXYGEN/ CARBON DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

SERVOMEX
MODEL NUMBER 1400B4 STD/FLS

I. PRINCIPLE of OPERATION

The Servomex oxygen/ carbon dioxide analyzer uses a magneto-dynamic paramagnetic technique for oxygen measurement and a single-beam, single-wave length infrared technique for carbon dioxide measurement.

II. SPECIFICATIONS

Ranges	
O2	0.1 to 100 vol%
CO2	0 to 1 vol%
	0 to 2 vol%
	0 to 5 vol%
	0 to 10 vol%
	0 to 25 vol%
	0 to 50 vol%
	0 to 100 vol%
Detection Limits	
O2 Minimum	0.1 vol%
O2 Maximum	100 vol%
CO2 Minimum	0.1 vol%
CO2 Maximum	100 vol%
Response Time, 90%	
O2	< 10 sec
CO2	< 30 sec
Interferences	
None	

Precision	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Linearity	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Drift	
Zero, 24-hr	+/- 0.2%
Span, 24-hr	+/- 0.2%

CRLLC-CHAL-000065

SULFUR DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

WESTERN RESEARCH
MODEL NUMBER 721AT

I. PRINCIPLE of OPERATION

he Western Research, Model 721AT, sulfur dioxide analyzer utilizes the principle of the unique and characteristic absorbsion of ultraviolet radiation for sulfur dioxide.

II. SPECIFICATIONS

Ranges	
SO2	0 to 500 PPMv
	0 to 5000 PPMv
Detection Limits	
Minimum	0.5 PPMv
Maximum	5000 PPMv
Response Time, 90%	
SO2	1 sec
Interferences	
Negligible	

CRLLC-CHAL-000066

OXIDES of NITROGEN ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 10

I. PRINCIPLE of OPERATION

The model 10 NO-NOx analyzer utilizes the principle of chemiluminescence for the detection of nitrogen oxide (NO). Detection of NO in the sample gas is accomplished by blending ozone (O3) with the sample gas in a reaction chamber. The reaction produces a characteristic luminescence with an intensity that is linearly proportional to the concentration of NO. The luminescence intensity is measured using an optical filter and photomultiplier at a narrow wavelength band that is unique to the NO and O3 reaction. In order to measure NOx (NO plus NO2), the sample gas is diverted through a NO2 to NO converter prior to entering the reaction chamber.

II. SPECIFICATIONS

Ranges		Precision	
NO	0 to 2.5 PPMv	NO	+/- 1.0 PPMv
	0 to 10 PPMv		
	0 to 25 PPMv		
	0 to 100 PPMv	Linearity	
	0 to 250 PPMv	NO	+/- 1%
	0 to 1000 PPMv		
	0 to 2500 PPMv		
	0 to 10000 PPMv	Drift	
		Zero, 12-hr	< 1.2%
Detection Limits		Span, 12-hr	< 1.2%
Minimum	0.1% FS		
Maximum	10000 PPMv		
		Noise	0.05 RMS
Response Time, 90%			
NO	1.5 sec		
NO2	1.7 sec	Sample Flow Rate	0.2 – 2 l/min

Interferences
Negligible for H20, carbon, and sulfur compounds

CRLLC-CHAL-000067

CARBON MONOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 48

I. PRINCIPLE of OPERATION

The model 48 CO analyzer utilizes non-dispersive infrared (NDIR) detection of CO enhanced by gas filter correlation (GFC). Sample gas is passed through an optical White Cell in which an IR beam passes. The White Cell provides a long beam path length in a relatively small cell by utilizing optical mirrors to produce multiple passes of the IR beam through the cell. The IR beam is first passed through a GFC chopper wheel and a narrow bandpass interference filter before entering the cell. The CO molecules in the cell absorb IR proportional to the CO concentration. The IR beam exiting the cell is measured using an IR detector.

II. SPECIFICATIONS

Ranges		Precision	
CO	0 to 1 PPMv	CO	+/- 0.1 PPMv
	0 to 2 PPMv		
	0 to 5 PPMv		
	0 to 10 PPMv	Linearity	
	0 to 20 PPMv	CO	+/- 1%
	0 to 50 PPMv		
	0 to 100 PPMv		
	0 to 200 PPMv	Drift	
	0 to 500 PPMv	Zero, 24-hr	+/- 0.2 PPMv
	0 to 1000 PPMv	Span, 24-hr	+/- 1% FS
Detection Limits		Sample Flow Rate	0.5 – 2 l/min
Minimum	0.1 PPMv		
Maximum	1000 PPMv	Noise	0.05 RMS
Response Time	1 min		

Interferences
Negligible for H2O and CO2

CRLLC-CHAL-000068

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

Certified Mail No. 7004 1160 0003 2552 2525

Agency Interest No. 1376
Activity No.: PER20070014

Mr. Richard A. Igercich
Refinery Manager
Chalmette Refining, L.L.C.
Post Office Box 1007
Chalmette, Louisiana 70044

RE: Part 70 Operating permit modification, Utilities Plant, Chalmette Refinery, Chalmette Refining, L.L.C., Chalmette, St. Bernard Parish, Louisiana

Dear Mr. Igercich:

This is to inform you that the permit modification for the above referenced facility has been approved under LAC 33:III.501. The permit is both a state preconstruction and Part 70 Operating Permit. The submittal was approved on the basis of the emissions reported and the approval in no way guarantees the design scheme presented will be capable of controlling the emissions as to the types and quantities stated. A new application must be submitted if the reported emissions are exceeded after operations begin. The synopsis, data sheets and conditions are attached herewith.

It will be considered a violation of the permit if all proposed control measures and/or equipment are not installed and properly operated and maintained as specified in the application.

Operation of this facility is hereby authorized under the terms and conditions of this permit. This authorization shall expire at midnight on the 7th of November, 2010, unless a timely and complete renewal application has been submitted six months prior to expiration. Terms and conditions of this permit shall remain in effect until such time as the permitting authority takes final action on the application for permit renewal. The permit number and Agency Interest No. cited above should be referenced in future correspondence regarding this facility.

Done this 29th day of October, 2007.

Permit No.: 2500-00005-V1

Sincerely,

Chuck Carr Brown, Ph.D.
Assistant Secretary
SGQ
cc: EPA Region VI

ENVIRONMENTAL **SERVICES**
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
WWW.DEQ.LOUISIANA.GOV

APPENDIX D
7.5.1

AIR PERMIT BRIEFING SHEET
AIR PERMITS DIVISION
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

I. Background

Chalmette Refining, L.L.C. (CRLLC) is a joint venture between ExxonMobil Corporation (EMOC) and Petroleos de Venezuela (PDV), the Venezuelan National Oil Company. Chalmette Refinery is located on the left descending bank of Mississippi River at Mile 89 above Head-of-Passes at Chalmette and is operated by EMOC. The Utilities Plant operates under a Part 70 Operating Permit No. 2500-00005-V0 dated November 7, 2005. This permit deals with the utilities equipment consisting of water treatment, boilers, cooling tower operation and support equipment (Utilities Plant). This permit incorporates the requirements of Prevention of Significant Deterioration (PSD) Permit No. PSD-LA-199(M-7).

II. Origin

This review was initiated by an application and Emission Inventory Questionnaire (EIQ) dated August 29, 2007; as well as additional information as of October 20, 2007.

III. Description

Chalmette Refinery is an integrated crude operation (high conversion) which includes crude distillation, catalytic reforming, fluid catalytic cracking (FCC), hydrocracking, HF alkylation, delayed coking, and aromatics processing units. The refinery is capable of producing gasoline, diesel, benzene/toluene/xylene (BTX), distillates, and recovers elemental sulfur; as well as by-products such as petroleum coke and LPG. The Utility Plant produces steam and compressed air to be used throughout the refinery and also provides filtered and treated water to the refinery units as well as treated boiler feed water. Closed Cooling Water Tower provides closed loop cooling system for a number of heat exchangers that contain aromatics.

The Utility Plant receives raw river water from the Mississippi River into the Water Treatment section of the unit. Through the combination of filtering and treatment, the filtered and treated water is used as makeup water to the boilers and other refinery process units. Filtered water is sent to the Filtered Water Storage tanks and utilized for fire/Alky mitigation water and make-up to the cooling water, boiler-house, and other process units. Treated water is sent to the Surge tanks for distribution to other refinery units and to the Boiler section. The boiler feed water is supplied to the four Boilers (No. 7, 9, 10, and F-402) as well as small refinery steam producers. Refinery utility steam is produced by the utility boilers at 600 psig and decreased to a number of pressure levels, as required by the plant processes.

AIR PERMIT BRIEFING SHEET
AIR PERMITS DIVISION
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CHALMETTE, ST. BERNARD PARISH, LOUISIANA

The Utility Plant consists of the following two sections; Water Treatment and Boiler Sections.

Water Treatment Section: The purpose of Water Treatment section is to filter and soften raw river water for use throughout the refinery and in the Boiler Section. The unit receives raw river water from the refinery's once through cooling water supply header. The entering water is strained and filtered to remove foreign matter and turbidity. The filtered water is routed to storage tanks for distribution. Filtered water is sent through the weak acid cation treaters, decarbonators, and softeners to remove other impurities and hardness from the water. The treated water is utilized as boiler feedwater, and distributed to other refinery processes

Boiler Section: The purpose of this Boiler Section is to produce utility boiler feedwater, steam, and collection of boiler steam condensate. The treated water from the Water Treatment Section enters the deaerators, where dissolved gases are removed using a steam stripping process. The water is then conditioned by injection of sulfite and polymer. The resulting boiler feedwater is then routed to the boilers for steam production. The boilers supply superheated steam to the refinery steam headers. Utility pressure steam is supplied to the operating units through the letdown stations. High and medium pressure condensate from the refinery collection headers is returned to the unit for recovery.

Cooling and Firewater System: The Cooling and Firewater system distributes cooling and firewater throughout the refinery and provides the emergency and backup Internal combustion drive pumps.

Compressed Air: The East Utilities provides compressed air for distribution throughout the refinery. The unit contains three electric and one steam turbine driven air compressors. In addition, a long-term rental backup diesel driven air compressor is located on site.

Close Cooling Water Tower: The Closed Cooling Water Tower provides a closed loop cooling system for a number of heat exchangers that contain concentrated aromatics. The cooling tower replaces once through cooling for a number of heat exchangers located at the Reformate Fractionation, Isom, Sulfolane, Orthooxylene, Reformer No. 1 and 3, and TDU Units. The cooling tower blowdown is sent to the Waste Water Treatment Plant. The unit has a backup water circulation diesel driven pump.

The facility proposes to install Ultra-Low NOx Burners on three existing Boilers Nos. 402, 9, and 10 (Emission Points 27, 66, and 70). This project is being undertaken as per the requirements of U.S. EPA Consent Decree, a NSR Global Settlement (Civil Action No. 05-4662 B(i)) between U.S. EPA and State of Louisiana verses Chalmette Refining,

AIR PERMIT BRIEFING SHEET
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CHALMETTE, ST. BERNARD PARISH, LOUISIANA

L.L.C. filed on April 26, 2006, to reduce NOx emissions from the facility. NOx emissions are expected to reduce by approximately 200 tons per year. There will not be any change in the emissions of other criteria pollutants. In order to achieve this goal the facility will replace the existing burners, modify the configuration of the windboxes to facilitate flue gas recirculation, install control dampers, install associated instrumentation, if required modify the existing air blowers and motors, on the above referenced boilers. The facility will also install new continuous emission monitoring system (CEMS) on Boiler No. 402.

This modification includes the above referenced project and the following changes at the facility:

1. Incorporate the Ultra-Low NOx Project and performance tests;
2. Update the fugitive emissions based on the LDAR program and operating conditions;
3. Add two new rental internal combustion engines to drive air compressors to supplement air supply; and
4. Update the Insignificant Activities and General Condition XVII List.

The other project is to add two new internal combustion engines, which is independent of the ULN Project. The emissions increase from these engines is as follows:

Pollutant	Emissions increase	PSD Deminimis
PM_{10}	0.66	15
SO_2	5.25	40
NO_X	37.37	40
CO	13.77	100
VOC	2.66	40

The change in emissions due to the addition of two internal combustion engines is less than the PSD significance level for all criteria pollutants; therefore, NSR/PSD review is not required.

AIR PERMIT BRIEFING SHEET
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UTILITIES PLANT
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CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

Permitted emissions from the Utilities Plant including the projects changes in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	29.72	25.12	- 4.60
SO_2	62.20	66.01	+ 3.81
NO_X	569.23	339.68	- 229.55
CO	446.99	448.54	+ 1.55
VOC	144.19	109.69	- 34.50

IV. Type of Review

This application was reviewed for compliance with the Louisiana Part 70 operating permit program, Louisiana Air Quality Regulations, NSPS, and NESHAP. Prevention of Significant Deterioration does not apply. The facility is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51.

V. Credible Evidence

Notwithstanding any other provisions of any applicable rule or regulation or requirement of this permit that state specific methods that may be used to assess compliance with applicable requirements, pursuant to 40 CFR Part 70 and EPA's Credible Evidence Rule, 62 Fed. Reg. 8314 (Feb. 24, 1997), any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed shall be considered for purposes of Title V compliance certifications. Furthermore, for purposes of establishing whether or not a person has violated or is in violation of any emissions limitation or standard or permit condition, nothing in this permit shall preclude the use, including the exclusive use, by any person of any such credible evidence or information.

VI. Public Notice

A public notice is not required to permit a minor modification at a Part 70 facility.

AIR PERMIT BRIEFING SHEET
AIR PERMITS DIVISION
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

VII. Effects on Ambient Air

Dispersion Model Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration ($\mu g/m^3$)	Louisiana Air Quality Standard (NAAQS) ($\mu g/m^3$)
PM_{10}	Annual	1.147	50
	24 hr	12.36	150
NO_2	Annual	14.26	100
SO_2	Annual	1.08	80
	24 hr	12.23	365
	3 hr	23.28	1,300

VIII. General Condition XVII Activities

Activity	Frequency	NOx	CO	SO2	PM10	VOC
Equipment Preparation, Maintenance and Other Routine	440 events/yr	2.57	0.61	0.20	0.96	0.32
Planned Startup/Shutdown and Turnaround	40 events/yr	-	<0.01	-	-	<0.01
May have combination of other speciated pollutants less than 0.01 tons per year						

IX. Insignificant Activities

ID No.:	Description	Citation
-	Organic Liquid Tanks (<250 gals and <3.5 psia)	LAC 33:III.501.B.5.A.2
-	Organic Liquid Tanks (<10,000 gals and <0.5 psia)	LAC 33:III.501. B.A.3
-	Inorganic Liquid Tanks (<10,000 gals and <0.5 psia	LAC 33:III.501. B.A.4
-	Process Stream Analyzer Emissions	LAC 33:III.501.B.5.A.9

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	LAC 33:III.Chapter																	
		5▲	9	11	13	15	2103	2111	2113	2121	2115	2141	17	2301	29*	51*	52	56	59
UNF001	Utilities (Complex) Plant	1	1	1	1	1			1			1			1	1		1	1
EQT019	27, Boiler No. 402			1	1	1										2			
EQT020	35, Boiler No. 7			1	1	1										2			
EQT021	66, Boiler No. 9			1	1	1										2			
EQT022	70, Boiler No. 10			1	1	1										2			
EQT023	CT-1, Closed Cooling Tower				2											1			
EQT024	ICE-U1, IC Engine			1	1											2			
EQT025	TK-1204, Sulfuric Acid Tank															1			
EQT026	TK-1205, Sulfuric Acid Tank															1			
EQT027	TK-804, Sulfuric Acid Tank															1			
EQT265	ICE-U2, IC Engine			1	1											2			
EQT266	ICE-U3, IC Engine			1	1											2			
FUG002	FE-U, Fugitives															1			

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

CRLLC-CHAL-000075

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

* The regulations indicated above are State Only regulations.
▲ All LAC 33:III.Chapter 5 citations are federally enforceable including LAC 33:III.501.C.6 citations, except when the requirement found in the "Specific Requirements" report specifically states that the regulation is State Only.

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	Q	GGG	NNN	QQQ	A	J	M	V	FF	A	F	G	CC	4E/Fs	4Zs	68	82
UNF001	Utilities Plant	1									1		1		1	1						1	1
EQT019	27, Boiler No. 402				1																		
EQT020	35, Boiler No. 7				1																		
EQT021	66, Boiler No. 9		1		1																		
EQT022	70, Boiler No. 10		1		1																		
EQT023	CT-1, Closed Cooling Tower						2										1						
EQT024	ICE-U1, IC Engine							1				2					1	1	1		2		
EQT025	TK-1204, Sulfuric Acid Tank					2													2	2/2			
EQT026	TK-1205, Sulfuric Acid Tank					2													2	2/2			
EQT027	TK-804, Sulfuric Acid Tank					2													2	2/2			
EQT265	ICE-U2, IC Engine																				2		
EQT266	ICE-U3, IC Engine																				2		
FUG002	FE-U, Fugitives																						

CRLLC-CHAL-000077

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	XX	GGG	NNN	QQQ	A	J	M	V	FF	A	F	G	CC	UUU	5Ds	68	82

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

CRLLC-CHAL-000078

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
UNF001 Utilities Complex	Compliance Assurance Monitoring	Does not apply	40 CFR 64	Emission sources do not emit more than 100 tons without controls
EQT019 and EQT020 27, Boiler No. 402 and 35, Boiler No. 7	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns natural gas and refinery fuel gas
	NSPS, Subpart Dc – Standards of Performance for Small Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40c(a)	The boilers have a capacity greater than 100 MM BTU/hr
	NSPS, Subpart D – Standards of Performance for Fossil-Fuel-Fired Steam Generator	Does not apply	40 CFR 60.40(a)	The boilers were constructed prior to August 17, 1971
	NSPS, Subpart Db - Standards of Performance for Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40b(a)	The Boiler No. 402 was constructed, modified, or reconstructed after June 19, 1986 and Boiler No. 7 was constructed prior to June 19, 1984
EQT021 and EQT022 66, Boiler No. 9 and 70, Boiler No. 10	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns natural gas and refinery fuel gas
	NSPS, Subpart Dc – Standards of Performance for Small Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40c(a)	The boilers have a capacity greater than 100 MM BTU/hr
	NSPS, Subpart D – Standards of Performance for Fossil-Fuel-Fired Steam Generator	Does not apply	40 CFR 60.40b(j)	The boilers are subject to NSPS, Subpart Db

CRLLC-CHAL-000079

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
EQT023 CT-1, Closed Cooling Tower	Emission Standard for Particulate Matter, Emission Limits – Including FCCU	Does not apply	LAC 33:III.1311.F	Presence of uncombined water
	NESHAP, Subpart Q – Cooling Towers	Does not apply	40 CFR 63.400(a)	Water treatment chemicals do not contain chromium or chromium compounds
FUG002 FE-U, Fugitives	Control of Emission of Organic Compounds – Oil/Water Separation	Does not apply	LAC 33:III2109	Does not receive effluent water from any equipment processing, refining, treating, storing, or handling VOC
	NSPS, Subpart QQQ – Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems	-	40 CFR 60.690	Currently under review. Permittee shall update or modify the permit based on the determination made under the settlement.
	NESHAP, Subpart J – National Emission Standard for Equipment Leaks of Benzene	Does not apply	40 CFR 61.110(c)(3)	Process unit do not have streams that contain greater than or equal to 10% by weight of benzene)
	NESHAP, Subpart V – National Emission Standard for Equipment Leaks of VHAP	Does not Apply	40 CFR 61.240(a) and 40 CFR 61.241	Process unit is not in VHAP service (streams that contain greater than or equal to 10% by weight of benzene)
	NESHAP, Subpart EEEE – Organic Liquids Distribution (Non-Gasoline)	Does not apply	40 CFR 63.2338	Not an organic liquids distribution (OLD) operation affected source
	NEHAP, Subpart FFFF – Miscellaneous Organic Chemical Manufacturing	Does not apply	40 CFR 63.2435(b)	Not associated with MCPU and/or is part of an affected source of NESHAP, 40 CFR 63
EQT024, EQT265, and EQT266 ICE-U1, ICE-U2, and ICE-U3; IC Engines	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns diesel which is considered as a virgin fossil fuel

CRLLC-CHAL-000080

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
EQT024, EQT265, and EQT266 ICE-U1, ICE-U2, and ICE-U3; IC Engines (Continued)	NSPS, Subpart J – Standards of Performance for Petroleum Refineries	Does not apply	40 CFR 60.101	Combust diesel as fuel
	NESHAP, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines	Does not apply	40 CFR 63.6590(a)	Engine less than 500 hp
EQT025, EQT026, and EQT027 TK-1204, TK-1205, and 804 Sulfuric Acid Tanks	Control of Organic Compounds – Storage of VOC	Does not apply	LAC 33:III.2103	Do not store VOCs
	NSPS, Subpart K NSPS, Subpart Ka NSPS, Subpart Kb	Does not apply	40 CFR 60.110 40 CFR 60.110a 40 CFR 60.110b	Tanks do not store petroleum liquids or VOC
	NESHAP, Subpart CC – Petroleum Refineries, Storage Vessels	Does not apply	40 CFR 63.641	Vessel capacity less than 10,567 gal
	NESHAP, Subpart EEEE – Organic Liquids Distribution (Non-Gasoline)	Does not apply	40 CFR 63.2330	Tanks do not store VOC
	NEHAP, Subpart FFFF – Miscellaneous Organic Chemical Manufacturing	Does not apply	40 CFR 63.2435(b)	Not associated with MCPU and/or is part of an affected source of NESHAP, 40 CFR 63

The above table provides explanation for both the exemption status or non-applicability of a source cited by 2 or 3 in the matrix presented in Section X of this permit

CRLLC-CHAL-000081

General Information

AI ID: 1376 Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Also Known As:

ID	Name	User Group	Start Date
2500-00005	Chalmette Refining LLC - Chalmette Refinery	CDS Number	05-27-1993
13-5401570	Mobil Oil Corp	Federal Tax ID	08-07-2002
LAD008179707	Chalmette Refining LLC	Hazardous Waste Notification	10-22-2002
PMT/CA	GPRA Baselines	Hazardous Waste Permitting	10-01-1997
00597	Chalmette Refining	Inactive & Abandoned Sites	11-23-1999
LA0004260	WPC File Number	LPDES Permit #	05-22-2003
WP0569	WPC State Permit Number	LWDPS Permit #	06-25-2003
WP3391	WPC State Permit Number	LWDPS Permit #	06-25-2003
01-269	Motor Fuel Delivery Certificate #	Motor Fuel Delivery Certificate	08-07-2002
	Priority 1 Emergency Site	Priority 1 Emergency Site	07-18-2006
LA-2247-L01	Radioactive Material License	Radiation License Number	01-19-1999
6264	X-Ray Registration Number	Radiation X-ray Registration Number	11-21-1999
GD-087-1774	Mobil Oil Corp	Solid Waste	01-08-2002
GD-087-1774	Site ID #	Solid Waste Facility No.	11-21-1999
19637	Exxon Co USA - Chalmette Terminal	TEMPO Merge	04-24-2001
36173	Mobil Oil Corp	TEMPO Merge	04-26-2001
38796	ExxonMobil Oil Corp - Chalmette Refining LLC	TEMPO Merge	12-16-2003
44916	Mobil Oil Corp - Chalmette Refinery	TEMPO Merge	05-22-2001
45047	Chalmette Refining LLC - A Delaware Ltd Liability Co	TEMPO Merge	03-28-2001
47202	Mobil Oil Corp - Chalmette Refinery	TEMPO Merge	10-02-2001
70143TNNCL500WE	TRI#	Toxic Release Inventory	07-09-2004
44015380	UST Facility ID (from UST legacy data)	UST FID #	10-12-2002

Physical Location: 500 W St Bernard Hwy
Chalmette, LA 70043

Main FAX: 5042811365
Main Phone: 5042811212

Mailing Address: PO Box 1007
Chalmette, LA 700441007

Location of Front Gate: 29° 56' 16" 45 hundredths latitude, 89° 58' 11" 65 hundredths longitude, Coordinate Method: GPS Code (Psuedo Range) Differential, Coordinate Datum: NAD83

Related People:

Name	Mailing Address	Phone (Type)	Relationship
Robert Cooper		5042320276 (WP)	Katrina Response Contact for
J M Dor	PO Box 4541 Houston, TX 772104541		Motor Fuel Delivery Certificate Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Radiation Safety Officer for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Radiation Safety Officer for

TPOR0148

APPENDIX D
7.5.14

CRLLC-CHAL-000082

General Information

AI ID: 1376 Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Related People:

Name	Mailing Address	Phone (Type)	Relationship
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Air Permit Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Air Permit Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Radiation Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Radiation Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Emission Inventory Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Emission Inventory Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Accident Prevention Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Accident Prevention Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Solid Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Solid Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Haz. Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Haz. Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Water Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Water Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Accident Prevention Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Accident Prevention Billing Party for

Related Organizations:

Name	Address	Phone (Type)	Relationship
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Emission Inventory Billing Party
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Air Billing Party for
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Radiation License Billing Party for
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Owns
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Radiation Registration Billing Party for
ExxonMobil Oil Corp	PO Box 1007 Chalmette, LA 700441007		UST Billing Party for
ExxonMobil Oil Corp	PO Box 1007 Chalmette, LA 700441007		Operates

Note: This report entitled "General Information" contains a summary of facility-level information contained in LDEQ's TEMPO database for this facility and is not considered a part of the permit. Please review the information contained in this document for accuracy and completeness. If any changes are required or if you have questions regarding this document, you may contact Mr. David Ferrand, Environmental Assistance Division, at (225) 219-3247 or email your changes to facupdate@la.gov.

APPENDIX D
7.5.15

TPOR0148

CRLLC-CHAL-000083

INVENTORIES

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Subject Item Inventory:

ID	Description	Tank Volume	Max. Operating Rate	Normal Operating Rate	Contents	Operating Time
UTILITIES COMPLEX						
EQT0019	27 - Boiler No. 402		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0020	35 - Boiler No. 7		160 MM BTU/hr	75 MM BTU/hr		8760 hr/yr (All Year)
EQT0021	66 - Boiler No. 9		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0022	70 - Boiler No. 10		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0023	CT-1 - Closed Cooling Water Tower		16000 gallons/min	16000 gallons/min		8760 hr/yr (All Year)
EQT0024	ICE-U1 - Internal Combustion Engine (Utilities Complex)		475 brake hp	475 brake hp		8760 hr/yr (All Year)
EQT0025	TK-1204 - Sulfuric Acid Tank	6000 gallons				8760 hr/yr (All Year)
EQT0026	TK-1205 - Sulfuric Acid Tank	264 gallons				8760 hr/yr (All Year)
EQT0027	TK-804 - Sulfuric acid Tank	12719 gallons				8760 hr/yr (All Year)
EQT0265	ICE-U2 - Internal Combustion Engine (Second Compressor)		475 brake hp	475 brake hp		8760 hr/yr (All Year)
EQT0266	ICE-U3 - Internal Combustion Engine (Third Compressor)		475 brake hp	475 brake hp		6888 hr/yr (All Year)
FUG0002	FE-U - Fugitive Emissions					8760 hr/yr (All Year)

Stack Information:

ID	Description	Velocity (ft/sec)	Flow Rate (cubic ft/min-actual)	Diameter (feet)	Discharge Area (square feet)	Height (feet)	Temperature (oF)
UTILITIES COMPLEX							
EQT0019	27 - Boiler No. 402	35.8	136650	9		135	420
EQT0020	35 - Boiler No. 7	44.9	52900	5		64	360
EQT0021	66 - Boiler No. 9	57.1	131850	7		62	440
EQT0022	70 - Boiler No. 10	55.1	123620	7		62	410

Relationships:

Subject Item Groups:

ID	Group Type	Group Description
GRP0022	Equipment Group	BC - Boiler CAP
UNF0001	Unit or Facility Wide	UC - UTILITIES COMPLEX

Group Membership:

ID	Description	Member of Groups
EQT0019	27 - Boiler No. 402	GRP0000000022
EQT0021	66 - Boiler No. 9	GRP0000000022
EQT0022	70 - Boiler No. 10	GRP0000000022

NOTE: The UNF group relationship is not printed in this table. Every subject item is a member of the UNF group

Annual Maintenance Fee:

TPOR0149

APPENDIX D
7.5.16

CRLLC-CHAL-000084

INVENTORIES

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Fee Number	Air Contaminant Source	Multiplier	Units Of Measure
0720	Petroleum Refining (Rated Capacity)	1	1,000 BBL/Day

SIC Codes:

2911	Petroleum refining	AI1376

APPENDIX D
7.5.17

TPOR0149

CRLLC-CHAL-000085

EMISSION RATES FOR CRITERIA POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Subject Item	CO			NOx			PM10			SO2			VOC		
	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year
UTILITIES COMPLEX															
EQT 0019 27		76.00			125.40			3.06			13.30			2.19	
EQT 0020 35	11.25	48.00	49.28	31.43	93.28	137.64	0.53	1.29	2.30	1.50	5.60	6.57	0.38	0.92	1.64
EQT 0021 66		133.00			144.40			3.06			13.30			2.19	
EQT 0022 70		133.00			144.40			3.06			13.30			2.19	
EQT 0023 CT-1							0.88		3.85				17.91		78.44
EQT 0024 ICE-U1	1.76	2.71	7.71	4.78	7.35	20.92	0.08	0.13	0.37	0.67	1.03	2.94	0.34	0.52	1.49
EQT 0265 ICE-U2	1.76	2.71	7.71	4.78	7.35	20.92	0.08	0.13	0.37	0.67	1.03	2.94	0.34	0.52	1.49
EQT 0266 ICE-U3	1.76	2.71	6.06	4.78	7.35	16.45	0.08	0.13	0.29	0.67	1.03	2.31	0.34	0.52	1.17
FUG 0002 FE-U													2.89		12.65
GRP 0022 BC	86.25		377.78	32.82		143.75	4.10		17.94	11.70		51.25	2.93		12.81

Note: Emission rates in bold are from alternate scenarios and are not included in permitted totals unless otherwise noted in a footnote.

APPENDIX D
7.5.18

TPOR0145

CRLLC-CHAL-000086

EMISSION RATES FOR TAP/HAP & OTHER POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Emission Pt.	Pollutant	Avg lb/hr	Tons/Year
EQT 0023 CT-1	Benzene	0.69	3.00
	Chloroform	0.38	1.65
	Dichloromethane	0.12	0.53
	Ethyl benzene	0.48	2.09
	Methyl ethyl keto	0.56	2.47
	Toluene	0.91	4.00
	Xylene (mixed iso	1.92	8.40
EQT 0025 TK-1204	Sulfuric acid		< 0.001
EQT 0026 TK-1205	Sulfuric acid		< 0.001
EQT 0027 TK-804	Sulfuric acid		< 0.001
FUG 0002 FE-U	1,3-Butadiene	0.002	0.01
	2,2,4-Trimethylpe	0.001	0.003
	Ammonia	0.23	1.02
	Benzene	0.03	0.14
	Biphenyl	0.01	0.03
	Carbon disulfide	< 0.001	< 0.001
	Cresol	0.01	0.06
	Cumene	0.003	0.01
	Ethyl benzene	0.01	0.06
	Hydrogen sulfide	0.001	0.004
	Methanol	0.18	0.77
	Methyl ethyl keto	0.02	0.07
	Methyl isobutyl k	< 0.001	0.001
	Naphthalene	0.05	0.21
	Phenol	0.02	0.10
	Tetrachloroethyle	< 0.001	< 0.001
	Toluene	0.13	0.56
	Trichloroethylene	< 0.001	< 0.001
	Xylene (mixed iso	0.13	0.59
	n-Hexane	0.12	0.54
UNF 0001 UC	1,3-Butadiene		0.01
	2,2,4-Trimethylpe		0.003
	Ammonia		1.02
	Benzene		3.14

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APPENDIX D
7.5.19

CRLLC-CHAL-000087

EMISSION RATES FOR TAP/HAP & OTHER POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Emission Pt.	Pollutant	Avg lb/hr	Tons/Year
UNF 0001 UC	Biphenyl		0.03
	Carbon disulfide		< 0.001
	Chloroform		1.65
	Cresol		0.06
	Cumene		0.01
	Ethyl benzene		2.15
	Hydrogen sulfide		0.004
	Methanol		0.77
	Methyl ethyl keto		2.54
	Methyl isobutyl k		0.001
	Phenol		0.10
	Sulfuric acid		< 0.003
	Tetrachloroethyle		< 0.001
	Toluene		4.56
	Trichloroethylene		< 0.001
	Xylene (mixed iso		8.99
	n-Hexane		0.54

Note: Emission rates in bold are from alternate scenarios and are not included in permitted totals unless otherwise noted in a footnote.

TPOR0146

APPENDIX D
7.5.20

CRLLC-CHAL-000088

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

EQT0019 27, Boiler No. 402

1	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
2	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span of the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
3	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
4	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
5	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
6	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
7	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J. 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
8	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
9	[LAC 33:III.501.C.6]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
10	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
11	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0020 35, Boiler No. 7

APPENDIX D
7.5.21

TPOR0147

CRLLC-CHAL-000089

EQT0020 35, Boiler No. 7

12	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
13	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span on the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
14	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
15	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
16	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
17	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
18	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
19	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
20	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
21	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0021 66, Boiler No. 9

22	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: None specified

APPENDIX D
7.5.22

CRLLC-CHAL-000090

EQT0021 66, Boiler No. 9

23	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span on the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
24	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
25	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
26	[40 CFR 60.44b]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
27	[40 CFR 60.48b(b)(1)]	Nitrogen oxides monitored by CMS continuously. Calculate nitrogen oxides emission rates as specified in 40 CFR 60.48b(d). Subpart Db. [40 CFR 60.48b(b)(1)] Which Months: All Year Statistical Basis: One-hour average
28	[40 CFR 60.48b(b)(1)]	Nitrogen oxides recordkeeping by CMS continuously. Subpart Db. [40 CFR 60.48b(b)(1)]
29	[40 CFR 60.48b(c)]	Operate NOx continuous monitoring systems and record data during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Record data during calibration checks, and zero and span adjustments. Subpart Db. [40 CFR 60.48b(c)]
30	[40 CFR 60.48b(e)]	Follow the procedures under 40 CFR 60.13 and 40 CFR 60.48b(e)(1) through (e)(3) for installation, evaluation, and operation of the NOx continuous monitoring systems. Subpart Db. [40 CFR 60.48b(e)]
31	[40 CFR 60.48b(f)]	When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, obtain emission data by using standby monitoring systems, 40 CFR 60, Appendix A, Method 7, Method 7a, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days. Subpart Db. [40 CFR 60.48b(f)]
32	[40 CFR 60.49b(d)]	Fuel rate recordkeeping by electronic or hard copy daily. Record the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for refinery fuel gas and natural gas for the reporting period. Determine the annual capacity factor on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. Subpart Db. [40 CFR 60.49b(d)]
33	[40 CFR 60.49b(g)]	Equipment/operational data recordkeeping by electronic or hard copy continuously. Maintain records of the information listed in 40 CFR 60.49b(g)(1) through (g)(10) for each steam generating unit operating day, except as provided under 40 CFR 60.49b(p). Subpart Db. [40 CFR 60.49b(g)]
34	[40 CFR 60.49b(h)]	Submit excess emissions report: Due by the 30th day following the end of each six-month period. Report any excess emissions which occurred during the reporting period. Subpart Db. [40 CFR 60.49b(h)]
35	[40 CFR 60.49b(o)]	Maintain all records required under 40 CFR 60.49b for a period of 2 years following the date of such record. Subpart Db. [40 CFR 60.49b(o)]
36	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
37	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0021 66, Boiler No. 9

38	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
39	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
40	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
41	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0022 70, Boiler No. 10

42	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
43	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span of the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
44	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
45	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
46	[40 CFR 60.44b]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
47	[40 CFR 60.48b(b)(1)]	Nitrogen oxides monitored by CMS continuously. Calculate nitrogen oxides emission rates as specified in 40 CFR 60.48b(d). Subpart Db. [40 CFR 60.48b(b)(1)] Which Months: All Year Statistical Basis: One-hour average
48	[40 CFR 60.48b(b)(1)]	Nitrogen oxides recordkeeping by CMS continuously. Subpart Db. [40 CFR 60.48b(b)(1)]
49	[40 CFR 60.48b(c)]	Operate NOx continuous monitoring systems and record data during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Record data during calibration checks, and zero and span adjustments. Subpart Db. [40 CFR 60.48b(c)]

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

EQT0022 70, Boiler No. 10

50	[40 CFR 60.48b(e)]	Follow the procedures under 40 CFR 60.13 and 40 CFR 60.48b(e)(1) through (e)(3) for installation, evaluation, and operation of the NOx. Subpart Db. [40 CFR 60.48b(e)]
51	[40 CFR 60.48b(f)]	When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, obtain emission data by using standby monitoring systems, 40 CFR 60, Appendix A, Method 7, Method 7a, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days. Subpart Db. [40 CFR 60.48b(f)]
52	[40 CFR 60.49b(d)]	Fuel rate recordkeeping by electronic or hard copy daily. Record the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for refinery fuel gas and natural gas for the reporting period. Determine the annual capacity factor on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. Subpart Db. [40 CFR 60.49b(d)]
53	[40 CFR 60.49b(g)]	Equipment/operational data recordkeeping by electronic or hard copy continuously. Maintain records of the information listed in 40 CFR 60.49b(g)(1) through (g)(10) for each steam generating unit operating day, except as provided under 40 CFR 60.49b(p). Subpart Db. [40 CFR 60.49b(g)]
54	[40 CFR 60.49b(h)]	Submit excess emissions report: Due by the 30th day following the end of each six-month period. Report any excess emissions which occurred during the reporting period. Subpart Db. [40 CFR 60.49b(h)]
55	[40 CFR 60.49b(o)]	Maintain all records required under 40 CFR 60.49b for a period of 2 years following the date of such record. Subpart Db. [40 CFR 60.49b(o)]
56	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
57	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
58	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
59	[LAC 33:III.501.C.6]	*Conduct a performance/emissions test:* Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
60	[LAC 33:III.501.C.6]	Submit notification: *Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment,* Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
61	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

CRLLC-CHAL-000093

EQT0023 CT-1, Closed Cooling Water Tower

62	[40 CFR 63.104(b)]	Heat exchange systems (cooling water): HAP monitored by the regulation's specified method(s) monthly for the first 6 months and quarterly thereafter to detect leaks. Monitor for total hazardous air pollutants, total volatile organic compounds, total organic carbon, one or more speciated HAP compounds, or other representative substances that would indicate the presence of a leak in the heat exchange system. Subpart F. [40 CFR 63.104(b)] Which Months: All Year Statistical Basis: None specified
63	[40 CFR 63.104(f)]	Heat exchange systems: Equipment/operational data recordkeeping by electronic or hard copy continuously. Retain the records identified in 40 CFR 63.104(f)(1)(i) through (iv) as specified in 40 CFR 63.103(c)(1). Subpart F. [40 CFR 63.104(f)]
64	[40 CFR 63.105(d)]	Maintenance wastewater: Incorporate the procedures described in 40 CFR 63.105(b) and (c) as part of the start-up, shutdown and malfunction plan required under 40 CFR 63.6(e)(3). Subpart F. [40 CFR 63.105(d)]
65	[40 CFR 63.105(e)]	Maintenance wastewater: Equipment/operational data recordkeeping by electronic or hard copy at the approved frequency. Maintain a record of the information required by 40 CFR 63.105(b) and (c) as part of the start-up, shut-down, and malfunction plan required under 40 CFR 63.6(e)(3). Subpart F. [40 CFR 63.105(e)]
66	[40 CFR 63.105]	Maintenance wastewater: Prepare a description of maintenance procedures for the management of wastewaters generated from the emptying and purging of equipment in the process during temporary shutdowns for inspections, maintenance, and repair and during periods which are not shutdowns as specified in 40 CFR 63.105(b)(1) through (b)(3). Modify and update the information required by 40 CFR 63.105(b) as needed following each maintenance procedure based on the actions taken and the wastewaters generated in the preceding maintenance procedure. Subpart F.
67	[LAC 33:III.5109.A]	Compliance with all the applicable requirements of NESHAP, 40 CFR 63, Subpart F is considered compliance with all the requirements of LAC 33:III.Chapter 51.

EQT0024 ICE-U1, Internal Combustion Engine (Utilities Complex)

68	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
69	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0025 TK-1204, Sulfuric Acid Tank

70	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0026 TK-1205, Sulfuric Acid Tank

71	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0027 TK-804, Sulfuric Acid Tank

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

EQT0027 TK-804, Sulfuric Acid Tank

72	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0265 ICE-U2, Internal Combustion Engine (Second Compressor)

73	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
74	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0266 ICE-U3, Internal Combustion Engine (Third Compressor)

75	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
76	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

FUG0002 FE-U, Fugitive Emissions (Utilities)

77	[40 CFR 60.592(a)]	Comply with the requirements of 40 CFR 60.482-1 to 482-10 as per approval letter dated March 24, 2005 by LDEQ. Subpart GGG. [40 CFR 60.592(a)]
78	[40 CFR 60.592(d)]	Comply with the provisions of 40 CFR 60.485 except as provided in 40 CFR 60.593. Subpart GGG. [40 CFR 60.592(d)]
79	[40 CFR 60.592(e)]	Comply with the provisions of 40 CFR 60.486 and 60.487. Subpart GGG. [40 CFR 60.592(e)]
80	[40 CFR 63.132(a)(3)]	Permittee shall comply with the requirements of Group 2 Wastewater Stream and also with the recordkeeping and reporting of 40 CFR 63, Subpart G. [40 CFR 63.132(a)(3), 40 CFR 63.146(b)(1), 40 CFR 63.147(b)(8)]
81	[40 CFR 63.642(e)]	Keep copies of all applicable reports and records required by 40 CFR 63 Subpart CC for at least 5 years except as otherwise specified in 40 CFR 63 Subpart CC. Maintain all applicable records in such a manner that they can be readily accessed within 24 hours. Subpart CC. [40 CFR 63.642(e)]
82	[40 CFR 63.642(g)]	Control emissions of organic HAPs to the level represented by the equation in 40 CFR 63.642(g). Subpart CC. [40 CFR 63.642(g)]
83	[40 CFR 63.642(h)]	Control emissions of organic HAPs to the level represented by the equation in 40 CFR 63.642(g). Subpart CC. [40 CFR 63.642(h)]
84	[40 CFR 63.654(g)]	Submit Periodic Report: Due no later than 60 days after the end of each 6-month period when any of the compliance exceptions specified in 40 CFR 63.654(g)(1) through (g)(6) occur. Include the information specified in 40 CFR 63.654(g)(1) through (g)(8). Subpart CC. [40 CFR 63.654(g)]
85	[40 CFR 63.654(h)(1)]	Submit reports of startup, shutdown, and malfunction required by 40 CFR 63.10(d)(5). Subpart CC. [40 CFR 63.654(h)(1)]
86	[40 CFR 63.654(h)(6)]	Submit the information specified in 40 CFR 63.654(h)(6)(i) through (iii), as applicable. Subpart CC. [40 CFR 63.654(h)(6)]

FUG0002 FE-U, Fugitive Emissions (Utilities)

87	[40 CFR 63.654(i)(2)]	Retain a record of all reported performance test results required under 40 CFR 63.654(f) and (g)(7) as well as a complete test report, as described in 40 CFR 63.654(f)(2)(ii) for each emission point tested. Subpart CC. [40 CFR 63.654(i)(2)]
88	[40 CFR 63.654(i)(4)]	Retain all information required to be reported under 40 CFR 63.654(a) through (h) for five years. Subpart CC. [40 CFR 63.654(i)(4)]
89	[LAC 33:III.501.C.6]	VOC, Total: The number of each type of components required to be monitored for each monitoring period under applicable leak detection and repair programs shall be reported to the LDEQ by inclusion with each periodic monitoring report. Fugitive emission piping components may be added to or removed from the permitted units, without triggering the need to apply for a permit modification, provided: A) Changes in components involve routine maintenance or are undertaken to address safety concerns or involve small piping revisions with no associated emissions increases except from the fugitive emission components themselves; B) The changes do not involve any associated increase in the production rate or capacity, or tie in of new or modified process equipment other than the piping components; C) Actual emissions following the changes will not exceed the emission limits contained in this permit; and D) The components are promptly incorporated into any applicable leak detection and repair program.
90	[LAC 33:III.5109.A]	Compliance with all the applicable requirements of NESHAP, 40 CFR 63, Subpart CC is considered compliance with all the applicable requirements of LAC 33:III.Chapter 51.

GRP0022 Boilers CAP

Group Members: EQT0019 EQT0021 EQT0022

91	[LAC 33:III.501.C.6]	Permittee shall continuously monitor the heat input to the boilers, Emission Points, 27, 66, and 70. Based on the monitored heat input and individual emission factors the permittee shall calculate emissions from each boiler. The total heat input to all boilers shall not exceed 585 MM BTU/hr (annual average) and the total calculated emissions from all boilers shall not exceed PM10, 17.94 tons per year (TPY); SO2, 51.25 TPY; NOx, 143.75 TPY; CO, 377.78 TPY; and VOC, 12.81 TPY. Emission from these boilers shall be reported under an emission cap. Emission Point Boiler CAP. The total heat input and the calculated emissions of the individual boiler shall be recorded each month, as well as the total heat input and the total calculated emissions for the last twelve months. These records shall be kept on site and available for inspection by the Office of Environmental Compliance, Surveillance Division. The total average heat input and calculated emissions above the maximum listed in this permit as referenced above for any twelve consecutive month period shall be a violation of this permit and must be reported to the Office of Environmental Compliance, Enforcement Division. A report showing the heat input of the individual boilers and the total calculated emissions for the last twelve months shall be submitted to the Office of Environmental Compliance, Surveillance Division by March 31 for the preceding calendar year.

UNF0001 UTILITIES COMPLEX

92	[40 CFR 60.]	All affected facilities shall comply with all applicable provisions in 40 CFR 60 Subpart A.
93	[40 CFR 61.145(b)(1)]	Provide DEQ with written notice of intention to demolish or renovate prior to performing activities to which 40 CFR 61 Subpart M applies. Delivery of the notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable. [40 CFR 61.145(b)(1)]
94	[40 CFR 61.148]	Do not install or reinstall on a facility component any insulating materials that contain commercial asbestos if the materials are either molded and friable or wet-applied and friable after drying. Subpart M.

UNF0001 UTILITIES COMPLEX

95	[40 CFR 61.342(e)]	Benzene: Permittee shall comply with all the applicable requirements of the alternative requirements to paragraphs 40 CFR 61.342(c) and (d). The permittee shall manage and treat facility waste with a flow weighted annual average water content of less than 10 percent in accordance with 40 CFR 61.342(c)(1). The benzene quantity for the wastes described in 40 CFR 61.342(e)(2) shall be equal to or less than 6.6 tons per year, as determined in 40 CFR 61.355(k). [40 CFR 61.342(e)]
96	[40 CFR 61.356(a)(4)]	Permittee shall comply with all the applicable reporting requirements as stated in 40 CFR 61.356 and all the applicable reporting requirements as stated in 40 CFR 61.357. Subpart FF. [40 CFR 61.356(a)(4), 40 CFR 61.357]
97	[40 CFR 61.]	All affected facilities shall comply with all applicable provisions in 40 CFR 61 Subpart A.
98	[40 CFR 70.6(a)(3)(iii)(A)]	Submit Title V monitoring results report: Due semiannually, by March 31st and September 30th for the preceding periods encompassing July through December and January through June, respectively. Submit reports to the Office of Environmental Compliance, Surveillance Division. Certify reports by a responsible company official. Clearly identify all instances of deviations from permitted monitoring requirements. For previously reported deviations, in lieu of attaching the individual deviation reports, clearly reference the communication(s)/correspondence(s) constituting the prior report, including the date the prior report was submitted. [40 CFR 70.6(a)(3)(iii)(A)]
99	[40 CFR 70.6(a)(3)(iii)(B)]	Submit Title V excess emissions report: Due quarterly, by June 30, September 30, December 31, March 31. Submit reports of all permit deviations to the Office of Environmental Compliance, Surveillance Division. Certify all reports by a responsible official in accordance with 40 CFR 70.5(d). The reports submitted on March 31 and September 30 may be consolidated with the semi-annual reports required by 40 CFR 70.6(a)(3)(iii)(A) as long as the report clearly indicates this and all required information is included and clearly delineated in the consolidated report. [40 CFR 70.6(a)(3)(iii)(B)]
100	[40 CFR 70.6(c)(5)(iv)]	Submit Title V compliance certification: Due annually, by the 31st of March. Submit to the Office of Environmental Compliance, Surveillance Division. [40 CFR 70.6(c)(5)(iv)]
101	[40 CFR 82.Subpart F]	Comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B.
102	[LAC 33:III.1103]	Emissions of smoke which pass onto or across a public road and create a traffic hazard by impairment of visibility as defined in LAC 33:III.111 or intensify an existing traffic hazard condition are prohibited.
103	[LAC 33:III.1109.B]	Outdoor burning of waste material or other combustible material is prohibited.
104	[LAC 33:III.1303.B]	Emissions of particulate matter which pass onto or across a public road and create a traffic hazard by impairment of visibility or intensify an existing traffic hazard condition are prohibited.
105	[LAC 33:III.1305]	Prevent particulate matter from becoming airborne by taking all reasonable precautions. These precautions shall include, but not be limited to, those specified in LAC 33:III.1305.A.1-7.
106	[LAC 33:III.1513.C]	Equipment/operational data recordkeeping by electronic or hard copy once initially and annually. Record and retain at the site sufficient data to show annual potential sulfur dioxide emissions.
107	[LAC 33:III.2113.A]	Maintain best practical housekeeping and maintenance practices at the highest possible standards to reduce the quantity of organic compounds emissions. Good housekeeping shall include, but not be limited to, the practices listed in LAC 33:III.2113.A.1-5.
108	[LAC 33:III.2141]	VOC, Total: Permittee shall control VOC emissions from petroleum refinery process unit turnarounds by pumping the liquid contents to storage and depressurizing the process units to 5 psig or below before venting to the atmosphere. [LAC 33:III.2141, LAC 33:III.2115.A, B, F, LAC 33:III.2115.I, J, K]

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

UNF0001 UTILITIES COMPLEX

109	[LAC 33:III.219]	Failure to pay the prescribed application fee or annual fee as provided herein, within 90 days after the due date, will constitute a violation of these regulations and shall subject the person to applicable enforcement actions under the Louisiana Environmental Quality Act including, but not limited to, revocation or suspension of the applicable permit, license, registration, or variance.
110	[LAC 33:III.2901.D]	Discharges of odorous substances at or beyond property lines which cause a perceived odor intensity of six or greater on the specified eight point butanol scale as determined by Method 41 of LAC 33:III.2901.G are prohibited.
111	[LAC 33:III.2901.F]	If requested to monitor for odor intensity, take and transport samples in a manner which minimizes alteration of the samples either by contamination or loss of material. Evaluate all samples as soon after collection as possible in accordance with the procedures set forth in LAC 33:III.2901.G.
112	[LAC 33:III.501.C.6]	Methylene Chloride <= 0.53 tons/yr. Which Months: All Year Statistical Basis: Annual maximum
113	[LAC 33:III.5105.A.1]	Do not construct or modify any stationary source subject to any standard set forth in LAC 33:III.Chapter 51.Subchapter A without first obtaining written authorization from DEQ in accordance with LAC 33:III.Chapter 51.Subchapter A, after the effective date of the standard.
114	[LAC 33:III.5105.A.2]	Do not cause a violation of any ambient air standard listed in LAC 33:III.Table 51.2, unless operating in accordance with LAC 33:III.5109.
115	[LAC 33:III.5105.A.3]	Do not build, erect, install, or use any article, machine, equipment, process, or method, the use of which conceals an emission that would otherwise constitute a violation of an applicable standard.
116	[LAC 33:III.5105.A.4]	Do not fail to keep records, notify, report or revise reports as required under LAC 33:III.Chapter 51.Subchapter A.
117	[LAC 33:III.5107.A.2]	Submit Annual Emissions Report (TEDI): Due annually, by the 1st of July, to the Office of Environmental Assessment, Environmental Evaluation Division in a form specified by the department. Identify the quantity of emissions in the previous calendar year for any toxic air pollutant listed in Table 51.1 or Table 51.3.
118	[LAC 33:III.5107.A.3]	Include a certification statement with initial and subsequent annual emission reports and revisions to any emission report to attest that the information contained in the emission report is true, accurate, and complete, and signed by a responsible official, as defined in LAC 33:III.502. Include the full name of the responsible official, title, signature, date of signature and phone number of the responsible official. The certification statement shall read: "I certify, under penalty of perjury, that the emissions data provided is accurate to the best of my knowledge, information, and belief, and I understand that submitting false or misleading information will expose me to prosecution under state regulations"
119	[LAC 33:III.5107.B.1]	Submit notification: Due to the Department of Public Safety 24-hour Louisiana Emergency Hazardous Materials Hotline at (225) 925-6595 immediately, but no later than 1 hour, after any discharge of a toxic air pollutant into the atmosphere which results or threatens to result in an emergency condition (a condition which could reasonably be expected to endanger the health and safety of the public, cause significant adverse impact to the land, water or air environment, or cause severe damage to property).
120	[LAC 33:III.5107.B.2]	Submit notification: Due to the Office of Environmental Compliance, except as provided in LAC 33:III.5107.B.6, no later than 24 hours after the beginning of any unauthorized discharge into the atmosphere of a toxic air pollutant as a result of bypassing an emission control device, when the emission control bypass was not the result of an upset, and the quantity of the unauthorized bypass is greater than or equal to the lower of the Minimum Emission Rate (MER) in LAC 33:III.Chapter 51.Table 51.1 or a reportable quantity (RQ) in LAC 33:I.3931, or the quantity of the unauthorized bypass is greater than one pound and there is no MER or RQ for the substance in question. Submit notification in the manner provided in LAC 33:I.3923.

CRLLC-CHAL-000098

UNF0001 UTILITIES COMPLEX

121	[LAC 33:III.5107.B.3]	Submit notification: Due to the Office of Environmental Compliance immediately, but in no case later than 24 hours after any unauthorized discharge of a toxic air pollutant into the atmosphere that does not cause an emergency condition, the rate or quantity of which is in excess of that allowed by permit, compliance schedule, or variance, or for upset events that exceed the reportable quantity in LAC 33:I.3931, except as provided in LAC 33:III.5107.B.6. Submit notification in the manner provided in LAC 33:I:3923.
122	[LAC 33:III.5107.B.4]	Submit written report: Due within seven calendar days of learning of any such discharge or equipment bypass as referred to in LAC 33:III.5107.B.1 through 3. Submit report to the Office of Environmental Compliance by certified mail. Include the information specified in LAC 33:III.5107.B.4.a.i through viii.
123	[LAC 33:III.5107.B.5]	Report all discharges to the atmosphere of a toxic air pollutant from a safety relief device, a line or vessel rupture, a sudden equipment failure, or a bypass of an emission control device, regardless of quantity, in the annual emissions report and where otherwise specified. Include the identity of the source, the date and time of the discharge, and the approximate total loss during the discharge.
124	[LAC 33:III.5109.B.1]	Submit to DEQ a compliance plan for achieving compliance with the ambient air standard(s), in accordance with LAC 33:III.5109.D. Include the elements listed under LAC 33:III.5109.E.
125	[LAC 33:III.5109.B.2]	Submit to DEQ a certification of compliance with all ambient air standards, in accordance with LAC 33:III.5109.D. Include the elements listed under LAC 33:III.5109.E.
126	[LAC 33:III.5109.B.3]	Achieve compliance with ambient air standards unless it can be demonstrated to the satisfaction of DEQ that compliance with an ambient air standard would be economically infeasible; that emissions could not reasonably be expected to pose a threat to public health or the environment; and that emissions would be controlled to a level that is Maximum Achievable Control Technology.
127	[LAC 33:III.5109.B]	Determine the status of compliance, beyond the property line, with applicable ambient air standards listed in LAC 33:III.5112.Table 51.2.
128	[LAC 33:III.5109.C]	Develop a standard operating procedure (SOP) within 120 days after achieving or demonstrating compliance with the standards specified in LAC 33:III.Chapter 51. Detail in the SOP all operating procedures or parameters established to ensure that compliance with the applicable standards is maintained and address operating procedures for any monitoring system in place, specifying procedures to ensure compliance with LAC 33:III.5113.C.5. Make a written copy of the SOP available on site or at an alternate approved location for inspection by DEQ. Provide a copy of the SOP within 30 days upon request by the department.
129	[LAC 33:III.5111.A.1]	Obtain a Louisiana Air Permit in accordance with LAC 33:III.5111.B and C and in accordance with LAC 33:I.1701, before commencement of the construction of any new source.
130	[LAC 33:III.5111.A.2.a]	Obtain a permit modification in accordance with LAC 33:III.5111.B and C before commencement of any modification not specified in a compliance plan submitted under LAC 33:III.5109.D, if the modification will result in an increase in emissions of any toxic air pollutant or will create a new point source.
131	[LAC 33:III.5111.A.3]	Obtain written authorization from DEQ before commencement of any modification specified in a compliance plan submitted pursuant to LAC 33:III.5109.
132	[LAC 33:III.5111.A.4]	Apply for a permit in accordance with LAC 33:III.5111.B, for any existing major source which is operating without a Louisiana Air Permit, or which is not fully permitted, or for any minor source that was once a major source.
133	[LAC 33:III.5111.A]	Do not commence construction or modification of any major source without first obtaining written authorization from DEQ, as specified.
134	[LAC 33:III.5113.A.1]	Submit notification in writing: Due to the Office of Environmental Compliance, Surveillance Division not more than 60 days nor less than 30 days prior to initial start-up. Submit the anticipated date of the initial start-up.

UNF0001 UTILITIES COMPLEX

135	[LAC 33:III.5113.A.2]	Submit notification in writing: Due to the Office of Environmental Compliance, Surveillance Division within 10 working days after the actual date of initial start-up of the source. Submit the actual date of initial start-up of the source.
136	[LAC 33:III.5113.B.1]	Ensure that all testing done to determine the emission of toxic air pollutants, upon request by the department, is conducted by qualified personnel.
137	[LAC 33:III.5113.B.3]	Provide necessary sampling and testing facilities, exclusive of instruments and sensing devices, as needed to properly determine the emission of toxic air pollutants, upon request of the department.
138	[LAC 33:III.5113.B.4]	Provide emission testing facilities as specified in LAC 33:III.5113.B.4.a through e.
139	[LAC 33:III.5113.B.5]	Analyze samples and determine emissions within 30 days after each emission test has been completed.
140	[LAC 33:III.5113.B.6]	Equipment/operational data recordkeeping by electronic or hard copy upon each occurrence of emissions testing. Retain records of emission test results and other data needed to determine emissions. Retained records at the source, or at an alternate location approved by DEQ for a minimum of two years, and make available upon request for inspection by DEQ.
141	[LAC 33:III.5113.B.7]	Submit notification: Due to the Office of Environmental Assessment, Environmental Technology Division at least 30 days before the emission test. Submit notification of emission test to allow DEQ the opportunity to have an observer present during the test.
142	[LAC 33:III.5113.C.1]	Maintain and operate each monitoring system in a manner consistent with good air pollution control practices for minimizing emissions. Repair or adjust any breakdown or malfunction of the monitoring system as soon as practicable after its occurrence.
143	[LAC 33:III.5113.C.2]	Conduct performance evaluation of the monitoring system when required at any other time requested by DEQ.
144	[LAC 33:III.5113.C.2]	Submit notification in writing: Due to the Office of Environmental Assessment, Environmental Technology Division at least 30 days before a performance evaluation of the monitoring system is to begin.
145	[LAC 33:III.5113.C.2]	Submit performance evaluation report: Due to the Office of Environmental Assessment, Environmental Technology Division within 60 days of the monitoring system performance evaluation.
146	[LAC 33:III.5113.C.3]	Install a monitoring system on each effluent or on the combined effluent, when monitoring is required and the effluents from a single source, or from two or more sources subject to the same emission standards, are combined before being released to the atmosphere. If two or more sources are not subject to the same emission standards, install a separate monitoring system on each effluent, unless otherwise specified. If the applicable standard is a mass emission standard and the effluent from one source is released to the atmosphere through more than one point, install a monitoring system at each emission point unless DEQ approves the installation of fewer systems.
147	[LAC 33:III.5113.C.5.a]	Evaluate the performance of continuous monitoring systems, upon request by DEQ, in accordance with the requirements and procedures contained in the applicable performance specification of 40 CFR Part 60, appendix B.
148	[LAC 33:III.5113.C.5.a]	Submit report: Due to DEQ within 60 days of the performance evaluation of the CMS, if requested. Furnish DEQ with two or more copies of a written report of the test results within 60 days.
149	[LAC 33:III.5113.C.5.d]	Install all continuous monitoring systems or monitoring devices to make representative measurements under variable process or operating parameters, if required to install a CMS.
150	[LAC 33:III.5113.C.5.e]	Collect and reduce all data as specified in LAC 33:III.5113.C.5.e.i and ii, if required to install a CMS.
151	[LAC 33:III.5113.C.5]	Submit plan: Due to the Office of Environmental Assessment, Environmental Technology Division within 90 days after DEQ requests either the initial plan or an updated plan, if required by DEQ to install a continuous monitoring system. Submit for approval a plan describing the affected sources and the methods for ensuring compliance with the continuous monitoring system.

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

UNF0001 UTILITIES COMPLEX

152	[LAC 33:III.5113.C.7]	Maintain records of monitoring data, monitoring system calibration checks, and the occurrence and duration of any period during which the monitoring system is malfunctioning or inoperative. Maintain these records at the source, or at an alternative location approved by DEQ, for a minimum of three years and make available, upon request, for inspection by DEQ.
153	[LAC 33:III.5151.F.1.f]	An individual or company contracted to perform a demolition or renovation activity which disturbs RACM must be recognized by the Licensing Board for Contractors to perform asbestos abatement, and shall meet the requirements of LAC 33:III.5151:F.2 and F.3 for each demolition or renovation activity.
154	[LAC 33:III.5609.A.1.b]	Activate the preplanned abatement strategy listed in LAC 33:III.5611.Table 5 when the administrative authority declares an Air Pollution Alert.
155	[LAC 33:III.5609.A.2.b]	Activate the preplanned strategy listed in LAC 33:III.5611.Table 6 when the administrative authority declares an Air Pollution Warning.
156	[LAC 33:III.5609.A.3.b]	Activate the preplanned abatement strategy listed in LAC 33:III.5611.Table 7 when the administrative authority declares an Air Pollution Emergency.
157	[LAC 33:III.5609.A]	Prepare standby plans for the reduction of emissions during periods of Air Pollution Alert, Air Pollution Warning and Air Pollution Emergency. Design standby plans to reduce or eliminate emissions in accordance with the objectives as set forth in LAC 33:III.5611.Tables 5, 6, and 7.
158	[LAC 33:III.5611.A]	Submit standby plan for the reduction or elimination of emissions during an Air Pollution Alert, Air Pollution Warning, or Air Pollution Emergency: Due within 30 days after requested by the administrative authority.
159	[LAC 33:III.5611.B]	During an Air Pollution Alert, Air Pollution Warning or Air Pollution Emergency, make the standby plan available on the premises to any person authorized by the department to enforce these regulations.
160	[LAC 33:III.5901.A]	Comply with the provisions in 40 CFR 68, except as specified in LAC 33:III.5901.
161	[LAC 33:III.5907]	Identify hazards that may result from accidental releases of the substances listed in 40 CFR 68.130, Table 59.0 of LAC 33:III.5907, or Table 59.1of LAC 33:III.5913 using appropriate hazard assessment techniques, design and maintain a safe facility, and minimize the off-site consequences of accidental releases of such substances that do occur.
162	[LAC 33:III.5911.A]	Submit registration: Due January 31, 1998, or within 60 days after the source becomes subject to LAC 33:III.Chapter 59, whichever is later. Include the information listed in LAC 33:III.5911.B, and submit to the Department of Environmental Quality, Office of Environmental Compliance, Surveillance Division.
163	[LAC 33:III.5911.C]	Submit amended registration: Due to the Department of Environmental Quality, Office of Environmental Compliance, Surveillance Division within 60 days after the information in the submitted registration is no longer accurate.
164	[LAC 33:III.905]	Install air pollution control facilities whenever practically, economically, and technologically feasible. When facilities have been installed on a property, use them and diligently maintain them in proper working order whenever any emissions are being made which can be controlled by the facilities, even though the ambient air quality standards in affected areas are not exceeded.
165	[LAC 33:III.917.A]	Where, upon written application of the responsible person or persons, the administrative authority finds that by reason of exceptional circumstances strict conformity with any provisions of these regulations would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the administrative authority may permit a variance from these regulations.
166	[LAC 33:III.917.B]	No variance may permit or authorize the maintenance of a nuisance, or a danger to public health or safety.
167	[LAC 33:III.919.D]	Submit Emission Inventory (EI)/Annual Emissions Statement: Due annually, by the 31st of March for the period January 1 to December 31 of the previous year. Submit emission inventory data in the format specified by the Office of Environmental Assessment, Environmental Evaluation Division. Include all data applicable to the emissions source(s), as specified in LAC 33:III.919.A-D.

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

UNF0001 UTILITIES COMPLEX

168	[LAC 33:III.927]	Report the unauthorized discharge of any air pollutant into the atmosphere in accordance with LAC 33:I.Chapter 39, Notification Regulations and Procedures for Unauthorized Discharges. Submit written reports to the department pursuant to LAC 33:I.3925. Submit timely and appropriate follow-up reports detailing methods and procedures to be used to prevent similar atmospheric releases.
169	[LAC 33:III.929.A]	No person or group of persons shall allow particulate matter or gases to become airborne in amounts which cause the ambient air quality standards to be exceeded.

APPENDIX D
7.5.34

TPOR0147

CRLLC-CHAL-000102

Jeff Bergeron/B/South-US/ExxonMobil

08/27/2008 02:30 PM

To gerri.garwood@la.gov

cc

bcc

Subject Boiler 10 Testing

Gerri,

Per our conversation we have postponed the performance testing and CEMS certification on Boiler 10 to the week of September 15th. I will follow-up with an exact date as soon as we know what day it will be. Thanks so much for your help and please let me know if you need anymore information.

Jeff Bergeron
ExxonMobil - Chalmette Refining, L.L.C.
Jeff.Bergeron@exxonmobil.com
(504) 281-1934 phone
(225) 485-5450 cell

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 281-1212

July 18, 2008

CERTIFIED MAIL (7006 0810 0004 8749 3045) RETURN RECEIPT REQUESTED

Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

30 DAY NOTIFICATION OF PERFORMANCE TESTING
BOILER NO. 10 UNIT
ACTIVITY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C.

Dear Ms. Garwood:

Pursuant to Permit 2500-00005-V1 Specific Requirements 59 and 60, Chalmette Refining, L.L.C. (CRLLC) submits this notification to conduct performance testing for the Boiler 10 Unit. Performance testing will be performed as required under Specific Condition 59 using the methods specified in 40 CFR 60 Appendix A. The test has been rescheduled from July 14, 2008 and will be conducted August 19, 2008 by Emission Testing Services, Inc.

Should you have any questions concerning this submittal, please contact Ms. Rebecca Bourg at (504) 281-1330 or by e-mail at rebecca.j.bourg@exxonmobil.com.

Very truly yours,

Charles Kominas
Environmental Group Leader

RJB

cc: EPA Region VI
LDEQ Southeast Regional Office

APPENDIX E
7.6.2

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 281-1212

June 13, 2008

CERTIFIED MAIL (7006 0810 0004 8748 0892) RETURN RECEIPT REQUESTED

Chris Roberie, Administrator
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

30 DAY NOTIFICATION OF PERFORMANCE TESTING
BOILER NO. 10 UNIT
ACTIVITY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C.

Dear Mr. Roberie:

Pursuant to Permit 2500-00005-V1 Specific Requirements 59 and 60, Chalmette Refining, L.L.C. (CRLLC) submits this notification to conduct performance testing for the Boiler 10 Unit. Performance testing will be performed as required under Specific Condition 59 using the methods specified in 40 CFR 60 Appendix A. The test will be conducted by Emission Testing Services, Inc. and is scheduled beginning the week of July 14, 2008.

Should you have any questions concerning this submittal, please contact Ms. Rebecca Bourg at (504) 281-1330 or by e-mail at rebecca.j.bourg@exxonmobil.com.

Very truly yours,

Charles Kominas
Environmental Group Leader

RJB

cc: EPA Region VI
LDEQ Southeast Regional Office

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL™

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CHALMETTE REFINING, L.L.C.

P.O. Box 1007

CHALMETTE, LA 70044

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Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P.O. Box 4314
Baton Rouge, LA 70821-4314

CRLLC-CHAL-000106

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 281-1212

June 12, 2009

CERTIFIED MAIL (7007 0710 0003 0019 8010) RETURN RECEIPT REQUESTED

Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

RECEIVED
JUN 22 2009
LDEQ/OEA/AQAD
Engineering Support

NOTICE OF COMPLIANCE AND INITIAL TEST REPORT
BOILER F0402 (CO BOILER)
ACTIVITY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C.

Dear Ms. Garwood:

Chalmette Refining, L.L.C. (CRLLC) submits this performance testing report to demonstrate compliance status for Boiler No. 9 pursuant to Permit 2500-00005-V1 Specific Requirement 8. Performance testing was performed as required using the methods specified in 40 CFR 60 Appendix A. The testing was performed on April 15, 2009 by Emission Testing Services, Inc.

Due to mechanical issues, testing was conducted at approximately 70% of full rate. CRLLC will retest once full rate can be achieved.

Should you have any questions concerning this submittal, please contact Ms. Rebecca Bourg at (504) 281-1330 or by e-mail at rebecca.j.bourg@exxonmobil.com.

Very truly yours,

George A Graham
Environmental Group Leader

JDB

cc: EPA Region VI
LDEQ Southeast Regional Office

CHALMETTE REFINING, L.L.C.
P.O. Box 1007
CHALMETTE, LA 70044

7007 0710 0003 0019 8010

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Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P.O. Box 4314
Baton Rouge, LA 70821-4314

CHALMETTE REFINING, LLC
CHALMETTE REFINERY

P.O. BOX 1007

CHALMETTE, LOUISIANA 70044

EMISSION COMPLIANCE TESTS

F-402 CO BOILER (EQT 019)

APRIL 15, 2009

STATE PERMIT NUMBER: 2500-00005-V1

RECEIVED
JUN 2 7 2009
LDEQ/OEA/AQAD
Engineering Support

ETS®
Emission Testing Services, Inc.
P.O. BOX 15075
BATON ROUGE, LOUISIANA 70895

Phone 225-925-8405 Fax 225-925-2343
Email: reporting@emissiontesting.com
www.emissiontesting.com

LELAP Certificate Number 02059 issued to ETS by LDEQ

ETS Project Number: 29045A

Final Report: 10-Jun-2009, 97 Pages
Draft Report: 10-Jun-2009, 97 Pages

CRLLC-CHAL-000109

CERTIFICATION of TEST REPORT

CHALMETTE REFINING LLC
CHALMETTE REFINING

EMISSION COMPLIANCE TESTS

F-402 CO BOILER (EQT 019)

APRIL 15, 2009

Testing Conducted by:

EMISSION TESTING SERVICES, INC.

Emission Testing Services, Inc. (ETS) is certified by the Louisiana Department of Environmental Quality (LDEQ), certificate number 02059, as a qualified environmental testing laboratory under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information; I believe the submitted information is true, accurate, and complete.

Jeff Bergeron, P.E.
Chalmette Refining LLC
Plant Representative

Kevin Thibodeaux
Emission Testing Services, Inc.
Project Leader

Barry Gipson
Emission Testing Services, Inc.
Manager

CRLLC-CHAL-000110

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CRLLC-CHAL-000111

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STANDARD RESULT NOTATIONS

< None detected (less than or equal to). Result is the minimum detection limit. Actual result value may be less including the value zero (0).

! Result is the sum or average of multiple results where one or more of the results have a positive detection and one or more results are None Detected. The magnitude of the None Detected result(s) is significant (>30%) in comparison to the positive detection results. Actual result may be less; however, does not include the value zero (0) and is not less than the result calculated using the positive detection results with the None Detected as zero (0).

CRLLC-CHAL-000112

I. INTRODUCTION

Emission Testing Services, Inc. (ETS) was contracted by Chalmette Refining, LLC (Chalmette Refining) to conduct emission tests at the Chalmette Refinery located in St. Bernard Parish, Louisiana. Emissions from the F-402 CO Boiler (EQT 019) were tested to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Tests were conducted in order to demonstrate compliance with emission permit limits. The F-402 CO Boiler operates under permit number 2500-00005-V1 issued by the Louisiana Department of Environmental Quality (LDEQ).

All tests were conducted following EPA test methods. The emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined using EPA Methods 6C, 7E, and 10. EPA Method 19 was used to calculate stack gas flow rate based on fuel firing rate, fuel composition, and stack gas oxygen concentration.

The ETS emission test team consisted of Project Leader Kevin Thibodeaux and test crewmember Keith Delk. Jeff Bergeron represented Chalmette Refining and coordinated testing with plant operations. The LDEQ was not represented on-site during the tests.

CRLLC-CHAL-000113

II. SUMMARY

Discussion of Tests

On April 15, 2009, emission tests were conducted at the Chalmette Refinery. Tests were conducted on the F-402 CO Boiler to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Three, 1-hour duration test runs were conducted.

F-402 CO Boiler Test Results

Results of tests on the F-402 CO Boiler indicate that emissions of sulfur dioxide, oxides of nitrogen and carbon monoxide are in compliance with emission permit limits. Sulfur dioxide emissions averaged 1.724 lb/hr, which is less than the 13.30 lb/hr maximum permit limit. Oxides of nitrogen emissions averaged 12.958 lb/hr, which is less than the 125.40 lb/hr maximum permit limit. Carbon monoxide emissions could not be detected with a minimum detection limit of <0.023 lb/hr, which is less than the 76.00 lb/hr maximum permit limit. During the tests, the unit was fired at an average 268.69 MMBTU/hr.

CRLLC-CHAL-000114

Notations and Conclusions

Test Method Modifications, Deviations, and Unusual Conditions

All tests were conducted using EPA test methods without modification. During the tests, there were no deviations from these methods. All unusual conditions encountered during the tests have been noted above.

Test Conclusions

Quality assurance and quality control procedures meeting EPA and LDEQ requirements were used during the emission tests. All quality indicators were within the range of acceptable results demonstrating that these test data are accurate, complete, and representative of emissions conditions. Overall, the quality of data obtained during the tests are acceptable to meet project objectives.

CRLLC-CHAL-000115

TABLE I
EMISSION TEST RESULTS

CHALMETTE REFINING, LLC
CHALMETTE REFINERY

F-402 CO BOILER (EQT 019)

		PERMIT LIMITS MAXIMUM	RUN 1	RUN 2	RUN 3	AVERAGE
DATE			15-Apr-09	15-Apr-09	15-Apr-09	
TIME			1232-1331	1411-1510	1547-1646	
SULFUR DIOXIDE	PPMv dry		3.3	3.8	2.9	3.3
	lb/hr	13.30	1.751	1.984	1.438	1.724
OXIDES OF NITROGEN	PPMv dry		34.3	33.5	36.6	34.8
	lb/hr	125.40	12.992	12.721	13.163	12.958
CARBON MONOXIDE	PPMv dry		< 0.1	< 0.1	< 0.1	< 0.1
	lb/hr	76.00	< 0.023	< 0.023	< 0.022	< 0.023
OXYGEN	Vol% dry		5.62	5.81	5.11	5.51
STACK GAS DATA	Flow Rate, dscfm		52888	53052	50259	52066
UNIT OPERATING DATA						
Fuel Heat Content	Btu/ft3		931.96	931.66	926.94	930.19
Heat Input Rate	MMBtu/hr		271.16	268.62	266.28	268.69

CRLLC-CHAL-000116

III. PROCEDURE

Emission tests were conducted using EPA test methods documented in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A. A brief description of each method used during the tests follows.

LOCATION of SAMPLE POINTS

Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide concentrations were determined on samples collected from a series of three sample traverse points selected per EPA Method 7E.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1. Results from the analyzer were used to verify the absence of sample line leaks, as a stack gas oxygen reference, and as a basis for gaseous component concentration corrections to specific oxygen basis when required. Oxygen data obtained using this method were not used to determine stack gas molecular weight.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the stack gas was continuously determined. A sample of the stack gas was extracted using a stainless steel sample probe. Sample was transferred from the probe through a heated Teflon sample line to a sample-conditioning unit. The sample-conditioning unit removed particulate and water vapor from the sample. Sample gas exiting the conditioning unit was routed directly to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000117

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE EMISSIONS from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 19
DETERMINATION of SULFUR DIOXIDE REMOVAL EFFICIENCY and PARTICULATE MATTER, SULFUR DIOXIDE, and NITROGEN OXIDES EMISSION RATES

Pollutant emission rates were determined based on measured pollutant concentration data and stack gas flow rate data that was calculated based on the fuel composition, fuel heat of combustion, fuel-firing rate, and stack gas oxygen concentration. A fuel Fd factor was calculated that relates the combustion gas volume to heat input.

CRLLC-CHAL-000118

IV. ANALYTICAL TECHNIQUE

All samples collected during the emission tests were analyzed using EPA or EPA approved test methods. A brief description of each method used during the tests follows.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined using a test analyzer that utilizes an electrochemical cell detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the gas sample was continuously determined using a test analyzer that utilizes an ultraviolet absorbance detection principle. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined using a test analyzer that utilizes a chemiluminescence detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined using a nondispersive infrared test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000119

V. QUALITY ASSURANCE/ QUALITY CONTROL

Test results were validated using rigorous quality assurance (QA) and quality control (QC) procedures documented in ETS' Standard Operating Procedures (SOP). Each SOP meets or exceeds EPA requirements and has been reviewed by the LDEQ under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

The QA/QC programs ensure that the test data are representative of the source conditions by verifying the completeness, accuracy, and precision of the test data. QA/QC functions cover all aspects of the test including field-testing, sampling, sample analysis, sample storage and transport, and data processing and reporting.

Emission testing at Chalmette Refining included a series of QA/QC functions that were completed satisfactorily within the required limits. Therefore, data collected during testing should be considered accurate, precise, complete, and representative of stack conditions.

CRLLC-CHAL-000120

VI. TEST DATA and CALCULATIONS

Data Processing and Calculation Methods

All emission test data, laboratory analytical data, and unit operation data are presented in this section along with the associated data reduction calculations.

Data from the field data forms were manually input into a computer for data processing and calculation. Integrity of manual data input is maintained by using a double entry system. Accuracy of computer calculations is verified by processing a known set of data developed using manual calculation. Additional control of data input and processing is conducted through review of results by more than one individual.

CRLLC-CHAL-000121

F-402 CO Boiler

Emission tests were conducted on the F-402 CO Boiler to determine the concentration of oxygen and the concentration and emission rate of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Oxygen concentration was determined using EPA Method 3A. Sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions were determined using EPA Methods 6C, 7E, and 10. EPA Method 19 was used to calculate stack gas flow rate based on the fuel gas firing rate, fuel gas composition, and excess air.

Prior to the emission tests, the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined at a series of three sample traverse points, Figure I, selected per EPA Method 7E, in order to verify the absence of stratification of component concentrations across the stack. As a result, all samples used to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were collected from a series of three sample points, Figure II, selected per EPA Method 7E.

CRLLC-CHAL-000122

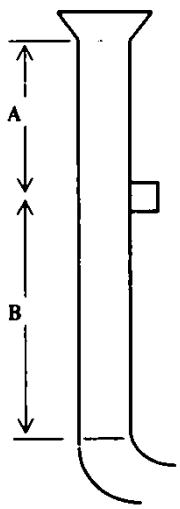
ETS

EMISSION TESTING SERVICES INC.

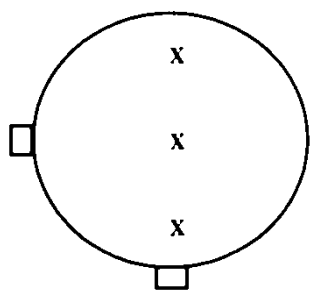
TRAVERSE POINT LAYOUT

METHODS 3A,6C,7E,&10

STRATIFICATION



CLIENT:	EXXONMOBIL
DATE:	04/15/09
UNIT TESTED:	F-402 CO BOILER
LOCATION:	CHALMETTE,LA.
UPSTREAM DIST. (A):	N/A
DOWNSTREAM DIST. (B):	N/A
INSIDE DIAMETER (INCHES):	114
COUPLING LENGTH (INCHES):	18
COUPLING TYPE:	4"8-BOLT FLANGED VALVE



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 3

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.167	114	18	37.04
2	0.500	114	18	75.00
3	0.833	114	18	112.96

SIGNATURE: _____

FIGURE I
6.2.2

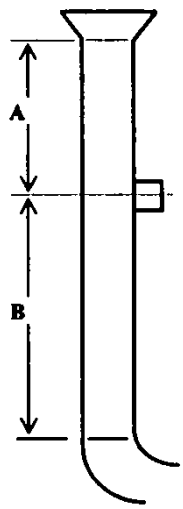
ETS-001

ETS

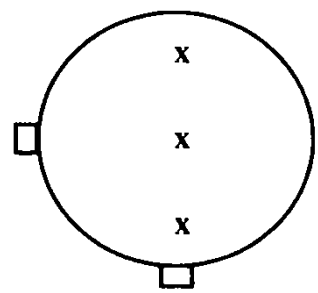
EMISSION TESTING SERVICES INC.

TRAVERSE POINT LAYOUT

METHODS 3A,6C,7E,&10



CLIENT:	EXXONMOBIL
DATE:	04/15/09
UNIT TESTED:	F-402 CO BOILER
LOCATION:	CHALMETTE,LA.
UPSTREAM DIST. (A):	N/A
DOWNSTREAM DIST. (B):	N/A
INSIDE DIAMETER (INCHES):	114
COUPLING LENGTH (INCHES):	18
COUPLING TYPE:	4"8-BOLT FLANGED VALVE



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 3

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.167	114	18	37.04
2	0.500	114	18	75.00
3	0.833	114	18	112.96

SIGNATURE: _____

FIGURE II
6.2.3

ETS-001

F-402 CO Boiler
EPA Method 19 (stack gas flow rate)

Flow rate of the stack gas during the emission test was calculated based on the fuel firing rate, fuel composition, and excess air. The F-402 CO Boiler is fired on refinery fuel gas (RFG) having an average Fd value of 8555.805 dscf/MMBtu. Fuel gas firing rate was measured continuously with the average value for each test used in the calculations. Calculation of the stack gas flow rates are presented on the following page.

CRLLC-CHAL-000125

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : F-402 CO Boiler

EPA METHOD 19, DETERMINATION of STACK GAS VOLUMETRIC FLOW RATE

Fd	Dry F factor, dscf/MMBtu (at 0% oxygen)
Fire	Fuel firing rate, MMBtu/hr
O2	Stack gas oxygen concentration, vol% dry
Qsd	Stack gas volumetric flow rate, dscf/hr (68 F, 29.92 in.Hg)

$$Qsd = (Fd)(Fire)\left\{\frac{20.9}{(20.9 - O2)}\right\}$$

----Run 1 15-Apr-09 ———

$$Qsd = (8555.805)(271.160)\left\{\frac{20.9}{(20.9 - 5.62)}\right\} = 3173287.6 \text{ dscf/hr}$$

52888.1 dscf/min

—Run 2 15-Apr-09 ———

$$Qsd = (8555.805)(268.620)\left\{\frac{20.9}{(20.9 - 5.81)}\right\} = 3183143.9 \text{ dscf/hr}$$

53052.4 dscf/min

—Run 3 15-Apr-09 ———

$$Qsd = (8555.805)(266.280)\left\{\frac{20.9}{(20.9 - 5.11)}\right\} = 3015529.5 \text{ dscf/hr}$$

50258.8 dscf/min

CRLLC-CHAL-000126

F-402 CO Boiler
EPA Methods 3A, 6C, 7E, and 10
(oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide)

Test Data and Calculations

During the emission tests, a sample of the stack gas was continuously drawn from the stack and analyzed to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide using EPA Methods 3A, 6C, 7E, and 10. Results of the tests are summarized on the following pages along with calculation of emission rates.

Test analyzer response was recorded using a computer data acquisition system. One minute average data were recorded on magnetic media and then printed in a format that aids interpretation of the data without editing or processing of the data. These data are presented following the data summary and calculations.

Each test analyzer was calibrated before and after each test run by challenging the analyzer with a set of certified calibration gas standards. Analyzer response was recorded using the computer data acquisition system. Calibration data are presented on each page of applicable test data.

CRLLC-CHAL-000127

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : F-402 CO Boiler

EPA METHOD 6C, DETERMINATION of SULFUR DIOXIDE EMISSION RATE

CSO2	SO2 concentration, PPMv actual O2
ESO2	SO2 emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of SO2, 64.065 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

--- Run 1 15-Apr-09 ---

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(3.32)(64.065)(3173287.6)}{(385.546)(1.00E+06)} \right\} = 1.7506$$

--- Run 2 15-Apr-09 ---

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(3.75)(64.065)(3183143.9)}{(385.546)(1.00E+06)} \right\} = 1.9835$$

--- Run 3 15-Apr-09 ---

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(2.87)(64.065)(3015529.5)}{(385.546)(1.00E+06)} \right\} = 1.4381$$

CRLLC-CHAL-000128

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : F-402 CO Boiler

EPA METHOD 7E, DETERMINATION of OXIDES of NITROGEN EMISSION RATE

CNOx	NOx concentration, PPMv actual O2
ENOx	NOx emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of NO2, 46.006 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

— Run 1 15-Apr-09 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(34.31)(46.006)(3173287.6)}{(385.546)(1.00E+06)} \right\} = 12.9918$$

--- Run 2 15-Apr-09 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(33.49)(46.006)(3183143.9)}{(385.546)(1.00E+06)} \right\} = 12.7207$$

--- Run 3 15-Apr-09 ———

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(36.58)(46.006)(3015529.5)}{(385.546)(1.00E+06)} \right\} = 13.1627$$

CRLLC-CHAL-000129

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : F-402 CO Boiler

EPA METHOD 10, DETERMINATION of CARBON MONOXIDE EMISSION RATE

CCO	CO concentration, PPMv actual O2
ECO	CO emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of CO, 28.011 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

--- Run 1 15-Apr-09 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(< 0.10)(28.011)(3173287.6)}{(385.546)(1.00E+06)} \right\} = < 0.0231$$

— Run 2 15-Apr-09 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(< 0.10)(28.011)(3183143.9)}{(385.546)(1.00E+06)} \right\} = < 0.0231$$

— Run 3 15-Apr-09 ———

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(< 0.10)(28.011)(3015529.5)}{(385.546)(1.00E+06)} \right\} = < 0.0219$$

CRLLC-CHAL-000130

ETS

EMISSION TESTING SERVICES INC.

NOX CONVERTER EFFICIENCY TEST

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**SLOPE:**	15.070551
DATE:	4/15/2009	**INTERCEPT:**	0.8261
		CORRELATION:	1.0000
		SPAN RANGE:	151.5317

CALIBRATION STATISTICS

	CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR < 2%	FINAL VOLT	CONC %	SPAN DRIFT < 3%
ZERO	0.00	-0.03	0.38	0.25	-0.03	0.38	0.00
MID	55.70	3.60	55.06	0.42	3.60	55.06	0.00
HIGH	137.00	9.05	137.26	0.17	9.05	137.26	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS < 5%	FINAL VOLT	CONC PPM	RESP BIAS < 5%	SPAN DRIFT < 3%
ZERO	0.00	0.06	1.78	0.92	0.06	1.78	0.92	0.00
HIGH	137.00	9.01	136.61	0.43	9.01	136.61	0.43	0.00

TIME	NOX-PPM	CHALLENGE CONCENTRATION
11:41:42	49.59	49.30
11:42:42	49.63	
11:43:42	49.74	
11:44:42	49.75	
11:45:42	49.74	% EFFICIENCY
AVG	49.69	100.79

Acceptable efficiency is greater than or equal to 90%

This NO2 to NO converter efficiency test is a modified version of that specified in EPA Method 7E. This modified methodology has been approved and accepted by the LDEQ as the preferred methodology. The gas standard used in this test is not required to be certified per EPA Protocol No. 1.

OPERATORS SIGNATURE

CRLLC-CHAL-000131

ETS®

EMISSION TESTING SERVICES, INC.

RESPONSE TIME SHEET

Source:	F-402 CO BOILER	Date:	4/15/2009
Monitor:	TECO MODEL EB1A&1B NOX	Location:	CHALMETTE,LA.
Serial Number:	10A/R-23178-209	CLIENT:	EXXONMOBIL

High Level Gas Concentration: 137.0 PPM

TEST RUN

ACTUAL TIME BEGIN	ACTUAL TIME END	UPSCALE SECONDS	ACTUAL TIME BEGIN	ACTUAL TIME END	DOWNSCAL SECONDS
0.00	37.98	37.98	0.00	40.22	40.22
0.00	38.03	38.03	0.00	39.87	39.87
0.00	38.11	38.11	0.00	40.03	40.03
	AVERAGE	38.04		AVERAGE	40.04

System Response Time (slower of A or B) = 40.04 SEC.

COMMENTS:

ETS REFERENCE SOPS-007,020

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXYGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	STRATIFICATION CHECK	**SLOPE:**	25.2544
ANALYZER ID :	ETS-O2-2	**INTERCEPT:**	-0.2505
		CORRELATION:	1.00000
		SPAN RANGE:	25.0039

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.01	0.00	0.02	0.00	-0.37	1.48
ALM004565	LOW	10.10	0.41	10.11	0.03	0.40	9.86	0.99
ALM028445	HIGH	20.10	0.81	20.10	0.02	0.80	19.97	0.49

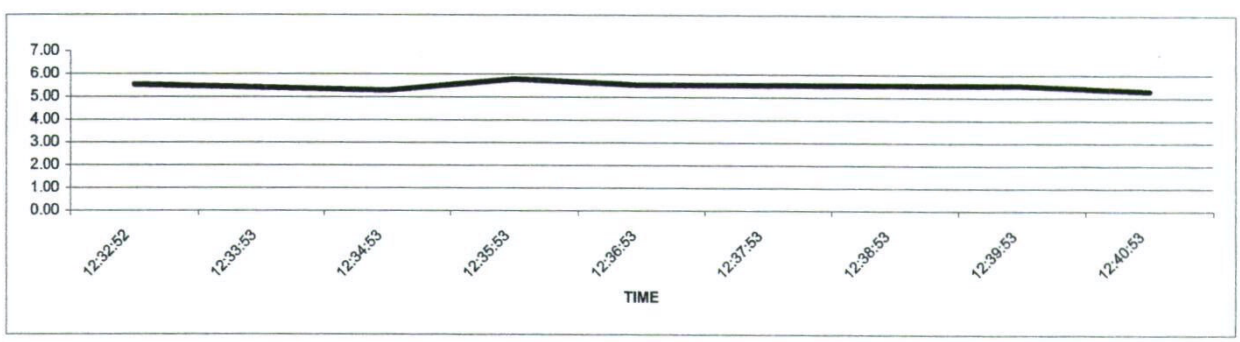
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.01	0.00	0.00	0.00	-0.25	0.49	0.99
BIAS HIGH	20.10	0.81	20.10	0.00	0.80	19.97	0.00	0.49

OXYGEN

TIME	O2-%		
12:32:52	5.53		
12:33:53	5.41	**PT. 1 AVG**	**5.41**
12:34:53	5.29		
12:35:53	5.78		
12:36:53	5.53	**PT. 2 AVG**	**5.61**
12:37:53	5.53		
12:38:53	5.53		
12:39:53	5.53	**PT. 3 AVG**	**5.45**
12:40:53	5.29		
		AVG	**5.49**

POINTS	%-DEVIATION
1	1.49
2	2.24
3	0.75



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000133

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	SULFUR DIOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	STRATIFICATION CHECK	**SLOPE:**	9.1677
ANALYZER ID :	ETS-SO2-1	**INTERCEPT:**	-0.2589
		CORRELATION:	0.99999
		SPAN RANGE:	91.4181

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.02	-0.08	0.09	0.02	-0.04	0.05
ALM060848	LOW	26.90	2.98	27.05	0.16	2.97	27.00	0.05
ALM008628	HIGH	59.30	6.49	59.23	0.07	6.48	59.14	0.10
				-0.26	0.28		-0.26	0.00

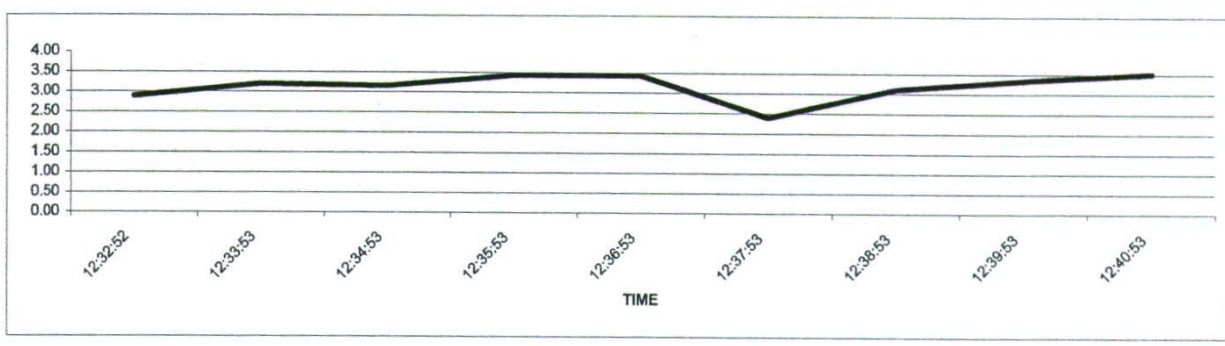
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.10	0.20	0.03	0.02	0.06	0.09
BIAS HIGH	59.30	6.46	58.96	0.29	6.45	58.87	0.30	0.10

SULFUR DIOXIDE

TIME	SO2-PPM		
12:32:52	2.88		
12:33:53	3.20	**PT. 1 AVG**	**3.08**
12:34:53	3.15		
12:35:53	3.42		
12:36:53	3.42	**PT. 2 AVG**	**3.08**
12:37:53	2.39		
12:38:53	3.11		
12:39:53	3.33	**PT. 3 AVG**	**3.32**
12:40:53	3.51		
		AVG	**3.16**

POINTS	%-DEVIATION
1	2.54
2	2.54
3	5.08



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000134

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	STRATIFICATION CHECK	**SLOPE:**	15.1448
ANALYZER ID :	ETS-NOX-10A&B	**INTERCEPT:**	0.2670
		CORRELATION:	0.99993
		SPAN RANGE:	151.7155

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.02	0.56	0.37	0.00	0.27	0.19
ALM026410	LOW	55.70	3.60	54.77	0.61	3.63	55.29	0.34
AAL13469	HIGH	137.00	9.05	137.37	0.24	9.05	137.37	0.00

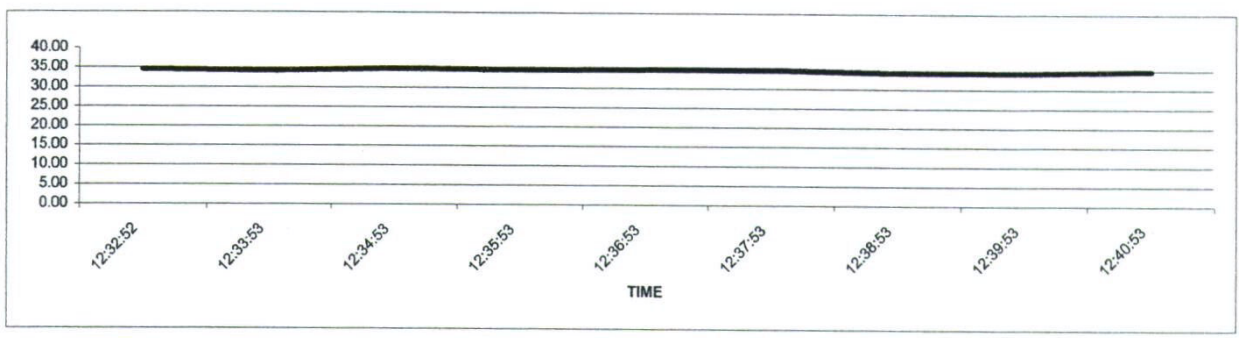
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.06	1.23	0.44	0.03	0.78	0.34	0.29
BIAS HIGH	137.00	9.01	136.72	0.43	9.02	136.85	0.34	0.09

OXIDES OF NITROGEN

TIME	NOX-PPM		
12:32:52	34.55	PT. 1 AVG	34.52
12:33:53	34.17		
12:34:53	34.84		
12:35:53	34.62	PT. 2 AVG	34.75
12:36:53	34.77		
12:37:53	34.84		
12:38:53	34.25	PT. 3 AVG	34.47
12:39:53	34.32		
12:40:53	34.84		
		AVG	34.58

POINTS	%-DEVIATION
1	0.17
2	0.48
3	0.31



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000135

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	CARBON MONOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	STRATIFICATION CHECK	**SLOPE:**	10.0270
ANALYZER ID :	ETS-CO-4	**INTERCEPT:**	-0.1083
		CORRELATION:	1.00000
		SPAN RANGE:	100.1617

CALIBRATION STATISTICS

CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.01	0.04	0.04	-0.01	-0.26	0.29
ALM031361	LOW	55.70	5.56	55.61	0.09	5.53	55.36	0.24
ALM002244	HIGH	95.80	9.57	95.85	0.05	9.56	95.71	0.15

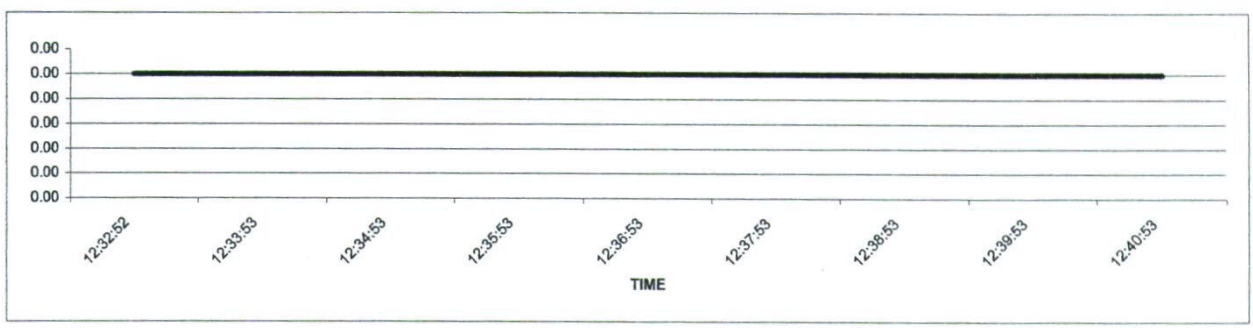
CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.14	0.10	0.02	0.14	0.39	0.00
BIAS HIGH	95.80	9.54	95.56	0.29	9.53	95.41	0.29	0.15

CARBON MONOXIDE

TIME	CO-PPM		
12:32:52	0.00		
12:33:53	0.00	**PT. 1 AVG**	**0.00**
12:34:53	0.00		
12:35:53	0.00		
12:36:53	0.00	**PT. 2 AVG**	**0.00**
12:37:53	0.00		
12:38:53	0.00		
12:39:53	0.00	**PT. 3 AVG**	**0.00**
12:40:53	0.00		
		AVG	**0.00**

POINTS	%-DEVIATION
1	0.00
2	0.00
3	0.00



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000136

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXYGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	1	**SLOPE:**	25.2544
ANALYZER ID :	ETS-O2-2	**INTERCEPT:**	-0.2505
		CORRELATION:	1.00000
		SPAN RANGE:	25.0039

CALIBRATION STATISTICS

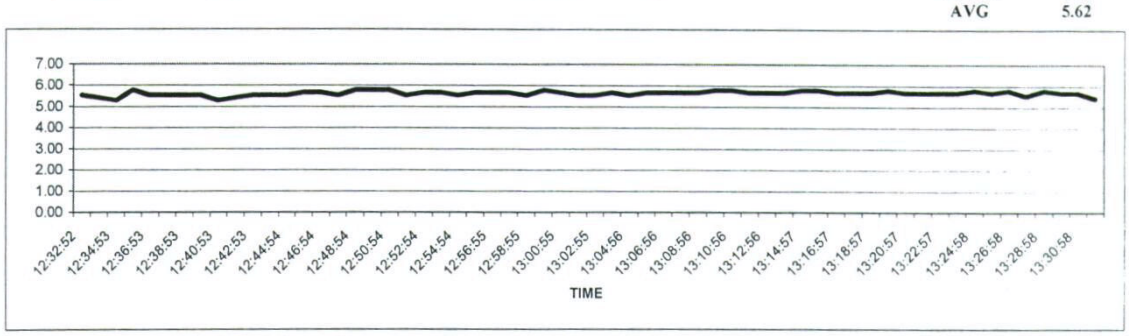
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.01	0.00	0.02	0.00	-0.37	1.48
ALM004565	LOW	10.10	0.41	10.11	0.03	0.40	9.86	0.99
ALM028445	HIGH	20.10	0.81	20.10	0.02	0.80	19.97	0.49

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.01	0.00	0.00	0.00	-0.25	0.49	0.99
BIAS HIGH	20.10	0.81	20.10	0.00	0.80	19.97	0.00	0.49

OXYGEN

TIME	O2-%		TIME	O2-%		TIME	O2-%	
12:32:52	5.53	PT. 1	12:52:54	5.66	PT. 2	13:12:56	5.66	PT. 3
12:33:53	5.41		12:53:54	5.66		13:13:57	5.66	
12:34:53	5.29		12:54:54	5.53		13:14:57	5.78	
12:35:53	5.78		12:55:55	5.66		13:15:57	5.78	
12:36:53	5.53		12:56:55	5.66		13:16:57	5.66	
12:37:53	5.53		12:57:55	5.66		13:17:57	5.66	
12:38:53	5.53		12:58:55	5.53		13:18:57	5.66	
12:39:53	5.53		12:59:55	5.78		13:19:57	5.78	
12:40:53	5.29		13:00:55	5.66		13:20:57	5.66	
12:41:53	5.41		13:01:55	5.53		13:21:57	5.66	
12:42:53	5.53		13:02:55	5.53		13:22:57	5.66	
12:43:53	5.53		13:03:55	5.66		13:23:58	5.66	
12:44:54	5.53		13:04:56	5.53		13:24:58	5.78	
12:45:54	5.66		13:05:56	5.66		13:25:58	5.66	
12:46:54	5.66		13:06:56	5.66		13:26:58	5.78	
12:47:54	5.53		13:07:56	5.66		13:27:58	5.53	
12:48:54	5.78		13:08:56	5.66		13:28:58	5.78	
12:49:54	5.78		13:09:56	5.78		13:29:58	5.66	
12:50:54	5.78		13:10:56	5.78		13:30:58	5.66	
12:51:54	5.53		13:11:56	5.66		13:31:58	5.41	
						AVG	**5.62**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000137

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL	OPERATOR:	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	PARAMETER:	SULFUR DIOXIDE
DATE:	4/15/2009	LOAD %:	NORMAL
RUN # :	1	SLOPE:	9.1677
ANALYZER ID :	ETS-SO2-1	INTERCEPT:	-0.2589
		CORRELATION:	0.99999
		SPAN RANGE:	91.4181

CALIBRATION STATISTICS

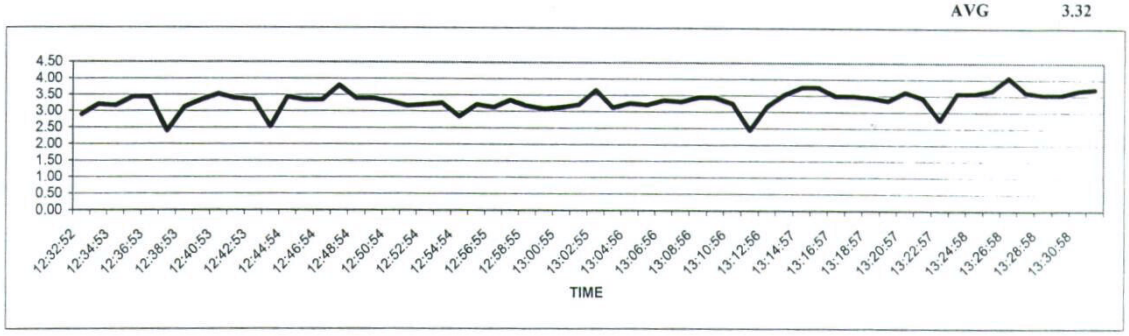
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.02	-0.08	0.09	0.02	-0.04	0.05
ALM060848	LOW	26.90	2.98	27.05	0.16	2.97	27.00	0.05
ALM008628	HIGH	59.30	6.49	59.23	0.07	6.48	59.14	0.10
				-0.26	0.28		-0.26	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.10	0.20	0.03	0.02	0.06	0.09
BIAS HIGH	59.30	6.46	58.96	0.29	6.45	58.87	0.30	0.10

SULFUR DIOXIDE

TIME	SO2-PPM		TIME	SO2-PPM		TIME	SO2-PPM	
12:32:52	2.88	PT. 1	12:52:54	3.20	PT. 2	13:12:56	3.15	PT. 3
12:33:53	3.20		12:53:54	3.24		13:13:57	3.51	
12:34:53	3.15		12:54:54	2.84		13:14:57	3.74	
12:35:53	3.42		12:55:55	3.20		13:15:57	3.74	
12:36:53	3.42		12:56:55	3.11		13:16:57	3.47	
12:37:53	2.39		12:57:55	3.33		13:17:57	3.47	
12:38:53	3.11		12:58:55	3.15		13:18:57	3.42	
12:39:53	3.33		12:59:55	3.06		13:19:57	3.33	
12:40:53	3.51		13:00:55	3.11		13:20:57	3.60	
12:41:53	3.38		13:01:55	3.20		13:21:57	3.42	
12:42:53	3.33		13:02:55	3.65		13:22:57	2.75	
12:43:53	2.52		13:03:55	3.11		13:23:58	3.56	
12:44:54	3.42		13:04:56	3.24		13:24:58	3.56	
12:45:54	3.33		13:05:56	3.20		13:25:58	3.65	
12:46:54	3.33		13:06:56	3.33		13:26:58	4.06	
12:47:54	3.78		13:07:56	3.29		13:27:58	3.60	
12:48:54	3.38		13:08:56	3.42		13:28:58	3.51	
12:49:54	3.38		13:09:56	3.42		13:29:58	3.51	
12:50:54	3.29		13:10:56	3.24		13:30:58	3.65	
12:51:54	3.15		13:11:56	2.43		13:31:58	3.69	
						AVG	**3.32**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000138

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	1	**SLOPE:**	15.1448
ANALYZER ID :	ETS-NOX-10A&B	**INTERCEPT:**	0.2670
		CORRELATION:	0.99993
		SPAN RANGE:	151.7155

CALIBRATION STATISTICS

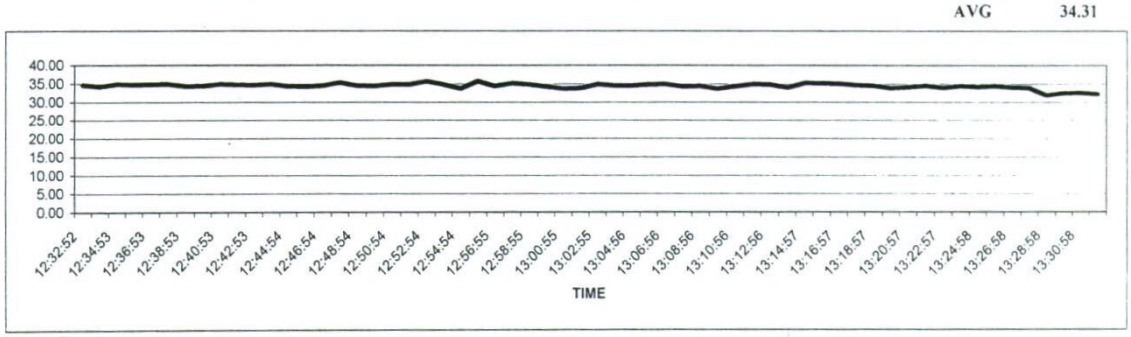
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.02	0.56	0.37	0.00	0.27	0.19
ALM026410	LOW	55.70	3.60	54.77	0.61	3.63	55.29	0.34
AAL13469	HIGH	137.00	9.05	137.37	0.24	9.05	137.37	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.06	1.23	0.44	0.03	0.78	0.34	0.29
BIAS HIGH	137.00	9.01	136.72	0.43	9.02	136.85	0.34	0.09

OXIDES OF NITROGEN

TIME	NOX-PPM		TIME	NOX-PPM		TIME	NOX-PPM	
12:32:52	34.55	PT. 1	12:52:54	35.59	PT. 2	13:12:56	34.77	PT. 3
12:33:53	34.17		12:53:54	34.70		13:13:57	33.95	
12:34:53	34.84		12:54:54	33.65		13:14:57	35.14	
12:35:53	34.62		12:55:55	35.67		13:15:57	35.07	
12:36:53	34.77		12:56:55	34.32		13:16:57	34.99	
12:37:53	34.84		12:57:55	35.07		13:17:57	34.55	
12:38:53	34.25		12:58:55	34.77		13:18:57	34.40	
12:39:53	34.32		12:59:55	34.17		13:19:57	33.73	
12:40:53	34.84		13:00:55	33.58		13:20:57	34.02	
12:41:53	34.62		13:01:55	33.73		13:21:57	34.40	
12:42:53	34.55		13:02:55	34.84		13:22:57	33.80	
12:43:53	34.84		13:03:55	34.40		13:23:58	34.32	
12:44:54	34.25		13:04:56	34.40		13:24:58	34.10	
12:45:54	34.17		13:05:56	34.70		13:25:58	34.32	
12:46:54	34.40		13:06:56	34.84		13:26:58	33.95	
12:47:54	35.22		13:07:56	34.17		13:27:58	33.80	
12:48:54	34.40		13:08:56	34.32		13:28:58	31.79	
12:49:54	34.32		13:09:56	33.58		13:29:58	32.31	
12:50:54	34.70		13:10:56	34.25		13:30:58	32.46	
12:51:54	34.70		13:11:56	34.84		13:31:58	32.08	
						AVG	**34.31**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000139

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	CARBON MONOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	1	**SLOPE:**	10.0270
ANALYZER ID :	ETS-CO-4	**INTERCEPT:**	-0.1083
		CORRELATION:	1.00000
		SPAN RANGE:	100.1617

CALIBRATION STATISTICS

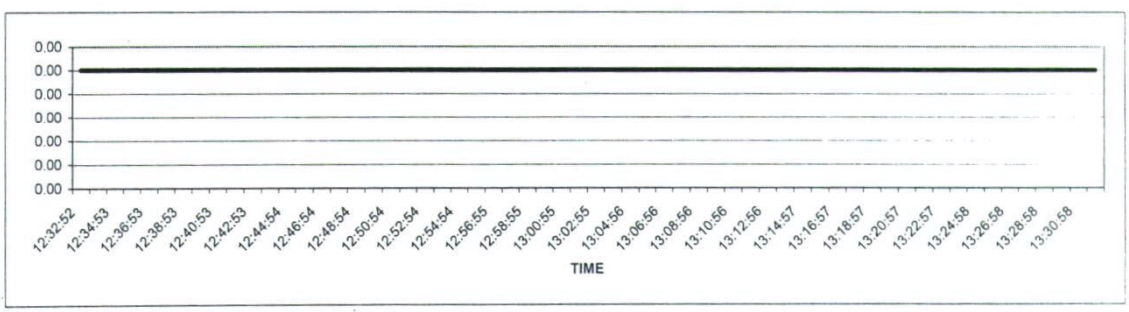
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.01	0.04	0.04	-0.01	-0.26	0.29
ALM031361	LOW	55.70	5.56	55.61	0.09	5.53	55.36	0.24
ALM002244	HIGH	95.80	9.57	95.85	0.05	9.56	95.71	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.14	0.10	0.02	0.14	0.39	0.00
BIAS HIGH	95.80	9.54	95.56	0.29	9.53	95.41	0.29	0.15

CARBON MONOXIDE

TIME	CO-PPM		TIME	CO-PPM		TIME	CO-PPM	
12:32:52	0.00	PT. 1	12:52:54	0.00	PT. 2	13:12:56	0.00	PT. 3
12:33:53	0.00		12:53:54	0.00		13:13:57	0.00	
12:34:53	0.00		12:54:54	0.00		13:14:57	0.00	
12:35:53	0.00		12:55:55	0.00		13:15:57	0.00	
12:36:53	0.00		12:56:55	0.00		13:16:57	0.00	
12:37:53	0.00		12:57:55	0.00		13:17:57	0.00	
12:38:53	0.00		12:58:55	0.00		13:18:57	0.00	
12:39:53	0.00		12:59:55	0.00		13:19:57	0.00	
12:40:53	0.00		13:00:55	0.00		13:20:57	0.00	
12:41:53	0.00		13:01:55	0.00		13:21:57	0.00	
12:42:53	0.00		13:02:55	0.00		13:22:57	0.00	
12:43:53	0.00		13:03:55	0.00		13:23:58	0.00	
12:44:54	0.00		13:04:56	0.00		13:24:58	0.00	
12:45:54	0.00		13:05:56	0.00		13:25:58	0.00	
12:46:54	0.00		13:06:56	0.00		13:26:58	0.00	
12:47:54	0.00		13:07:56	0.00		13:27:58	0.00	
12:48:54	0.00		13:08:56	0.00		13:28:58	0.00	
12:49:54	0.00		13:09:56	0.00		13:29:58	0.00	
12:50:54	0.00		13:10:56	0.00		13:30:58	0.00	
12:51:54	0.00		13:11:56	0.00		13:31:58	0.00	
						AVG	**0.00**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000140

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXYGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	2	**SLOPE:**	24.9483
ANALYZER ID :	ETS-O2-2	**INTERCEPT:**	0.1182
		CORRELATION:	1.00000
		SPAN RANGE:	25.0665

CALIBRATION STATISTICS

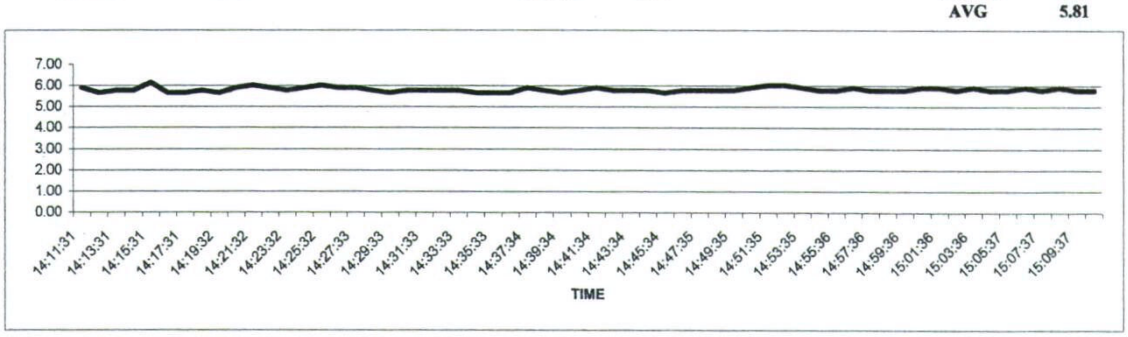
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	0.00	0.01	0.00	0.00	0.00
ALM004565	LOW	10.10	0.40	10.11	0.03	0.40	10.11	0.00
ALM028445	HIGH	20.10	0.80	20.10	0.01	0.80	20.10	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.12	0.49	0.00	0.12	0.49	0.00
BIAS HIGH	20.10	0.80	20.10	0.00	0.80	19.97	0.49	0.49

OXYGEN

TIME	O2-%		TIME	O2-%		TIME	O2-%	
14:11:31	5.90	PT. 1	14:31:33	5.78	PT. 2	14:51:35	6.02	PT. 3
14:12:31	5.66		14:32:33	5.78		14:52:35	6.02	
14:13:31	5.78		14:33:33	5.78		14:53:35	5.90	
14:14:31	5.78		14:34:33	5.66		14:54:35	5.78	
14:15:31	6.15		14:35:33	5.66		14:55:36	5.78	
14:16:31	5.66		14:36:34	5.66		14:56:36	5.90	
14:17:31	5.66		14:37:34	5.90		14:57:36	5.78	
14:18:32	5.78		14:38:34	5.78		14:58:36	5.78	
14:19:32	5.66		14:39:34	5.66		14:59:36	5.78	
14:20:32	5.90		14:40:34	5.78		15:00:36	5.90	
14:21:32	6.02		14:41:34	5.90		15:01:36	5.90	
14:22:32	5.90		14:42:34	5.78		15:02:36	5.78	
14:23:32	5.78		14:43:34	5.78		15:03:36	5.90	
14:24:32	5.90		14:44:34	5.78		15:04:36	5.78	
14:25:32	6.02		14:45:34	5.66		15:05:37	5.78	
14:26:32	5.90		14:46:35	5.78		15:06:37	5.90	
14:27:33	5.90		14:47:35	5.78		15:07:37	5.78	
14:28:33	5.78		14:48:35	5.78		15:08:37	5.90	
14:29:33	5.66		14:49:35	5.78		15:09:37	5.78	
14:30:33	5.78		14:50:35	5.90		15:10:37	5.78	
						AVG	**5.81**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000141

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	SULFUR DIOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	2	**SLOPE:**	9.1883
ANALYZER ID :	ETS-SO2-1	**INTERCEPT:**	-0.2941
		CORRELATION:	0.99999
		SPAN RANGE:	91.5887

CALIBRATION STATISTICS

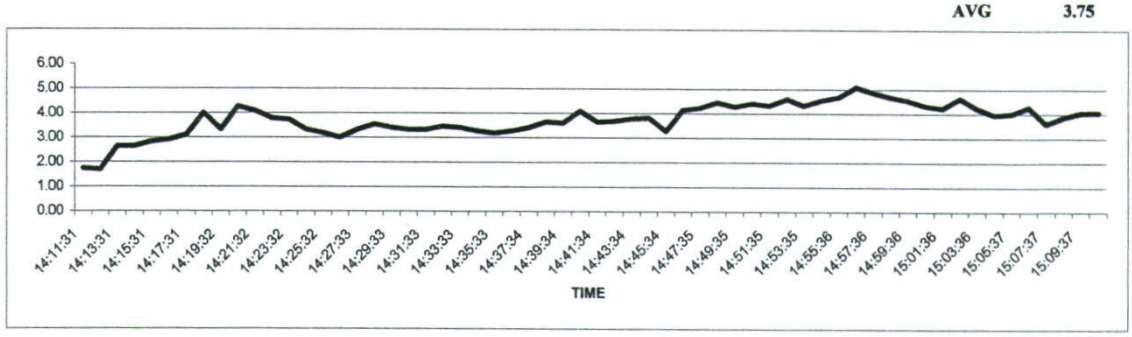
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.02	-0.07	0.08	0.04	0.11	0.20
ALM060848	LOW	26.90	2.97	27.03	0.14	2.95	26.80	0.24
ALM008628	HIGH	59.30	6.48	59.24	0.06	6.45	58.93	0.34
				-0.29	0.32		-0.29	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.03	-0.02	0.06	0.06	0.29	0.20	0.34
BIAS HIGH	59.30	6.45	58.97	0.30	6.44	58.88	0.05	0.10

SULFUR DIOXIDE

TIME	SO2-PPM		TIME	SO2-PPM		TIME	SO2-PPM	
14:11:31	1.74	PT. 1	14:31:33	3.32	PT. 2	14:51:35	4.32	PT. 3
14:12:31	1.69		14:32:33	3.46		14:52:35	4.59	
14:13:31	2.64		14:33:33	3.41		14:53:35	4.32	
14:14:31	2.64		14:34:33	3.28		14:54:35	4.54	
14:15:31	2.83		14:35:33	3.19		14:55:36	4.68	
14:16:31	2.92		14:36:34	3.28		14:56:36	5.09	
14:17:31	3.10		14:37:34	3.41		14:57:36	4.86	
14:18:32	4.00		14:38:34	3.64		14:58:36	4.68	
14:19:32	3.32		14:39:34	3.59		14:59:36	4.54	
14:20:32	4.27		14:40:34	4.09		15:00:36	4.32	
14:21:32	4.09		14:41:34	3.64		15:01:36	4.23	
14:22:32	3.78		14:42:34	3.68		15:02:36	4.64	
14:23:32	3.73		14:43:34	3.78		15:03:36	4.23	
14:24:32	3.32		14:44:34	3.82		15:04:36	3.96	
14:25:32	3.19		14:45:34	3.28		15:05:37	4.00	
14:26:32	3.01		14:46:35	4.14		15:06:37	4.27	
14:27:33	3.32		14:47:35	4.23		15:07:37	3.59	
14:28:33	3.55		14:48:35	4.45		15:08:37	3.87	
14:29:33	3.41		14:49:35	4.27		15:09:37	4.05	
14:30:33	3.32		14:50:35	4.41		15:10:37	4.05	
						AVG	**3.75**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000142

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	2	**SLOPE:**	15.1232
ANALYZER ID :	ETS-NOX-10A&B	**INTERCEPT:**	0.2847
		CORRELATION:	0.99998
		SPAN RANGE:	151.5165

CALIBRATION STATISTICS

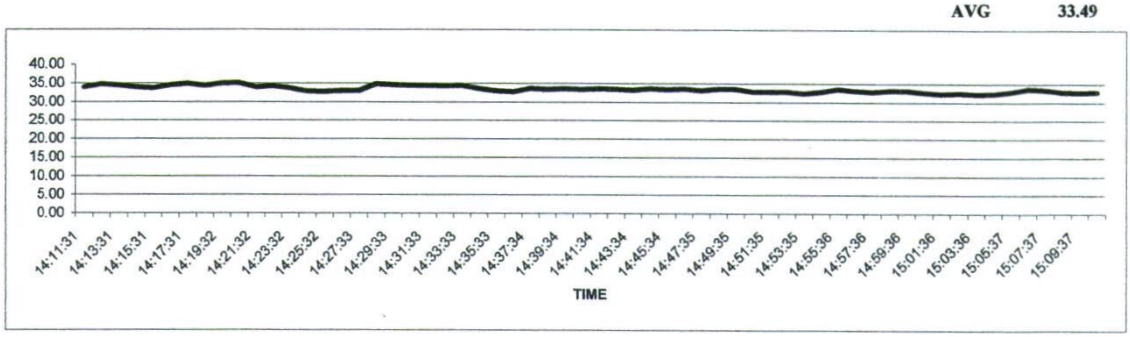
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	0.28	0.19	0.03	0.73	0.29
ALM026410	LOW	55.70	3.63	55.22	0.31	3.66	55.59	0.24
AAL13469	HIGH	137.00	9.05	137.19	0.13	9.07	137.49	0.19

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.03	0.80	0.34	0.04	0.88	0.10	0.05
BIAS HIGH	137.00	9.02	136.67	0.34	9.06	137.34	0.10	0.44

OXIDES OF NITROGEN

TIME	NOX-PPM		TIME	NOX-PPM		TIME	NOX-PPM	
14:11:31	33.92	PT. 1	14:31:33	34.44	PT. 2	14:51:35	32.80	PT. 3
14:12:31	34.73		14:32:33	34.36		14:52:35	32.80	
14:13:31	34.44		14:33:33	34.44		14:53:35	32.43	
14:14:31	33.92		14:34:33	33.54		14:54:35	32.88	
14:15:31	33.69		14:35:33	33.02		14:55:36	33.62	
14:16:31	34.51		14:36:34	32.73		14:56:36	33.10	
14:17:31	34.88		14:37:34	33.69		14:57:36	32.88	
14:18:32	34.29		14:38:34	33.40		14:58:36	33.17	
14:19:32	34.96		14:39:34	33.54		14:59:36	33.17	
14:20:32	35.03		14:40:34	33.40		15:00:36	32.65	
14:21:32	33.92		14:41:34	33.62		15:01:36	32.36	
14:22:32	34.21		14:42:34	33.47		15:02:36	32.50	
14:23:32	33.69		14:43:34	33.25		15:03:36	32.28	
14:24:32	32.80		14:44:34	33.69		15:04:36	32.36	
14:25:32	32.73		14:45:34	33.40		15:05:37	32.88	
14:26:32	33.02		14:46:35	33.54		15:06:37	33.69	
14:27:33	33.02		14:47:35	33.17		15:07:37	33.40	
14:28:33	34.81		14:48:35	33.54		15:08:37	32.80	
14:29:33	34.58		14:49:35	33.54		15:09:37	32.73	
14:30:33	34.44		14:50:35	32.88		15:10:37	32.80	
						AVG	**33.49**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000143

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	CARBON MONOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	2	**SLOPE:**	10.0120
ANALYZER ID :	ETS-CO-4	**INTERCEPT:**	0.1953
		CORRELATION:	1.00000
		SPAN RANGE:	100.3158

CALIBRATION STATISTICS

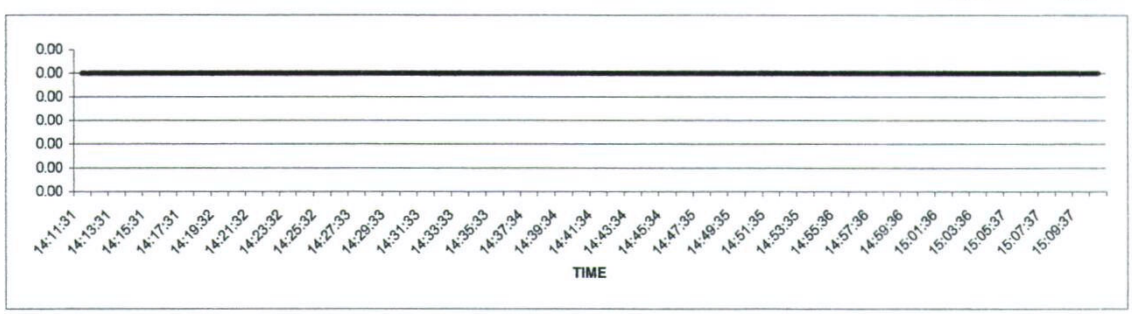
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.01	0.05	0.05	-0.03	-0.15	0.19
ALM031361	LOW	55.70	5.53	55.58	0.12	5.52	55.49	0.10
ALM002244	HIGH	95.80	9.56	95.87	0.07	9.55	95.77	0.10

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.44	0.39	0.00	0.20	0.34	0.24
BIAS HIGH	95.80	9.53	95.57	0.29	9.53	95.61	0.16	0.04

CARBON MONOXIDE

TIME	CO-PPM		TIME	CO-PPM		TIME	CO-PPM	
14:11:31	0.00	PT. 1	14:31:33	0.00	PT. 2	14:51:35	0.00	PT. 3
14:12:31	0.00		14:32:33	0.00		14:52:35	0.00	
14:13:31	0.00		14:33:33	0.00		14:53:35	0.00	
14:14:31	0.00		14:34:33	0.00		14:54:35	0.00	
14:15:31	0.00		14:35:33	0.00		14:55:36	0.00	
14:16:31	0.00		14:36:34	0.00		14:56:36	0.00	
14:17:31	0.00		14:37:34	0.00		14:57:36	0.00	
14:18:32	0.00		14:38:34	0.00		14:58:36	0.00	
14:19:32	0.00		14:39:34	0.00		14:59:36	0.00	
14:20:32	0.00		14:40:34	0.00		15:00:36	0.00	
14:21:32	0.00		14:41:34	0.00		15:01:36	0.00	
14:22:32	0.00		14:42:34	0.00		15:02:36	0.00	
14:23:32	0.00		14:43:34	0.00		15:03:36	0.00	
14:24:32	0.00		14:44:34	0.00		15:04:36	0.00	
14:25:32	0.00		14:45:34	0.00		15:05:37	0.00	
14:26:32	0.00		14:46:35	0.00		15:06:37	0.00	
14:27:33	0.00		14:47:35	0.00		15:07:37	0.00	
14:28:33	0.00		14:48:35	0.00		15:08:37	0.00	
14:29:33	0.00		14:49:35	0.00		15:09:37	0.00	
14:30:33	0.00		14:50:35	0.00		15:10:37	0.00	
						AVG	**0.00**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000144

ETS.

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXYGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	24.9483
ANALYZER ID :	ETS-O2-2	**INTERCEPT:**	0.1182
		CORRELATION:	1.00000
		SPAN RANGE:	25.0665

CALIBRATION STATISTICS

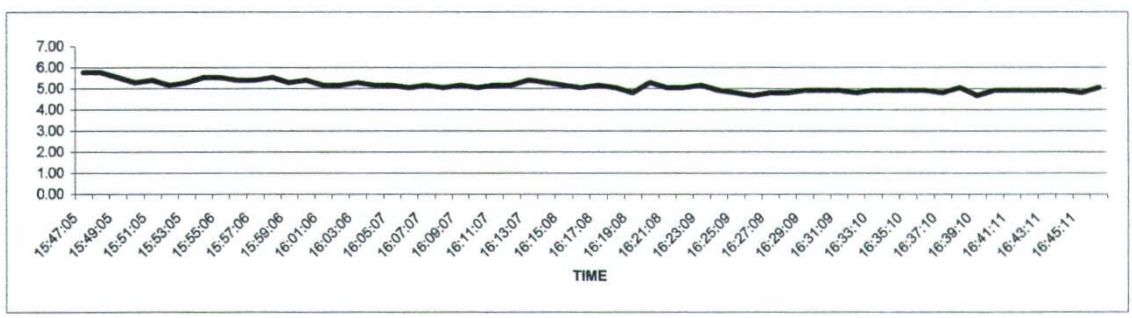
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.00	0.00	0.01	0.00	0.12	0.49
ALM004565	LOW	10.10	0.40	10.11	0.03	0.40	10.10	0.04
ALM028445	HIGH	20.10	0.80	20.10	0.01	0.80	20.08	0.08

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.12	0.49	0.00	0.12	0.00	0.00
BIAS HIGH	20.10	0.80	19.97	0.49	0.80	20.13	0.20	0.61

OXYGEN

TIME	O2-%		TIME	O2-%		TIME	O2-%	
15:47:05	5.77	PT. 1	16:07:07	5.16	PT. 2	16:27:09	4.79	PT. 3
15:48:05	5.77		16:08:07	5.04		16:28:09	4.79	
15:49:05	5.53		16:09:07	5.16		16:29:09	4.91	
15:50:05	5.28		16:10:07	5.04		16:30:09	4.91	
15:51:05	5.41		16:11:07	5.16		16:31:09	4.91	
15:52:05	5.16		16:12:07	5.16		16:32:10	4.79	
15:53:05	5.28		16:13:07	5.41		16:33:10	4.91	
15:54:05	5.53		16:14:08	5.28		16:34:10	4.91	
15:55:06	5.53		16:15:08	5.16		16:35:10	4.91	
15:56:06	5.41		16:16:08	5.04		16:36:10	4.91	
15:57:06	5.41		16:17:08	5.16		16:37:10	4.79	
15:58:06	5.53		16:18:08	5.04		16:38:10	5.04	
15:59:06	5.28		16:19:08	4.79		16:39:10	4.67	
16:00:06	5.41		16:20:08	5.28		16:40:10	4.91	
16:01:06	5.16		16:21:08	5.04		16:41:11	4.91	
16:02:06	5.16		16:22:09	5.04		16:42:11	4.91	
16:03:06	5.28		16:23:09	5.16		16:43:11	4.91	
16:04:07	5.16		16:24:09	4.91		16:44:11	4.91	
16:05:07	5.16		16:25:09	4.79		16:45:11	4.79	
16:06:07	5.04		16:26:09	4.67		16:46:11	5.04	
						AVG	**5.11**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000145

ETS.

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	SULFUR DIOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	9.2638
ANALYZER ID :	ETS-SO2-1	**INTERCEPT:**	-0.4120
		CORRELATION:	1.00000
		SPAN RANGE:	92.2258

CALIBRATION STATISTICS

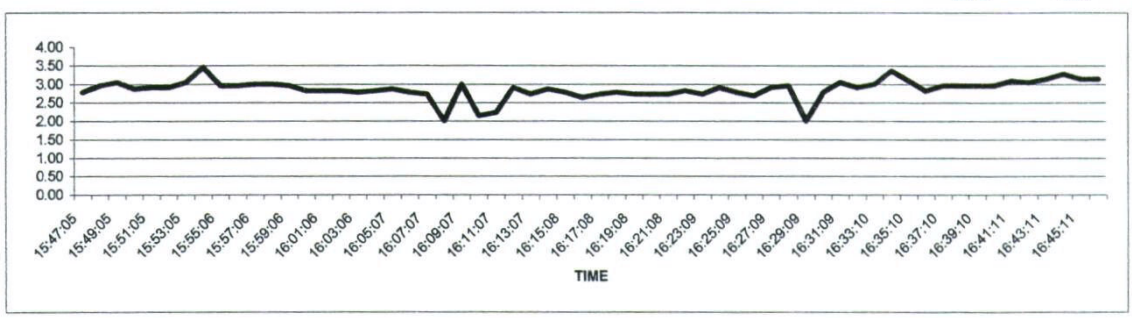
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.04	0.00	0.01	0.03	-0.11	0.11
ALM060848	LOW	26.90	2.95	26.91	0.01	2.97	27.10	0.21
ALM008628	HIGH	59.30	6.45	59.30	0.00	6.47	59.52	0.25
				-0.41	0.45		-0.41	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.06	0.18	0.20	0.04	-0.04	0.07	0.24
BIAS HIGH	59.30	6.44	59.25	0.05	6.45	59.34	0.20	0.10

SULFUR DIOXIDE

TIME	SO2-PPM		TIME	SO2-PPM		TIME	SO2-PPM	
15:47:05	2.78	PT. 1	16:07:07	2.74	PT. 2	16:27:09	2.92	PT. 3
15:48:05	2.96		16:08:07	2.01		16:28:09	2.96	
15:49:05	3.05		16:09:07	3.01		16:29:09	2.01	
15:50:05	2.87		16:10:07	2.15		16:30:09	2.78	
15:51:05	2.92		16:11:07	2.24		16:31:09	3.05	
15:52:05	2.92		16:12:07	2.92		16:32:10	2.92	
15:53:05	3.05		16:13:07	2.74		16:33:10	3.01	
15:54:05	3.46		16:14:08	2.87		16:34:10	3.37	
15:55:06	2.96		16:15:08	2.78		16:35:10	3.10	
15:56:06	2.96		16:16:08	2.65		16:36:10	2.83	
15:57:06	3.01		16:17:08	2.74		16:37:10	2.96	
15:58:06	3.01		16:18:08	2.78		16:38:10	2.96	
15:59:06	2.96		16:19:08	2.74		16:39:10	2.96	
16:00:06	2.83		16:20:08	2.74		16:40:10	2.96	
16:01:06	2.83		16:21:08	2.74		16:41:11	3.10	
16:02:06	2.83		16:22:09	2.83		16:42:11	3.05	
16:03:06	2.78		16:23:09	2.74		16:43:11	3.14	
16:04:07	2.83		16:24:09	2.92		16:44:11	3.28	
16:05:07	2.87		16:25:09	2.78		16:45:11	3.14	
16:06:07	2.78		16:26:09	2.69		16:46:11	3.14	
						AVG	**2.87**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000146

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	15.1393
ANALYZER ID :	ETS-NOX-10A&B	**INTERCEPT:**	-0.1530
		CORRELATION:	0.99998
		SPAN RANGE:	151.2399

CALIBRATION STATISTICS

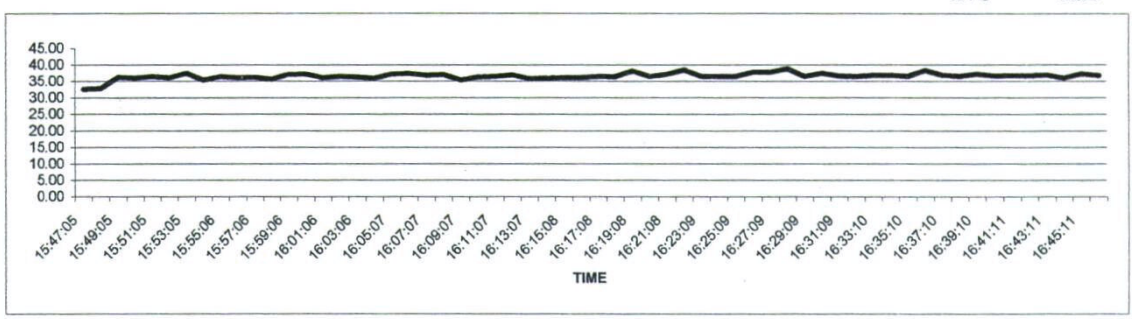
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	0.03	0.29	0.19	0.02	0.15	0.09
ALM026410	LOW	55.70	3.66	55.21	0.32	3.67	55.41	0.13
AAL13469	HIGH	137.00	9.07	137.19	0.13	9.06	137.01	0.12

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.44	0.10	0.05	0.60	0.30	0.11
BIAS HIGH	137.00	9.06	137.05	0.10	9.05	136.86	0.10	0.13

OXIDES OF NITROGEN

TIME	NOX-PPM		TIME	NOX-PPM		TIME	NOX-PPM	
15:47:05	32.58	PT. 1	16:07:07	36.81	PT. 2	16:27:09	37.77	PT. 3
15:48:05	32.80		16:08:07	37.03		16:28:09	38.81	
15:49:05	36.29		16:09:07	35.40		16:29:09	36.51	
15:50:05	35.99		16:10:07	36.29		16:30:09	37.48	
15:51:05	36.44		16:11:07	36.51		16:31:09	36.66	
15:52:05	36.14		16:12:07	36.96		16:32:10	36.51	
15:53:05	37.48		16:13:07	35.84		16:33:10	36.88	
15:54:05	35.32		16:14:08	35.92		16:34:10	36.88	
15:55:06	36.51		16:15:08	36.07		16:35:10	36.59	
15:56:06	36.07		16:16:08	36.07		16:36:10	38.37	
15:57:06	36.22		16:17:08	36.51		16:37:10	36.81	
15:58:06	35.62		16:18:08	36.36		16:38:10	36.59	
15:59:06	37.11		16:19:08	38.15		16:39:10	37.18	
16:00:06	37.25		16:20:08	36.51		16:40:10	36.66	
16:01:06	36.14		16:21:08	37.11		16:41:11	36.74	
16:02:06	36.51		16:22:09	38.44		16:42:11	36.74	
16:03:06	36.29		16:23:09	36.51		16:43:11	36.96	
16:04:07	35.92		16:24:09	36.51		16:44:11	35.99	
16:05:07	37.18		16:25:09	36.51		16:45:11	37.33	
16:06:07	37.40		16:26:09	37.77		16:46:11	36.74	
						AVG	**36.58**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000147

ETS.

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	EXXONMOBIL	**OPERATOR:**	KEVIN THIBODEAUX
SOURCE:	F-402 CO BOILER	**PARAMETER:**	CARBON MONOXIDE
DATE:	4/15/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	10.0014
ANALYZER ID :	ETS-CO-4	**INTERCEPT:**	0.3791
		CORRELATION:	1.00000
		SPAN RANGE:	100.3930

CALIBRATION STATISTICS

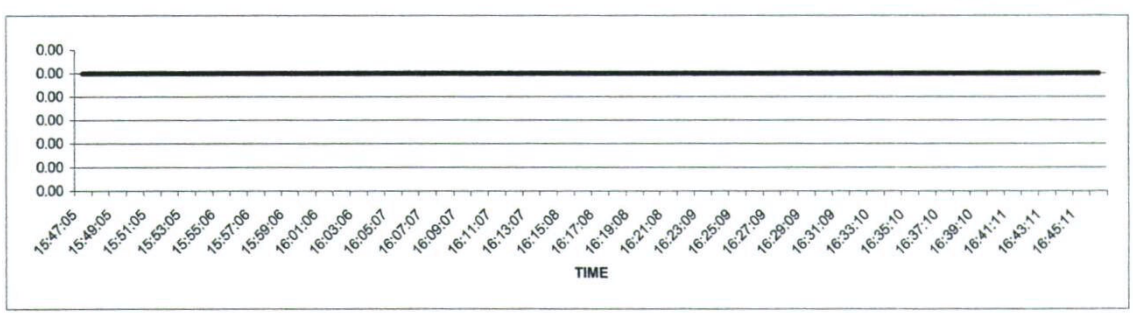
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM017958	ZERO	0.00	-0.03	0.04	0.04	-0.02	0.18	0.14
ALM031361	LOW	55.70	5.52	55.61	0.09	5.54	55.79	0.17
ALM002244	HIGH	95.80	9.55	95.85	0.05	9.57	96.09	0.24

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.38	0.34	0.01	0.48	0.30	0.10
BIAS HIGH	95.80	9.53	95.69	0.16	9.55	95.89	0.20	0.20

CARBON MONOXIDE

TIME	CO-PPM		TIME	CO-PPM		TIME	CO-PPM	
15:47:05	0.00	PT. 1	16:07:07	0.00	PT. 2	16:27:09	0.00	PT. 3
15:48:05	0.00		16:08:07	0.00		16:28:09	0.00	
15:49:05	0.00		16:09:07	0.00		16:29:09	0.00	
15:50:05	0.00		16:10:07	0.00		16:30:09	0.00	
15:51:05	0.00		16:11:07	0.00		16:31:09	0.00	
15:52:05	0.00		16:12:07	0.00		16:32:10	0.00	
15:53:05	0.00		16:13:07	0.00		16:33:10	0.00	
15:54:05	0.00		16:14:08	0.00		16:34:10	0.00	
15:55:06	0.00		16:15:08	0.00		16:35:10	0.00	
15:56:06	0.00		16:16:08	0.00		16:36:10	0.00	
15:57:06	0.00		16:17:08	0.00		16:37:10	0.00	
15:58:06	0.00		16:18:08	0.00		16:38:10	0.00	
15:59:06	0.00		16:19:08	0.00		16:39:10	0.00	
16:00:06	0.00		16:20:08	0.00		16:40:10	0.00	
16:01:06	0.00		16:21:08	0.00		16:41:11	0.00	
16:02:06	0.00		16:22:09	0.00		16:42:11	0.00	
16:03:06	0.00		16:23:09	0.00		16:43:11	0.00	
16:04:07	0.00		16:24:09	0.00		16:44:11	0.00	
16:05:07	0.00		16:25:09	0.00		16:45:11	0.00	
16:06:07	0.00		16:26:09	0.00		16:46:11	0.00	
						AVG	**0.00**	



OPERATORS SIGNATURE

ETS REFERENCE SOP-007

CRLLC-CHAL-000148

F-402 CO Boiler
Unit Operating Data

During the emission tests, Chalmette Refining recorded F-402 CO Boiler operating data. These data are presented on the following pages.

CRLLC-CHAL-000149

Chalmette Refining LLC
Chalmette Refinery

F-402 CO Boiler

F-0402 April 15, 2009 Timestamp	CHL F0402Q MBTU/HR COB:DUTY F0402Q - Average	CHL F0402N1 LB/HR COB:NOX F0402N1 - Average	CHL F0402C1 LB/HR COB:CO F0402C1 - Average	CHL F0402S1 LB/HR COB:SO2 F0402S1 - Average	CHL F0402V1 LB/HR COB:VOC F0402V1 - Average	CHL 55FC036 MSCFD CO BLR FUEL 55FC036 - Average	CHL 46AI816 BTU FUEL 46AI816 - Average	CHL 55AI841A PPM CO BLR 55AI841A - Average	CHL 55AI841B PCT CO BLR 55AI841B - Average
TEST RUN 1									
4/15/2009 12:32	277.85	29.29	10.71	3.98	1.39	7.44	930.87	47.11	5.66
4/15/2009 12:33	277.24	29.25	10.68	4.02	1.39	7.41	930.83	46.43	5.56
4/15/2009 12:34	276.64	29.21	10.68	4.03	1.38	7.40	932.14	46.33	5.53
4/15/2009 12:35	276.64	29.24	10.68	4.02	1.38	7.40	932.02	46.47	5.55
4/15/2009 12:36	276.73	29.28	10.68	4.02	1.38	7.37	934.44	46.63	5.54
4/15/2009 12:37	276.78	29.31	10.68	3.99	1.38	7.34	938.05	47.05	5.60
4/15/2009 12:38	276.17	29.20	10.68	3.96	1.38	7.34	937.58	46.95	5.74
4/15/2009 12:39	275.80	29.04	10.59	3.95	1.38	7.34	936.69	47.58	5.73
4/15/2009 12:40	275.26	28.89	10.57	3.95	1.38	7.33	937.30	47.09	5.63
4/15/2009 12:41	275.38	28.91	10.59	3.95	1.38	7.35	938.37	46.69	5.62
4/15/2009 12:42	276.06	29.06	10.61	3.95	1.38	7.37	937.58	46.53	5.68
4/15/2009 12:43	276.84	29.24	10.63	3.97	1.38	7.37	937.98	46.84	5.66
4/15/2009 12:44	277.41	29.42	10.65	3.98	1.39	7.37	940.16	46.90	5.56
4/15/2009 12:45	278.09	29.60	10.67	3.98	1.39	7.37	942.66	46.42	5.58
4/15/2009 12:46	278.73	29.68	10.69	3.94	1.39	7.35	943.86	46.70	5.65
4/15/2009 12:47	277.64	29.45	10.71	3.92	1.39	7.35	943.25	46.84	5.74
4/15/2009 12:48	277.89	29.49	10.66	3.92	1.39	7.38	942.24	46.43	5.69
4/15/2009 12:49	278.27	29.54	10.63	3.93	1.39	7.32	939.57	46.50	5.75
4/15/2009 12:50	275.29	28.98	10.58	3.91	1.38	7.22	937.16	46.87	5.80
4/15/2009 12:51	272.74	28.44	10.53	3.87	1.36	7.17	938.33	46.54	5.85
4/15/2009 12:52	270.45	28.03	10.43	3.83	1.36	7.16	934.62	47.00	5.87
4/15/2009 12:53	269.30	27.85	10.32	3.82	1.35	7.17	935.91	46.59	5.84
4/15/2009 12:54	269.33	27.75	10.27	3.82	1.34	7.18	934.91	47.31	5.78
4/15/2009 12:55	268.59	27.53	10.26	3.82	1.34	7.16	934.20	47.69	5.74
4/15/2009 12:56	268.26	27.46	10.25	3.82	1.34	7.13	936.80	48.11	5.68
4/15/2009 12:57	268.22	27.47	10.24	3.82	1.34	7.15	936.85	47.27	5.71
4/15/2009 12:58	267.88	27.39	10.23	3.82	1.34	7.16	934.39	47.22	5.82
4/15/2009 12:59	268.43	27.49	10.26	3.82	1.34	7.18	934.62	47.33	5.73
4/15/2009 13:00	268.76	27.56	10.30	3.83	1.34	7.19	933.78	47.51	5.75
4/15/2009 13:01	268.87	27.58	10.24	3.84	1.34	7.21	931.55	47.55	5.86
4/15/2009 13:02	268.97	27.60	10.22	3.85	1.34	7.22	930.73	47.65	5.85
4/15/2009 13:03	268.87	27.63	10.23	3.86	1.34	7.22	932.26	46.99	5.81
4/15/2009 13:04	269.78	27.82	10.24	3.87	1.35	7.22	933.80	46.48	5.88
4/15/2009 13:05	269.76	27.83	10.26	3.88	1.35	7.22	932.40	46.67	5.89
4/15/2009 13:06	269.19	27.71	10.32	3.88	1.34	7.20	931.34	47.04	5.80
4/15/2009 13:07	267.94	27.46	10.27	3.86	1.34	7.18	931.60	47.19	5.80
4/15/2009 13:08	268.35	27.50	10.25	3.82	1.34	7.21	932.30	47.51	5.71
4/15/2009 13:09	269.33	27.67	10.26	3.81	1.35	7.21	929.45	48.18	5.73
4/15/2009 13:10	267.91	27.41	10.26	3.81	1.34	7.19	925.91	47.74	5.75
4/15/2009 13:11	266.78	27.19	10.24	3.81	1.34	7.17	926.59	47.47	5.86
4/15/2009 13:12	266.10	27.06	10.19	3.81	1.33	7.14	926.96	46.67	5.91
4/15/2009 13:13	265.47	26.94	10.14	3.81	1.33	7.18	925.16	47.38	5.91
4/15/2009 13:14	265.65	27.06	10.10	3.82	1.33	7.19	923.91	47.14	5.80
4/15/2009 13:15	266.67	27.28	10.10	3.83	1.33	7.21	926.56	47.06	5.82
4/15/2009 13:16	267.88	27.49	10.13	3.84	1.34	7.24	927.62	46.99	5.84
4/15/2009 13:17	268.37	27.58	10.15	3.72	1.34	7.25	925.98	46.87	5.81
4/15/2009 13:18	268.62	27.62	10.18	3.68	1.34	7.27	924.24	48.29	5.79
4/15/2009 13:19	268.88	27.65	10.21	3.69	1.35	7.24	926.47	47.44	5.75
4/15/2009 13:20	269.27	27.68	10.23	3.68	1.35	7.21	930.62	47.07	5.80
4/15/2009 13:21	268.38	27.53	10.26	3.79	1.34	7.22	928.46	47.54	5.80
4/15/2009 13:22	268.48	27.57	10.26	3.84	1.34	7.23	926.84	47.17	5.89
4/15/2009 13:23	268.39	27.56	10.24	3.85	1.34	7.25	925.20	46.93	5.86
4/15/2009 13:24	268.02	27.50	10.23	3.86	1.34	7.26	921.31	46.90	5.87
4/15/2009 13:25	267.62	27.44	10.22	3.86	1.34	7.25	921.36	47.26	5.81
4/15/2009 13:26	266.68	27.27	10.21	3.87	1.33	7.23	922.16	46.56	5.82
4/15/2009 13:27	267.51	27.44	10.19	3.88	1.34	7.26	924.41	47.40	5.83
4/15/2009 13:28	269.13	27.77	10.18	3.90	1.35	7.32	924.95	47.25	5.89
4/15/2009 13:29	271.33	28.21	10.26	3.92	1.36	7.30	926.38	47.27	5.78
4/15/2009 13:30	269.90	27.95	10.37	3.88	1.35	7.26	925.98	47.02	5.75
4/15/2009 13:31	268.87	27.74	10.36	3.86	1.35	7.25	927.85	45.38	5.79
Averages	271.16	28.11	10.38	3.87	1.38	7.26	931.96	47.05	5.76

F-0402 April 15, 2009 Timestamp	CHL F0402Q MBTU/HR COB:DUTY F0402Q - Average	CHL F0402N1 LB/HR COB:NOX F0402N1 - Average	CHL F0402C1 LB/HR COB:CO F0402C1 - Average	CHL F0402S1 LB/HR COB:SO2 F0402S1 - Average	CHL F0402V1 LB/HR COB:VOC F0402V1 - Average	CHL 55FC036 MSCFD CO BLR FUEL 55FC036 - Average	CHL 46AI816 BTU FUEL 46AI816 - Average	CHL 55AI841A PPM CO BLR 55AI841A - Average	CHL 55AI841B PCT CO BLR 55AI841B - Average
TEST RUN 2									
4/15/2009 14:11	267.22	27.81	10.19	3.68	1.33	7.26	921.73	44.83	5.79
4/15/2009 14:12	267.55	27.90	10.21	3.68	1.34	7.30	919.30	46.11	5.81
4/15/2009 14:13	268.12	27.97	10.23	3.70	1.34	7.30	918.52	45.67	5.84
4/15/2009 14:14	268.12	28.03	10.25	3.81	1.34	7.28	919.41	46.32	5.84
4/15/2009 14:15	267.89	27.99	10.27	3.84	1.34	7.22	925.46	47.36	5.70
4/15/2009 14:16	268.31	28.06	10.29	3.82	1.34	7.20	929.98	46.92	5.79
4/15/2009 14:17	266.69	27.75	10.30	3.80	1.33	7.21	924.43	46.94	5.85
4/15/2009 14:18	266.22	27.63	10.14	3.81	1.33	7.23	922.67	46.97	5.96
4/15/2009 14:19	267.80	27.91	10.17	3.82	1.34	7.26	932.40	47.34	5.74
4/15/2009 14:20	272.19	28.75	10.31	3.84	1.36	7.29	937.44	47.88	5.72
4/15/2009 14:21	272.49	28.85	10.45	3.85	1.36	7.28	929.52	47.06	5.73
4/15/2009 14:22	269.89	28.36	10.42	3.84	1.35	7.21	928.70	47.71	5.78
4/15/2009 14:23	267.71	27.92	10.32	3.90	1.34	7.16	931.91	48.15	5.89
4/15/2009 14:24	266.86	27.75	10.22	3.92	1.34	7.17	932.52	48.60	5.91
4/15/2009 14:25	267.81	27.92	10.13	3.92	1.34	7.20	932.77	48.16	5.88
4/15/2009 14:26	269.22	28.20	10.14	3.94	1.35	7.22	931.53	47.39	5.87
4/15/2009 14:27	269.23	28.24	10.19	3.95	1.34	7.20	930.45	45.83	5.85
4/15/2009 14:28	267.40	27.97	10.24	3.84	1.34	7.19	925.44	45.70	5.82
4/15/2009 14:29	265.53	27.61	10.22	3.80	1.33	7.21	921.52	44.96	5.81
4/15/2009 14:30	265.17	27.55	10.16	3.80	1.33	7.23	920.73	46.36	5.74
4/15/2009 14:31	265.78	27.61	10.11	3.81	1.33	7.22	921.85	47.31	5.74
4/15/2009 14:32	267.12	27.85	10.22	3.84	1.34	7.22	928.65	47.54	5.62
4/15/2009 14:33	268.65	28.15	10.28	3.85	1.34	7.24	930.78	46.49	5.67
4/15/2009 14:34	269.57	28.34	10.29	3.85	1.35	7.25	925.79	46.22	5.76
4/15/2009 14:35	268.08	28.06	10.30	3.85	1.34	7.25	923.89	46.36	5.78
4/15/2009 14:36	268.06	28.09	10.24	3.72	1.34	7.25	928.27	46.24	5.78
4/15/2009 14:37	269.35	28.32	10.28	3.67	1.34	7.24	931.79	44.75	5.65
4/15/2009 14:38	269.91	28.44	10.32	3.67	1.35	7.24	933.38	44.08	5.66
4/15/2009 14:39	270.10	28.50	10.38	3.67	1.35	7.24	931.67	44.40	5.67
4/15/2009 14:40	269.72	28.43	10.39	3.67	1.35	7.25	930.10	45.73	5.70
4/15/2009 14:41	269.21	28.33	10.37	3.79	1.35	7.23	934.74	45.41	5.68
4/15/2009 14:42	269.79	28.39	10.35	3.83	1.35	7.21	938.35	44.66	5.68
4/15/2009 14:43	270.21	28.51	10.34	3.83	1.35	7.20	938.27	45.88	5.72
4/15/2009 14:44	269.37	28.37	10.32	3.82	1.35	7.23	934.02	45.37	5.74
4/15/2009 14:45	269.43	28.32	10.30	3.84	1.35	7.25	933.99	45.65	5.78
4/15/2009 14:46	271.81	28.72	10.29	3.88	1.36	7.26	936.62	46.26	5.78
4/15/2009 14:47	272.49	28.85	10.36	3.89	1.36	7.26	938.47	46.12	5.67
4/15/2009 14:48	272.28	28.81	10.47	3.88	1.36	7.25	938.40	46.41	5.62
4/15/2009 14:49	272.08	28.76	10.49	3.87	1.36	7.23	938.44	46.56	5.66
4/15/2009 14:50	271.83	28.72	10.46	3.87	1.36	7.23	938.59	46.49	5.69
4/15/2009 14:51	270.77	28.51	10.44	3.86	1.35	7.21	936.62	46.11	5.75
4/15/2009 14:52	269.37	28.23	10.41	3.86	1.34	7.18	934.37	45.77	5.74
4/15/2009 14:53	267.07	27.75	10.33	3.85	1.33	7.15	929.37	45.64	5.84
4/15/2009 14:54	265.93	27.49	10.23	3.85	1.33	7.12	928.46	45.85	5.91
4/15/2009 14:55	264.01	27.11	10.13	3.84	1.32	7.10	926.94	46.02	5.96
4/15/2009 14:56	263.94	27.11	10.04	3.83	1.32	7.12	929.00	45.88	5.86
4/15/2009 14:57	265.37	27.31	10.04	3.83	1.33	7.14	934.91	46.18	5.79
4/15/2009 14:58	267.01	27.57	10.09	3.84	1.33	7.17	937.55	46.01	5.82
4/15/2009 14:59	268.39	27.85	10.15	3.85	1.34	7.21	937.93	45.77	5.88
4/15/2009 15:00	269.66	28.14	10.20	3.86	1.35	7.21	937.77	45.54	5.82
4/15/2009 15:01	270.59	28.36	10.25	3.87	1.35	7.19	940.46	45.37	5.77
4/15/2009 15:02	270.62	28.40	10.30	3.86	1.35	7.15	943.88	45.41	5.77
4/15/2009 15:03	269.13	28.11	10.35	3.86	1.35	7.15	940.11	45.06	5.82
4/15/2009 15:04	268.37	27.95	10.30	3.88	1.34	7.17	935.98	44.60	5.88
4/15/2009 15:05	268.14	27.89	10.22	3.90	1.34	7.17	936.64	45.80	5.82
4/15/2009 15:06	269.25	28.13	10.21	3.91	1.35	7.17	936.87	44.38	5.80
4/15/2009 15:07	269.03	28.15	10.23	3.84	1.35	7.19	936.73	44.79	5.82
4/15/2009 15:08	268.76	28.15	10.25	3.82	1.34	7.18	935.84	45.73	5.84
4/15/2009 15:09	268.16	28.07	10.26	3.82	1.34	7.17	934.81	45.54	5.85
4/15/2009 15:10	267.46	27.96	10.27	3.82	1.34	7.18	934.65	45.36	5.86
Averages	268.62	28.10	10.27	3.83	1.34	7.21	931.66	46.08	5.78

F-0402 April 15, 2009 Timestamp	CHL F0402Q MBTU/HR COB:DUTY F0402Q - Average	CHL F0402N1 LB/HR COB:NOX F0402N1 - Average	CHL F0402C1 LB/HR COB:CO F0402C1 - Average	CHL F0402S1 LB/HR COB:SO2 F0402S1 - Average	CHL F0402V1 LB/HR COB:VOC F0402V1 - Average	CHL 55FC036 MSCFD CO BLR FUEL 55FC036 - Average	CHL 46AI816 BTU FUEL 46AI816 - Average	CHL 55AI841A PPM CO BLR 55AI841A - Average	CHL 55AI841B PCT CO BLR 55AI841B - Average
TEST RUN 3									
4/15/2009 15:47	268.66	28.13	10.41	3.89	1.34	7.24	924.66	44.04	5.64
4/15/2009 15:48	267.67	27.95	10.37	3.88	1.34	7.22	924.15	44.56	5.75
4/15/2009 15:49	267.01	27.80	10.32	3.87	1.34	7.22	927.01	44.85	5.74
4/15/2009 15:50	267.66	27.91	10.26	3.86	1.34	7.21	927.31	44.09	5.77
4/15/2009 15:51	267.13	27.70	10.29	3.83	1.33	7.17	925.55	46.34	5.65
4/15/2009 15:52	265.61	27.33	10.34	3.80	1.33	7.18	926.09	47.88	5.31
4/15/2009 15:53	265.84	27.32	10.40	3.80	1.33	7.19	927.78	47.01	5.31
4/15/2009 15:54	266.73	27.46	10.46	3.80	1.33	7.19	928.65	47.93	5.34
4/15/2009 15:55	266.82	27.47	10.52	3.81	1.33	7.17	928.84	47.86	5.38
4/15/2009 15:56	266.61	27.42	10.57	3.84	1.33	7.16	930.15	49.20	5.24
4/15/2009 15:57	266.46	27.38	10.47	3.86	1.34	7.18	930.36	47.90	5.33
4/15/2009 15:58	267.09	27.47	10.43	3.87	1.34	7.19	927.99	49.31	5.29
4/15/2009 15:59	266.45	27.35	10.44	3.87	1.33	7.19	926.98	48.32	5.32
4/15/2009 16:00	266.69	27.41	10.45	3.86	1.33	7.18	928.23	47.71	5.29
4/15/2009 16:01	266.59	27.38	10.46	3.86	1.33	7.19	929.28	47.43	5.43
4/15/2009 16:02	266.82	27.35	10.47	3.85	1.33	7.19	928.09	49.22	5.34
4/15/2009 16:03	266.74	27.35	10.48	3.84	1.33	7.19	926.77	49.02	5.42
4/15/2009 16:04	266.47	27.31	10.49	3.84	1.33	7.18	927.57	47.32	5.45
4/15/2009 16:05	266.23	27.25	10.57	3.81	1.33	7.18	928.60	48.49	5.27
4/15/2009 16:06	266.65	27.31	10.57	3.80	1.33	7.18	929.68	47.92	5.34
4/15/2009 16:07	266.57	27.31	10.52	3.80	1.33	7.15	929.37	47.56	5.18
4/15/2009 16:08	266.25	27.28	10.63	3.80	1.33	7.15	930.31	48.86	5.07
4/15/2009 16:09	266.57	27.37	10.68	3.81	1.33	7.18	929.80	48.42	5.08
4/15/2009 16:10	267.08	27.51	10.67	3.82	1.33	7.19	929.75	48.61	5.19
4/15/2009 16:11	266.71	27.46	10.66	3.84	1.33	7.19	928.18	48.03	5.24
4/15/2009 16:12	266.01	27.35	10.66	3.84	1.33	7.18	927.36	46.40	5.13
4/15/2009 16:13	265.35	27.24	10.73	3.84	1.33	7.14	927.13	47.54	5.02
4/15/2009 16:14	265.27	27.14	10.60	3.84	1.33	7.16	927.97	48.36	5.10
4/15/2009 16:15	265.75	27.19	10.54	3.84	1.33	7.18	929.14	48.25	5.05
4/15/2009 16:16	265.57	27.16	10.55	3.83	1.33	7.18	930.01	48.10	5.21
4/15/2009 16:17	266.22	27.29	10.56	3.83	1.33	7.16	931.09	47.43	5.20
4/15/2009 16:18	265.98	27.20	10.57	3.83	1.33	7.14	928.09	46.25	5.18
4/15/2009 16:19	264.83	27.00	10.58	3.83	1.32	7.15	926.19	46.97	5.14
4/15/2009 16:20	265.08	27.03	10.59	3.83	1.32	7.16	926.40	47.89	5.14
4/15/2009 16:21	265.05	27.04	10.70	3.83	1.32	7.15	927.29	48.46	5.11
4/15/2009 16:22	264.64	26.99	10.84	3.82	1.32	7.14	925.48	48.43	4.99
4/15/2009 16:23	263.36	26.77	10.69	3.82	1.32	7.16	922.65	48.13	5.04
4/15/2009 16:24	264.16	26.89	10.62	3.82	1.32	7.17	925.93	48.49	4.92
4/15/2009 16:25	265.06	27.10	10.64	3.82	1.32	7.17	927.90	49.50	4.76
4/15/2009 16:26	265.93	27.25	10.67	3.82	1.33	7.16	924.24	47.67	4.96
4/15/2009 16:27	264.05	26.89	10.80	3.79	1.32	7.15	922.09	46.26	4.93
4/15/2009 16:28	264.54	26.96	10.90	3.78	1.32	7.14	927.78	47.20	4.82
4/15/2009 16:29	265.20	27.16	10.95	3.79	1.32	7.18	927.27	47.96	4.75
4/15/2009 16:30	265.82	27.28	10.95	3.79	1.33	7.18	926.16	48.60	4.89
4/15/2009 16:31	264.81	27.06	10.92	3.79	1.33	7.15	924.88	48.72	4.89
4/15/2009 16:32	263.83	26.88	10.89	3.80	1.32	7.16	924.76	48.06	4.91
4/15/2009 16:33	264.67	27.02	10.86	3.80	1.32	7.22	923.35	48.24	4.90
4/15/2009 16:34	266.06	27.26	10.83	3.83	1.33	7.25	922.95	47.50	4.92
4/15/2009 16:35	266.88	27.40	10.96	3.87	1.33	7.27	921.38	47.07	4.86
4/15/2009 16:36	268.50	27.67	11.02	3.88	1.34	7.26	924.85	47.53	4.88
4/15/2009 16:37	269.29	27.81	11.02	3.88	1.35	7.22	926.70	46.83	4.94
4/15/2009 16:38	267.48	27.45	11.01	3.87	1.34	7.22	926.33	46.89	4.92
4/15/2009 16:39	267.41	27.42	10.90	3.86	1.34	7.24	926.59	48.62	4.89
4/15/2009 16:40	268.18	27.58	10.87	3.86	1.34	7.22	925.34	47.41	4.91
4/15/2009 16:41	266.94	27.35	10.91	3.85	1.34	7.19	925.67	47.82	4.88
4/15/2009 16:42	266.22	27.22	11.02	3.83	1.33	7.22	925.20	47.48	4.87
4/15/2009 16:43	266.64	27.34	10.90	3.83	1.33	7.24	926.19	47.26	4.92
4/15/2009 16:44	267.36	27.52	10.88	3.84	1.34	7.24	926.72	47.30	4.84
4/15/2009 16:45	268.60	27.68	10.95	3.84	1.34	7.21	927.29	47.31	4.90
4/15/2009 16:46	267.22	27.40	11.01	3.84	1.34	7.18	924.83	47.39	4.93
Averages	266.28	27.33	10.67	3.83	1.33	7.18	926.94	47.62	5.13

VII. APPENDIX

The following appendices are presented as supporting documentation to this test report.

A. Resumes of Test Personnel
B. Test Analyzer Calibration Gas Certifications
C. Test Analyzer Descriptions and Specifications
D. Permit Number 2500-00005-V1 Excerpts
E. Correspondence, Chalmette Refining and LDEQ

CRLLC-CHAL-000153

ETS®
Emission Testing Services, Inc.

Resume

KEVIN L. THIBODEAUX
Senior Sampling Specialist

EDUCATION

High School Graduate
U.S. EPA Round Robin Sample Integrity Audits
Participates in on-going Air-Pollution Training Institute Courses (APTI)

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record
EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

08/98 to Present Emission Testing Services, Inc. Senior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to conduct and provide project management for all manual emission test methods including 40 CFR 60, Methods 5, 6, 7, 8, 11, 12, 18, 26 and 29. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

CRLLC-CHAL-000154

ETS®
Emission Testing Services, Inc.

Resume

R. KEITH DELK, JR.
Junior Sampling Specialist

EDUCATION

High School Graduate

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record
EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

02/08 to Present Emission Testing Services, Inc. Junior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

CRLLC-CHAL-000155

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

Shipped From:
9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ANALYSIS

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE

BATON ROUGE LA 70814

PROJECT #: 04-61403-020
PO#: 20080121-RM01
ITEM #: 0401813 AL
DATE: 18Feb2008

CYLINDER #: ALM017958
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9

GRADE: ZERO GAS

PURITY: 99.998%

IMPURITY	MAXIMUM CONCENTRATIONS
THC	0.5 PPM

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-013

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM004565 **Certification Date:** 18Feb2008 **Exp. Date:** 18Feb2011
Cylinder Pressure*:** 1950 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	10.1 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	01Jan2010	K025996	10.03 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	04Feb2008	PARAMAGNETIC

ANALYZER READINGS

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

OXYGEN

First Triad Analysis

Date: 18Feb2008 Response Unit:VOLTS

Z1 = 0.00000	R1 = 1.00480	T1 = 1.00590
R2 = 1.00480	Z2 = 0.00020	T2 = 1.00550
Z3 = 0.00140	T3 = 1.00360	R3 = 1.00200

Avg. Concentration: 10.07 %

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.9999904

Constants:	A = .004162074
B = 10.00386942	C =
D =	E =

APPROVED BY: DAVID KELLY

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-014

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM028445 **Certification Date:** 13Feb2008 **Exp. Date:** 13Feb2011

Cylinder Pressure*:** 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	20.1 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2350	01May2009	K003567	23.48 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	04Feb2008	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis

OXYGEN

Date: 13Feb2008 Response Unit:VOLTS

Z1=0.00000	R1=0.98480	T1=0.84180
R2=0.98500	Z2=0.00000	T2=0.84190
Z3=0.00000	T3=0.84180	R3=0.98480

Avg. Concentration: 20.06 %

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r = 0.9999996

Constants: A = -.00540053

B = 23.821333399 C =

D = E =

APPROVED BY: DAVID KELLY

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 012108R-RM01
Project No.: 04-61627-007

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM060848 Certification Date: 06Feb2008 Exp. Date: 06Feb2010
Cylinder Pressure***: 1702 PSIG Prev Certification Date: 21Jun2007

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	26.9	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Prot

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	01Nov2010	ALM034319	50.18 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	07Jan2008	FTIR

ANALYZER READINGS

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

SULFUR DIOXIDE *

First Triad Analysis

Date: 21Jun2007 Response Unit:PPM

Z1 = 0.00000	R1 = 0.00000	T1 = 0.00000
R2 = 0.00000	Z2 = 0.00000	T2 = 0.00000
Z3 = 0.00000	T3 = 0.00000	R3 = 0.00000

Avg. Concentration: 27.00 PPM

Second Triad Analysis

Date: 06Feb2008 Response Unit: PPM

Z1 = -0.01151	R1 = 50.22892	T1 = 26.83116
R2 = 50.26837	Z2 = 0.02807	T2 = 26.84626
Z3 = 0.02821	T3 = 26.87325	R3 = 50.32396

Avg. Concentration: 26.79 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99991E-1

Constants:	
B = 1.03089E+0	A = 0.00000E+0
D = 0.00000E+0	C = -1.75000E-4
	E = 0.00000E+0

APPROVED BY: _____
RAMIEN JR

APPENDIX B
7.3.4

CRLLC-CHAL-000159

AIR LIQUIDE | Air Liquide America Specialty Gases LLC | SCOTT™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 103008-RM01
Project No.: 04-70137-013

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM008628 **Certification Date:** 18Dec2008 **Exp. Date:** 18Dec2010
Cylinder Pressure*:** 1603 PSIG **Prev Certification Date:** 28Feb2006

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	59.3	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	15Aug2009	ALM024377	50.79 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	11Dec2008	FTIR

ANALYZER READINGS

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

SULFUR DIOXIDE *

First Triad Analysis

Date: 28Feb2006	Response Unit:PPM	
Z1=0.00000	R1=0.00000	T1=0.00000
R2=0.00000	Z2=0.00000	T2=0.00000
Z3=0.00000	T3=0.00000	R3=0.00000
Avg. Concentration:	59.50	PPM

Second Triad Analysis

Date: 18Dec2008	Response Unit: PPM	
Z1=-0.02511	R1=50.80123	T1=59.01992
R2=50.82368	Z2=-0.01567	T2=59.05760
Z3=0.00685	T3=59.06852	R3=50.85286
Avg. Concentration:	59.00	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99999E-1	
Constants:	A=0.00000E+0
B=9.95191E-1	C=0.00000E+0
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
Ramien JR

CRLLC-CHAL-000160

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080619-RM01
Project No.: 04-65749-004

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM026410 **Certification Date:** 17Jul2008 **Exp. Date:** 17Jul2010
Cylinder Pressure*:** 1972 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	55.7	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	55.7	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1684	01Sep2010	KAL003524	97.68 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	14Jul2008	FTIR

ANALYZER READINGS

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

First Triad Analysis

Second Triad Analysis

Calibration Curve

NITRIC OXIDE

Date: 01Jul2008	Response Unit:PPM	
Z1 = -0.03655	R1 = 97.40175	T1 = 55.37907
R2 = 97.48004	Z2 = 0.05357	T2 = 55.53257
Z3 = 0.07818	T3 = 55.54189	R3 = 97.63292
Avg. Concentration:	55.57	PPM

Date: 17Jul2008	Response Unit: PPM	
Z1 = 0.03741	R1 = 97.39487	T1 = 55.58712
R2 = 97.47449	Z2 = 0.05192	T2 = 55.73165
Z3 = 0.08321	T3 = 55.84821	R3 = 97.48817
Avg. Concentration:	55.83	PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = 9.99995E-1	
Constants:	A = 0.00000E+0
B = 9.77459E-1	C = 1.62000E-4
D = 0.00000E+0	E = 0.00000E+0

APPROVED BY: _____
Ramien JR

APPENDIX B
7.3.6

RATA CLASS

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20081106-RM01
Project No.: 04-69422-003

Customer

EMISSIÒN TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: AAL13469 **Certification Date:** 08Dec2008 **Exp. Date:** 08Dec2010
Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	137	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	137.	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1685	01Sep2010	KAL003490	247.1 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	04Dec2008	FTIR

ANALYZER READINGS

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

NITRIC OXIDE

First Triad Analysis

Date: 01Dec2008	Response Unit:PPM	
Z1 = -0.09613	R1 = 248.0965	T1 = 137.6067
R2 = 248.1907	Z2 = 0.03255	T2 = 137.6059
Z3 = 0.03587	T3 = 137.7966	R3 = 248.7311
Avg. Concentration:	137.0	PPM

Second Triad Analysis

Date: 08Dec2008	Response Unit: PPM	
Z1 = -0.10999	R1 = 247.3627	T1 = 137.2412
R2 = 247.5286	Z2 = -0.04028	T2 = 137.4224
Z3 = 0.08586	T3 = 137.4809	R3 = 248.0307
Avg. Concentration:	137.1	PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = 9.99996E-1	
Constants:	A = 0.00000E+0
B = 9.79122E-1	C = 1.72000E-4
D = 0.00000E+0	E = 0.00000E+0

APPROVED BY: _____
Ramien JR

Page 1 of 1

APPENDIX B
7.3.7

CRLLC-CHAL-000162

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT, CO 80501

P.O. No.: 103008-RM01
Project No.: 08-72016-001

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: AAL6541 Certification Date: 27Jan2009 Exp. Date: 28Jul2009
Cylinder Pressure***: 1900 PSIG Prev Certification Date: 11Feb2008

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITROGEN DIOXIDE	49.3	PPM	+/- 2%	GMIS
NITROGEN		BALANCE		

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

** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
GMIS NO2/AIR	19May2010	AAL021739	97.60 PPM	NITROGEN DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
NONOX/CLA-220/41528750062	14Jan2009	CHEMILUMINESCENT

APPROVED BY: JW
JON WITZAK

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-002

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM031361 **Certification Date:** 14Feb2008 **Exp. Date:** 14Feb2011
Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	55.7	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2635	02Oct2010	KAL003167	25.21 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	08Feb2008	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 06Feb2008 Response Unit:PPM

Z1 = 0.00432	R1 = 25.24969	T1 = 55.84692
R2 = 25.31409	Z2 = 0.04393	T2 = 55.92991
Z3 = 0.07750	T3 = 55.96750	R3 = 25.32974

Avg. Concentration: 55.77 PPM

Second Triad Analysis

Date: 14Feb2008 Response Unit: PPM

Z1 = -0.03364	R1 = 25.12123	T1 = 55.53817
R2 = 25.15710	Z2 = 0.03653	T2 = 55.61026
Z3 = 0.06659	T3 = 55.64416	R3 = 25.23942

Avg. Concentration: 55.71 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99998E-1

Constants:	
A = 0.00000E+0	
B = 9.96927E-1	C = 2.92000E-4
D = 2.00000E-6	E = 0.00000E+0

APPROVED BY: RAMIEN JR

APPENDIX B
7.3.9

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-004

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM002244 **Certification Date:** 14Feb2008 **Exp. Date:** 14Feb2011
Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	95.8	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1679	01May2011	ALM007279	94.90 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	08Feb2008	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 07Feb2008	Response Unit:PPM	
Z1=-0.00431	R1=101.7026	T1=96.74009
R2=101.9221	Z2=0.08187	T2=96.74306
Z3=0.09412	T3=96.78831	R3=101.9586
Avg. Concentration:	95.94	PPM

Second Triad Analysis

Date: 14Feb2008	Response Unit: PPM	
Z1=-0.01126	R1=95.17712	T1=95.92258
R2=95.29609	Z2=0.11102	T2=95.99919
Z3=0.11449	T3=96.13007	R3=95.29877
Avg. Concentration:	95.66	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99998E-1

Constants:	
A=0.00000E+0	
B=6.41204E-1	C=1.15000E-4
D=1.00000E-6	E=0.00000E+0

APPROVED BY: _____
RAMIEN JR

APPENDIX B
7.3.10

OXYGEN/ CARBON DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

SERVOMEX
MODEL NUMBER 1400B4 STD/FLS

I. PRINCIPLE of OPERATION

The Servomex oxygen/ carbon dioxide analyzer uses a magneto-dynamic paramagnetic technique for oxygen measurement and a single-beam, single-wave length infrared technique for carbon dioxide measurement.

II. SPECIFICATIONS

Ranges	
O2	0.1 to 100 vol%
CO2	0 to 1 vol%
	0 to 2 vol%
	0 to 5 vol%
	0 to 10 vol%
	0 to 25 vol%
	0 to 50 vol%
	0 to 100 vol%
Detection Limits	
O2 Minimum	0.1 vol%
O2 Maximum	100 vol%
CO2 Minimum	0.1 vol%
CO2 Maximum	100 vol%
Response Time, 90%	
O2	< 10 sec
CO2	< 30 sec
Interferences	
None	

Precision	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Linearity	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Drift	
Zero, 24-hr	+/- 0.2%
Span, 24-hr	+/- 0.2%

CRLLC-CHAL-000166

SULFUR DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

WESTERN RESEARCH
MODEL NUMBER 721AT

I. PRINCIPLE of OPERATION

The Western Research, Model 721AT, sulfur dioxide analyzer utilizes the principle of the unique and characteristic absorbsion of ultraviolet radiation for sulfur dioxide.

II. SPECIFICATIONS

Ranges	
SO2	0 to 500 PPMv
	0 to 5000 PPMv
Detection Limits	
Minimum	0.5 PPMv
Maximum	5000 PPMv
Response Time, 90%	
SO2	1 sec
Interferences	
Negligible	

APPENDIX C
7.4.2

OXIDES of NITROGEN ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 10

I. PRINCIPLE of OPERATION

The model 10 NO-NOx analyzer utilizes the principle of chemiluminescence for the detection of nitrogen oxide (NO). Detection of NO in the sample gas is accomplished by blending ozone (O3) with the sample gas in a reaction chamber. The reaction produces a characteristic luminescence with an intensity that is linearly proportional to the concentration of NO. The luminescence intensity is measured using an optical filter and photomultiplier at a narrow wavelength band that is unique to the NO and O3 reaction. In order to measure NOx (NO plus NO2), the sample gas is diverted through a NO2 to NO converter prior to entering the reaction chamber.

II. SPECIFICATIONS

Ranges		Precision	
NO	0 to 2.5 PPMv	NO	+/- 1.0 PPMv
	0 to 10 PPMv		
	0 to 25 PPMv		
	0 to 100 PPMv	Linearity	
	0 to 250 PPMv	NO	+/- 1%
	0 to 1000 PPMv		
	0 to 2500 PPMv		
	0 to 10000 PPMv	Drift	
		Zero, 12-hr	< 1.2%
Detection Limits		Span, 12-hr	< 1.2%
Minimum	0.1% FS		
Maximum	10000 PPMv		
		Noise	0.05 RMS
Response Time, 90%			
NO	1.5 sec		
NO2	1.7 sec	Sample Flow Rate	0.2 – 2 l/min

Interferences
Negligible for H20, carbon, and sulfur compounds

CRLLC-CHAL-000168

III. INTERFERENCE CHECK RESPONSE

Manufacturer:	Thermo Environmental	High Span Calibration Gas (b):	95.8
Monitor:	Model 10	High Gas Cylinder Number:	AAL5239
Serial Number:	ETSNOX4A/11B	High Gas Certification Date:	02/14/2008
Date:	06/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response Without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	02/06/2008	CO2	5.06%	0.0	0.000	0.010
CC139299	Air Liquide	12/13/2007	CO2	13.90%	-0.1	0.000	0.100
AAL9663	Scott Gas	02/18/2008	NO	24.9 PPMv	N/A	N/A	0.000
AAL6541	Scott Gas	02/11/2008	NO2	49.3 PPMv	N/A	N/A	0.000
A4072	Scott Gas	10/03/2007	N2O	9.9 PPMv	0.1	0.015	0.100
ALM031361	Scott Gas	02/14/2008	CO	55.7 PPMv	-0.1	0.000	0.100
ALM023311	Scott Gas	10/03/2007	NH3	10.37 PPMv	0.9	0.000	0.900
ALM036171	Scott Gas	04/14/2005	CH4	50.92 PPMv	0.0	0.000	0.000
ALM001797	Scott Gas	10/11/2007	SO2	25.7 PPMv	-0.1	0.050	0.100
A10634	Scott Gas	10/04/2007	H2	50 PPMv	-0.2	0.010	0.200

Sum of the Maximum Deviations (a)	1.500
2.5% of Span (b)	2.395
Pass if Sum of the Maximum Deviations (a) is less than 2.5% of Span (b)	PASS

Comments:

APPENDIX C
7.4.4

CARBON MONOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 48

I. PRINCIPLE of OPERATION

The model 48 CO analyzer utilizes non-dispersive infrared (NDIR) detection of CO enhanced by gas filter correlation (GFC). Sample gas is passed through an optical White Cell in which an IR beam passes. The White Cell provides a long beam path length in a relatively small cell by utilizing optical mirrors to produce multiple passes of the IR beam through the cell. The IR beam is first passed through a GFC chopper wheel and a narrow bandpass interference filter before entering the cell. The CO molecules in the cell absorb IR proportional to the CO concentration. The IR beam exiting the cell is measured using an IR detector.

II. SPECIFICATIONS

Ranges		Precision	
CO	0 to 1 PPMv	CO	+/- 0.1 PPMv
	0 to 2 PPMv		
	0 to 5 PPMv		
	0 to 10 PPMv	Linearity	
	0 to 20 PPMv	CO	+/- 1%
	0 to 50 PPMv		
	0 to 100 PPMv		
	0 to 200 PPMv	Drift	
	0 to 500 PPMv	Zero, 24-hr	+/- 0.2 PPMv
	0 to 1000 PPMv	Span, 24-hr	+/- 1% FS
Detection Limits		Sample Flow Rate	0.5 – 2 l/min
Minimum	0.1 PPMv		
Maximum	1000 PPMv	Noise	0.05 RMS
Response Time	1 min		

Interferences
Negligible for H2O and CO2

APPENDIX C
7.4.5

ETS®
Emission Testing Services, Inc.

INTERFERENCE CHECK RESPONSE

Manufacturer:	Thermo Environmental	High Span Calibration Gas(b):	95.8
Monitor:	Model 48i	High Gas Cylinder Number:	ALM002244
Serial Number:	ETS-CO-2	High Gas Certification Date:	2/14/2008
Date:	6/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	2/6/2008	CO2	5.06%	0.0	-0.012	0.012
CC139299	Air Liquide	12/13/2007	CO2	13.90%	0.1	0.004	0.100
AAL9663	Scott Gas	2/18/2008	NO	24.9 ppmv	0.0	-0.010	0.010
AAL6541	Scott Gas	2/11/2008	NO2	49.3 ppmv	-0.2	0.015	0.200
A4072	Scott Gas	10/3/2007	N2O	9.9 ppmv	0.1	-0.090	0.100
ALM031361	Scott Gas	2/14/2008	CO	55.7 ppmv	N/A	N/A	0.000
ALM023311	Scott Gas	10/3/2007	NH3	10.37 ppmv	0.1	0.000	0.100
ALM036171	Scott Gas	4/14/2005	CH4	50.92 ppmv	0.0	0.110	0.110
ALM001797	Scott Gas	10/11/2007	SO2	25.7 ppmv	0.3	0.496	0.496
A10634	Scott Gas	10/4/2007	H2	50 ppmv	0.1	0.000	0.100

Sum of the maximum deviations (a) =	1.228
2.5% of span (b) =	2.395
Sum of the maximum deviations (a) < 2.5% of span (b) =	PASS

COMMENTS:

ETS REFERENCE SOP 5-007.020

CRLLC-CHAL-000171

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

Certified Mail No. 7004 1160 0003 2552 2525

Agency Interest No. 1376
Activity No.: PER20070014

Mr. Richard A. Igercich
Refinery Manager
Chalmette Refining, L.L.C.
Post Office Box 1007
Chalmette, Louisiana 70044

RE: Part 70 Operating permit modification, Utilities Plant, Chalmette Refinery, Chalmette Refining, L.L.C., Chalmette, St. Bernard Parish, Louisiana

Dear Mr. Igercich:

This is to inform you that the permit modification for the above referenced facility has been approved under LAC 33:III.501. The permit is both a state preconstruction and Part 70 Operating Permit. The submittal was approved on the basis of the emissions reported and the approval in no way guarantees the design scheme presented will be capable of controlling the emissions as to the types and quantities stated. A new application must be submitted if the reported emissions are exceeded after operations begin. The synopsis, data sheets and conditions are attached herewith.

It will be considered a violation of the permit if all proposed control measures and/or equipment are not installed and properly operated and maintained as specified in the application.

Operation of this facility is hereby authorized under the terms and conditions of this permit. This authorization shall expire at midnight on the 7th of November, 2010, unless a timely and complete renewal application has been submitted six months prior to expiration. Terms and conditions of this permit shall remain in effect until such time as the permitting authority takes final action on the application for permit renewal. The permit number and Agency Interest No. cited above should be referenced in future correspondence regarding this facility.

Done this 29th day of October, 2007.

Permit No.: 2500-00005-V1

Sincerely,

Chuck Carr Brown, Ph.D.
Assistant Secretary
SGQ
cc: EPA Region VI

ENVIRONMENTAL SERVICES
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
WWW.DEQ.LOUISIANA.GOV

APPENDIX D
7.5.1

AIR PERMIT BRIEFING SHEET
AIR PERMITS DIVISION
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

I. Background

Chalmette Refining, L.L.C. (CRLLC) is a joint venture between ExxonMobil Corporation (EMOC) and Petroleos de Venezuela (PDV), the Venezuelan National Oil Company. Chalmette Refinery is located on the left descending bank of Mississippi River at Mile 89 above Head-of-Passes at Chalmette and is operated by EMOC. The Utilities Plant operates under a Part 70 Operating Permit No. 2500-00005-V0 dated November 7, 2005. This permit deals with the utilities equipment consisting of water treatment, boilers, cooling tower operation and support equipment (Utilities Plant). This permit incorporates the requirements of Prevention of Significant Deterioration (PSD) Permit No. PSD-LA-199(M-7).

II. Origin

This review was initiated by an application and Emission Inventory Questionnaire (EIQ) dated August 29, 2007; as well as additional information as of October 20, 2007.

III. Description

Chalmette Refinery is an integrated crude operation (high conversion) which includes crude distillation, catalytic reforming, fluid catalytic cracking (FCC), hydrocracking, HF alkylation, delayed coking, and aromatics processing units. The refinery is capable of producing gasoline, diesel, benzene/toluene/xylene (BTX), distillates, and recovers elemental sulfur; as well as by-products such as petroleum coke and LPG. The Utility Plant produces steam and compressed air to be used throughout the refinery and also provides filtered and treated water to the refinery units as well as treated boiler feed water. Closed Cooling Water Tower provides closed loop cooling system for a number of heat exchangers that contain aromatics.

The Utility Plant receives raw river water from the Mississippi River into the Water Treatment section of the unit. Through the combination of filtering and treatment, the filtered and treated water is used as makeup water to the boilers and other refinery process units. Filtered water is sent to the Filtered Water Storage tanks and utilized for fire/Alky mitigation water and make-up to the cooling water, boiler-house, and other process units. Treated water is sent to the Surge tanks for distribution to other refinery units and to the Boiler section. The boiler feed water is supplied to the four Boilers (No. 7, 9, 10, and F-402) as well as small refinery steam producers. Refinery utility steam is produced by the utility boilers at 600 psig and decreased to a number of pressure levels, as required by the plant processes.

AIR PERMIT BRIEFING SHEET
AIR PERMITS DIVISION
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

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CHALMETTE, ST. BERNARD PARISH, LOUISIANA

The Utility Plant consists of the following two sections; Water Treatment and Boiler Sections.

Water Treatment Section: The purpose of Water Treatment section is to filter and soften raw river water for use throughout the refinery and in the Boiler Section. The unit receives raw river water from the refinery's once through cooling water supply header. The entering water is strained and filtered to remove foreign matter and turbidity. The filtered water is routed to storage tanks for distribution. Filtered water is sent through the weak acid cation treaters, decarbonators, and softeners to remove other impurities and hardness from the water. The treated water is utilized as boiler feedwater, and distributed to other refinery processes

Boiler Section: The purpose of this Boiler Section is to produce utility boiler feedwater, steam, and collection of boiler steam condensate. The treated water from the Water Treatment Section enters the deaerators, where dissolved gases are removed using a steam stripping process. The water is then conditioned by injection of sulfite and polymer. The resulting boiler feedwater is then routed to the boilers for steam production. The boilers supply superheated steam to the refinery steam headers. Utility pressure steam is supplied to the operating units through the letdown stations. High and medium pressure condensate from the refinery collection headers is returned to the unit for recovery.

Cooling and Firewater System: The Cooling and Firewater system distributes cooling and firewater throughout the refinery and provides the emergency and backup Internal combustion drive pumps.

Compressed Air: The East Utilities provides compressed air for distribution throughout the refinery. The unit contains three electric and one steam turbine driven air compressors. In addition, a long-term rental backup diesel driven air compressor is located on site.

Close Cooling Water Tower: The Closed Cooling Water Tower provides a closed loop cooling system for a number of heat exchangers that contain concentrated aromatics. The cooling tower replaces once through cooling for a number of heat exchangers located at the Reformate Fractionation, Isom, Sulfolane, Orthooxylene, Reformer No. 1 and 3, and TDU Units. The cooling tower blowdown is sent to the Waste Water Treatment Plant. The unit has a backup water circulation diesel driven pump.

The facility proposes to install Ultra-Low NOx Burners on three existing Boilers Nos. 402, 9, and 10 (Emission Points 27, 66, and 70). This project is being undertaken as per the requirements of U.S. EPA Consent Decree, a NSR Global Settlement (Civil Action No. 05-4662 B(i)) between U.S. EPA and State of Louisiana verses Chalmette Refining,

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L.L.C. filed on April 26, 2006, to reduce NOx emissions from the facility. NOx emissions are expected to reduce by approximately 200 tons per year. There will not be any change in the emissions of other criteria pollutants. In order to achieve this goal the facility will replace the existing burners, modify the configuration of the windboxes to facilitate flue gas recirculation, install control dampers, install associated instrumentation, if required modify the existing air blowers and motors, on the above referenced boilers. The facility will also install new continuous emission monitoring system (CEMS) on Boiler No. 402.

This modification includes the above referenced project and the following changes at the facility:

1. Incorporate the Ultra-Low NOx Project and performance tests;
2. Update the fugitive emissions based on the LDAR program and operating conditions;
3. Add two new rental internal combustion engines to drive air compressors to supplement air supply; and
4. Update the Insignificant Activities and General Condition XVII List.

The other project is to add two new internal combustion engines, which is independent of the ULN Project. The emissions increase from these engines is as follows:

Pollutant	Emissions increase	PSD Deminimis
PM_{10}	0.66	15
SO_2	5.25	40
NO_X	37.37	40
CO	13.77	100
VOC	2.66	40

The change in emissions due to the addition of two internal combustion engines is less than the PSD significance level for all criteria pollutants; therefore, NSR/PSD review is not required.

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Permitted emissions from the Utilities Plant including the projects changes in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	29.72	25.12	- 4.60
SO_2	62.20	66.01	+ 3.81
NO_X	569.23	339.68	- 229.55
CO	446.99	448.54	+ 1.55
VOC	144.19	109.69	- 34.50

IV. Type of Review

This application was reviewed for compliance with the Louisiana Part 70 operating permit program, Louisiana Air Quality Regulations, NSPS, and NESHAP. Prevention of Significant Deterioration does not apply. The facility is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51.

V. Credible Evidence

Notwithstanding any other provisions of any applicable rule or regulation or requirement of this permit that state specific methods that may be used to assess compliance with applicable requirements, pursuant to 40 CFR Part 70 and EPA's Credible Evidence Rule, 62 Fed. Reg. 8314 (Feb. 24, 1997), any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed shall be considered for purposes of Title V compliance certifications. Furthermore, for purposes of establishing whether or not a person has violated or is in violation of any emissions limitation or standard or permit condition, nothing in this permit shall preclude the use, including the exclusive use, by any person of any such credible evidence or information.

VI. Public Notice

A public notice is not required to permit a minor modification at a Part 70 facility.

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VII. Effects on Ambient Air

Dispersion Model Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration ($\mu g/m^3$)	Louisiana Air Quality Standard (NAAQS) ($\mu g/m^3$)
PM_{10}	Annual	1.147	50
	24 hr	12.36	150
NO_2	Annual	14.26	100
SO_2	Annual	1.08	80
	24 hr	12.23	365
	3 hr	23.28	1,300

VIII. General Condition XVII Activities

Activity	Frequency	NOx	CO	SO2	PM10	VOC
Equipment Preparation, Maintenance and Other Routine	440 events/yr	2.57	0.61	0.20	0.96	0.32
Planned Startup/Shutdown and Turnaround	40 events/yr	-	<0.01	-	-	<0.01
May have combination of other speciated pollutants less than 0.01 tons per year						

IX. Insignificant Activities

ID No.:	Description	Citation
-	Organic Liquid Tanks (<250 gals and <3.5 psia)	LAC 33:III.501.B.5.A.2
-	Organic Liquid Tanks (<10,000 gals and <0.5 psia)	LAC 33:III.501. B.A.3
-	Inorganic Liquid Tanks (<10,000 gals and <0.5 psia	LAC 33:III.501. B.A.4
-	Process Stream Analyzer Emissions	LAC 33:III.501.B.5.A.9

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X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	LAC 33:III.Chapter																	
		5▲	9	11	13	15	2103	2111	2113	2121	2115	2141	17	2301	29*	51*	52	56	59
UNF001	Utilities (Complex) Plant	1	1	1	1	1			1			1			1	1		1	1
EQT019	27, Boiler No. 402			1	1	1										2			
EQT020	35, Boiler No. 7			1	1	1										2			
EQT021	66, Boiler No. 9			1	1	1										2			
EQT022	70, Boiler No. 10			1	1	1										2			
EQT023	CT-1, Closed Cooling Tower				2											1			
EQT024	ICE-U1, IC Engine			1	1											2			
EQT025	TK-1204, Sulfuric Acid Tank															1			
EQT026	TK-1205, Sulfuric Acid Tank															1			
EQT027	TK-804, Sulfuric Acid Tank															1			
EQT265	ICE-U2, IC Engine			1	1											2			
EQT266	ICE-U3, IC Engine			1	1											2			
FUG002	FE-U, Fugitives															1			

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

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* The regulations indicated above are State Only regulations.
▲ All LAC 33:III.Chapter 5 citations are federally enforceable including LAC 33:III.501.C.6 citations, except when the requirement found in the "Specific Requirements" report specifically states that the regulation is State Only.

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X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	Q	GGG	NNN	QQQ	A	J	M	V	FF	A	F	G	CC	4E/Fs	4Zs	68	82
UNF001	Utilities Plant	1									1		1		1	1						1	1
EQT019	27, Boiler No. 402				1																		
EQT020	35, Boiler No. 7				1																		
EQT021	66, Boiler No. 9		1		1																		
EQT022	70, Boiler No. 10		1		1																		
EQT023	CT-1, Closed Cooling Tower						2										1						
EQT024	ICE-U1, IC Engine							1				2					1	1	1		2		
EQT025	TK-1204, Sulfuric Acid Tank					2													2	2/2			
EQT026	TK-1205, Sulfuric Acid Tank					2													2	2/2			
EQT027	TK-804, Sulfuric Acid Tank					2													2	2/2			
EQT265	ICE-U2, IC Engine																				2		
EQT266	ICE-U3, IC Engine																				2		
FUG002	FE-U, Fugitives																						

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X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	XX	GGG	NNN	QQQ	A	J	M	V	FF	A	F	G	CC	UUU	5Ds	68	82

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

APPENDIX D
7.5.10

CRLLC-CHAL-000181

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

UTILITIES PLANT
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XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
UNF001 Utilities Complex	Compliance Assurance Monitoring	Does not apply	40 CFR 64	Emission sources do not emit more than 100 tons without controls
EQT019 and EQT020 27, Boiler No. 402 and 35, Boiler No. 7	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns natural gas and refinery fuel gas
	NSPS, Subpart Dc – Standards of Performance for Small Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40c(a)	The boilers have a capacity greater than 100 MM BTU/hr
	NSPS, Subpart D – Standards of Performance for Fossil-Fuel-Fired Steam Generator	Does not apply	40 CFR 60.40(a)	The boilers were constructed prior to August 17, 1971
	NSPS, Subpart Db - Standards of Performance for Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40b(a)	The Boiler No. 402 was constructed, modified, or reconstructed after June 19, 1986 and Boiler No. 7 was constructed prior to June 19, 1984
EQT021 and EQT022 66, Boiler No. 9 and 70, Boiler No. 10	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns natural gas and refinery fuel gas
	NSPS, Subpart Dc – Standards of Performance for Small Industrial-Commercial-institutional Steam Generating Units	Does not apply	40 CFR 60.40c(a)	The boilers have a capacity greater than 100 MM BTU/hr
	NSPS, Subpart D – Standards of Performance for Fossil-Fuel-Fired Steam Generator	Does not apply	40 CFR 60.40b(j)	The boilers are subject to NSPS, Subpart Db

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UTILITIES PLANT
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XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
EQT023 CT-1, Closed Cooling Tower	Emission Standard for Particulate Matter, Emission Limits – Including FCCU	Does not apply	LAC 33:III.1311.F	Presence of uncombined water
	NESHAP, Subpart Q – Cooling Towers	Does not apply	40 CFR 63.400(a)	Water treatment chemicals do not contain chromium or chromium compounds
FUG002 FE-U, Fugitives	Control of Emission of Organic Compounds – Oil/Water Separation	Does not apply	LAC 33:III2109	Does not receive effluent water from any equipment processing, refining, treating, storing, or handling VOC
	NSPS, Subpart QQQ – Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems	-	40 CFR 60.690	Currently under review. Permittee shall update or modify the permit based on the determination made under the settlement.
	NESHAP, Subpart J – National Emission Standard for Equipment Leaks of Benzene	Does not apply	40 CFR 61.110(c)(3)	Process unit do not have streams that contain greater than or equal to 10% by weight of benzene)
	NESHAP, Subpart V – National Emission Standard for Equipment Leaks of VHAP	Does not Apply	40 CFR 61.240(a) and 40 CFR 61.241	Process unit is not in VHAP service (streams that contain greater than or equal to 10% by weight of benzene)
	NESHAP, Subpart EEEE – Organic Liquids Distribution (Non-Gasoline)	Does not apply	40 CFR 63.2338	Not an organic liquids distribution (OLD) operation affected source
	NEHAP, Subpart FFFF – Miscellaneous Organic Chemical Manufacturing	Does not apply	40 CFR 63.2435(b)	Not associated with MCPU and/or is part of an affected source of NESHAP, 40 CFR 63
EQT024, EQT265, and EQT266 ICE-U1, ICE-U2, and ICE-U3; IC Engines	Comprehensive Toxic Air Pollutant Emission Control Program	Exempt	LAC 33:III.5105.B.3.a	Burns diesel which is considered as a virgin fossil fuel

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CHALMETTE, ST. BERNARD PARISH, LOUISIANA

XI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Status	Citation	Explanation
EQT024, EQT265, and EQT266 ICE-U1, ICE-U2, and ICE-U3; IC Engines (Continued)	NSPS, Subpart J – Standards of Performance for Petroleum Refineries	Does not apply	40 CFR 60.101	Combust diesel as fuel
	NESHAP, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines	Does not apply	40 CFR 63.6590(a)	Engine less than 500 hp
EQT025, EQT026, and EQT027 TK-1204, TK-1205, and 804 Sulfuric Acid Tanks	Control of Organic Compounds – Storage of VOC	Does not apply	LAC 33:III.2103	Do not store VOCs
	NSPS, Subpart K NSPS, Subpart Ka NSPS, Subpart Kb	Does not apply	40 CFR 60.110 40 CFR 60.110a 40 CFR 60.110b	Tanks do not store petroleum liquids or VOC
	NESHAP, Subpart CC – Petroleum Refineries, Storage Vessels	Does not apply	40 CFR 63.641	Vessel capacity less than 10,567 gal
	NESHAP, Subpart EEEE – Organic Liquids Distribution (Non-Gasoline)	Does not apply	40 CFR 63.2330	Tanks do not store VOC
	NEHAP, Subpart FFFF – Miscellaneous Organic Chemical Manufacturing	Does not apply	40 CFR 63.2435(b)	Not associated with MCPU and/or is part of an affected source of NESHAP, 40 CFR 63

The above table provides explanation for both the exemption status or non-applicability of a source cited by 2 or 3 in the matrix presented in Section X of this permit

CRLLC-CHAL-000184

General Information

AI ID: 1376 Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Also Known As:

ID	Name	User Group	Start Date
2500-00005	Chalmette Refining LLC - Chalmette Refinery	CDS Number	05-27-1993
13-5401570	Mobil Oil Corp	Federal Tax ID	08-07-2002
LAD008179707	Chalmette Refining LLC	Hazardous Waste Notification	10-22-2002
PMT/CA	GPRA Baselines	Hazardous Waste Permitting	10-01-1997
00597	Chalmette Refining	Inactive & Abandoned Sites	11-23-1999
LA0004260	WPC File Number	LPDES Permit #	05-22-2003
WP0569	WPC State Permit Number	LWDPS Permit #	06-25-2003
WP3391	WPC State Permit Number	LWDPS Permit #	06-25-2003
01-269	Motor Fuel Delivery Certificate #	Motor Fuel Delivery Certificate	08-07-2002
	Priority 1 Emergency Site	Priority 1 Emergency Site	07-18-2006
LA-2247-L01	Radioactive Material License	Radiation License Number	01-19-1999
6264	X-Ray Registration Number	Radiation X-ray Registration Number	11-21-1999
GD-087-1774	Mobil Oil Corp	Solid Waste	01-08-2002
GD-087-1774	Site ID #	Solid Waste Facility No.	11-21-1999
19637	Exxon Co USA - Chalmette Terminal	TEMPO Merge	04-24-2001
36173	Mobil Oil Corp	TEMPO Merge	04-26-2001
38796	ExxonMobil Oil Corp - Chalmette Refining LLC	TEMPO Merge	12-16-2003
44916	Mobil Oil Corp - Chalmette Refinery	TEMPO Merge	05-22-2001
45047	Chalmette Refining LLC - A Delaware Ltd Liability Co	TEMPO Merge	03-28-2001
47202	Mobil Oil Corp - Chalmette Refinery	TEMPO Merge	10-02-2001
70143TNNCL500WE	TRI#	Toxic Release Inventory	07-09-2004
44015380	UST Facility ID (from UST legacy data)	UST FID #	10-12-2002

Physical Location: 500 W St Bernard Hwy
Chalmette, LA 70043

Main FAX: 5042811365
Main Phone: 5042811212

Mailing Address: PO Box 1007
Chalmette, LA 700441007

Location of Front Gate: 29° 56' 16" 45 hundredths latitude, 89° 58' 11" 65 hundredths longitude, Coordinate Method: GPS Code (Psuedo Range) Differential, Coordinate Datum: NAD83

Related People:

Name	Mailing Address	Phone (Type)	Relationship
Robert Cooper		5042320276 (WP)	Katrina Response Contact for
J M Dor	PO Box 4541 Houston, TX 772104541		Motor Fuel Delivery Certificate Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Radiation Safety Officer for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Radiation Safety Officer for

TPOR0148

APPENDIX D
7.5.14

CRLLC-CHAL-000185

General Information

AI ID: 1376 Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Related People:

Name	Mailing Address	Phone (Type)	Relationship
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Air Permit Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Air Permit Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Radiation Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Radiation Contact For
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Emission Inventory Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Emission Inventory Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Accident Prevention Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Accident Prevention Contact for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Solid Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Solid Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Haz. Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Haz. Waste Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Water Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Water Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	CHARLIE.KOMINAS	Accident Prevention Billing Party for
Charles Kominas	PO Box 1007 Chalmette, LA 700441007	5042811811 (WP)	Accident Prevention Billing Party for

Related Organizations:

Name	Address	Phone (Type)	Relationship
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Emission Inventory Billing Party
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Air Billing Party for
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Radiation License Billing Party for
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Owns
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 700441007		Radiation Registration Billing Party for
ExxonMobil Oil Corp	PO Box 1007 Chalmette, LA 700441007		UST Billing Party for
ExxonMobil Oil Corp	PO Box 1007 Chalmette, LA 700441007		Operates

Note: This report entitled "General Information" contains a summary of facility-level information contained in LDEQ's TEMPO database for this facility and is not considered a part of the permit. Please review the information contained in this document for accuracy and completeness. If any changes are required or if you have questions regarding this document, you may contact Mr. David Ferrand, Environmental Assistance Division, at (225) 219-3247 or email your changes to facupdate@la.gov.

APPENDIX D
7.5.15

1POR0148

CRLLC-CHAL-000186

INVENTORIES

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Subject Item Inventory:

ID	Description	Tank Volume	Max. Operating Rate	Normal Operating Rate	Contents	Operating Time
UTILITIES COMPLEX						
EQT0019	27 - Boiler No. 402		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0020	35 - Boiler No. 7		160 MM BTU/hr	75 MM BTU/hr		8760 hr/yr (All Year)
EQT0021	66 - Boiler No. 9		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0022	70 - Boiler No. 10		380 MM BTU/hr		CAP, Ultra Low NOx Burners	8760 hr/yr (All Year)
EQT0023	CT-1 - Closed Cooling Water Tower		16000 gallons/min	16000 gallons/min		8760 hr/yr (All Year)
EQT0024	ICE-U1 - Internal Combustion Engine (Utilities Complex)		475 brake hp	475 brake hp		8760 hr/yr (All Year)
EQT0025	TK-1204 - Sulfuric Acid Tank	6000 gallons				8760 hr/yr (All Year)
EQT0026	TK-1205 - Sulfuric Acid Tank	264 gallons				8760 hr/yr (All Year)
EQT0027	TK-804 - Sulfuric acid Tank	12719 gallons				8760 hr/yr (All Year)
EQT0265	ICE-U2 - Internal Combustion Engine (Second Compressor)		475 brake hp	475 brake hp		8760 hr/yr (All Year)
EQT0266	ICE-U3 - Internal Combustion Engine (Third Compressor)		475 brake hp	475 brake hp		6888 hr/yr (All Year)
FUG0002	FE-U - Fugitive Emissions					8760 hr/yr (All Year)

Stack Information:

ID	Description	Velocity (ft/sec)	Flow Rate (cubic ft/min-actual)	Diameter (feet)	Discharge Area (square feet)	Height (feet)	Temperature (oF)
UTILITIES COMPLEX							
EQT0019	27 - Boiler No. 402	35.8	136650	9		135	420
EQT0020	35 - Boiler No. 7	44.9	52900	5		64	360
EQT0021	66 - Boiler No. 9	57.1	131850	7		62	440
EQT0022	70 - Boiler No. 10	55.1	123620	7		62	410

Relationships:

Subject Item Groups:

ID	Group Type	Group Description
GRP0022	Equipment Group	BC - Boiler CAP
UNF0001	Unit or Facility Wide	UC - UTILITIES COMPLEX

Group Membership:

ID	Description	Member of Groups
EQT0019	27 - Boiler No. 402	GRP0000000022
EQT0021	66 - Boiler No. 9	GRP0000000022
EQT0022	70 - Boiler No. 10	GRP0000000022

NOTE: The UNF group relationship is not printed in this table. Every subject item is a member of the UNF group

Annual Maintenance Fee:

TPOR0149

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CRLLC-CHAL-000187

INVENTORIES

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Fee Number	Air Contaminant Source	Multiplier	Units Of Measure
0720	Petroleum Refining (Rated Capacity)	1	1,000 BBL/Day

SIC Codes:

2911	Petroleum refining	AI1376

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TPOR0149

CRLLC-CHAL-000188

EMISSION RATES FOR CRITERIA POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Subject Item	CO			NOx			PM10			SO2			VOC		
	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year
UTILITIES COMPLEX															
EQT 0019 27		76.00			125.40			3.06			13.30			2.19	
EQT 0020 35	11.25	48.00	49.28	31.43	93.28	137.64	0.53	1.29	2.30	1.50	5.60	6.57	0.38	0.92	1.64
EQT 0021 66		133.00			144.40			3.06			13.30			2.19	
EQT 0022 70		133.00			144.40			3.06			13.30			2.19	
EQT 0023 CT-1							0.88		3.85				17.91		78.44
EQT 0024 ICE-U1	1.76	2.71	7.71	4.78	7.35	20.92	0.08	0.13	0.37	0.67	1.03	2.94	0.34	0.52	1.49
EQT 0265 ICE-U2	1.76	2.71	7.71	4.78	7.35	20.92	0.08	0.13	0.37	0.67	1.03	2.94	0.34	0.52	1.49
EQT 0266 ICE-U3	1.76	2.71	6.06	4.78	7.35	16.45	0.08	0.13	0.29	0.67	1.03	2.31	0.34	0.52	1.17
FUG 0002 FE-U													2.89		12.65
GRP 0022 BC	86.25		377.78	32.82		143.75	4.10		17.94	11.70		51.25	2.93		12.81

Note: Emission rates in bold are from alternate scenarios and are not included in permitted totals unless otherwise noted in a footnote.

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TPOR0145

CRLLC-CHAL-000189

EMISSION RATES FOR TAP/HAP & OTHER POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Emission Pt.	Pollutant	Avg lb/hr	Tons/Year
EQT 0023 C1-1	Benzene	0.69	3.00
	Chloroform	0.38	1.65
	Dichloromethane	0.12	0.53
	Ethyl benzene	0.48	2.09
	Methyl ethyl keto	0.56	2.47
	Toluene	0.91	4.00
	Xylene (mixed iso	1.92	8.40
EQT 0025 TK-1204	Sulfuric acid		< 0.001
EQT 0026 TK-1205	Sulfuric acid		< 0.001
EQT 0027 TK-804	Sulfuric acid		< 0.001
FUG 0002 FE-U	1,3-Butadiene	0.002	0.01
	2,2,4-Trimethylpe	0.001	0.003
	Ammonia	0.23	1.02
	Benzene	0.03	0.14
	Biphenyl	0.01	0.03
	Carbon disulfide	< 0.001	< 0.001
	Cresol	0.01	0.06
	Cumene	0.003	0.01
	Ethyl benzene	0.01	0.06
	Hydrogen sulfide	0.001	0.004
	Methanol	0.18	0.77
	Methyl ethyl keto	0.02	0.07
	Methyl isobutyl k	< 0.001	0.001
	Naphthalene	0.05	0.21
	Phenol	0.02	0.10
	Tetrachloroethyle	< 0.001	< 0.001
	Toluene	0.13	0.56
	Trichloroethylene	< 0.001	< 0.001
	Xylene (mixed iso	0.13	0.59
	n-Hexane	0.12	0.54
UNF 0001 UC	1,3-Butadiene		0.01
	2,2,4-Trimethylpe		0.003
	Ammonia		1.02
	Benzene		3.14

TPOR0146

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CRLLC-CHAL-000190

EMISSION RATES FOR TAP/HAP & OTHER POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

Emission Pt.	Pollutant	Avg lb/hr	Tons/Year
UNF 0001 UC	Biphenyl		0.03
	Carbon disulfide		< 0.001
	Chloroform		1.65
	Cresol		0.06
	Cumene		0.01
	Ethyl benzene		2.15
	Hydrogen sulfide		0.004
	Methanol		0.77
	Methyl ethyl keto		2.54
	Methyl isobutyl k		0.001
	Phenol		0.10
	Sulfuric acid		< 0.003
	Tetrachloroethyle		< 0.001
	Toluene		4.56
	Trichloroethylene		< 0.001
	Xylene (mixed iso		8.99
	n-Hexane		0.54

Note: Emission rates in bold are from alternate scenarios and are not included in permitted totals unless otherwise noted in a footnote.

TPORD146

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7.5.20

CRLLC-CHAL-000191

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

EQT0019 27, Boiler No. 402

1	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
2	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span of the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
3	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
4	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
5	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
6	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
7	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS. Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
8	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
9	[LAC 33:III.501.C.6]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
10	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
11	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0020 35, Boiler No. 7

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TPOH0147

CRLLC-CHAL-000192

EQT0020 35, Boiler No. 7

12	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
13	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span on the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
14	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
15	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
16	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
17	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
18	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS. Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
19	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
20	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
21	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0021 66, Boiler No. 9

22	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: None specified

EQT0021 66, Boiler No. 9

23	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span on the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
24	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
25	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
26	[40 CFR 60.44b]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
27	[40 CFR 60.48b(b)(1)]	Nitrogen oxides monitored by CMS continuously. Calculate nitrogen oxides emission rates as specified in 40 CFR 60.48b(d). Subpart Db. [40 CFR 60.48b(b)(1)] Which Months: All Year Statistical Basis: One-hour average
28	[40 CFR 60.48b(b)(1)]	Nitrogen oxides recordkeeping by CMS continuously. Subpart Db. [40 CFR 60.48b(b)(1)]
29	[40 CFR 60.48b(c)]	Operate NOx continuous monitoring systems and record data during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Record data during calibration checks, and zero and span adjustments. Subpart Db. [40 CFR 60.48b(c)]
30	[40 CFR 60.48b(e)]	Follow the procedures under 40 CFR 60.13 and 40 CFR 60.48b(e)(1) through (e)(3) for installation, evaluation, and operation of the NOx continuous monitoring systems. Subpart Db. [40 CFR 60.48b(e)]
31	[40 CFR 60.48b(f)]	When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, obtain emission data by using standby monitoring systems, 40 CFR 60, Appendix A, Method 7, Method 7a, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days. Subpart Db. [40 CFR 60.48b(f)]
32	[40 CFR 60.49b(d)]	Fuel rate recordkeeping by electronic or hard copy daily. Record the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for refinery fuel gas and natural gas for the reporting period. Determine the annual capacity factor on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. Subpart Db. [40 CFR 60.49b(d)]
33	[40 CFR 60.49b(g)]	Equipment/operational data recordkeeping by electronic or hard copy continuously. Maintain records of the information listed in 40 CFR 60.49b(g)(1) through (g)(10) for each steam generating unit operating day, except as provided under 40 CFR 60.49b(p). Subpart Db. [40 CFR 60.49b(g)]
34	[40 CFR 60.49b(h)]	Submit excess emissions report: Due by the 30th day following the end of each six-month period. Report any excess emissions which occurred during the reporting period. Subpart Db. [40 CFR 60.49b(h)]
35	[40 CFR 60.49b(o)]	Maintain all records required under 40 CFR 60.49b for a period of 2 years following the date of such record. Subpart Db. [40 CFR 60.49b(o)]
36	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
37	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0021 66, Boiler No. 9

38	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
39	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
40	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
41	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0022 70, Boiler No. 10

42	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.1 gr/dscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
43	[40 CFR 60.105(a)(4)]	Hydrogen sulfide monitored by continuous emission monitor (CEM) continuously The span of the analyzer shall be 400 ppm. Monitor the H2S in fuel gases before being burned in any fuel gas combustion device. Subpart J. [40 CFR 60.105(a)(4)] Which Months: All Year Statistical Basis: None specified
44	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
45	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
46	[40 CFR 60.44b]	Nitrogen oxides <= 0.056 lb/MMBTU heat input (expressed as NO2). The nitrogen oxide standards apply at all times, including periods of startup, shutdown, or malfunction. Subpart Db. Which Months: All Year Statistical Basis: Annual average
47	[40 CFR 60.48b(b)(1)]	Nitrogen oxides monitored by CMS continuously. Calculate nitrogen oxides emission rates as specified in 40 CFR 60.48b(d). Subpart Db. [40 CFR 60.48b(b)(1)] Which Months: All Year Statistical Basis: One-hour average
48	[40 CFR 60.48b(b)(1)]	Nitrogen oxides recordkeeping by CMS continuously. Subpart Db. [40 CFR 60.48b(b)(1)]
49	[40 CFR 60.48b(c)]	Operate NOx continuous monitoring systems and record data during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Record data during calibration checks, and zero and span adjustments. Subpart Db. [40 CFR 60.48b(c)]

EQT0022 70, Boiler No. 10

50	[40 CFR 60.48b(c)]	Follow the procedures under 40 CFR 60.13 and 40 CFR 60.48b(e)(1) through (e)(3) for installation, evaluation, and operation of the NOx. Subpart Db. [40 CFR 60.48b(e)]
51	[40 CFR 60.48b(f)]	When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, obtain emission data by using standby monitoring systems, 40 CFR 60, Appendix A, Method 7, Method 7a, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days. Subpart Db. [40 CFR 60.48b(f)]
52	[40 CFR 60.49b(d)]	Fuel rate recordkeeping by electronic or hard copy daily. Record the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for refinery fuel gas and natural gas for the reporting period. Determine the annual capacity factor on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. Subpart Db. [40 CFR 60.49b(d)]
53	[40 CFR 60.49b(g)]	Equipment/operational data recordkeeping by electronic or hard copy continuously. Maintain records of the information listed in 40 CFR 60.49b(g)(1) through (g)(10) for each steam generating unit operating day, except as provided under 40 CFR 60.49b(p). Subpart Db. [40 CFR 60.49b(g)]
54	[40 CFR 60.49b(h)]	Submit excess emissions report: Due by the 30th day following the end of each six-month period. Report any excess emissions which occurred during the reporting period. Subpart Db. [40 CFR 60.49b(h)]
55	[40 CFR 60.49b(o)]	Maintain all records required under 40 CFR 60.49b for a period of 2 years following the date of such record. Subpart Db. [40 CFR 60.49b(o)]
56	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
57	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified
58	[LAC 33:III.1503.C]	Compliance with all the applicable requirements of NSPS, Subpart J, 40 CFR 60.104 is considered compliance with all the applicable requirements of LAC 33:III.Chapter 15.
59	[LAC 33:III.501.C.6]	Conduct a performance/emissions test: Due within 180 days after the issuance of the Part 70 permit. The stack test's purpose is to demonstrate compliance with the emission limits of this permit. Test methods and procedures shall be in accordance with New Source Performance Standards, 40 CFR 60, Appendix A, Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources; Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources; Method 25A - Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer; Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure); and Method 5 - Determination of Particulate Matter Emissions from Stationary Sources. Use alternate stack test methods only with the prior approval of the Office of Environmental Assessment, Air Quality Assessment Division. As required by LAC 33:III.913, provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
60	[LAC 33:III.501.C.6]	Submit notification: Due at least 30 days prior to performance/emissions test to the Office of Environmental Assessment, Air Quality Assessment Division, to provide the opportunity to conduct a pretest meeting and observe the emission testing.
61	[LAC 33:III.501.C.6]	Submit report: Due within 60 days after performance/emissions test. Submit emissions test results to the Office of Environmental Assessment, Air Quality Assessment Division.

EQT0023 CT-1, Closed Cooling Water Tower

62	[40 CFR 63.104(b)]	Heat exchange systems (cooling water): HAP monitored by the regulation's specified method(s) monthly for the first 6 months and quarterly thereafter to detect leaks. Monitor for total hazardous air pollutants, total volatile organic compounds, total organic carbon, one or more speciated HAP compounds, or other representative substances that would indicate the presence of a leak in the heat exchange system. Subpart F. [40 CFR 63.104(b)] Which Months: All Year Statistical Basis: None specified
63	[40 CFR 63.104(f)]	Heat exchange systems: Equipment/operational data recordkeeping by electronic or hard copy continuously. Retain the records identified in 40 CFR 63.104(f)(1)(i) through (iv) as specified in 40 CFR 63.103(c)(1). Subpart F. [40 CFR 63.104(f)]
64	[40 CFR 63.105(d)]	Maintenance wastewater: Incorporate the procedures described in 40 CFR 63.105(b) and (c) as part of the start-up, shutdown and malfunction plan required under 40 CFR 63.6(e)(3). Subpart F. [40 CFR 63.105(d)]
65	[40 CFR 63.105(e)]	Maintenance wastewater: Equipment/operational data recordkeeping by electronic or hard copy at the approved frequency. Maintain a record of the information required by 40 CFR 63.105(b) and (c) as part of the start-up, shut-down, and malfunction plan required under 40 CFR 63.6(e)(3). Subpart F. [40 CFR 63.105(e)]
66	[40 CFR 63.105]	Maintenance wastewater: Prepare a description of maintenance procedures for the management of wastewaters generated from the emptying and purging of equipment in the process during temporary shutdowns for inspections, maintenance, and repair and during periods which are not shutdowns as specified in 40 CFR 63.105(b)(1) through (b)(3). Modify and update the information required by 40 CFR 63.105(b) as needed following each maintenance procedure based on the actions taken and the wastewaters generated in the preceding maintenance procedure. Subpart F.
67	[LAC 33:III.5109.A]	Compliance with all the applicable requirements of NESHAP, 40 CFR 63, Subpart F is considered compliance with all the requirements of LAC 33:III.Chapter 51.

EQT0024 ICE-U1, Internal Combustion Engine (Utilities Complex)

68	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
69	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0025 TK-1204, Sulfuric Acid Tank

70	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0026 TK-1205, Sulfuric Acid Tank

71	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0027 TK-804, Sulfuric Acid Tank

EQT0027 TK-804, Sulfuric Acid Tank

72	[LAC 33:III.5109.A]	Shall comply with all the applicable requirements of LAC 33:III.Chapter 51. MACT is not required for Class III pollutant.

EQT0265 ICE-U2, Internal Combustion Engine (Second Compressor)

73	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
74	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

EQT0266 ICE-U3, Internal Combustion Engine (Third Compressor)

75	[LAC 33:III.1101.B]	Opacity <= 20 percent, except during the cleaning of a fire box or building of a new fire, soot blowing or lancing, charging of an incinerator, equipment changes, ash removal or rapping of precipitators, which may have an opacity in excess of 20 percent for not more than one six-minute period in any 60 consecutive minutes. Which Months: All Year Statistical Basis: None specified
76	[LAC 33:III.1313.C]	Total suspended particulate <= 0.6 lb/MMBTU of heat input. Which Months: All Year Statistical Basis: None specified

FUG0002 FE-U, Fugitive Emissions (Utilities)

77	[40 CFR 60.592(a)]	Comply with the requirements of 40 CFR 60.482-1 to 482-10 as per approval letter dated March 24, 2005 by LDEQ. Subpart GGG. [40 CFR 60.592(a)]
78	[40 CFR 60.592(d)]	Comply with the provisions of 40 CFR 60.485 except as provided in 40 CFR 60.593. Subpart GGG. [40 CFR 60.592(d)]
79	[40 CFR 60.592(e)]	Comply with the provisions of 40 CFR 60.486 and 60.487. Subpart GGG. [40 CFR 60.592(e)]
80	[40 CFR 63.132(a)(3)]	Permittee shall comply with the requirements of Group 2 Wastewater Stream and also with the recordkeeping and reporting of 40 CFR 63, Subpart G. [40 CFR 63.132(a)(3), 40 CFR 63.146(b)(1), 40 CFR 63.147(b)(8)]
81	[40 CFR 63.642(e)]	Keep copies of all applicable reports and records required by 40 CFR 63 Subpart CC for at least 5 years except as otherwise specified in 40 CFR 63 Subpart CC. Maintain all applicable records in such a manner that they can be readily accessed within 24 hours. Subpart CC. [40 CFR 63.642(e)]
82	[40 CFR 63.642(g)]	Control emissions of organic HAPs to the level represented by the equation in 40 CFR 63.642(g). Subpart CC. [40 CFR 63.642(g)]
83	[40 CFR 63.642(h)]	Control emissions of organic HAPs to the level represented by the equation in 40 CFR 63.642(g). Subpart CC. [40 CFR 63.642(h)]
84	[40 CFR 63.654(g)]	Submit Periodic Report: Due no later than 60 days after the end of each 6-month period when any of the compliance exceptions specified in 40 CFR 63.654(g)(1) through (g)(6) occur. Include the information specified in 40 CFR 63.654(g)(1) through (g)(8). Subpart CC. [40 CFR 63.654(g)]
85	[40 CFR 63.654(h)(1)]	Submit reports of startup, shutdown, and malfunction required by 40 CFR 63.10(d)(5). Subpart CC. [40 CFR 63.654(h)(1)]
86	[40 CFR 63.654(h)(6)]	Submit the information specified in 40 CFR 63.654(h)(6)(i) through (iii), as applicable. Subpart CC. [40 CFR 63.654(h)(6)]

FUG0002 FE-U, Fugitive Emissions (Utilities)

87	[40 CFR 63.654(i)(2)]	Retain a record of all reported performance test results required under 40 CFR 63.654(f) and (g)(7) as well as a complete test report, as described in 40 CFR 63.654(f)(2)(ii) for each emission point tested. Subpart CC. [40 CFR 63.654(i)(2)]
88	[40 CFR 63.654(i)(4)]	Retain all information required to be reported under 40 CFR 63.654(a) through (h) for five years. Subpart CC. [40 CFR 63.654(i)(4)]
89	[LAC 33:III.501.C.6]	VOC, Total: The number of each type of components required to be monitored for each monitoring period under applicable leak detection and repair programs shall be reported to the LDEQ by inclusion with each periodic monitoring report. Fugitive emission piping components may be added to or removed from the permitted units, without triggering the need to apply for a permit modification, provided: A) Changes in components involve routine maintenance or are undertaken to address safety concerns or involve small piping revisions with no associated emissions increases except from the fugitive emission components themselves; B) The changes do not involve any associated increase in the production rate or capacity, or tie in of new or modified process equipment other than the piping components; C) Actual emissions following the changes will not exceed the emission limits contained in this permit; and D) The components are promptly incorporated into any applicable leak detection and repair program.
90	[LAC 33:III.5109.A]	Compliance with all the applicable requirements of NESHAP, 40 CFR 63, Subpart CC is considered compliance with all the applicable requirements of LAC 33:III.Chapter 51.

GRP0022 Boilers CAP

Group Members: EQT0019 EQT0021 EQT0022

91	[LAC 33:III.501.C.6]	Permittee shall continuously monitor the heat input to the boilers, Emission Points, 27, 66, and 70. Based on the monitored heat input and individual emission factors the permittee shall calculate emissions from each boiler. The total heat input to all boilers shall not exceed 585 MM BTU/hr (annual average) and the total calculated emissions from all boilers shall not exceed PM10, 17.94 tons per year (TPY); SO2, 51.25 TPY; NOx, 143.75 TPY; CO, 377.78 TPY; and VOC, 12.81 TPY. Emission from these boilers shall be reported under an emission cap, Emission Point Boiler CAP. The total heat input and the calculated emissions of the individual boiler shall be recorded each month, as well as the total heat input and the total calculated emissions for the last twelve months. These records shall be kept on site and available for inspection by the Office of Environmental Compliance, Surveillance Division. The total average heat input and calculated emissions above the maximum listed in this permit as referenced above for any twelve consecutive month period shall be a violation of this permit and must be reported to the Office of Environmental Compliance, Enforcement Division. A report showing the heat input of the individual boilers and the total calculated emissions for the last twelve months shall be submitted to the Office of Environmental Compliance, Surveillance Division by March 31 for the preceding calendar year.

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92	[40 CFR 60.]	All affected facilities shall comply with all applicable provisions in 40 CFR 60 Subpart A.
93	[40 CFR 61.145(b)(1)]	Provide DEQ with written notice of intention to demolish or renovate prior to performing activities to which 40 CFR 61 Subpart M applies. Delivery of the notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable. [40 CFR 61.145(b)(1)]
94	[40 CFR 61.148]	Do not install or reinstall on a facility component any insulating materials that contain commercial asbestos if the materials are either molded and friable or wet-applied and friable after drying. Subpart M.

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95	[40 CFR 61.342(e)]	Benzene: Permittee shall comply with all the applicable requirements of the alternative requirements to paragraphs 40 CFR 61.342(c) and (d). The permittee shall manage and treat facility waste with a flow weighted annual average water content of less than 10 percent in accordance with 40 CFR 61.342(c)(1). The benzene quantity for the wastes described in 40 CFR 61.342(e)(2) shall be equal to or less than 6.6 tons per year, as determined in 40 CFR 61.355(k). [40 CFR 61.342(e)]
96	[40 CFR 61.356(a)(4)]	Permittee shall comply with all the applicable reporting requirements as stated in 40 CFR 61.356 and all the applicable reporting requirements as stated in 40 CFR 61.357. Subpart FF. [40 CFR 61.356(a)(4), 40 CFR 61.357]
97	[40 CFR 61.]	All affected facilities shall comply with all applicable provisions in 40 CFR 61 Subpart A.
98	[40 CFR 70.6(a)(3)(iii)(A)]	Submit Title V monitoring results report: Due semiannually, by March 31st and September 30th for the preceding periods encompassing July through December and January through June, respectively. Submit reports to the Office of Environmental Compliance, Surveillance Division. Certify reports by a responsible company official. Clearly identify all instances of deviations from permitted monitoring requirements. For previously reported deviations, in lieu of attaching the individual deviation reports, clearly reference the communication(s)/correspondence(s) constituting the prior report, including the date the prior report was submitted. [40 CFR 70.6(a)(3)(iii)(A)]
99	[40 CFR 70.6(a)(3)(iii)(B)]	Submit Title V excess emissions report: Due quarterly, by June 30, September 30, December 31, March 31. Submit reports of all permit deviations to the Office of Environmental Compliance, Surveillance Division. Certify all reports by a responsible official in accordance with 40 CFR 70.5(d). The reports submitted on March 31 and September 30 may be consolidated with the semi-annual reports required by 40 CFR 70.6(a)(3)(iii)(A) as long as the report clearly indicates this and all required information is included and clearly delineated in the consolidated report. [40 CFR 70.6(a)(3)(iii)(B)]
100	[40 CFR 70.6(c)(5)(iv)]	Submit Title V compliance certification: Due annually, by the 31st of March. Submit to the Office of Environmental Compliance, Surveillance Division. [40 CFR 70.6(c)(5)(iv)]
101	[40 CFR 82.Subpart F]	Comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B.
102	[LAC 33:III.1103]	Emissions of smoke which pass onto or across a public road and create a traffic hazard by impairment of visibility as defined in LAC 33:III.111 or intensify an existing traffic hazard condition are prohibited.
103	[LAC 33:III.1109.B]	Outdoor burning of waste material or other combustible material is prohibited.
104	[LAC 33:III.1303.B]	Emissions of particulate matter which pass onto or across a public road and create a traffic hazard by impairment of visibility or intensify an existing traffic hazard condition are prohibited.
105	[LAC 33:III.1305]	Prevent particulate matter from becoming airborne by taking all reasonable precautions. These precautions shall include, but not be limited to, those specified in LAC 33:III.1305.A.1-7.
106	[LAC 33:III.1513.C]	Equipment/operational data recordkeeping by electronic or hard copy once initially and annually. Record and retain at the site sufficient data to show annual potential sulfur dioxide emissions.
107	[LAC 33:III.2113.A]	Maintain best practical housekeeping and maintenance practices at the highest possible standards to reduce the quantity of organic compounds emissions. Good housekeeping shall include, but not be limited to, the practices listed in LAC 33:III.2113.A.1-5.
108	[LAC 33:III.2141]	VOC, Total: Permittee shall control VOC emissions from petroleum refinery process unit turnarounds by pumping the liquid contents to storage and depressurizing the process units to 5 psig or below before venting to the atmosphere. [LAC 33:III.2141, LAC 33:III.2115.A, B, F, LAC 33:III.2115.I, J, K]

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109	[LAC 33:III.219]	Failure to pay the prescribed application fee or annual fee as provided herein, within 90 days after the due date, will constitute a violation of these regulations and shall subject the person to applicable enforcement actions under the Louisiana Environmental Quality Act including, but not limited to, revocation or suspension of the applicable permit, license, registration, or variance.
110	[LAC 33:III.2901.D]	Discharges of odorous substances at or beyond property lines which cause a perceived odor intensity of six or greater on the specified eight point butanol scale as determined by Method 41 of LAC 33:III.2901.G are prohibited.
111	[LAC 33:III.2901.F]	If requested to monitor for odor intensity, take and transport samples in a manner which minimizes alteration of the samples either by contamination or loss of material. Evaluate all samples as soon after collection as possible in accordance with the procedures set forth in LAC 33:III.2901.G.
112	[LAC 33:III.501.C.6]	Methylene Chloride <= 0.53 tons/yr. Which Months: All Year Statistical Basis: Annual maximum
113	[LAC 33:III.5105.A.1]	Do not construct or modify any stationary source subject to any standard set forth in LAC 33:III.Chapter 51.Subchapter A without first obtaining written authorization from DEQ in accordance with LAC 33:III.Chapter 51.Subchapter A, after the effective date of the standard.
114	[LAC 33:III.5105.A.2]	Do not cause a violation of any ambient air standard listed in LAC 33:III.Table 51.2, unless operating in accordance with LAC 33:III.5109.
115	[LAC 33:III.5105.A.3]	Do not build, erect, install, or use any article, machine, equipment, process, or method, the use of which conceals an emission that would otherwise constitute a violation of an applicable standard.
116	[LAC 33:III.5105.A.4]	Do not fail to keep records, notify, report or revise reports as required under LAC 33:III.Chapter 51.Subchapter A.
117	[LAC 33:III.5107.A.2]	Submit Annual Emissions Report (TEDI): Due annually, by the 1st of July, to the Office of Environmental Assessment, Environmental Evaluation Division in a form specified by the department. Identify the quantity of emissions in the previous calendar year for any toxic air pollutant listed in Table 51.1 or Table 51.3.
118	[LAC 33:III.5107.A.3]	Include a certification statement with initial and subsequent annual emission reports and revisions to any emission report to attest that the information contained in the emission report is true, accurate, and complete, and signed by a responsible official, as defined in LAC 33:III.502. Include the full name of the responsible official, title, signature, date of signature and phone number of the responsible official. The certification statement shall read: "I certify, under penalty of perjury, that the emissions data provided is accurate to the best of my knowledge, information, and belief, and I understand that submitting false or misleading information will expose me to prosecution under state regulations"
119	[LAC 33:III.5107.B.1]	Submit notification: Due to the Department of Public Safety 24-hour Louisiana Emergency Hazardous Materials Hotline at (225) 925-6595 immediately, but no later than 1 hour, after any discharge of a toxic air pollutant into the atmosphere which results or threatens to result in an emergency condition (a condition which could reasonably be expected to endanger the health and safety of the public, cause significant adverse impact to the land, water or air environment, or cause severe damage to property).
120	[LAC 33:III.5107.B.2]	Submit notification: Due to the Office of Environmental Compliance, except as provided in LAC 33:III.5107.B.6, no later than 24 hours after the beginning of any unauthorized discharge into the atmosphere of a toxic air pollutant as a result of bypassing an emission control device, when the emission control bypass was not the result of an upset, and the quantity of the unauthorized bypass is greater than or equal to the lower of the Minimum Emission Rate (MER) in LAC 33:III.Chapter 51.Table 51.1 or a reportable quantity (RQ) in LAC 33:I.3931, or the quantity of the unauthorized bypass is greater than one pound and there is no MER or RQ for the substance in question. Submit notification in the manner provided in LAC 33:I.3923.

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121	[LAC 33:III.5107.B.3]	Submit notification: Due to the Office of Environmental Compliance immediately, but in no case later than 24 hours after any unauthorized discharge of a toxic air pollutant into the atmosphere that does not cause an emergency condition, the rate or quantity of which is in excess of that allowed by permit, compliance schedule, or variance, or for upset events that exceed the reportable quantity in LAC 33:I.3931, except as provided in LAC 33:III.5107.B.6. Submit notification in the manner provided in LAC 33:I.3923.
122	[LAC 33:III.5107.B.4]	Submit written report: Due within seven calendar days of learning of any such discharge or equipment bypass as referred to in LAC 33:III.5107.B.1 through 3. Submit report to the Office of Environmental Compliance by certified mail. Include the information specified in LAC 33:III.5107.B.4.a.i through viii.
123	[LAC 33:III.5107.B.5]	Report all discharges to the atmosphere of a toxic air pollutant from a safety relief device, a line or vessel rupture, a sudden equipment failure, or a bypass of an emission control device, regardless of quantity, in the annual emissions report and where otherwise specified. Include the identity of the source, the date and time of the discharge, and the approximate total loss during the discharge.
124	[LAC 33:III.5109.B.1]	Submit to DEQ a compliance plan for achieving compliance with the ambient air standard(s), in accordance with LAC 33:III.5109.D. Include the elements listed under LAC 33:III.5109.E.
125	[LAC 33:III.5109.B.2]	Submit to DEQ a certification of compliance with all ambient air standards, in accordance with LAC 33:III.5109.D. Include the elements listed under LAC 33:III.5109.E.
126	[LAC 33:III.5109.B.3]	Achieve compliance with ambient air standards unless it can be demonstrated to the satisfaction of DEQ that compliance with an ambient air standard would be economically infeasible; that emissions could not reasonably be expected to pose a threat to public health or the environment; and that emissions would be controlled to a level that is Maximum Achievable Control Technology.
127	[LAC 33:III.5109.B]	Determine the status of compliance, beyond the property line, with applicable ambient air standards listed in LAC 33:III.5112.Table 51.2.
128	[LAC 33:III.5109.C]	Develop a standard operating procedure (SOP) within 120 days after achieving or demonstrating compliance with the standards specified in LAC 33:III.Chapter 51. Detail in the SOP all operating procedures or parameters established to ensure that compliance with the applicable standards is maintained and address operating procedures for any monitoring system in place, specifying procedures to ensure compliance with LAC 33:III.5113.C.5. Make a written copy of the SOP available on site or at an alternate approved location for inspection by DEQ. Provide a copy of the SOP within 30 days upon request by the department.
129	[LAC 33:III.5111.A.1]	Obtain a Louisiana Air Permit in accordance with LAC 33:III.5111.B and C and in accordance with LAC 33:I.1701, before commencement of the construction of any new source.
130	[LAC 33:III.5111.A.2.a]	Obtain a permit modification in accordance with LAC 33:III.5111.B and C before commencement of any modification not specified in a compliance plan submitted under LAC 33:III.5109.D, if the modification will result in an increase in emissions of any toxic air pollutant or will create a new point source.
131	[LAC 33:III.5111.A.3]	Obtain written authorization from DEQ before commencement of any modification specified in a compliance plan submitted pursuant to LAC 33:III.5109.
132	[LAC 33:III.5111.A.4]	Apply for a permit in accordance with LAC 33:III.5111.B, for any existing major source which is operating without a Louisiana Air Permit, or which is not fully permitted, or for any minor source that was once a major source.
133	[LAC 33:III.5111.A]	Do not commence construction or modification of any major source without first obtaining written authorization from DEQ, as specified.
134	[LAC 33:III.5113.A.1]	Submit notification in writing: Due to the Office of Environmental Compliance, Surveillance Division not more than 60 days nor less than 30 days prior to initial start-up. Submit the anticipated date of the initial start-up.

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135	[LAC 33:III.5113.A.2]	Submit notification in writing: Due to the Office of Environmental Compliance, Surveillance Division within 10 working days after the actual date of initial start-up of the source. Submit the actual date of initial start-up of the source.
136	[LAC 33:III.5113.B.1]	Ensure that all testing done to determine the emission of toxic air pollutants, upon request by the department, is conducted by qualified personnel.
137	[LAC 33:III.5113.B.3]	Provide necessary sampling and testing facilities, exclusive of instruments and sensing devices, as needed to properly determine the emission of toxic air pollutants, upon request of the department.
138	[LAC 33:III.5113.B.4]	Provide emission testing facilities as specified in LAC 33:III.5113.B.4.a through e.
139	[LAC 33:III.5113.B.5]	Analyze samples and determine emissions within 30 days after each emission test has been completed.
140	[LAC 33:III.5113.B.6]	Equipment/operational data recordkeeping by electronic or hard copy upon each occurrence of emissions testing. Retain records of emission test results and other data needed to determine emissions. Retained records at the source, or at an alternate location approved by DEQ for a minimum of two years, and make available upon request for inspection by DEQ.
141	[LAC 33:III.5113.B.7]	Submit notification: Due to the Office of Environmental Assessment, Environmental Technology Division at least 30 days before the emission test. Submit notification of emission test to allow DEQ the opportunity to have an observer present during the test.
142	[LAC 33:III.5113.C.1]	Maintain and operate each monitoring system in a manner consistent with good air pollution control practices for minimizing emissions. Repair or adjust any breakdown or malfunction of the monitoring system as soon as practicable after its occurrence.
143	[LAC 33:III.5113.C.2]	Conduct performance evaluation of the monitoring system when required at any other time requested by DEQ.
144	[LAC 33:III.5113.C.2]	Submit notification in writing: Due to the Office of Environmental Assessment, Environmental Technology Division at least 30 days before a performance evaluation of the monitoring system is to begin.
145	[LAC 33:III.5113.C.2]	Submit performance evaluation report: Due to the Office of Environmental Assessment, Environmental Technology Division within 60 days of the monitoring system performance evaluation.
146	[LAC 33:III.5113.C.3]	Install a monitoring system on each effluent or on the combined effluent, when monitoring is required and the effluents from a single source, or from two or more sources subject to the same emission standards, are combined before being released to the atmosphere. If two or more sources are not subject to the same emission standards, install a separate monitoring system on each effluent, unless otherwise specified. If the applicable standard is a mass emission standard and the effluent from one source is released to the atmosphere through more than one point, install a monitoring system at each emission point unless DEQ approves the installation of fewer systems.
147	[LAC 33:III.5113.C.5.a]	Evaluate the performance of continuous monitoring systems, upon request by DEQ, in accordance with the requirements and procedures contained in the applicable performance specification of 40 CFR Part 60, appendix B.
148	[LAC 33:III.5113.C.5.a]	Submit report: Due to DEQ within 60 days of the performance evaluation of the CMS, if requested. Furnish DEQ with two or more copies of a written report of the test results within 60 days.
149	[LAC 33:III.5113.C.5.d]	Install all continuous monitoring systems or monitoring devices to make representative measurements under variable process or operating parameters, if required to install a CMS.
150	[LAC 33:III.5113.C.5.e]	Collect and reduce all data as specified in LAC 33:III.5113.C.5.e.i and ii, if required to install a CMS.
151	[LAC 33:III.5113.C.5]	Submit plan: Due to the Office of Environmental Assessment, Environmental Technology Division within 90 days after DEQ requests either the initial plan or an updated plan, if required by DEQ to install a continuous monitoring system. Submit for approval a plan describing the affected sources and the methods for ensuring compliance with the continuous monitoring system.

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152	[LAC 33:III.5113.C.7]	Maintain records of monitoring data, monitoring system calibration checks, and the occurrence and duration of any period during which the monitoring system is malfunctioning or inoperative. Maintain these records at the source, or at an alternative location approved by DEQ, for a minimum of three years and make available, upon request, for inspection by DEQ.
153	[LAC 33:III.5151.F.1.f]	An individual or company contracted to perform a demolition or renovation activity which disturbs RACM must be recognized by the Licensing Board for Contractors to perform asbestos abatement, and shall meet the requirements of LAC 33:III.5151.F.2 and F.3 for each demolition or renovation activity.
154	[LAC 33:III.5609.A.1.b]	Activate the preplanned abatement strategy listed in LAC 33:III.5611.Table 5 when the administrative authority declares an Air Pollution Alert.
155	[LAC 33:III.5609.A.2.b]	Activate the preplanned strategy listed in LAC 33:III.5611.Table 6 when the administrative authority declares an Air Pollution Warning.
156	[LAC 33:III.5609.A.3.b]	Activate the preplanned abatement strategy listed in LAC 33:III.5611.Table 7 when the administrative authority declares an Air Pollution Emergency.
157	[LAC 33:III.5609.A]	Prepare standby plans for the reduction of emissions during periods of Air Pollution Alert, Air Pollution Warning and Air Pollution Emergency. Design standby plans to reduce or eliminate emissions in accordance with the objectives as set forth in LAC 33:III.5611.Tables 5, 6, and 7.
158	[LAC 33:III.5611.A]	Submit standby plan for the reduction or elimination of emissions during an Air Pollution Alert, Air Pollution Warning, or Air Pollution Emergency: Due within 30 days after requested by the administrative authority.
159	[LAC 33:III.5611.B]	During an Air Pollution Alert, Air Pollution Warning or Air Pollution Emergency, make the standby plan available on the premises to any person authorized by the department to enforce these regulations.
160	[LAC 33:III.5901.A]	Comply with the provisions in 40 CFR 68, except as specified in LAC 33:III.5901.
161	[LAC 33:III.5907]	Identify hazards that may result from accidental releases of the substances listed in 40 CFR 68.130, Table 59.0 of LAC 33:III.5907, or Table 59.1of LAC 33:III.5913 using appropriate hazard assessment techniques, design and maintain a safe facility, and minimize the off-site consequences of accidental releases of such substances that do occur.
162	[LAC 33:III.5911.A]	Submit registration: Due January 31, 1998, or within 60 days after the source becomes subject to LAC 33:III.Chapter 59, whichever is later. Include the information listed in LAC 33:III.5911.B, and submit to the Department of Environmental Quality, Office of Environmental Compliance, Surveillance Division.
163	[LAC 33:III.5911.C]	Submit amended registration: Due to the Department of Environmental Quality, Office of Environmental Compliance, Surveillance Division within 60 days after the information in the submitted registration is no longer accurate.
164	[LAC 33:III.905]	Install air pollution control facilities whenever practically, economically, and technologically feasible. When facilities have been installed on a property, use them and diligently maintain them in proper working order whenever any emissions are being made which can be controlled by the facilities, even though the ambient air quality standards in affected areas are not exceeded.
165	[LAC 33:III.917.A]	Where, upon written application of the responsible person or persons, the administrative authority finds that by reason of exceptional circumstances strict conformity with any provisions of these regulations would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the administrative authority may permit a variance from these regulations.
166	[LAC 33:III.917.B]	No variance may permit or authorize the maintenance of a nuisance, or a danger to public health or safety.
167	[LAC 33:III.919.D]	Submit Emission Inventory (EI)/Annual Emissions Statement: Due annually, by the 31st of March for the period January 1 to December 31 of the previous year. Submit emission inventory data in the format specified by the Office of Environmental Assessment, Environmental Evaluation Division. Include all data applicable to the emissions source(s), as specified in LAC 33:III.919.A-D.

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20070014
Permit Number: 2500-00005-V1
Air - Title V Regular Permit Minor Mod

UNF0001 UTILITIES COMPLEX

168	[LAC 33:III.927]	Report the unauthorized discharge of any air pollutant into the atmosphere in accordance with LAC 33:I.Chapter 39, Notification Regulations and Procedures for Unauthorized Discharges. Submit written reports to the department pursuant to LAC 33:I.3925. Submit timely and appropriate follow-up reports detailing methods and procedures to be used to prevent similar atmospheric releases.
169	[LAC 33:III.929.A]	No person or group of persons shall allow particulate matter or gases to become airborne in amounts which cause the ambient air quality standards to be exceeded.

APPENDIX D
7.5.34

TPOR0147

CRLLC-CHAL-000205

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 279-9481

July 14, 2009

CERTIFIED MAIL (7007 0710 0003 0019 8065) RETURN RECEIPT REQUESTED

RECEIVED
JUL 21 2010
LDEQ/OEA/AQAD
Engineering Support

Gerri Garwood
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

NOTICE OF COMPLIANCE AND INITIAL TEST REPORT
BOILER NO. 9 UNIT
ACTIVITY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C.

Dear Ms. Garwood:

Chalmette Refining, L.L.C. (CRLLC) submits this performance testing report to demonstrate compliance status for Boiler No. 9 pursuant to Permit 2500-00005-V1 Specific Requirement 39. Performance testing was performed as required using the methods specified in 40 CFR 60 Appendix A. The testing was performed on May 15, 2009 by Shaw Environmental, Inc.

This report is intended to supplement the testing that was conducted on February 19, 2009 at approximately 50% of full rate due to mechanical issues. Retesting occurred once full rate was achieved.

Should you have any questions concerning this submittal, please contact Mr. Jeff Bergeron at (504) 281-1934 or by e-mail at jeff.bergeron@exxonmobil.com.

Very truly yours,

George A. Graham
Environmental Group Leader

JDB

cc: EPA Region VI
LDEQ Southeast Regional Office

METTE REFINING, L.L.C.
1007
TE, LA 70044

7007 0710 0003 0019 8065

UNITED STATES POSTAGE
PITNEY BOWES
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Baton Rouge, LA 70821-4314

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Louisiana Department of Environmental Quality
Office of Environmental Assessment
P.O. Box 4314
Baton Rouge, LA 70821-4314

CRLLC-CHAL-000208

SOURCE TEST REPORT

CHALMETTE REFINING, LLC
BOILER NO. 9 (EQT 021)
NITROGEN OXIDES (NO_X), SULFUR DIOXIDE (SO_2), AND CARBON MONOXIDE (CO) EMISSION COMPLIANCE TEST

Prepared for:

Chalmette Refining, L.L.C
Chalmette, St. Bernard Parish, Louisiana
Agency Interest No. 1376
Permit Number 2500-00005-V1

Facility Contact:

Mr. Jeff Bergeron
Office: 504.281.1934

Prepared by:

Shaw® Shaw Environmental, Inc.

4171 Essen Lane
Baton Rouge, LA 70809
Office: 225.932.2745
Fax: 225.213.1274

Test Date: May 15, 2009
Shaw Project No. 135890

STATEMENT OF CERTIFICATION

Chalmette Refining, LLC
Boiler No. 9 (EQT 021)
Nitrogen Oxides (NO_X), Sulfur Dioxide (SO_2), and Carbon Monoxide (CO) Emission Compliance Test
Conducted: May 15, 2009

Shaw Environmental, Inc. (Shaw) is a commercial laboratory that operates in compliance with the *Louisiana Environmental Laboratory Accreditation Program* (LELAP), Certificate No. 04113. Shaw provides defensible air quality assessment data as a certified emission source testing firm. Agency Interest No. 122938 has been assigned to Shaw Environmental by the *Louisiana Department of Environmental Quality* (LDEQ) in accordance with *Louisiana Administrative Code of LAC 33.I. Chapter 45.*

I certify that I have examined and approve the contents of this document. Based on the information contained within, and procedures pursuant to EPA 40 CFR 60, Appendix A and/or B, other approved test methods, and test data obtained on-site by Shaw personnel, I believe the contents of this report to be true, accurate, and complete to the best of my knowledge.

	7/13/2009
Shaw Environmental, Inc. Representative	Date
	7/13/09
Facility Representative	Date

CRLLC-CHAL-000210

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CRLLC-CHAL-000211

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1.0 INTRODUCTION

Shaw Environmental, Inc. (Shaw) was retained by Chalmette Refining, LLC (CRLLC) to conduct an emission compliance demonstration of the Boiler No. 9 (F0809). The emission source testing was performed at the Chalmette Refinery in Chalmette, St. Bernard Parish, Louisiana. The objective of this test program was to measure nitrogen oxides (NO_X), sulfur dioxide (SO_2), and carbon monoxide (CO) mass emission rates. The test program was coordinated through Mr. Jeff Bergeron of CRLLC and conducted on May 15, 2009 by Messrs. Blake Fogleman and Matthew Wall of Shaw.

1.1 Source Description

CRLLC owns and operates Boiler No. 9 which is used to produce steam and compressed air throughout the refinery.

1.2 Applicable State and/or Federal Regulations

The test program was performed to demonstrate compliance with Title V Permit No. 2500-00005-V1, Specific Condition 39.

1.3 Test Results and Discussions

Shaw conducted three sixty minute compliance test runs on F0809. The boiler was tested on May 15, 2009 while operating at an average firing rate of 304.72 million British Thermal Units per hour (MBtu/hr). Analyzer runs three, four, five were used in the three compliance run calculations. CRLLC was adjusting rates on the boiler during the first two data runs. The runs were used for preliminary measurement only. No exceedances were observed during the preliminary runs.

For each test run, O_2, NO_X, SO_2, and CO emissions were measured, and the three test runs were then averaged. Process data was provided by the facility to correlate unit operating parameters to the emission compliance test. A comprehensive summary, including compliance status, operational conditions, and emission results is presented on Table 1 and Table 2, respectively. Documentation supporting results of this test program are presented in the appendices.

CRLLC-CHAL-000213

Table 1 Boiler No. 9 Compliance Status

Parameter	Permit Limit	Test Results	Status
NO_x	144.40 lb/hr	22.68 lb/hr	No exceedance
SO_2	13.30 lb/hr	2.20 lb/hr	No exceedance
CO	133.00 lb/hr	21.61 lb/hr	No exceedance

Table 2 Boiler No. 9 Emission Compliance Demonstration Test Summary

Sampling Parameters

Test No.		1	2	3	Average
Date		05/15/09	05/15/09	05/15/09	
Test Period		14:03-15:03	15:50-16:50	17:15-18:15	
Sampling Duration	min	60	60	60	60

Unit Operating Parameters

Fuel Gas HHV	Btu/ft^3	1096.04	1093.21	1084.41	1091.22
Fuel Feed Rate	MCF/hr	0.26	0.26	0.26	0.26
F_d Factor	dscf/MMBtu	8665.65	8665.65	8665.65	8665.65
Fuel Firing Rate	MMBtu/hr	304.73	305.34	304.10	304.72
Excess Oxygen (O_2)	vol%	2.38	2.61	2.70	2.56

Pollutant Emissions

Sulfur Dioxide (SO_2)	ppmv	3.63	5.57	3.98	4.39
	lb/MMBtu	0.01	0.01	0.01	0.01
	lb/hr	1.80	2.80	2.00	2.20
	tons/yr	7.87	12.25	8.76	9.63
Nitrogen Oxides (NO_X)	ppmv	59.46	65.49	64.41	63.12
	lb/MMBtu	0.07	0.08	0.08	0.07
	lb/hr	21.15	23.64	23.27	22.68
	tons/yr	92.64	103.53	101.91	99.36
Carbon Monoxide (CO)	ppmv*	183.80	58.50	55.40	99.23
	lb/MMBtu	0.131	0.042	0.040	0.071
	lb/hr	39.81	12.85	12.18	21.61
	tons/yr	174.35	56.30	53.37	94.67

Note: tons/yr based on operating 8760 hours per year.

1.4 Test Program Chronology

The F0809 test program was conducted on May 15, 2009. A comprehensive chronology of events outlining the test period is presented below in Table 3.

Table 3 Chronology of Events

Date	Time	Activity
05/15/09	07:00	Arrive at plant. Perform preliminary and final setup.
05/15/09	09:00	Calibrate Analyzers
05/15/09	12:54	Preliminary measurements. Change CO range to 1000 ppm.
05/15/09	14:03	Start Compliance Test 1.
05/15/09	15:50	Start Compliance Test 2.
05/15/09	17:15	Start Compliance Test 3.
05/15/09	18:15	Demobilization
05/15/09	20:00	Leave plant.

2.0 MANUAL REFERENCE TEST METHODS AND PROCEDURES

Shaw employed standard reference methods to conduct this test program. Reference test methods specified by applicable federal and/or state regulations were performed with strict adherence to the method unless a deviation was approved in advance by the appropriate regulatory agency. Descriptions of the approved test methods employed to conduct this test program are presented below.

Table 4 Reference Test Methods

Emission Source	Test Methods				
	RM 3A	RM 6C	RM 7E	RM 10	RM 19
	Oxygen (O_2)	Sulfur Dioxide (SO_2)	Nitrogen Oxides (NO_X)	Carbon Monoxide (CO)	Mass Emission Rates
Boiler No. 9	X	X	X	X	X

2.1 Excess Oxygen (O_2) Content

Shaw employed 40 CFR 60, Appendix A, Reference Method 3A (RM 3A) *Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)* to determine excess O_2 content of the flue gas. The O_2 concentrations were measured with a paramagnetic O_2 analyzer (California Analytical Model 300) and reported in percentage of O_2 by volume (vol% O_2). The O_2 content was used to calculate SO_2, NO_X, and CO emissions in lb/MMBtu at 0% O_2.

2.2 Sulfur Dioxide (SO_2)

Shaw employed 40 CFR 60, Appendix A, Reference Method 6C (RM 6C) Determination of Sulfur Dioxide in Emissions From Stationary Sources (Instrumental Analyzer Procedure) to determine SO_2 concentration. SO_2 was measured using a UV fluorescence SO_2 gas analyzer (TECO Model 43C) and reported in parts per million by volume (ppmv).SO_2 levels and process data were used in calculations to convert the pollutant concentration level from ppmv to lb/hr.

2.3 Nitrogen Oxides (NO_X)

Shaw employed 40 CFR 60, Appendix A, Reference Method 7E (RM 7E) Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) to determine NO_X concentrations. Nitric oxide (NO) and nitrogen dioxide (NO_2) make up total NO_X and the constituents were measured using a chemiluminescent NO-NO_X gas analyzer (California Analytical Model 200) and reported in parts per million by volume (ppmv). NO_X levels and process data were used in calculations to convert the pollutant concentration level from ppmv to lb/hr.

2.4 Carbon Monoxide (CO)

Shaw employed 40 CFR 60, Appendix A, Reference Method 10 (RM 10) Determination of Carbon Monoxide Emissions From Stationary Sources to determine CO concentrations of the flue gas. The CO concentrations were measured using a non-dispersive infrared (NDIR) CO analyzer (California Analytical Model 300) and reported in ppmv.

2.5 Pollutant Mass Emission Rates

Shaw used 40CFR60, Appendix A, Reference Method 19 (RM 19) *Determination of Sulfur Dioxide Removal Efficiency and Particulate, Sulfur Dioxide and Nitrogen Oxides Emission Rates* to determine NO_X and CO emission rates. Because the boiler is gas-fired, an F Factor in dry standard cubic feet per million British Thermal Units (dscf/MMBtu) was used to calculate pollutant emission rates of each test. Details on determination of the F factors can be found in the appendices. The F factor is the ratio of the gas volume of the products of combustion to the heat content of the fuel in standard cubic feet per million British Thermal Units (scf/MMBtu). The dry F factor (F_d) includes all components of combustion less water. The F_d is used to calculate the pollutant emission rate as follows:

$$E = C_d F_d \frac{20.9}{(20.9 - \%O_{2d})} \qquad \text{Eq. 19-1}$$

where:

E	=	Pollutant emission rate, lb/scf.
C_d	=	Pollutant concentration, dry basis, ppmv.
F_d	=	Fuel gas F factor, scf/MMBtu.
$\%O_{2d}$	=	Oxygen concentration, dry basis, vol%.
20.9	=	Concentration of oxygen in ambient air, vol%.

3.0 Approved Standard Test Method Deviations

No test method deviations were employed during this test program.

CRLLC-CHAL-000218

Appendix A
Raw Field Data

Calibration Error Test, Run 1 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2	N2	CC216440	CC216440	ambient air
NOx	N2	CC196300	CC196300	CC116454
SO2	N2	~~[illegible]~~	~~[illegible]~~	CC13891
CO	N2	CC160222	CC160222	CC156383

Initial Calibration

Date/Time 05-15-2009 09:32:13 PASSED

Analyte	O2	NOx	SO2	CO
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.00
Zero Avg	-0.231	-0.03	-0.03	0.10
Zero Error%	0.9%	0.0%	0.0%	0.1%
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl	9.993	51.30	49.52	49.87
Mid Avg	10.009	52.63	48.27	49.55
Mid Error%	0.1%	1.3%	1.3%	0.3%
High Ref Cyl	20.900	94.93	90.59	95.04
High Avg	20.883	95.93	90.16	95.27
High Error%	0.1%	1.0%	0.4%	0.2%

Calibration Error Test End

Calibration Error Test, Run 3 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
CO	N2	CC160222	CC200089	CC192903

Recalibration of CO Analyzer

Date/Time	05-15-2009	13:26:21	PASSED
Analyte	CO		
Units	ppm		
Zero Ref Cyl	0.0		
Zero Avg	-1.1		
Zero Error%	0.1%		
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	469.5		
Mid Avg	468.6		
Mid Error%	0.1%		
High Ref Cyl	997.7		
High Avg	999.4		
High Error%	0.2%		

Calibration Error Test End

Initial System Bias Check, Run ~~2~~ 3 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Compliance Test #1

	Reference Cylinder Numbers	
	Zero	Span
CO	N2	CC200089

Date/Time	05-15-2009	13:31:09	PASSED
Analyte	CO		
Units	ppm		
Zero Ref Cyl	0.0		
Zero Cal	-1.1		
Zero Avg	1.1		
Zero Bias%	0.2%		
Zero Drift%			
Span Ref Cyl	469.5		
Span Cal	468.6		
Span Avg	459.3		
Span Bias%	0.9%		
Span Drift%			

System Bias Check End

Compliance Test #1

Test Run 3 STRATA Version 3.01

Begin calculating run averages

	O2 %	NOx ppm	SO2 ppm	CO ppm
05-15-2009 14:04:30	2.269	58.88	5.39	97.7
05-15-2009 14:05:31	2.362	60.76	5.16	86.5
05-15-2009 14:06:31	2.330	60.63	4.97	94.4
05-15-2009 14:07:31	2.281	59.45	5.13	94.2
05-15-2009 14:08:32	2.355	61.03	5.54	95.4
05-15-2009 14:09:30	2.300	62.04	5.53	85.6
05-15-2009 14:10:31	2.164	60.85	5.82	68.2
05-15-2009 14:11:31	2.208	61.31	5.69	68.8
05-15-2009 14:12:31	2.248	62.18	5.57	66.4
05-15-2009 14:13:32	2.059	59.45	5.19	75.7
05-15-2009 14:14:30	2.065	58.86	4.79	53.2
05-15-2009 14:15:30	2.169	59.88	4.58	47.8
05-15-2009 14:16:31	2.158	58.34	4.17	46.9
05-15-2009 14:17:31	2.310	58.52	3.91	41.4
05-15-2009 14:18:32	2.514	62.23	3.28	43.6
05-15-2009 14:19:30	2.479	59.52	3.49	49.0
05-15-2009 14:20:30	2.545	58.68	3.59	50.1
05-15-2009 14:21:31	2.511	59.13	3.59	58.0
05-15-2009 14:22:31	2.308	56.99	3.64	64.1
05-15-2009 14:23:32	2.329	56.95	3.68	69.2
05-15-2009 14:24:30	2.454	58.80	3.68	68.9
05-15-2009 14:25:30	2.441	56.44	3.27	92.7
05-15-2009 14:26:31	2.473	58.59	3.52	105.8
05-15-2009 14:27:31	2.193	55.95	3.60	213.9
05-15-2009 14:28:32	2.311	58.89	3.62	146.5
05-15-2009 14:29:30	2.052	56.69	3.61	315.0
05-15-2009 14:30:30	2.112	59.26	3.96	193.9
05-15-2009 14:31:31	1.915	56.80	4.41	335.9
05-15-2009 14:32:31	1.960	58.80	4.35	262.3
05-15-2009 14:33:32	1.813	56.94	4.74	407.3
05-15-2009 14:34:30	2.006	59.23	4.86	269.9
05-15-2009 14:35:30	1.835	57.05	5.56	431.4
05-15-2009 14:36:31	2.012	58.94	5.66	309.0
05-15-2009 14:37:31	1.835	56.78	5.40	641.0*
05-15-2009 14:38:32	2.047	58.85	5.35	332.5
05-15-2009 14:39:30	1.893	57.56	5.40	531.8
05-15-2009 14:40:30	1.953	57.10	5.53	705.3*
05-15-2009 14:41:31	2.016	58.99	5.72	386.1
05-15-2009 14:42:31	1.909	56.61	5.58	674.7
05-15-2009 14:43:32	1.901	58.91	5.68	394.9
05-15-2009 14:44:30	1.756	57.47	5.63	534.9
05-15-2009 14:45:30	1.878	60.91	5.78	267.1
05-15-2009 14:46:31	1.900	57.89	6.04	212.6
05-15-2009 14:47:31	1.870	57.50	6.32	233.3
05-15-2009 14:48:32	1.948	59.47	6.61	127.3
05-15-2009 14:49:30	1.961	58.65	6.84	118.2
05-15-2009 14:50:30	1.870	60.59	7.24	115.0
05-15-2009 14:51:31	1.745	59.26	7.68	113.3
05-15-2009 14:52:31	1.859	59.96	7.61	96.8
05-15-2009 14:53:32	1.840	60.30	8.08	100.6
05-15-2009 14:54:30	2.102	59.12	7.85	66.0
05-15-2009 14:55:30	2.196	60.37	7.33	63.6
05-15-2009 14:56:31	2.024	58.23	6.59	71.4
05-15-2009 14:57:31	1.941	57.12	6.08	85.7
05-15-2009 14:58:32	1.889	59.16	5.91	76.6
05-15-2009 14:59:30	2.078	59.19	5.77	60.2
05-15-2009 15:00:30	2.055	60.29	5.44	67.2
05-15-2009 15:01:31	2.076	61.90	5.74	61.3
05-15-2009 15:02:31	1.915	60.40	6.05	81.4
05-15-2009 15:03:32	2.251	62.66	5.94	57.2

Run Averages

	O2 %	NOx ppm	SO2 ppm	CO ppm
05-15-2009 15:03:32	2.104	59.06	5.28	179.6*

Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1
Test Run 3 End

Final System Bias Check, Run ~~2~~ 3 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Compliance Test #1

Reference Cylinder Numbers

	Zero	Span
O2	N2	CC216440
NOx	N2	CC196300
SO2	N2	~~[illegible]~~ XC081652 BSF 5/15/09
CO	N2	CC200089

Date/Time 05-15-2009 15:25:26 PASSED

Analyte	O2	NOx	SO2	CO
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.0
Zero Cal	-0.231	-0.03	-0.03	-1.1
Zero Avg	-0.287	0.02	1.45	-1.2
Zero Bias%	0.2%	0.1%	1.5%	0.0%
Zero Drift%	0.0%	-0.1%	-1.4%	-0.2%
Span Ref Cyl	9.993	51.30	49.52	469.5
Span Cal	10.009	52.63	48.27	468.6
Span Avg	9.767	50.50	44.67	458.6
Span Bias%	1.0%	2.1%	3.6%	1.0%
Span Drift%	-0.1%	-0.9%	-0.3%	-0.1%
Ini Zero Avg	-0.286	0.14	2.86	1.1
Ini Span Avg	9.783	51.42	44.94	459.3
Run Avg	2.104	59.06	5.28	179.6
Co	-0.287	0.08	2.16	-0.1
Cm	9.775	50.96	44.80	458.9
Correct Avg	2.375	59.46	3.63	183.8

System Bias Check End

Initial System Bias Check, Run 4 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Reference Cylinder Numbers

	Zero	Span
O2	N2	CC216440
NOx	N2	CC196300
SO2	N2	~~X0069152~~ XC031652 BCF 5/15/09
CO	N2	CC200089

Compliance Test #2

Date/Time 05-15-2009 15:46:32 PASSED

Analyte	O2	NOx	SO2	CO
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.0
Zero Cal	-0.231	-0.03	-0.03	-1.1
Zero Avg	-0.237	0.03	2.17	-0.6
Zero Bias%	0.0%	0.1%	2.2%	0.0%
Zero Drift%				
Span Ref Cyl	9.993	51.30	49.52	469.5
Span Cal	10.009	52.63	48.27	468.6
Span Avg	9.762	51.73	45.25	465.9
Span Bias%	1.0%	0.9%	3.0%	0.3%
Span Drift%				

System Bias Check End

Test Run 4 STRATA Version 3.01

Compliance Test # 2

	O2 %	NOx ppm	SO2 ppm	CO ppm
Begin calculating run averages				
Pause				
End Pause				
05-15-2009 15:50:52	2.380	65.59	9.69	53.1
05-15-2009 15:51:53	2.266	63.79	9.41	60.6
05-15-2009 15:52:53	2.472	66.96	9.00	51.2
05-15-2009 15:53:54	2.444	66.21	8.72	51.6
05-15-2009 15:54:52	2.549	65.87	8.50	48.1
05-15-2009 15:55:52	2.621	67.37	8.35	46.8
05-15-2009 15:56:53	2.545	65.01	7.94	49.3
05-15-2009 15:57:53	2.517	66.68	7.87	51.0
05-15-2009 15:58:54	2.332	65.00	7.72	55.3
05-15-2009 15:59:52	2.211	63.27	7.58	65.8
05-15-2009 16:00:52	2.355	65.99	7.39	54.9
05-15-2009 16:01:53	2.438	66.39	7.31	53.0
05-15-2009 16:02:54	2.510	65.17	7.09	49.9
05-15-2009 16:03:52	2.565	66.79	7.15	47.8
05-15-2009 16:04:52	2.521	66.05	7.04	50.5
05-15-2009 16:05:53	2.509	64.56	6.97	51.8
05-15-2009 16:06:53	2.517	67.05	6.96	49.0
05-15-2009 16:07:54	2.364	64.17	6.99	56.9
05-15-2009 16:08:52	2.352	65.17	7.03	57.3
05-15-2009 16:09:52	2.448	64.09	7.21	51.9
05-15-2009 16:10:53	2.509	63.26	7.03	51.0
05-15-2009 16:11:53	2.281	65.97	6.91	61.0
05-15-2009 16:12:54	2.118	63.78	6.88	69.3
05-15-2009 16:13:52	2.270	65.97	6.97	63.6
05-15-2009 16:14:52	2.292	67.02	7.01	62.8
05-15-2009 16:15:53	2.413	68.20	7.12	56.1
05-15-2009 16:16:53	2.236	67.34	7.11	66.6
05-15-2009 16:17:53	2.261	66.49	7.13	67.1
05-15-2009 16:18:52	2.383	69.01	7.07	58.0
05-15-2009 16:19:52	2.261	66.78	6.98	67.7
05-15-2009 16:20:53	2.259	66.38	7.01	68.0
05-15-2009 16:21:53	2.410	69.22	6.99	55.9
05-15-2009 16:22:54	2.483	67.32	6.78	54.0
05-15-2009 16:23:52	2.464	68.28	6.75	56.0
05-15-2009 16:24:52	2.404	67.57	6.74	57.0
05-15-2009 16:25:53	2.472	67.00	6.80	59.4
05-15-2009 16:26:53	2.415	68.05	6.57	59.1
05-15-2009 16:27:54	2.306	66.56	6.73	59.5
05-15-2009 16:28:52	2.275	65.09	6.69	64.8
05-15-2009 16:29:52	2.348	67.37	6.78	59.9
05-15-2009 16:30:53	2.258	64.88	5.83	62.3
05-15-2009 16:31:53	2.303	65.31	5.90	63.3
05-15-2009 16:32:53	2.337	66.02	6.56	62.8
05-15-2009 16:33:52	2.261	63.38	6.55	61.1
05-15-2009 16:34:52	2.505	67.03	6.45	53.4
05-15-2009 16:35:53	2.412	65.84	6.41	57.1
05-15-2009 16:36:53	2.562	65.89	6.48	52.0
05-15-2009 16:37:53	2.501	66.38	6.32	54.7
05-15-2009 16:38:52	2.457	65.49	6.37	54.3
05-15-2009 16:39:52	2.329	63.84	6.31	57.8
05-15-2009 16:40:53	2.447	65.54	6.38	54.0
05-15-2009 16:41:53	2.372	65.11	6.38	55.9
05-15-2009 16:42:54	2.288	63.87	6.47	60.8
05-15-2009 16:43:52	2.477	65.66	6.48	54.6
05-15-2009 16:44:52	2.405	64.99	6.36	56.6
05-15-2009 16:45:53	2.378	63.32	6.30	58.0
05-15-2009 16:46:53	2.303	63.67	6.18	58.5
05-15-2009 16:47:53	2.425	64.92	6.02	57.2
05-15-2009 16:48:52	2.343	62.18	5.79	56.1
05-15-2009 16:49:52	2.367	64.56	5.52	55.8
Run Averages	O2 %	NOx ppm	SO2 ppm	CO ppm
05-15-2009 16:50:30	2.393	65.76	6.95	57.0

Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1
Test Run 4 End

Final System Bias Check, Run 4 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Compliance Test #2

Reference Cylinder Numbers

	Zero	Span
O2	N2	CC216440
NOx	N2	CC196300
SO2	N2	~~[illegible]~~ XC031652 BSF 5/15/09
CO	N2	CC200089

Date/Time 05-15-2009 17:06:49 PASSED

Analyte	O2	NOx	SO2	CO
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.0
Zero Cal	-0.231	-0.03	-0.03	-1.1
Zero Avg	-0.192	0.18	2.06	-0.8
Zero Bias%	0.2%	0.2%	2.1%	0.0%
Zero Drift%	0.2%	0.1%	-0.1%	0.0%
Span Ref Cyl	9.993	51.30	49.52	469.5
Span Cal	10.009	52.63	48.27	468.6
Span Avg	9.810	51.34	44.81	459.0
Span Bias%	0.8%	1.3%	3.5%	1.0%
Span Drift%	0.2%	-0.4%	-0.4%	-0.7%
Ini Zero Avg	-0.237	0.03	2.17	-0.6
Ini Span Avg	9.762	51.73	45.25	465.9
Run Avg	2.393	65.76	6.95	57.0
Co	-0.214	0.11	2.12	-0.7
Cm	9.786	51.54	45.03	462.5
Correct Avg	2.606	65.49	5.57	58.5

System Bias Check End

Compliance Test #3

Test Run 5 STRATA Version 3.01

	O2 %	NOx ppm	SO2 ppm	CO ppm
Begin calculating run averages				
05-15-2009 17:16:30	2.592	64.68	6.36	50.2
05-15-2009 17:17:31	2.680	66.82	6.02	46.5
05-15-2009 17:18:31	2.541	64.41	5.90	49.2
05-15-2009 17:19:31	2.630	65.76	5.72	49.3
05-15-2009 17:20:32	2.522	64.32	5.57	50.0
05-15-2009 17:21:30	2.511	64.04	5.62	53.9
05-15-2009 17:22:31	2.534	65.34	5.44	50.1
05-15-2009 17:23:31	2.504	63.42	5.33	51.4
05-15-2009 17:24:31	2.468	64.01	5.09	52.2
05-15-2009 17:25:30	2.579	64.82	4.99	49.3
05-15-2009 17:26:30	2.437	62.68	5.05	50.8
05-15-2009 17:27:31	2.639	65.76	4.95	46.1
05-15-2009 17:28:31	2.472	63.27	4.82	53.1
05-15-2009 17:29:31	2.518	65.75	4.86	50.8
05-15-2009 17:30:32	2.424	63.79	4.86	55.3
05-15-2009 17:31:30	2.527	65.94	4.94	49.3
05-15-2009 17:32:31	2.420	64.43	4.81	54.9
05-15-2009 17:33:31	2.560	64.92	4.50	50.8
05-15-2009 17:34:31	2.545	65.91	5.04	50.9
05-15-2009 17:35:32	2.503	64.57	5.32	50.4
05-15-2009 17:36:30	2.643	66.26	5.21	49.2
05-15-2009 17:37:30	2.554	65.36	5.11	47.9
05-15-2009 17:38:31	2.573	64.93	5.28	48.4
05-15-2009 17:39:31	2.518	65.25	5.36	51.1
05-15-2009 17:40:32	2.568	63.89	5.38	51.8
05-15-2009 17:41:30	2.399	64.21	5.54	55.1
05-15-2009 17:42:31	2.254	62.03	5.50	60.7
05-15-2009 17:43:31	2.423	65.41	5.53	53.7
05-15-2009 17:44:31	2.407	63.83	5.24	55.2
05-15-2009 17:45:32	2.520	65.50	5.27	50.1
05-15-2009 17:46:30	2.438	64.71	5.34	51.9
05-15-2009 17:47:31	2.628	67.02	5.40	46.8
05-15-2009 17:48:31	2.453	63.61	5.46	53.3
05-15-2009 17:49:31	2.599	66.36	5.45	50.0
05-15-2009 17:50:32	2.463	63.44	5.34	52.3
05-15-2009 17:51:30	2.562	66.16	5.35	49.6
05-15-2009 17:52:30	2.536	64.30	5.30	50.9
05-15-2009 17:53:31	2.475	64.72	5.39	52.7
05-15-2009 17:54:31	2.407	63.96	5.43	55.1
05-15-2009 17:55:32	2.365	63.57	5.73	56.9
05-15-2009 17:56:30	2.463	64.01	5.48	54.7
05-15-2009 17:57:30	2.474	64.40	5.32	50.8
05-15-2009 17:58:31	2.467	63.29	5.22	54.7
05-15-2009 17:59:31	2.425	64.17	5.44	53.5
05-15-2009 18:00:32	2.446	63.02	5.23	56.1
05-15-2009 18:01:30	2.462	63.58	5.34	55.8
05-15-2009 18:02:31	2.517	62.92	5.22	52.8
05-15-2009 18:03:31	2.394	62.89	5.35	56.8
05-15-2009 18:04:31	2.565	63.33	5.39	51.0
05-15-2009 18:05:32	2.518	64.17	5.40	54.9
05-15-2009 18:06:30	2.497	63.24	5.36	54.2
05-15-2009 18:07:30	2.389	63.13	5.39	56.0
05-15-2009 18:08:31	2.183	59.32	5.37	66.3
05-15-2009 18:09:31	2.322	60.55	5.47	57.7
05-15-2009 18:10:32	2.301	58.56	5.37	56.8
05-15-2009 18:11:30	2.249	58.62	5.24	58.0
05-15-2009 18:12:30	2.326	58.52	5.35	58.3
05-15-2009 18:13:31	2.333	59.42	5.22	58.9
05-15-2009 18:14:31	2.190	58.17	5.50	66.3
05-15-2009 18:15:32	2.247	59.59	5.57	59.8
Run Averages	O2 %	NOx ppm	SO2 ppm	CO ppm
05-15-2009 18:15:32	2.469	63.73	5.33	53.2

Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1
Test Run 5 End

Final System Bias Check, Run 5 STRATA Version 3.01
Operator: BF
Plant Name: Chalmette Boiler #9
Location: System 1

Compliance Test #3

	Reference Cylinder Numbers	
	Zero	Span
O2	N2	CC216440
NOx	N2	CC196300
SO2	N2	~~XC063152~~ XC031652 BEF 5/15/09
CO	N2	CC200089

Date/Time 05-15-2009 18:35:44 PASSED

Analyte	O2	NOx	SO2	CO
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.0
Zero Cal	-0.231	-0.03	-0.03	-1.1
Zero Avg	-0.269	0.08	1.75	-1.5
Zero Bias%	0.2%	0.1%	1.8%	0.0%
Zero Drift%	-0.3%	-0.1%	-0.3%	-0.1%
Span Ref Cyl	9.993	51.30	49.52	469.5
Span Cal	10.009	52.63	48.27	468.6
Span Avg	9.745	50.23	44.24	458.6
Span Bias%	1.1%	2.4%	4.0%	1.0%
Span Drift%	-0.3%	-1.1%	-0.6%	0.0%
Ini Zero Avg	-0.192	0.18	2.06	-0.8
Ini Span Avg	9.810	51.34	44.81	459.0
Run Avg	2.469	63.73	5.33	53.7
Co	-0.231	0.13	1.91	-1.1
Cm	9.778	50.79	44.52	458.8
Correct Avg	2.696	64.41	3.98	55.4

System Bias Check End

Company:	Chalmette Refining, LLC	Test Date:	05/15/09
Location:	Chalmette, LA	Test :	Run 3
Unit:	0	Constituent:	Oxygen
Source:	Boiler No. 9		
Unit Load	80% Max Load		

Source Parameters

Sampling Elevation			~125 feet	
Stack Inside Diameter			83.13 in.	
Port Extension			7.13 in.	
Sampling Points[1]	1	2	3	
	21.01	48.69	76.37	in.
Point Averages	2.32	2.20	2.24	%
Test Average		2.25		%
Test Results[2]	Unstratified	Unstratified	Unstratified	

Notes:

[1] Sample point are calculated to be 16.7, 50, and 83.3 percent of the measurement line Stack inside diameter. Also, each sampling point accounts for the port extension.

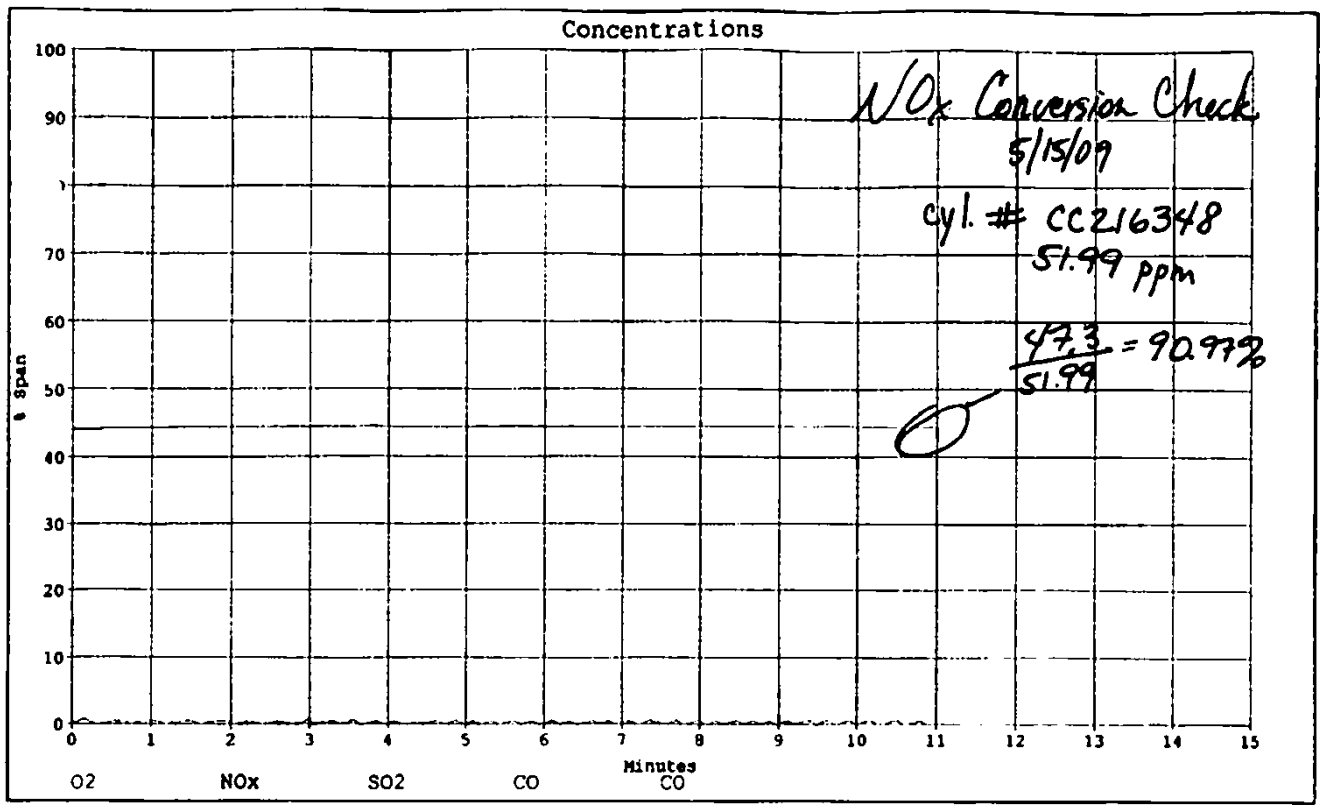
[2] Test Result explanation:

Unstratified - If the concentration at each traverse point differs from the mean concentration for all traverse points by no more than: (a) ± 5 percent of the mean concentration; or (b) ± 0.5 ppm (whichever is less restrictive), the gas stream is considered *unstratified* and you may collect samples from a single point that.

Minimally Stratified - If the 5 percent or 0.5 ppm criterion is not met, but the concentration at each traverse point differs from the mean concentration for all traverse points by no more than: (a) ± 10 percent of the mean; or (b) ± 1 ppm (whichever is less restrictive), the gas stream is considered to be *minimally stratified*, and you may take samples from three points. Space the three points at 16.7, 50.0, and 83.3 percentn of the measurement line.

Stratified - If the gas stream is found to be *stratified* because the 10 percent or 1ppm criterion for a 3-point test is not met, locate twelve traverse points for the test in accordance with Table 1-1 or Table 1-2 of Method 1.

*40 CFR 60 App. A-4, Meth.7E - *Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure*


Concentrations
% Span
100
90
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Minutes
O2
NOx
SO2
CO
CO
NOx Conversion Check
5/15/09
Cyl. # CC216348
51.99 ppm
47.3 / 51.99 = 90.97%

Appendix B
Emission Calculations

CRLLC-CHAL-000232

ASME Gaseous Fuel Composition Calculations
(Based on Higher Heating Value (HHV) @ 60°F and 30.00 in Hg)

Client: Chalmette Refining
Source ID: Boiler #9
Sample Date: 05/15/09

Component	Chemical Formula	Volume Percent			Molecular Weight		Weight Percent	Specific Gravity		Higher Heating Value			
										Btu/ft³		Btu/lb	
		(wet)	(normalized)	(dry)	(component)	(per fraction)		(component)	(per fraction)	(component)	(per fraction)	(component)	(per fraction)
Methane	CH_4	94.500	94.500	94.500	16.04	15.16	0.8697	0.5543	0.5238	1008.927	953.44	23875	20765
Ethane	C_2H_6	1.750	1.750	1.750	30.07	0.53	0.0302	1.0488	0.0184	1767.614	30.93	22323	674
Propane	C_3H_8	0.750	0.750	0.750	44.09	0.33	0.0190	1.5617	0.0117	2515.68	18.87	21669	411
n-Butane	C_4H_{10}	0.500	0.500	0.500	58.12	0.29	0.0167	2.0665	0.0103	3250.756	16.25	21321	355
Isobutane	C_4H_{10}	0.500	0.500	0.500	58.12	0.29	0.0167	2.0665	0.0103	3260.238	16.30	21271	355
n-Pentane	C_5H_{12}	0.200	0.200	0.200	72.15	0.14	0.0083	2.4872	0.0050	3997.969	8.00	21095	175
Isopentane	C_5H_{12}	0.200	0.200	0.200	72.15	0.14	0.0083	2.4872	0.0050	4007.072	8.01	21047	174
Carbon Dioxide	CO_2	0.600	0.600	0.600	44.01	0.26	0.0151	1.5282	0.0092	0	0.00	0	0
Nitrogen	N_2	1.000	1.000	1.000	28.02	0.28	0.0161	0.9672	0.0097	0	0.00	0	0
Total		100.000	100.000	100.000		17.43	1.0000		0.6033		1051.80		22908

Ultimate Fuel Analysis (wt%)	
Carbon:	73.62%
Hydrogen:	23.67%
Sulfur:	0.00%
Oxygen:	1.10%
Nitrogen:	1.61%
Moisture:	0.00%

*Note: Composition data given by contact as representative of a "typical" fuel gas composition.

F_d factor = 8665.65 dscf/MMBtu

CRLLC-CHAL-000233

Shaw Environmental, Inc.

Chalmette Refining
Boiler No. 9
Emission Compliance Test Summary

Company: ExxonMobil - Chalmette Refining, LLC
Location: Chalmette, LA
Source: Boiler No. 9
Source ID: EQT021
Unit Load Approximately 80% of Maximum Operation

Sampling Parameters

Test No.		1	2	3	Average
Date		05/15/09	05/15/09	05/15/09	
Test Period		14:03-15:03	15:50-16:50	17:15-18:15	
Sampling Duration	min	60	60	60	60

Unit Operating Parameters

Fuel Gas HHV	Btu/ft^3	1096.04	1093.21	1084.41	1091.22
Fuel Feed Rate	MCF/hr	0.26	0.26	0.26	0.26
F_d Factor	dscf/MMBtu	8665.65	8665.65	8665.65	8665.65
Fuel Firing Rate	MMBtu/hr	304.73	305.34	304.10	304.72
Excess Oxygen (O_2)	vol%	2.38	2.61	2.70	2.56

Pollutant Emissions

Sulfur Dioxide (SO_2)	ppmv	3.63	5.57	3.98	4.39
	lb/MMBtu	0.01	0.01	0.01	0.01
	lb/hr	1.80	2.80	2.00	2.20
	tons/yr	7.87	12.25	8.76	9.63
Nitrogen Oxides (NO_x)	ppmv	59.46	65.49	64.41	63.12
	lb/MMBtu	0.07	0.08	0.08	0.07
	lb/hr	21.15	23.64	23.27	22.68
	tons/yr	92.64	103.53	101.91	99.36
Carbon Monoxide (CO)	ppmv*	183.80	58.50	55.40	99.23
	lb/MMBtu	0.131	0.042	0.040	0.071
	lb/hr	39.81	12.85	12.18	21.61
	tons/yr	174.35	56.30	53.37	94.67

Note: tons/yr based on operating 8760 hours per year.

CRLLC-CHAL-000234

Calculation of NO_X, SO_2, and CO values in lb/MMBtu and lb/hr:

Nomenclature:

C_{NOX}	=	NO_X value, ppmv.
C_{CO}	=	CO value, ppmv.
CC_{NOX}	=	NO_X value expressed in lb/MMBtu.
CC_{SO2}	=	SO_2 value expressed in lb/MMBtu.
CC_{CO}	=	CO value expressed in lb/MMBtu.
MER_{NOX}	=	NO_X mass emission rate in lb/hr.
MER_{SO2}	=	CO mass emission rate in lb/hr..
MER_{CO}	=	CO mass emission rate in lb/hr..
FR	=	Firing Rate, MMBtu/hr.
E_{O2}	=	Excess Oxygen, vol %.
Fd	=	Fuel Gas Factor, dscf/MMBtu.
M_{NOX}	=	Molecular Weight of NO_X, g/mol.
M_{SO2}	=	Molecular Weight of CO, g/mol.
M_{CO}	=	Molecular Weight of CO, g/mol.

Variable:

$C_{NOX} := 59.46 \cdot ppmv$

$E_{O2} := 2.38\%$

$C_{SO2} := 3.63 \cdot ppmv$

$F_d := 8665.65 \cdot \frac{dscf}{MMBtu}$

$C_{CO} := 183.80 \cdot ppm$

$FR := 289.99 \cdot \frac{MMBtu}{hr}$

Constant:

$M_{NOX} := 46.006 \cdot \frac{g}{mol}$

$M_{SO2} := 64.0644 \cdot \frac{g}{mol}$

$M_{CO} := 28.010 \cdot \frac{g}{mol}$

$C_V := 28.3168 \cdot \frac{l}{dscf}$

$C_M := 453.59 \frac{g}{lb}$

$C_{O2} := 20.9\%$

$C_C := 24.0551 \frac{l}{mol}$

Calculation:

NO_X Mass Emission Rate

$$CC_{NOX} := \frac{C_{NOX} \cdot 10^6}{10^6} \cdot F_d \cdot \frac{M_{NOX} \cdot C_V}{C_C \cdot C_M} \cdot \frac{C_{O2}}{C_{O2} - E_{O2}}$$

$$CC_{NOX} = 0.069 \frac{lb}{MMBtu}$$

$$MER_{NOX} := CC_{NOX} \cdot FR$$

$$MER_{NOX} = 20.13 \frac{lb}{hr}$$

$$MER_{NOX} = 88.24 \frac{ton}{yr}$$

SO_2 Mass Emission Rate

$$CC_{SO2} := \frac{C_{SO2} \cdot 10^6}{10^6} \cdot F_d \cdot \frac{M_{SO2} \cdot C_V}{C_C \cdot C_M} \cdot \left(\frac{C_{O2}}{C_{O2} - E_{O2}} \right)$$

$$CC_{SO2} = 0.006 \frac{lb}{MMBtu}$$

$$MER_{SO2} := CC_{SO2} \cdot FR$$

$$MER_{SO2} = 1.71 \frac{lb}{hr}$$

$$MER_{SO2} = 7.502 \frac{ton}{yr}$$

CO Mass Emission Rate

$$CC_{CO} := \frac{C_{CO} \cdot 10^6}{10^6} \cdot F_d \cdot \frac{M_{CO} \cdot C_V}{C_C \cdot C_M} \cdot \left(\frac{C_{O2}}{C_{O2} - E_{O2}} \right)$$

$$CC_{CO} = 0.131 \frac{lb}{MMBtu}$$

$$MER_{CO} := CC_{CO} \cdot FR$$

$$MER_{CO} = 37.89 \frac{lb}{hr}$$

$$MER_{CO} = 166.067 \frac{ton}{yr}$$

Appendix C
Facility Process Data

CRLLC-CHAL-000237

5/15/09 2:00 PM
5/15/09 6:30 PM

Timestamp	F0809Q MBTU/HR BOILER#9 DUTY CALC F0809Q - Average	F0809N1 LB/HR BOILER#9 NOX CALC F0809N1 - Average	F0809C1 LB/HR BOILER#9 CO CALC F0809C1 - Average	F0809S1 LB/HR BOILER#9 SO2 CALC F0809S1 - Average	01FC611 MSCFD BOILR-9 FUEL GAS 01FC611 - Average	46AI816 BTU FUEL GAS: BTU/SCF (HHV) 46AI816 - Average	01AI641B PCT BLR-9 CEMS O2 01AI641B - Average	01AI641A PPM BLR-9 CEMS CORR NOX 01AI641A - Average
5/15/2009 14:00	310.40	22.13	27.60	3.67	6.35	1112.79	1.95	56.01
5/15/2009 14:01	309.87	21.47	26.75	3.69	6.34	1099.57	1.97	54.47
5/15/2009 14:02	303.79	21.56	27.88	3.69	6.34	1082.51	1.78	56.30
5/15/2009 14:03	304.69	21.40	28.42	3.70	6.34	1089.68	1.97	56.42
5/15/2009 14:04	304.53	20.89	25.79	3.65	6.34	1089.54	2.01	53.74
5/15/2009 14:05	301.63	21.34	26.99	3.54	6.34	1086.05	1.90	55.54
5/15/2009 14:06	302.63	21.60	27.55	3.54	6.34	1088.51	1.98	56.46
5/15/2009 14:07	304.21	21.25	24.93	3.54	6.34	1090.85	2.07	55.30
5/15/2009 14:08	306.19	21.90	25.65	3.54	6.33	1095.77	1.91	56.56
5/15/2009 14:09	306.09	21.88	26.61	3.54	6.33	1094.56	1.99	57.04
5/15/2009 14:10	304.96	21.57	25.57	3.53	6.34	1093.62	2.07	56.24
5/15/2009 14:11	305.76	22.60	25.46	3.56	6.34	1101.66	1.88	58.48
5/15/2009 14:12	304.45	22.88	26.01	3.66	6.36	1094.09	2.04	59.36
5/15/2009 14:13	300.33	21.73	23.12	3.66	6.36	1081.83	2.19	56.86
5/15/2009 14:14	300.25	21.99	23.05	3.66	6.36	1084.03	2.08	56.85
5/15/2009 14:15	298.77	22.25	24.47	3.66	6.36	1074.47	2.01	56.99
5/15/2009 14:16	297.77	21.34	23.95	3.65	6.36	1078.34	2.11	55.10
5/15/2009 14:17	302.08	21.65	24.47	3.62	6.37	1087.83	2.10	55.72
5/15/2009 14:18	299.06	21.83	24.43	3.53	6.36	1077.02	2.15	57.55
5/15/2009 14:19	299.27	21.19	22.61	3.52	6.36	1078.90	2.37	57.32
5/15/2009 14:20	298.61	21.55	21.70	3.53	6.37	1070.44	2.44	57.05
5/15/2009 14:21	294.42	21.74	20.99	3.53	6.35	1061.06	2.35	57.98
5/15/2009 14:22	297.93	21.72	20.55	3.53	6.34	1060.36	2.46	56.18
5/15/2009 14:23	299.50	21.39	20.41	3.53	6.34	1061.13	2.34	54.79
5/15/2009 14:24	301.46	21.22	21.55	3.54	6.35	1079.60	2.17	55.15
5/15/2009 14:25	304.10	20.58	22.37	3.54	6.34	1087.36	2.26	53.71
5/15/2009 14:26	301.61	20.67	23.30	3.54	6.33	1078.38	2.19	55.41
5/15/2009 14:27	299.90	21.09	23.75	3.54	6.34	1073.77	2.29	54.59
5/15/2009 14:28	298.21	20.33	21.57	3.54	6.35	1066.67	2.21	54.40
5/15/2009 14:29	296.03	20.54	22.57	3.52	6.36	1075.76	1.98	53.06
5/15/2009 14:30	301.16	20.37	23.06	3.50	6.37	1088.25	2.07	54.21
5/15/2009 14:31	297.99	20.70	23.94	3.51	6.36	1077.19	2.01	53.96
5/15/2009 14:32	304.12	20.34	24.21	3.52	6.35	1097.67	1.96	54.02
5/15/2009 14:33	304.54	21.04	27.13	3.52	6.34	1099.71	1.82	53.46
5/15/2009 14:34	303.95	20.17	27.75	3.53	6.34	1091.25	1.75	52.45
5/15/2009 14:35	302.19	20.51	29.42	3.54	6.35	1086.45	1.65	53.10
5/15/2009 14:36	305.60	20.28	29.71	3.54	6.35	1098.70	1.80	53.18
5/15/2009 14:37	304.68	20.58	30.13	3.52	6.36	1096.36	1.71	53.20
5/15/2009 14:38	303.50	19.77	30.72	3.50	6.36	1097.13	1.86	52.26
5/15/2009 14:39	307.18	20.47	29.31	3.51	6.36	1110.21	1.70	52.27
5/15/2009 14:40	309.63	20.16	30.03	3.51	6.36	1114.41	1.84	52.05
5/15/2009 14:41	308.41	20.80	29.93	3.52	6.34	1104.21	1.68	52.74
5/15/2009 14:42	305.77	19.83	29.71	3.52	6.34	1095.82	1.79	49.89
5/15/2009 14:43	309.18	20.06	29.56	3.53	6.35	1107.66	1.75	53.09
5/15/2009 14:44	309.18	20.48	32.53	3.52	6.36	1109.27	1.77	50.18
5/15/2009 14:45	307.57	19.79	30.95	3.51	6.35	1110.21	1.64	51.51
5/15/2009 14:46	310.56	20.58	34.59	3.53	6.36	1115.34	1.67	50.80
5/15/2009 14:47	308.63	20.15	33.33	3.53	6.36	1109.74	1.62	54.07
5/15/2009 14:48	306.79	21.60	36.84	3.53	6.35	1103.60	1.76	56.01
5/15/2009 14:49	309.10	21.55	29.61	3.57	6.36	1111.57	1.79	54.19

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5/15/2009 14:50	308.09	21.88	31.00	3.68	6.35	1108.62	1.73	58.49
5/15/2009 14:51	305.89	22.56	33.47	3.68	6.36	1100.09	1.94	56.98
5/15/2009 14:52	307.15	22.19	27.80	3.67	6.36	1110.68	1.77	56.56
5/15/2009 14:53	310.02	22.78	31.11	3.62	6.35	1118.88	1.75	57.98
5/15/2009 14:54	307.32	22.05	30.61	3.51	6.35	1113.19	1.85	56.55
5/15/2009 14:55	314.50	23.19	30.63	3.52	6.34	1137.87	1.74	60.24
5/15/2009 14:56	317.49	23.82	31.27	3.53	6.34	1140.87	2.05	60.63
5/15/2009 14:57	312.38	23.44	26.12	3.54	6.35	1125.33	2.08	58.66
5/15/2009 14:58	313.05	23.64	25.44	3.53	6.36	1134.00	1.90	58.71
5/15/2009 14:59	312.19	22.44	26.23	3.53	6.36	1124.01	2.06	54.71
5/15/2009 15:00	309.00	21.49	26.71	3.52	6.35	1114.01	1.87	55.51
5/15/2009 15:01	307.78	22.17	30.25	3.52	6.34	1109.11	2.06	57.48
5/15/2009 15:02	302.98	21.74	26.28	3.51	6.34	1095.12	2.17	56.47
5/15/2009 15:03	306.47	22.48	24.14	3.51	6.34	1100.93	1.93	57.71
5/15/2009 15:04	309.16	23.04	26.44	3.51	6.33	1109.74	1.98	59.23
5/15/2009 15:05	306.90	22.33	25.17	3.51	6.34	1105.95	2.20	58.29
5/15/2009 15:06	305.75	23.46	24.56	3.51	6.35	1103.88	2.09	60.71
5/15/2009 15:07	304.64	23.03	23.81	3.51	6.35	1099.59	2.17	58.18
5/15/2009 15:08	303.33	22.19	23.37	3.51	6.35	1106.20	2.15	57.97
5/15/2009 15:09	306.94	23.03	24.73	3.55	6.36	1114.71	2.12	58.72
5/15/2009 15:10	305.21	22.13	22.82	3.67	6.36	1100.09	2.17	56.13
5/15/2009 15:11	308.98	22.62	23.50	3.69	6.36	1109.39	2.04	57.81
5/15/2009 15:12	309.53	23.09	25.74	3.69	6.35	1105.88	2.09	58.92
5/15/2009 15:13	307.57	22.29	24.54	3.68	6.35	1092.47	2.19	57.67
5/15/2009 15:14	303.48	22.74	24.97	3.66	6.36	1094.20	2.11	59.53
5/15/2009 15:15	308.57	23.15	23.91	3.62	6.35	1113.54	2.19	58.00
5/15/2009 15:16	312.72	22.57	22.87	3.53	6.34	1117.52	2.08	56.36
5/15/2009 15:17	308.53	22.59	25.01	3.52	6.35	1100.18	2.00	58.16
5/15/2009 15:18	303.41	21.90	25.40	3.55	6.35	1091.60	2.14	56.74
5/15/2009 15:19	306.12	21.91	23.78	3.66	6.35	1106.41	2.11	56.07
5/15/2009 15:20	311.51	22.99	24.38	3.68	6.34	1123.34	2.04	58.17
5/15/2009 15:21	313.44	22.89	24.37	3.68	6.34	1115.27	2.19	57.90
5/15/2009 15:22	304.90	21.83	23.96	3.69	6.34	1088.93	2.17	57.02
5/15/2009 15:23	303.04	22.57	24.79	3.70	6.34	1088.39	2.02	58.89
5/15/2009 15:24	307.09	23.52	24.22	3.71	6.34	1100.86	2.10	59.91
5/15/2009 15:25	307.14	23.88	22.83	3.66	6.34	1096.85	2.10	61.02
5/15/2009 15:26	304.44	23.10	22.59	3.54	6.34	1093.27	2.16	61.81
5/15/2009 15:27	305.82	23.06	22.40	3.52	6.36	1105.97	2.23	60.14
5/15/2009 15:28	308.01	23.61	22.54	3.55	6.37	1110.66	2.39	61.33
5/15/2009 15:29	303.16	24.85	22.42	3.66	6.36	1091.16	2.39	65.69
5/15/2009 15:30	301.70	25.47	20.17	3.66	6.36	1088.23	2.46	64.11
5/15/2009 15:31	305.80	25.32	19.62	3.66	6.36	1099.62	2.31	62.72
5/15/2009 15:32	301.10	23.61	21.02	3.66	6.35	1086.89	2.30	60.19
5/15/2009 15:33	302.78	23.73	22.07	3.66	6.35	1097.41	2.11	61.76
5/15/2009 15:34	308.68	24.00	23.42	3.67	6.35	1107.30	2.30	61.49
5/15/2009 15:35	302.88	23.54	22.43	3.69	6.34	1089.21	2.34	62.06
5/15/2009 15:36	300.56	24.35	22.33	3.70	6.34	1082.02	2.31	64.93
5/15/2009 15:37	300.58	24.34	21.03	3.70	6.36	1082.58	2.49	62.97
5/15/2009 15:38	303.99	24.25	19.82	3.70	6.36	1093.55	2.48	64.98
5/15/2009 15:39	303.53	25.06	20.53	3.70	6.35	1091.46	2.47	66.40
5/15/2009 15:40	304.04	24.70	19.53	3.70	6.34	1093.97	2.48	63.70
5/15/2009 15:41	304.28	25.17	20.10	3.72	6.34	1092.35	2.34	65.48
5/15/2009 15:42	305.05	25.38	20.52	3.73	6.35	1092.61	2.45	63.65
5/15/2009 15:43	305.91	24.18	20.52	3.73	6.35	1095.63	2.34	63.90
5/15/2009 15:44	303.10	24.23	22.65	3.72	6.35	1095.40	2.38	61.58
5/15/2009 15:45	307.56	24.23	22.10	3.71	6.35	1102.62	2.31	62.59
5/15/2009 15:46	306.37	24.95	22.38	3.72	6.34	1093.76	2.42	63.87
5/15/2009 15:47	304.17	24.07	20.21	3.71	6.35	1090.43	2.49	61.71
5/15/2009 15:48	303.28	24.13	20.76	3.68	6.36	1088.09	2.34	61.98

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5/15/2009 15:49	298.74	23.59	21.68	3.68	6.35	1075.31	2.22	63.55
5/15/2009 15:50	303.01	23.52	21.40	3.69	6.34	1085.84	2.26	61.45
5/15/2009 15:51	306.70	24.28	21.71	3.73	6.35	1091.04	2.23	63.13
5/15/2009 15:52	304.22	24.83	22.40	3.73	6.35	1086.80	2.32	63.02
5/15/2009 15:53	305.76	23.94	21.31	3.72	6.36	1093.99	2.29	60.43
5/15/2009 15:54	306.34	24.30	22.90	3.71	6.36	1105.03	2.15	64.04
5/15/2009 15:55	308.59	25.02	23.23	3.69	6.34	1106.39	2.33	63.85
5/15/2009 15:56	306.23	24.50	20.98	3.69	6.34	1094.56	2.40	63.96
5/15/2009 15:57	307.15	25.19	21.19	3.65	6.35	1096.69	2.39	65.12
5/15/2009 15:58	306.57	24.83	20.89	3.55	6.36	1095.42	2.55	62.09
5/15/2009 15:59	305.82	25.03	20.54	3.54	6.35	1096.20	2.34	63.76
5/15/2009 16:00	308.18	24.89	21.08	3.60	6.34	1105.95	2.27	62.56
5/15/2009 16:01	312.49	23.93	21.44	3.75	6.35	1116.70	2.22	60.21
5/15/2009 16:02	311.20	24.28	24.15	3.75	6.36	1111.01	2.08	62.84
5/15/2009 16:03	308.54	24.43	24.93	3.74	6.35	1103.70	2.33	64.11
5/15/2009 16:04	308.32	24.23	22.26	3.71	6.35	1101.26	2.43	63.16
5/15/2009 16:05	306.89	25.13	21.71	3.72	6.35	1092.99	2.36	64.55
5/15/2009 16:06	303.89	24.80	21.36	3.72	6.35	1085.37	2.38	63.72
5/15/2009 16:07	307.45	24.28	20.48	3.67	6.36	1096.43	2.44	62.36
5/15/2009 16:08	305.63	24.63	21.28	3.54	6.36	1091.06	2.30	64.43
5/15/2009 16:09	299.99	24.00	21.30	3.52	6.35	1079.49	2.36	61.66
5/15/2009 16:10	305.59	24.17	20.90	3.58	6.35	1095.14	2.21	62.72
5/15/2009 16:11	305.38	24.31	22.34	3.70	6.36	1093.06	2.24	62.77
5/15/2009 16:12	301.71	23.26	21.82	3.70	6.35	1078.41	2.42	61.85
5/15/2009 16:13	302.30	23.67	20.99	3.71	6.36	1081.57	2.23	62.07
5/15/2009 16:14	306.81	23.64	21.26	3.73	6.35	1095.94	2.10	60.36
5/15/2009 16:15	304.67	23.58	24.10	3.72	6.35	1093.92	2.00	61.59
5/15/2009 16:16	305.32	24.44	25.52	3.72	6.35	1098.02	2.10	63.39
5/15/2009 16:17	306.36	25.06	22.95	3.68	6.35	1101.14	2.13	65.16
5/15/2009 16:18	308.18	24.83	22.28	3.69	6.35	1102.88	2.26	63.89
5/15/2009 16:19	307.81	24.55	22.63	3.70	6.34	1095.26	2.11	63.11
5/15/2009 16:20	304.89	25.11	24.45	3.71	6.34	1089.89	2.11	65.64
5/15/2009 16:21	310.11	25.22	23.59	3.72	6.36	1106.53	2.28	63.67
5/15/2009 16:22	310.05	24.63	23.61	3.73	6.36	1107.35	2.18	63.22
5/15/2009 16:23	306.84	25.03	25.63	3.72	6.35	1103.06	2.10	65.74
5/15/2009 16:24	308.74	25.26	23.66	3.72	6.36	1108.73	2.41	64.43
5/15/2009 16:25	304.83	25.40	21.97	3.71	6.36	1095.38	2.27	65.00
5/15/2009 16:26	304.91	25.09	21.77	3.70	6.35	1101.09	2.29	64.87
5/15/2009 16:27	308.24	24.70	21.56	3.68	6.35	1108.41	2.36	63.46
5/15/2009 16:28	306.82	25.32	21.86	3.68	6.35	1099.34	2.22	65.44
5/15/2009 16:29	305.92	24.97	22.01	3.71	6.34	1093.31	2.17	63.92
5/15/2009 16:30	304.54	24.03	22.41	3.77	6.34	1097.74	2.19	61.92
5/15/2009 16:31	307.83	24.66	23.45	3.77	6.34	1108.31	2.05	62.87
5/15/2009 16:32	304.78	24.06	23.56	3.75	6.34	1088.41	2.20	61.02
5/15/2009 16:33	300.19	23.77	22.67	3.71	6.34	1077.80	1.99	61.57
5/15/2009 16:34	304.16	24.19	23.74	3.71	6.36	1086.35	2.11	62.60
5/15/2009 16:35	303.07	23.41	22.31	3.69	6.36	1082.88	2.26	60.27
5/15/2009 16:36	300.18	23.51	22.18	3.67	6.36	1077.19	2.17	62.96
5/15/2009 16:37	300.44	23.81	22.50	3.67	6.36	1080.82	2.44	62.71
5/15/2009 16:38	303.60	23.96	20.77	3.67	6.35	1093.10	2.35	62.98
5/15/2009 16:39	305.46	24.96	21.64	3.68	6.36	1098.82	2.38	63.23
5/15/2009 16:40	306.42	24.26	20.61	3.69	6.35	1095.96	2.38	62.89
5/15/2009 16:41	305.01	24.24	21.15	3.70	6.34	1090.81	2.25	60.54
5/15/2009 16:42	302.90	23.44	22.33	3.72	6.35	1082.27	2.26	61.92
5/15/2009 16:43	301.35	23.87	22.80	3.73	6.35	1086.61	2.29	62.08
5/15/2009 16:44	307.94	23.32	20.99	3.74	6.35	1094.58	2.29	59.61
5/15/2009 16:45	300.29	23.23	22.42	3.72	6.34	1074.38	2.14	62.00
5/15/2009 16:46	299.64	23.70	23.06	3.68	6.35	1076.35	2.28	62.59
5/15/2009 16:47	303.36	23.23	21.00	3.69	6.35	1084.24	2.29	60.62

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5/15/2009 16:48	303.95	23.50	21.99	3.69	6.34	1079.46	2.18	60.22
5/15/2009 16:49	300.16	22.94	22.79	3.70	6.34	1069.31	2.24	62.19
5/15/2009 16:50	302.01	23.82	22.87	3.70	6.36	1076.11	2.24	60.56
5/15/2009 16:51	301.26	23.13	22.42	3.70	6.36	1078.10	2.21	61.20
5/15/2009 16:52	301.74	23.10	22.51	3.70	6.36	1079.81	2.29	61.61
5/15/2009 16:53	301.59	23.53	22.07	3.70	6.35	1080.33	2.22	62.60
5/15/2009 16:54	302.64	23.48	22.02	3.71	6.35	1083.89	2.40	62.10
5/15/2009 16:55	302.74	23.68	20.89	3.71	6.35	1086.45	2.53	61.58
5/15/2009 16:56	303.89	24.41	20.36	3.71	6.34	1088.20	2.45	63.07
5/15/2009 16:57	300.94	24.47	20.25	3.71	6.34	1074.33	2.46	63.93
5/15/2009 16:58	299.59	24.03	19.23	3.71	6.35	1075.34	2.51	62.07
5/15/2009 16:59	301.65	24.11	19.14	3.71	6.35	1076.58	2.36	62.97
5/15/2009 17:00	297.60	23.93	20.21	3.71	6.34	1065.75	2.45	63.52
5/15/2009 17:01	301.06	23.56	19.25	3.71	6.34	1078.03	2.51	61.38
5/15/2009 17:02	299.33	23.88	19.85	3.71	6.34	1076.49	2.35	62.31
5/15/2009 17:03	299.80	23.38	20.02	3.72	6.35	1078.76	2.44	60.82
5/15/2009 17:04	303.56	23.63	20.35	3.72	6.36	1081.67	2.35	62.04
5/15/2009 17:05	303.12	23.73	21.00	3.73	6.35	1083.66	2.41	60.27
5/15/2009 17:06	305.50	23.73	21.02	3.73	6.35	1086.35	2.30	61.69
5/15/2009 17:07	302.93	23.50	21.52	3.73	6.35	1078.97	2.44	61.38
5/15/2009 17:08	302.68	23.77	20.70	3.73	6.34	1081.22	2.43	62.83
5/15/2009 17:09	302.61	24.34	21.11	3.73	6.34	1074.49	2.43	63.39
5/15/2009 17:10	298.98	23.29	19.95	3.73	6.35	1064.39	2.48	61.39
5/15/2009 17:11	300.63	23.87	20.21	3.73	6.35	1072.17	2.39	63.65
5/15/2009 17:12	300.04	24.04	20.83	3.72	6.35	1066.55	2.48	62.35
5/15/2009 17:13	301.11	24.01	20.06	3.71	6.36	1073.88	2.38	63.27
5/15/2009 17:14	305.02	24.48	20.47	3.70	6.36	1090.06	2.49	63.21
5/15/2009 17:15	302.37	23.73	20.09	3.69	6.36	1082.32	2.54	62.66
5/15/2009 17:16	299.69	24.08	20.22	3.68	6.36	1075.10	2.33	62.49
5/15/2009 17:17	299.21	23.51	20.02	3.69	6.35	1075.31	2.36	63.60
5/15/2009 17:18	303.45	23.64	20.24	3.74	6.35	1080.05	2.50	63.01
5/15/2009 17:19	302.03	24.34	20.07	3.74	6.35	1081.36	2.46	65.31
5/15/2009 17:20	304.41	24.96	20.25	3.74	6.34	1088.04	2.48	64.10
5/15/2009 17:21	301.88	24.03	19.76	3.74	6.34	1077.87	2.46	62.94
5/15/2009 17:22	298.96	24.03	20.23	3.74	6.34	1067.18	2.38	63.13
5/15/2009 17:23	302.15	23.68	20.33	3.73	6.34	1078.83	2.44	60.89
5/15/2009 17:24	303.60	23.84	20.86	3.73	6.34	1080.82	2.33	62.54
5/15/2009 17:25	303.03	24.19	21.80	3.73	6.35	1081.31	2.44	61.40
5/15/2009 17:26	303.67	23.74	20.91	3.73	6.35	1077.63	2.31	63.02
5/15/2009 17:27	299.55	24.18	22.01	3.73	6.36	1066.74	2.47	62.92
5/15/2009 17:28	303.76	24.28	20.47	3.73	6.35	1079.84	2.36	61.92
5/15/2009 17:29	305.20	24.11	21.12	3.73	6.35	1085.39	2.49	63.02
5/15/2009 17:30	306.11	24.60	21.00	3.74	6.35	1086.47	2.40	61.70
5/15/2009 17:31	305.76	23.74	20.87	3.76	6.34	1082.74	2.31	63.11
5/15/2009 17:32	301.83	24.04	21.90	3.74	6.33	1074.63	2.39	60.59
5/15/2009 17:33	304.03	23.65	21.42	3.73	6.34	1083.42	2.29	61.95
5/15/2009 17:34	305.10	24.16	22.84	3.71	6.34	1091.93	2.31	62.92
5/15/2009 17:35	306.94	23.91	21.10	3.70	6.34	1093.62	2.40	61.43
5/15/2009 17:36	304.30	24.56	21.21	3.70	6.34	1081.31	2.28	63.49
5/15/2009 17:37	303.25	24.76	21.07	3.71	6.34	1080.84	2.38	63.88
5/15/2009 17:38	305.12	24.29	20.52	3.71	6.34	1082.95	2.48	63.51
5/15/2009 17:39	301.98	24.56	20.84	3.71	6.36	1072.06	2.40	64.37
5/15/2009 17:40	300.86	23.93	20.61	3.71	6.36	1075.10	2.45	62.29
5/15/2009 17:41	303.83	24.09	20.38	3.70	6.36	1081.34	2.40	63.00
5/15/2009 17:42	302.42	23.98	21.06	3.69	6.36	1073.27	2.48	61.38
5/15/2009 17:43	299.93	23.52	20.38	3.64	6.36	1074.45	2.30	60.61
5/15/2009 17:44	303.08	23.19	20.95	3.54	6.35	1087.41	2.19	59.64
5/15/2009 17:45	306.00	23.40	22.33	3.53	6.35	1094.18	2.21	62.61
5/15/2009 17:46	302.82	24.11	22.98	3.59	6.35	1089.02	2.41	62.01

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5/15/2009 17:47	303.25	23.59	20.50	3.72	6.35	1092.24	2.38	61.55
5/15/2009 17:48	306.51	24.37	21.42	3.73	6.34	1093.34	2.32	63.05
5/15/2009 17:49	309.08	24.62	21.08	3.73	6.34	1096.48	2.45	63.70
5/15/2009 17:50	309.83	24.69	20.87	3.73	6.34	1095.94	2.38	61.80
5/15/2009 17:51	305.70	23.55	21.04	3.74	6.35	1086.14	2.44	62.75
5/15/2009 17:52	302.85	23.89	21.35	3.74	6.35	1084.03	2.40	61.93
5/15/2009 17:53	306.38	23.92	20.75	3.73	6.36	1088.06	2.42	63.34
5/15/2009 17:54	301.04	24.42	21.31	3.73	6.35	1074.61	2.46	61.95
5/15/2009 17:55	306.46	24.52	20.15	3.73	6.35	1086.80	2.34	63.11
5/15/2009 17:56	310.55	24.52	21.07	3.74	6.35	1104.38	2.32	61.35
5/15/2009 17:57	310.65	24.06	21.59	3.70	6.35	1106.98	2.21	62.44
5/15/2009 17:58	304.15	23.74	22.98	3.68	6.35	1087.17	2.35	61.22
5/15/2009 17:59	303.30	23.90	21.25	3.68	6.36	1082.98	2.32	62.20
5/15/2009 18:00	306.23	24.08	20.96	3.68	6.36	1094.18	2.41	60.78
5/15/2009 18:01	307.87	23.80	20.81	3.69	6.36	1092.38	2.28	61.86
5/15/2009 18:02	303.85	23.51	22.12	3.65	6.36	1085.56	2.35	60.54
5/15/2009 18:03	305.01	23.58	21.26	3.54	6.35	1091.65	2.30	62.44
5/15/2009 18:04	306.18	24.01	21.80	3.54	6.34	1090.13	2.43	59.62
5/15/2009 18:05	304.00	23.34	20.78	3.54	6.34	1080.54	2.22	61.00
5/15/2009 18:06	300.20	23.04	21.97	3.54	6.36	1069.45	2.45	60.71
5/15/2009 18:07	301.18	23.39	20.78	3.54	6.36	1079.04	2.35	62.09
5/15/2009 18:08	309.21	24.20	20.90	3.54	6.36	1104.61	2.41	60.16
5/15/2009 18:09	309.54	23.75	21.31	3.60	6.36	1108.90	2.22	59.20
5/15/2009 18:10	307.11	22.86	22.36	3.76	6.36	1094.70	2.14	56.99
5/15/2009 18:11	302.41	21.94	22.91	3.77	6.35	1075.43	2.17	59.82
5/15/2009 18:12	302.80	22.65	23.73	3.75	6.36	1076.95	2.22	58.21
5/15/2009 18:13	304.24	22.63	22.17	3.71	6.35	1086.33	2.10	59.25
5/15/2009 18:14	303.40	22.76	23.15	3.71	6.35	1080.38	2.26	58.12
5/15/2009 18:15	300.84	22.56	21.98	3.71	6.36	1076.98	2.14	60.75
5/15/2009 18:16	303.33	23.00	22.76	3.71	6.34	1082.74	2.24	59.75
5/15/2009 18:17	303.66	22.45	22.20	3.71	6.34	1084.71	2.15	59.08
5/15/2009 18:18	306.57	23.06	24.31	3.71	6.35	1092.19	2.10	58.97
5/15/2009 18:19	304.68	22.85	23.86	3.71	6.35	1087.03	2.24	61.25
5/15/2009 18:20	302.45	23.49	23.70	3.70	6.36	1081.13	2.33	60.39
5/15/2009 18:21	305.26	23.27	21.69	3.72	6.35	1087.97	2.40	62.18
5/15/2009 18:22	305.00	24.31	22.04	3.70	6.35	1096.83	2.37	60.88
5/15/2009 18:23	306.36	23.67	21.39	3.70	6.34	1094.95	2.31	62.26
5/15/2009 18:24	306.89	24.02	21.75	3.71	6.34	1086.75	2.32	61.04
5/15/2009 18:25	308.38	23.58	21.86	3.67	6.35	1088.44	2.38	62.94
5/15/2009 18:26	304.60	24.04	22.20	3.58	6.35	1076.84	2.42	60.60
5/15/2009 18:27	302.43	23.37	20.77	3.61	6.35	1076.93	2.34	61.52
5/15/2009 18:28	305.06	23.79	21.52	3.70	6.35	1081.50	2.46	60.43
5/15/2009 18:29	299.80	23.50	20.82	3.70	6.36	1075.52	2.43	61.22
5/15/2009 18:30	305.20	24.06	20.46	3.69	6.36	1092.05	2.56	62.06

CRLLC-CHAL-000242

Appendix D
Calibration Gas Certifications

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:	E02NI99E15A0302	Reference Number:	83-124129460-1
Cylinder Number:	CC160222	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Mar 27, 2008	Valve Outlet:	350

Expiration Date: Mar 27, 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 Uncertainity
CARBON MONOXIDE	50.00 PPM	49.87 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	980608	CC10263	98.0PPM CARBON MONOXIDE/NITROGEN	Jun 01, 2008
NTRM	98060215	XC012369B	49.59PPM CARBON MONOXIDE/NITROGEN	Jul 05, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SCOGL	NonDispersive Infrared	Mar 19, 2008

Triad Data Available Upon Request

Notes:

QA Approval

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:	E02NI99E15A1403	Reference Number:	83-124130335-4
Cylinder Number:	CC156383	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Apr 03, 2008	Valve Outlet:	350

Expiration Date: Apr 03, 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 Uncertainity
CARBON MONOXIDE	95.00 PPM	95.04 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	98060215	XC012369B	49.59PPM CARBON MONOXIDE/NITROGEN	Jul 05, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SCOGL	NonDispersive Infrared	Mar 19, 2008

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

Airgas Specialty Gases
1075 Cinders Drive
Port Allen, LA 70767
225.383.0900
FAX 225.388.0949
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A3168	Reference Number:	83-124164884-6
Cylinder Number:	CC200089	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 02, 2009	Valve Outlet:	350

Expiration Date: Feb 02, 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	500.0 PPM	499.8 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080803	CC255641	250.0PPM CARBON MONOXIDE/NITROGEN	May 05, 2012
NTRM	08080423	CC255481	1002.4PPM CARBON MONOXIDE/NITROGEN	Apr 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2HCO	FTIR	Jan 22, 2009

Triad Data Available Upon Request

Notes:

QA Approval

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Airgas

Airgas Specialty Gases
1075 Centaur Drive
Port Allen, LA 70767
225.388.3900
FAX 225.388.0959
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0101	Reference Number:	83-124164877-3
Cylinder Number:	CC192903	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 03, 2009	Valve Outlet:	350

Expiration Date: Feb 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
CARBON MONOXIDE	1000 PPM	997.7 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080604	cc255365	1002.4PPM CARBON MONOXIDE/NITROGEN	Apr 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2HCO	FTIR	Jan 22, 2009

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

Airgas Specialty Gases
12722 S. Western Avenue
Chicago, IL 60628
1-773-785-3000
FAX: 1-773-785-1978
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A1704	Reference Number:	54-124164831-1
Cylinder Number:	CC216348	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jan 19, 2009	Valve Outlet:	660

Expiration Date: Jul 19, 2009

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. 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
NITROGEN DIOXIDE	50.00 PPM	51.99 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
GMIS	112008	CC208124	57.23PPM NITROGEN DIOXIDE/NITROGEN	Nov 16, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet Magna	FTIR	Jan 07, 2009

Triad Data Available Upon Request

Notes:

QA Approval

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AIR LIQUIDE

11426 Patewood Pkwy, LaPorte, TX 77571 (281)474-6400

EPA Protocol

EPA-600/R-97/121

Section 2.2 Procedure G-1

Customer: Shaw Environmental, Inc

S.O. #: 32672841
Trnsf. # : 32672841
P.O. # :
Item# :

Cylinder # :	Lot # :	Valve:
CC196300	LPX249280	CGA660

Component	Concentration (Mole)	
Nitrogen	Balance	
Nitric Oxide	50.9	±1.1 ppm
Total NOX	51.3	ppm

Assay Date:	Expiration Date:	*Cyl. Press:
13-Mar-09	13-Mar-11	1900psig

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

Mid-Range Stack Testing
AI# 122938

CRLLC-CHAL-000249

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Customer:	SHAW ENVIRONMENTAL		
Part Number:	E02NI99E15AC1E0	Reference Number:	83-124129460-5
Cylinder Number:	CC116454	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Mar 25, 2008	Valve Outlet:	660

Expiration Date: Mar 25, 2010

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	95.00 PPM	94.92 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

Total oxides of nitrogen	94.93 PPM	For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	06060415	CC207622	93.2PPM NITRIC OXIDE/NITROGEN	Jan 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIRLNO	FTIR	Mar 20, 2008

Triad Data Available Upon Request

Notes:NITRIC OXIDE 90-100 PPM PROTOCOL 1 STANDARD

QA Approval

Airgas

Airgas Specialty Gases
1075 Concare Drive
Port Allen, LA 70767
225.388.0900
FAX: 225.388.0953
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI90E15A0228	Reference Number:	83-124140032-1
Cylinder Number:	CC218440	Cylinder Volume:	145 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jun 10, 2008	Valve Outlet:	590

Expiration Date: Jun 10, 2011

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	10.00 %	9.993 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	06060829	CC207986	22.51% OXYGEN/NITROGEN	May 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SO2GH	Paramagnetic	May 22, 2008

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

Airgas Specialty Gases
1075 Cuneiform Drive
Port Allen, LA 70767
225 338 0900
FAX 225.388.0959
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number	E02NI99E15A0350	Reference Number:	83-124164864-4
Cylinder Number:	XC031652	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 16, 2009	Valve Outlet:	660

Expiration Date: Feb 16, 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
SULFUR DIOXIDE	50.00 PPM	49.82 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	060613	CC207437	45.91PPM SULFUR DIOXIDE/NITROGEN	Sep 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2L6O2	FTIR	Jan 28, 2009

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

Airgas Specialty Gases
1075 Cinclare Drive
Port Allen, LA 70767
225.368.0900
FAX: 225.388.0969
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0239	Reference Number:	83-124116278-1
Cylinder Number:	CC13891	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 28, 2007	Valve Outlet:	660

Expiration Date: Nov 28, 2009

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 Uncertainity
SULFUR DIOXIDE	90.00 PPM	90.59 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	06061308	CC207585	45.91PPM SULFUR DIOXIDE/NITROGEN	Sep 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIRLSO2	FTIR	Nov 08, 2007

Triad Data Available Upon Request

Notes:

QA Approval

Appendix E
Shaw Personnel Resumes

Last Updated: 02 Jan 2007

Richard H. Ishikawa

Professional Qualifications

Mr. Ishikawa has over 14 years of experience as an air quality professional managing large, multi-task programs. He is very knowledgeable about federal and state environmental laws and regulations.

Education

Bachelor of Science, Biology/Chemistry, Texas State University, San Marcos, Texas, 1985
Postgraduate Studies, Chemistry, University of Houston - Clear Lake, Houston, Texas

Additional Training/Continuing Education

Basic Plus Safety, Houston, TX, 2006
Respirator Training, Houston, TX, 2005
40-Hour Hazardous Waste Operations and Emergency Response Training (29CFR1910.120), Houston, TX, 1995

Experience and Background

06/2006 - Present
Project Manager, Shaw Environmental & Infrastructure, Inc., Baton Rouge, Louisiana

Responsibilities include providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Air Permit Support, Little Gypsy 3 Repowering Project, 120581, Entergy Louisiana, LLC, Baton Rouge, LA, 07/2006 - 08/2006
Submit Title V air permit application.

11/1996 - 06/2006
Project Manager, Entech Engineering Inc., League City, Texas

Responsibilities included providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Project Manager, Wet -Scrubber Removal Efficiency Test Program, , Lubrizol Corporation, Deer Park, Texas, $50,000.00, 05/2006 - 06/2006
Quantify HRVOC/VOC and HCL/Cl2 emissions during worst-case operations at multiple wet scrubbers. Determine HCl/Cl2 removal efficiencies.

CRLLC-CHAL-000255

Project Manager, HRVOC Source Inventory, , Chevron Phillips Chemical Company, Pasadena, TX, $1,000,000.00, 10/2005 - 06/2006
Identify and quantify all potential sources of HRVOC/VOC emissions during worst-case operations at multiple polymer plants within the Pasadena Plastics Plant. The project involved multiple crews working two twelve-hour shifts over several months.

Other Comments:
Project was long-term and was still continuing when I departed. The revenue for this one project was year-to-date.

Project Manager, Ambient H2S Monitoring, , MeadWestvaco Paper Plant, Vidor, Texas, $30,000.00, 04/2006 - 04/2006
12-Hour fenceline monitoring of ambient H2S concentrations. The data was to support plant claim that TCEQ measurements were inconclusive.

Project Manager, Fuel Gas H2S Monitoring Project, , ExxonMobil Chemical Company, Beaumont, Texas, $40,000.00, 12/2005 - 02/2006
Long-term project involving the continuous measurement of H2S content of fuel gas.

04/1992 - 11/1996
Principal Environmental Scientist, Tenerx Corporation, Friendswood, Texas

Responsibilities included providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Principal Environmental Scientist, Burner Optimization Project, , Tennessee Valley Authority, Knoxville, TN, $150,000.00, 10/1995 - 10/1995
Long-term project to facilitate the optimization of the burners for minimizing fuel usage.

Accomplishments:
Fuel saving over a year estimated between 0.8 to 1 million dollars.

Professional Affiliations
Air and Waste Management Association, 1992

CRLLC-CHAL-000256

Last Updated: 04 Dec 2008

Blake Fogleman

Professional Qualifications

Blake Fogleman has over a year of engineering consulting experience, providing technical assistance, engineering design, and project support. He has performed engineering calculations, report and presentation generation, as well as daily support in several civil and environmental engineering projects throughout the United States. He has been specifically involved in wetland and vegetation surveying, dredging design, roadway design, geotechnical design, and site development. Blake is most recently involved in providing technical assistance, in the field and office, on numerous air emission testing projects.

Education

Bachelor of Science, Civil and Environmental Engineering, Louisiana State University, Baton Rouge, Louisiana, 2007

Additional Training/Continuing Education

Basic Plus Safety, Baton Rouge Safety Council, 2008

Registrations/Certifications/Licenses

Engineering Intern, 2007, 0028729, Active, Louisiana, 03/2010

Security Clearance

Transportation Worker Identification Credential, Department of Homeland Security/FEMA, 2008, Active, 04/2013

Experience and Background

01/2008 - Present
Engineer 1, Shaw Environmental & Infrastructure, Inc., Engineering and National Air Measurement Group, Baton Rouge, Louisiana

Responsibilities include assistance with engineering calculations, graphing, and report generation. Daily activities include working alongside mid-level civil and environmental engineers and scientists, under direct supervision of the Program Manager.

05/2007 - 12/2007
Intern / Co-Op, Shaw Environmental & Infrastructure, Inc., Engineering, Baton Rouge, Louisiana

Assisted in engineering calculations, graphing, and project report preparations. Daily activities included working alongside mid-level civil and environmental engineers under the direct supervision of the Program Manager

CRLLC-CHAL-000257

06/2000 - 01/2007
General Assistant, BCI Louisiana, Mermentau, Louisiana

Assisted in development of process flows and piping for pilot plant expansion project. Participated in operations of Biomass to Ethanol R and D facility. Pipe fabricator's assistant. Ground keeper and maintenance in a fifty acre refinery. Handled all accounting functions for the plant: AR, payroll, GL, etc.

07/2001 - 07/2006
Louisiana Youth Seminar Counselor and Staff Assistant, Louisiana Seminars of America, Baton Rouge, Louisiana

One of four high school delegates chosen out of 200 to return and honor a four year commitment as a leader of LYS.
Staff (junior counselor and counselor) 4 years, Head Table (2 years)

Planned and organized 2005 and 2006's week long program. Assisted in executive duties during program. Political Party Coordinator. Responsible for daily leadership activities of 15-20 high school delegates. Mentor for Junior Counselor.

08/2001 - 06/2006
Louisiana Boys State Counselor and Staff member, Louisiana Boys State, Baton Rouge, Louisiana

Chosen out of 600 high school juniors to lead Louisiana Boys State as a counselor.
Requested to serve every year from 2001 to 2006.

Logistics and Operations supervisor. Organization and supervision of daily activities of up to 600 Boys State citizens and 60 counselors. Development and organization of Louisiana Boys State 2006

Professional Affiliations

Air & Waste Management Association, fellow, 2008
Louisiana Engineering Society, fellow, 2008
Louisiana Water Environment Association, fellow, 2006
WEF, fellow, 2005
Louisiana Water Environment Association at LSU, fellow, 2003

CRLLC-CHAL-000258

Last Updated: 17 Feb 2009

Matthew Wall

Professional Qualifications

Mr. Wall is an environmental technician with experience in Instrument Process Technology. He is proficient with PLCs, pumps, motors, breakers, power and hand tools, and electrical equipment and instrumentation. He has a thorough understanding of analytical procedures, maintenance, and nuclear facilities, as well as some knowledge of transformers, turbines, and reactors. Mr. Wall is certified in First Aid and CPR and is perceptive of safety and Personal Protective Equipment (PPE).

Education

Associate of Specialized Technology, Instrumentation and Operations, ITI Technical College, Baton Rouge, Louisiana, 2008

Security Clearance

Nuclear Plant Security Clearance, Other, 2008, Active, 01/2008

Experience and Background

06/2008 - 01/2008
I&E technician, Entergy, Nuclear, St. Francisville, Louisiana

Performing nuclear facility and plant maintenance, reviewing technical documents, adhering to maintenance and safety procedures, and operating electrical equipment and instrumentation.

CRLLC-CHAL-000259

Appendix F
Project Participants

Project Participants

The CRLLC contact for additional information is Mr. Jeff Bergeron. The testing organization is Shaw Environmental, Inc. and the contacts at Shaw are Messrs. Richard Ishikawa and Blake Fogleman. The names and addresses of these contacts are as follows:

Jeff Bergeron, P.E.
Environmental Advisor
Chalmette Refining, LLC
500 W. St. Bernard Hwy.
Chalmette, La 70044
Bus: 504.281.1934
Cell: 225.485.5450
E-mail: Jeff.Bergeron@exxonmobil.com

Richard Ishikawa
Project Manager
Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, LA 70809
Bus: (225) 932-2745
Fax: (225) 213-1274
E-mail: richard.ishikawa@shawgrp.com

Blake Fogleman, E.I.
Environmental Engineer
Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, LA 70809
Bus: (225) 932-5870
Fax: (225) 213-1274
E-mail: blake.fogleman@shawgrp.com

CRLLC-CHAL-000261

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 279-9481

July 20, 2006

U.S. Environmental Protection Agency
Director, Air Enforcement Division
Office of Regulatory Enforcement
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code 2242-A
Washington, DC 20460
Certified Mail: 7003 1010 0002 9997 9353

Peggy M. Hatch
Administrator, Enforcement Division
Office of Environmental Compliance
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, LA 70821-4312
Certified Mail: 7003 1010 0002 9997 9346

Re: Flare 2 Velocity Test
United States of America, and the State of Louisiana v. Chalmette Refining, L.L.C.
Civil Action Case Number 05-4662
DOJ Case Number 90-5-2-1-07030/2

Dear Sir or Madam:

Pursuant to Paragraph 60.b.2 of the Consent Decree (CD) entered on April 26, 2006 between the United States and Chalmette Refining, L.L.C., CRLLC conducted a velocity test on Flare 2. The test report is enclosed.

If you have any questions, or need any additional information, please contact me at (504) 281-1989.

Sincerely,

Claudine Gorman

Claudine Gorman, P.E.
Environmental Group Leader

cc:

Director, Air Enforcement Division
Office of Regulatory Enforcement
c/o Matrix New World Engineering, Inc.
120 Eagle Rock Avenue, Suite 207
East Hanover, NJ 07936
Certified Mail: 7003 1010 0002 9997 9193

Chief
Air, Toxics, and Inspections Coordination Branch
Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733
Certified Mail: 7003 1010 0002 9997 9209

cc (electronic):

jmack@matrixneworld.com
foley.patrick@epa.gov
charles.p.feerick@exxonmobil.com

CHALMETTE REFINING

P.O. BOX 1007

CHALMETTE, LOUISIANA 70044

EMISSION COMPLIANCE TESTS

NO. 2 FLARE
(source ID 29)

JUNE 15, 2006

ETS®
Emission Testing Services, Inc.
P.O. BOX 15075
BATON ROUGE, LOUISIANA 70895

Phone 225-925-8405 Fax 225-925-2343
Email: reporting@emissiontesting.com
www.emissiontesting.com

LELAP Certificate Number 02059 issued to ETS by LDEQ

ETS Project Number: 26089

Final Report: 12-Jul-2006, 41 Pages
Draft Report: 06-Jul-2006, 89 Pages

CRLLC-CHAL-000264

CERTIFICATION of TEST REPORT

CHALMETTE REFINING

EMISSION COMPLIANCE TESTS

NO. 2 FLARE
(source ID 29)

JUNE 15, 2006

Testing Conducted by:

EMISSION TESTING SERVICES, INC.

Emission Testing Services, Inc. (ETS) is certified by the Louisiana Department of Environmental Quality (LDEQ), certificate number 02059, as a qualified environmental testing laboratory under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information; I believe the submitted information is true, accurate, and complete.

Rebecca Bourg
Chalmette Refining
Plant Representative

Ronald McCabe
Emission Testing Services, Inc.
Project Leader

Barry Gipson
Emission Testing Services, Inc.
Manager

CRLLC-CHAL-000265

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STANDARD RESULT NOTATIONS

< None detected (less than or equal to). Result is the minimum detection limit. Actual result value may be less including the value zero (0).

! Result is the sum or average of multiple results where one or more of the results have a positive detection and one or more results are None Detected. The magnitude of the None Detected result(s) is significant (>30%) in comparison to the positive detection results. Actual result may be less; however, does not include the value zero (0) and is not less than the result calculated using the positive detection results alone.

CRLLC-CHAL-000266

I. INTRODUCTION

Emission Testing Services, Inc. (ETS) was contracted by Chalmette Refining LLC (Chalmette Refining) to conduct emission tests at the Chalmette Refinery located in St. Bernard Parish, Louisiana. The No. 2 Flare, source ID 29, was tested to demonstrate compliance in accordance with Paragraph 60.b of the CRLLC Consent Decree (Case No. 05-4662)

All tests were conducted following EPA test methods. EPA Method 18 was used to determine the flare gas composition and heat of combustion. Flow rate of the flare gas was determined using EPA Method 2D.

The ETS emission test team consisted of Project Leader Ronald McCabe. Rebecca Bourg represented Chalmette Refining and coordinated testing with plant operations. The LDEQ was not represented during the emission tests.

Tests on the No. 2 Flare were conducted on June 15, 2006. Three, 60-minute duration test runs were conducted.

CRLLC-CHAL-000267

II. SUMMARY

Discussion of Tests

On June 15, 2006, emission tests were conducted on the No. 2 Flare located at Chalmette Refining. The No. 2 Flare was tested to demonstrate compliance in accordance with Paragraph 60.b of the CRLLC Consent Decree (Case No. 05-4662)

Three, 60-minute duration test runs were conducted to determine the exit velocity, gas composition, and gas heat of combustion.

The No. 2 Flare is a steam-assisted flare that has a single, 27.06 in.-diameter burner tip. The flare is equipped with a continuous pilot ignition system and flame integrity monitor.

No. 2 Flare Test Results

Results of the tests, summarized in Table I, indicate that the No. 2 Flare is operating in compliance with applicable limits.

The flare gas was found to have an average net heat of combustion of 751.65 Btu/ft3 which is in compliance with the minimum required net heat of combustion of 300 Btu/ft3.

During the tests, flare gas flow rate was determined to have an average exit velocity of 2.621 ft/sec, wet basis, which is in compliance with the maximum permitted exit velocity (Vmax) of 203.2 ft/sec, wet basis.

CRLLC-CHAL-000268

Notations and Conclusions

Test Method Modifications, Deviations, and Unusual Conditions

All tests were conducted using EPA test methods without modification. During the tests, there were no deviations from the methods and no unusual conditions were noted.

Test Conclusions

Quality assurance and quality control procedures meeting EPA and LDEQ requirements were used during the emission tests. All quality indicators were within the range of acceptable results demonstrating that these test data are accurate, complete, and representative of emissions conditions. Overall, the quality of data obtained during the tests are acceptable to meet project objectives.

CRLLC-CHAL-000269

TABLE I
EMISSION TEST RESULTS

CHALMETTE REFINING LLC

NO. 2 FLARE (steam-assisted flare)

		Permit Limit	RUN 1	RUN 2	RUN 3	AVERAGE
DATE			15-Jun-06	15-Jun-06	15-Jun-06	
TIME			1310-1400	1400-1500	1500-1600	
FLARE GAS DATA						
net Heat of Combustion	Btu/ft3	300	745.80	751.44	757.70	751.65
Exit Velocity	ft/sec	< Vmax	2.558	2.713	2.591	2.621
Max. Permitted Exit Velocity (Vmax), ft/sec			200.0	203.0	206.5	203.2

CRLLC-CHAL-000270

III. PROCEDURE

Emission tests were conducted per the emission test plan outlined in Table I using EPA test methods documented in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A. A brief description of each method used during the tests follows.

LOCATION of SAMPLE POINTS

Samples of the flare gas were collected from a single sample point located on the Flare Gas Knock Out Drum, C1015.

EPA METHOD 2D
MEASUREMENT of GAS VOLUME FLOW RATES in SMALL PIPES and DUCTS

The volumetric flow rate of the source gas was measured by routing all of the flow through a flow measuring device such as a rotometer, orifice plate, or similar device. The flow meter was calibrated per manufacturer's specifications prior to use.

EPA METHOD 18
MEASUREMENT of GASEOUS COMPOUND EMISSIONS by GAS CHROMATOGRAPHY

Tedlar Gas Sample Bag Procedure

Concentration of the organic compounds of interest in the stack gas was determined by extracting a sample of the stack gas using a stainless steel probe. Sample gas was transferred from the probe through a Teflon sample line to a Tedlar gas sample bag. Sample was continuously collected into the Tedlar bag (integrated sample) over the entire duration of the test run.

After sampling, the Tedlar bag was removed from the sample train, sealed, and prepared for shipment to the analytical laboratory.

CRLLC-CHAL-000271

IV. ANALYTICAL TECHNIQUE

All samples collected during the emission tests were analyzed using EPA or EPA approved test methods. A brief description of each method used during the tests follows.

EPA METHODS 2D

There are no samples analysis associated with this method.

EPA METHOD 18
MEASUREMENT of GASEOUS COMPOUND EMISSIONS by GAS CHROMATOGRAPHY

Tedlar Gas Sample Bag Procedure

Concentration of the organic compounds of interest in the sample was determined through analysis using a gas chromatograph equipped with a flame ionization detector (FID). The compounds of interest were separated from the sample using an appropriate column. Retention time and peak area were compared with those of known standards that were analyzed at identical conditions.

CRLLC-CHAL-000272

V. QUALITY ASSURANCE/ QUALITY CONTROL

Test results were validated using rigorous quality assurance (QA) and quality control (QC) procedures documented in ETS' Standard Operating Procedures (SOP). These SOP meet or exceed EPA requirements and have the approval of the LDEQ under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

The QA/QC programs ensure that the test data are representative of the source conditions by verifying the completeness, accuracy, and precision of the test data. QA/QC functions cover all aspects of the test including field-testing, sampling, sample analysis, sample storage and transport, and data processing and reporting.

Emission testing at Chalmette Refining included a series of QA/QC functions that were completed satisfactorily within the required limits. Therefore, data collected during testing should be considered accurate, precise, complete, and representative of stack conditions.

CRLLC-CHAL-000273

CHAIN of CUSTODY
for SAMPLES COLLECTED in the FIELD
and TRANSPORTED to the ANALYTICAL LABORATORY

For all samples transported away from the sample site for laboratory analysis, a Chain of Custody form was prepared during the sample recovery process. The sample ID, number of samples, liquid level when applicable, name of the person responsible for sample recovery, name of the sample recovery supervisor, and name and signature of the sample trustee were recorded on the form.

During all subsequent handling, the Chain of Custody form accompanied the samples. As personnel relinquished responsibility for the samples, the receiving sample trustee verified the number and integrity of the samples and signed the form.

Upon receipt at the analytical laboratory, the lab sample trustee verified the number, type, and integrity of the samples. These data were recorded on the custody form along with the date of receipt and the lab sample trustee's signature. At the time of analysis, the laboratory analyst recorded the date of analysis and signed the form. The Chain of Custody form was then attached to the final laboratory report of analysis.

Chain of custody forms are presented on the following pages for all samples collected during testing.

CRLLC-CHAL-000274

2006060181

ETS

EMISSION TESTING SERVICES, INC.

CHAIN of CUSTODY and ANALYTICAL REQUIREMENTS

CLIENT: EXXONMOBIL CHALMETTE	SOURCE: #2 FLARE

ETS SAMPLE ID	LAB ID NUMBER	SAMPLE DESCRIPTION	COLLECTION DATE	SAMPLE MEDIA	PRESERVATIVE/ TYPE & AMOUNT	STORE ON ICE	VOLUME MARKED	SEALED
BAG-R1		TEDLAR BAG	6/15/2006	TEDLAR	N/A	N/A	N/A	Y
BAG-R2		TEDLAR BAG	6/15/2006	TEDLAR	N/A	N/A	N/A	Y
BAG-R3		TEDLAR BAG	6/15/2006	TEDLAR	N/A	N/A	N/A	Y

TOTAL NUMBER of SAMPLES including BLANKS and SPIKES: 3	FIELD SAMPLE RECOVERY SUPERVISOR: Ron McCabe
SAMPLES COLLECTED BY: Ron McCabe	SAMPLE TRUSTEE FROM SAMPLE POINT: Ron McCabe

SAMPLES TRANSFERRED TO (LAB NAME)	TRANSFER DATE	TRANSFER METHOD	NUMBER OF SAMPLES	CONDITION OF SAMPLES	NOTES	RECEIVING SAMPLE TRUSTEE SIGNATURE
SPL, Inc.	6-16-06	Truck	3			Patti Petro

ANALYSIS REQUIRED: CO2, O2, H2, N2, AND EXTENDED REFINERY FUEL GAS ANALYSIS	DATE of ANALYSIS: ____ ANALYST:-- ____ REPORT DATE: ____ REPORT NUMBER: ____

NOTES RUSH!!! RUSH!!!

SAMPLE SET ____ OF ____ PAGE 1 OF 1

5.1.3

VI. TEST DATA and CALCULATIONS

Data Processing and Calculation Methods

All emission test data, laboratory analytical data, and unit operation data are presented in this section along with the associated data reduction calculations.

Data from the field data forms were manually input into a computer for data processing and calculation. Integrity of manual data input is maintained by using a double entry system. Accuracy of computer calculations is verified by processing a known set of data developed using manual calculation. Additional control of data input and processing is conducted through review of results by more than one individual.

CRLLC-CHAL-000276

No. 2 Flare

Emission tests were conducted on the No. 2 Flare to determine the composition and heat of combustion of the flare gas and the flare gas exit velocity. The composition and heat of combustion of the flare gas was determined using EPA Method 18. Flare gas exit velocity was determined by measuring flare gas volumetric flow rate per EPA Method 2D using Chalmette Refining's flow meter that is permanently installed on the flare.

Concentrations of oxygen, carbon dioxide, hydrogen, methane, and other flare gas components were determined on samples collected from a single test point located near the center of the flare feed line.

Test data and associated calculations are presented on the following pages.

CRLLC-CHAL-000277

No. 2 Flare
EPA Method 2D
(flare gas flow rate)

Flow rate of the flare gas during the emission tests was measured per EPA Method 2D using Chalmette Refining's flow meter that is permanently installed on the flare. Moisture of the flare gas was assumed saturated (3.5% moisture) at an assumed temperature of 70 F. This assumption results in a worst case concentration and heat of combustion.

Flow rate data obtained during the tests are presented on the following page. Data are presented in the units Klb/hr on a wet basis. These mass flow data were converted to volumetric flow data based on the molecular weight of the flare gas as determined from an analysis of the gas presented later in this report. Flow meter calibration data and specifications are presented in the appendices to this report.

CRLLC-CHAL-000278

Date	#2 FLARE BEST RANGE KLB/HR	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 13:10	2.221997994	0
6/15/06 13:11	2.255468589	0
6/15/06 13:12	2.265002966	0
6/15/06 13:13	2.24166081	0
6/15/06 13:14	2.252969265	0
6/15/06 13:15	2.284225941	0
6/15/06 13:16	2.315482378	0
6/15/06 13:17	2.346090478	0
6/15/06 13:18	2.340522528	0
6/15/06 13:19	2.31412816	0
6/15/06 13:20	2.28910886	0
6/15/06 13:21	2.339003128	0
6/15/06 13:22	2.332812548	0
6/15/06 13:23	2.26891017	0
6/15/06 13:24	2.20603146	0
6/15/06 13:25	2.20024991	0
6/15/06 13:26	2.22733891	0
6/15/06 13:27	2.25517807	0
6/15/06 13:28	2.323312277	0
6/15/06 13:29	2.329235435	0
6/15/06 13:30	2.286167753	0
6/15/06 13:31	2.281673193	0
6/15/06 13:32	2.298728859	0
6/15/06 13:33	2.279172659	0
6/15/06 13:34	2.239441586	0
6/15/06 13:35	2.247520185	0
6/15/06 13:36	2.14713704	0
6/15/06 13:37	2.174051571	0
6/15/06 13:38	2.214940429	0
6/15/06 13:39	2.194970137	0
6/15/06 13:40	2.223379731	0
6/15/06 13:41	2.279641509	0
6/15/06 13:42	2.334215647	0
6/15/06 13:43	2.295762157	0
6/15/06 13:44	2.265437245	0
6/15/06 13:45	2.270993948	0
6/15/06 13:46	2.275784868	0
6/15/06 13:47	2.238823152	0
6/15/06 13:48	2.22961542	0
6/15/06 13:49	2.182073528	0
6/15/06 13:50	2.172598124	0
6/15/06 13:51	2.208439112	0
6/15/06 13:52	2.244279861	0
6/15/06 13:53	2.28012085	0
6/15/06 13:54	2.314433277	0
6/15/06 13:55	2.264367431	0
6/15/06 13:56	2.214037418	0
6/15/06 13:57	2.191810608	0
6/15/06 13:58	2.170958865	0
6/15/06 13:59	2.22534107	0
6/15/06 14:00	2.242411011	0
Averages	2.256805061 Klb/hr	
	36776.79378 ft3/hr @ 23.659 lb/lb-mole	

Date	#2 FLARE BEST RANGE KLB/HR	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 14:00	2.242411011	0
6/15/06 14:01	2.262398243	0
6/15/06 14:02	2.31018312	0
6/15/06 14:03	2.293025887	0
6/15/06 14:04	2.298655987	0
6/15/06 14:05	2.338465202	0
6/15/06 14:06	2.332291603	0
6/15/06 14:07	2.299645901	0
6/15/06 14:08	2.267707145	0
6/15/06 14:09	2.27521348	0
6/15/06 14:10	2.306166637	0
6/15/06 14:11	2.376866454	0
6/15/06 14:12	2.390862942	0
6/15/06 14:13	2.359420097	0
6/15/06 14:14	2.374906391	0
6/15/06 14:15	2.373411298	0
6/15/06 14:16	2.346322298	0
6/15/06 14:17	2.319233298	0
6/15/06 14:18	2.292800689	0
6/15/06 14:19	2.302979827	0
6/15/06 14:20	2.333369011	0
6/15/06 14:21	2.316351044	0
6/15/06 14:22	2.325744867	0
6/15/06 14:23	2.365997541	0
6/15/06 14:24	2.385002255	0
6/15/06 14:25	2.391774535	0
6/15/06 14:26	2.398546815	0
6/15/06 14:27	2.403719109	0
6/15/06 14:28	2.321506613	0
6/15/06 14:29	2.291477442	0
6/15/06 14:30	2.321067095	0
6/15/06 14:31	2.350656509	0
6/15/06 14:32	2.380246162	0
6/15/06 14:33	2.409174627	0
6/15/06 14:34	2.402096993	0
6/15/06 14:35	2.421171379	0
6/15/06 14:36	2.412308455	0
6/15/06 14:37	2.371327639	0
6/15/06 14:38	2.331026429	0
6/15/06 14:39	2.328644872	0
6/15/06 14:40	2.34809351	0
6/15/06 14:41	2.366737282	0
6/15/06 14:42	2.340487838	0
6/15/06 14:43	2.290222013	0
6/15/06 14:44	2.340528065	0
6/15/06 14:45	2.370441914	0
6/15/06 14:46	2.355622411	0
6/15/06 14:47	2.384941095	0
6/15/06 14:48	2.385966063	0
6/15/06 14:49	2.356216288	0
6/15/06 14:50	2.352399945	0
6/15/06 14:51	2.36351335	0
6/15/06 14:52	2.374173528	0
6/15/06 14:53	2.359554172	0
6/15/06 14:54	2.331295651	0
6/15/06 14:55	2.354032159	0
6/15/06 14:56	2.40541541	0
6/15/06 14:57	2.417135835	0
6/15/06 14:58	2.40602231	0
6/15/06 14:59	2.394447756	0
6/15/06 15:00	2.355891949	0
Averages	2.34880845 Klb/hr	
	39008.12848 ft3/hr @ 23.215 lb/lb-mole	

Date	#2 FLARE BEST RANGE KLB/HR	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 15:00	2.355891949	0
6/15/06 15:01	2.235181648	0
6/15/06 15:02	2.254495597	0
6/15/06 15:03	2.318295479	0
6/15/06 15:04	2.346647888	0
6/15/06 15:05	2.330407441	0
6/15/06 15:06	2.351745331	0
6/15/06 15:07	2.32965219	0
6/15/06 15:08	2.263255316	0
6/15/06 15:09	2.327164525	0
6/15/06 15:10	2.370066851	0
6/15/06 15:11	2.412403983	0
6/15/06 15:12	2.397481561	0
6/15/06 15:13	2.392811257	0
6/15/06 15:14	2.362263083	0
6/15/06 15:15	2.295582414	0
6/15/06 15:16	2.229995745	0
6/15/06 15:17	2.22542882	0
6/15/06 15:18	2.255990744	0
6/15/06 15:19	2.285904318	0
6/15/06 15:20	2.280555886	0
6/15/06 15:21	2.304321241	0
6/15/06 15:22	2.298603892	0
6/15/06 15:23	2.260125732	0
6/15/06 15:24	2.283756971	0
6/15/06 15:25	2.342288935	0
6/15/06 15:26	2.353997105	0
6/15/06 15:27	2.388570666	0
6/15/06 15:28	2.449863517	0
6/15/06 15:29	2.384976149	0
6/15/06 15:30	2.248236519	0
6/15/06 15:31	2.155518293	0
6/15/06 15:32	2.088142991	0
6/15/06 15:33	2.02227577	0
6/15/06 15:34	2.040528655	0
6/15/06 15:35	2.107209325	0
6/15/06 15:36	2.173890233	0
6/15/06 15:37	2.239640999	0
6/15/06 15:38	2.253525019	0
6/15/06 15:39	2.237549543	0
6/15/06 15:40	2.221003407	0
6/15/06 15:41	2.173460335	0
6/15/06 15:42	2.153364897	0
6/15/06 15:43	2.158912957	0
6/15/06 15:44	2.126757789	0
6/15/06 15:45	2.157011628	0
6/15/06 15:46	2.235046268	0
6/15/06 15:47	2.249010086	0
6/15/06 15:48	2.226088643	0
6/15/06 15:49	2.20269835	0
6/15/06 15:50	2.155360252	0
6/15/06 15:51	2.214260679	0
6/15/06 15:52	2.253698587	0
6/15/06 15:53	2.241195917	0
6/15/06 15:54	2.228646362	0
6/15/06 15:55	2.213481784	0
6/15/06 15:56	2.196061516	0
6/15/06 15:57	2.137728882	0
6/15/06 15:58	2.107174754	0
6/15/06 15:59	2.106480122	0
6/15/06 16:00	2.107082647	0
Averages	2.247848679 Klb/hr 37255.99978 ft3/hr @ 23.262 lb/lb-mole	

No. 2 Flare
EPA Method 18
(O2, CO2, H2, and organics)

Test Data and Calculations

During the emission tests, samples of the flare gas were collected into Tedlar gas sample bags. Sample date and time, sample rate, volumes, etc. are recorded on the following test data sheet.

CRLLC-CHAL-000282

ETS

EMISSION TESTING SERVICES, INC.

EPA METHOD 18 SAMPLE COLLECTION DATA

GASEOUS SAMPLE in TEDLAR SAMPLE BAG

Client Name EXXONMOBIL CHALMETTE

Client Location CHALMETTE, LA Source Name #2 FLARE

RUN NO. (sample ID)	RUN-1	RUN-2	RUN-3
SAMPLE DATE	6/15/2006	6/15/2006	6/15/2006
SAMPLE TIME (start – stop)	13:10 - 14:00	14:00 - 15:00	15:00 - 16:00
BAG SIZE, liters	10	10	10
LEAK CHECK (good, bad, none)	NONE	NONE	NONE
SAMPLE RATE, l/min	.200	.150	.150
SAMPLE CONDITIONING (none, P205, etc.)	NONE	NONE	NONE
PROBE TYPE (stainless, Teflon)	TEFLON	TEFLON	TEFLON
PROBE FILTER (none, glass wool)	NONE	NONE	NONE
SAMPLE LINE PURGE (yes/no)	YES	YES	YES
SOURCE TEMP., F	____	____	____
AMBIENT TEMP., F	93	93	92
BAROMETRIC PRESS., in. Hg	30.04	30.06	30.06

NOTES _____

Signed Ronald McCabe

CRLLC-CHAL-000283

No. 2 Flare
EPA Method 18
(O_2, CO_2, H_2, and organics)

Results of Laboratory Analysis of Samples

During the emission tests, samples of the flare gas were collected during each test run. These samples were transported to Southern Petroleum Laboratories in Lafayette, Louisiana for analysis. A summary of laboratory results is presented on the following pages.

Southern Petroleum Laboratories is certified as a qualified environmental testing laboratory under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

CRLLC-CHAL-000284

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY.
SCOTT, LOUISIANA 70583-1790
PHONE (337) 237-4775
FAX (337) 237-8005

SPL WORKORDER NO: 2030-2006060181

Mail To: Wade Latham
Emission Testing Services
PO Box 15075
Baton Rouge, LA 70895

Field: ExxonMobil / Chalmette

Approved By:

Data Reviewer

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aba

CRLLC-CHAL-000285

SPL

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-001A**

For: **Emission Testing Services, Inc.**
PO Box 15075
Baton Rouge LA 70895
Attn: Wade Latham

Project Name:	**EXXONMOBIL CHALMETTE**	Report Date:	**06/19/06**
Field:		Sample of:	**FLARE GAS**
Location:	**BAG-R1**	Sample Date/Time:	**06/15/06**
Sample Point:	**#2 FLARE**	Sample Press (psig):	
Sampled By:	**EMISSION**	Sample Temp (° F):	
		PO / Ref. No:	

Method: **GPA 2286 M**

ANALYTICAL DATA

COMPONENTS		Mol %	Wt %	Liq. Vol. %
CARBON MONOXIDE	CO	0.200	0.235	0.144
HELIUM	He	0.000	0.000	0.000
HYDROGEN	H2	24.117	2.036	13.770
OXYGEN	O2	1.157	1.550	0.653
NITROGEN	N2	33.914	39.786	23.705
CARBON DIOXIDE	CO2	0.239	0.441	0.256
METHANE	C1	21.298	14.308	22.936
ETHANE	C2	5.346	6.732	9.077
ETHYLENE	C2=	0.840	0.987	2.012
ACETYLENE	C2=	0.000	0.000	0.000
PROPANE	C3	4.470	8.254	7.819
PROPYLENE	C3=	0.289	0.509	0.469
PROPADIENE	C3=	0.000	0.000	0.000
METHYACETYLENE	C3=	0.000	0.000	0.000
ISOBUTANE	IC4	1.337	3.254	2.777
N-BUTANE	NC4	1.683	4.096	3.370
1-BUTENE	C4=	0.059	0.139	0.112
ISOBUTYLENE	C4=	0.060	0.141	0.112
trans-2-BUTENE	C4=	0.119	0.280	0.220
cis-2-BUTENE	C4=	0.124	0.291	0.224
1,2-BUTADIENE	C4=	0.000	0.000	0.000
1,3-BUTADIENE	C4=	0.002	0.005	0.004
ISOPENTANE	IC5	0.914	2.761	2.124
N-PENTANE	NC5	0.648	1.958	1.491
neo-PENTANE	C5	0.004	0.012	0.008
1-PENTENE	C5=	0.033	0.097	0.072
C5 OLEFINS	C5=	0.158	0.464	0.345
HEXANES PLUS	C6+	2.989	11.664	8.300
		100.000	100.000	100.000

SPL

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-001A**

CONTINUED FROM PAGE 1

ANALYTICAL DATA HEXANES PLUS BREAKDOWN

C6+ COMPONENTS		Mol %	Wt %	Liq. Vol. %
ISOHEXANES	IC6s	0.750	2.739	2.185
N-HEXANE	NC6	0.252	0.933	0.748
ISO-HEPTANES	IC7s	0.376	1.551	1.162
N-HEPTANE	NC7	0.097	0.419	0.325
BENZENE		0.658	2.198	1.321
CYCLOHEXANE		0.035	0.125	0.085
TOLUENE		0.276	1.093	0.668
ISO-OCTANE	IC8s	0.298	1.372	0.979
N-OCTANE	NC8	0.038	0.186	0.140
ETHYLBENZENE		0.021	0.095	0.058
XYLENES		0.071	0.326	0.200
ISO-NONANES	IC9s	0.095	0.477	0.325
N-NONANES	NC9	0.005	0.029	0.021
ISO-DECANES	IC10s	0.017	0.114	0.079
N-DECANE	NC10	0.000	0.003	0.002
ISO-UNDECANES PLUS	C11+	0.000	0.004	0.002
		2.989	11.664	8.300

PHYSICAL PROPERTIES

HEXANES PLUS

Specific Gravity @ 60 Deg. F.	0.7487
API Gravity @ 60 Deg. F.	57.4943
Molecular Weight	90.810
Pounds Per Gallon (in Vacuum)	6.2436
Cu. Ft. Vapor/Gallon @ 15.025 psia	25.520

TOTAL SAMPLE

Specific Gravity @ 60 Deg. F.	0.4841
API Gravity @ 60 Deg. F.	160.7950
Molecular Weight	23.808
Pounds Per Gallon (in Vacuum)	4.036
Specific Gravity as a Vapor	0.8221
Cu. Ft. Vapor/Gallon @ 15.025 psia	62.922

Comments:

SPL Data Reviewer

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

6.2.11

CRLLC-CHAL-000287

SPL

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-002A**

For: **Emission Testing Services, Inc.**
PO Box 15075
Baton Rouge LA 70895
Attn: Wade Latham

Project Name:	**EXXONMOBIL CHALMETTE**	Report Date:	**06/19/06**
Field:		Sample of:	**FLARE GAS**
Location:	**BAG-R2**	Sample Date/Time:	**06/15/06**
Sample Point:	**#2 FLARE**	Sample Press (psig):	
Sampled By:	**EMISSION**	Sample Temp (° F):	
		PO / Ref. No:	

Method: **GPA 2286 M**

ANALYTICAL DATA

COMPONENTS		Mol %	Wt %	Liq. Vol. %
CARBON MONOXIDE	CO	0.190	0.226	0.134
HELIUM	He	0.000	0.000	0.000
HYDROGEN	H2	25.282	2.167	14.364
OXYGEN	O2	0.478	0.651	0.267
NITROGEN	N2	32.620	38.858	22.687
CARBON DIOXIDE	CO2	0.230	0.430	0.247
METHANE	C1	21.864	14.915	23.436
ETHANE	C2	5.449	6.968	9.211
ETHYLENE	C2=	0.887	1.058	2.113
ACETYLENE	C2=	0.000	0.000	0.000
PROPANE	C3	4.650	8.719	8.095
PROPYLENE	C3=	0.354	0.634	0.570
PROPADIENE	C3=	0.000	0.000	0.000
METHYACETYLENE	C3=	0.000	0.000	0.000
ISOBUTANE	IC4	1.139	2.815	2.357
N-BUTANE	NC4	1.684	4.162	3.358
1-BUTENE	C4=	0.082	0.196	0.153
ISOBUTYLENE	C4=	0.074	0.176	0.137
trans-2-BUTENE	C4=	0.075	0.179	0.137
cis-2-BUTENE	C4=	0.063	0.150	0.114
1,2-BUTADIENE	C4=	0.000	0.000	0.000
1,3-BUTADIENE	C4=	0.002	0.005	0.004
ISOPENTANE	IC5	0.922	2.829	2.133
N-PENTANE	NC5	0.669	2.053	1.532
neo-PENTANE	C5	0.004	0.012	0.008
1-PENTENE	C5=	0.044	0.131	0.094
C5 OLEFINS	C5=	0.169	0.504	0.369
HEXANES PLUS	C6+	3.069	12.162	8.480
		100.000	100.000	100.000

SPL

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-002A**

CONTINUED FROM PAGE 1

ANALYTICAL DATA HEXANES PLUS BREAKDOWN

C6+ COMPONENTS		Mol %	Wt %	Liq. Vol. %
ISOHEXANES	IC6s	0.826	3.122	2.475
N-HEXANE	NC6	0.262	1.006	0.801
ISO-HEPTANES	IC7s	0.300	1.281	0.957
N-HEPTANE	NC7	0.047	0.208	0.160
BENZENE		0.821	2.842	1.700
CYCLOHEXANE		0.021	0.079	0.053
TOLUENE		0.397	1.627	0.987
ISO-OCTANE	IC8s	0.153	0.724	0.512
N-OCTANE	NC8	0.026	0.131	0.098
ETHYLBENZENE		0.021	0.101	0.061
XYLENES		0.076	0.360	0.220
ISO-NONANES	IC9s	0.087	0.452	0.302
N-NONANES	NC9	0.005	0.031	0.023
ISO-DECANES	IC10s	0.022	0.166	0.111
N-DECANE	NC10	0.001	0.007	0.005
ISO-UNDECANES PLUS	C11+	0.004	0.025	0.015
		3.069	12.162	8.480

PHYSICAL PROPERTIES

HEXANES PLUS

Specific Gravity @ 60 Deg. F.	0.7585
API Gravity @ 60 Deg. F.	55.0524
Molecular Weight	89.030
Pounds Per Gallon (in Vacuum)	6.3258
Cu. Ft. Vapor/Gallon @ 15.025 psia	26.373

TOTAL SAMPLE

Specific Gravity @ 60 Deg. F.	0.4746
API Gravity @ 60 Deg. F.	166.6458
Molecular Weight	23.389
Pounds Per Gallon (in Vacuum)	3.957
Specific Gravity as a Vapor	0.8077
Cu. Ft. Vapor/Gallon @ 15.025 psia	62.796

Comments:

SPL Data Reviewer

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

6.2.13

CRLLC-CHAL-000289

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LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-003A**

For: **Emission Testing Services, Inc.**
PO Box 15075
Baton Rouge LA 70895
Attn: Wade Latham

Project Name:	**EXXONMOBIL CHALMETTE**	Report Date:	**06/19/06**
Field:		Sample of:	**FLARE GAS**
Location:	**BAG-R3**	Sample Date/Time:	**06/15/06**
Sample Point:	**#2 FLARE**	Sample Press (psig):	
Sampled By:	**EMISSION**	Sample Temp (° F):	
		PO / Ref. No:	

Method: **GPA 2286 M**

ANALYTICAL DATA

COMPONENTS		Mol %	Wt %	Liq. Vol. %
CARBON MONOXIDE	CO	0.193	0.230	0.137
HELIUM	He	0.000	0.000	0.000
HYDROGEN	H2	25.765	2.204	14.588
OXYGEN	O2	0.491	0.667	0.274
NITROGEN	N2	32.376	38.494	22.439
CARBON DIOXIDE	CO2	0.212	0.396	0.227
METHANE	C1	20.964	14.274	22.391
ETHANE	C2	5.686	7.256	9.576
ETHYLENE	C2=	0.990	1.179	2.353
ACETYLENE	C2=	0.000	0.000	0.000
PROPANE	C3	4.776	8.939	8.286
PROPYLENE	C3=	0.381	0.680	0.612
PROPADIENE	C3=	0.000	0.000	0.000
METHYACETYLENE	C3=	0.000	0.000	0.000
ISOBUTANE	IC4	1.214	2.995	2.502
N-BUTANE	NC4	1.772	4.371	3.521
1-BUTENE	C4=	0.090	0.214	0.169
ISOBUTYLENE	C4=	0.080	0.191	0.149
trans-2-BUTENE	C4=	0.085	0.202	0.157
cis-2-BUTENE	C4=	0.072	0.171	0.129
1,2-BUTADIENE	C4=	0.000	0.000	0.000
1,3-BUTADIENE	C4=	0.003	0.007	0.004
ISOPENTANE	IC5	0.919	2.814	2.118
N-PENTANE	NC5	0.679	2.079	1.549
neo-PENTANE	C5	0.004	0.012	0.008
1-PENTENE	C5=	0.049	0.146	0.106
C5 OLEFINS	C5=	0.178	0.530	0.388
HEXANES PLUS	C6+	3.021	11.949	8.317
		100.000	100.000	100.000

SPL

LAFAYETTE LABORATORY
500 AMBASSADOR CAFFERY PKWY
SCOTT LA 70583
PHONE 337-237-4775

Certificate of Analysis
Number: **2006060181-003A**

CONTINUED FROM PAGE 1

ANALYTICAL DATA HEXANES PLUS BREAKDOWN

C6+ COMPONENTS		Mol %	Wt %	Liq. Vol. %
ISOHEXANES	IC6s	0.772	2.913	2.318
N-HEXANE	NC6	0.251	0.960	0.768
ISO-HEPTANES	IC7s	0.293	1.249	0.937
N-HEPTANE	NC7	0.047	0.209	0.161
BENZENE		0.825	2.881	1.730
CYCLOHEXANE		0.021	0.079	0.054
TOLUENE		0.411	1.682	1.025
ISO-OCTANE	IC8s	0.126	0.589	0.418
N-OCTANE	NC8	0.018	0.092	0.069
ETHYLBENZENE		0.027	0.126	0.077
XYLENES		0.105	0.494	0.303
ISO-NONANES	IC9s	0.082	0.418	0.282
N-NONANES	NC9	0.007	0.039	0.029
ISO-DECANES	IC10s	0.031	0.186	0.125
N-DECANE	NC10	0.001	0.008	0.006
ISO-UNDECANES PLUS	C11+	0.004	0.024	0.015
		3.021	11.949	8.317

PHYSICAL PROPERTIES

HEXANES PLUS

Specific Gravity @ 60 Deg. F.	0.7642
API Gravity @ 60 Deg. F.	53.6610
Molecular Weight	88.990
Pounds Per Gallon (in Vacuum)	6.3675
Cu. Ft. Vapor/Gallon @ 15.025 psia	26.559

TOTAL SAMPLE

Specific Gravity @ 60 Deg. F.	0.4740
API Gravity @ 60 Deg. F.	167.0232
Molecular Weight	23.434
Pounds Per Gallon (in Vacuum)	3.952
Specific Gravity as a Vapor	0.8092
Cu. Ft. Vapor/Gallon @ 15.025 psia	62.596

Comments:

SPL Data Reviewer

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

No. 2 Flare
Flare Calculations
(flare gas heat of combustion and exit velocity)

Presented on the following pages are calculations of the flare gas heat of combustion and exit velocity per 40 CFR 60.18.

CRLLC-CHAL-000292

ETS®
Emission Testing Services, Inc.

FLARE CALCULATIONS (steam-Assisted and non-Assisted Flares)

Chalmette Refining LLC
Chalmette Refinery

Flare No. 2
15-Jun-06 Run 1

At	- Cross-sectional area of the flare tip, ft2	F1	- Conversion factor, 3600 sec/hr	K1	- Conversion factor
Bws	- Moisture fraction of flare gas, vol%/100	F2	- Conversion factor, 3.2808 ft/m		- 1.740 X10-7 (l g-mole Mj)/(PPMv scm kcal)
Cji	- Flare gas component conc. i, PPMv wet	F3	- Conversion factor, 0.08333 ft/in.	Qsd	- Flare gas flow rate, dry std. ft3/hr
Cjid	- Flare gas component conc. i, PPMv dry	Hji	- Net heat of combustion, component i, kcal/g-mole	Qsw	- Flare gas flow rate, wet std. ft3/hr
Dia	- Diameter of flare tip, in.	Ht	- Net heat of combustion, flare gas, kcal/g-mole	Vmax	- Maximum permitted exit velocity, wet ft/sec
FTn	- Number of flare tips	pi	- Mathematical constant, 3.14159	Vx	- Flare gas exit velocity, wet ft/sec

Ht = k1 (Cj1 Hj1 + Cj2 Hj2 + ... + Cji Hji)
At = pi [(Dia F3 / 2)^0.5]

Vx = Qsd / [F1 At (1 - Bws)]
Vmax = (F2) (10 ^[(Ht + 28.8) / 31.7])

Cji = (Cjid)(1 - Bws)
Qsd = (Qsw)(1 - Bws)

Qsw =	36776.79	Dia =	27.06	Vx =	2.558
Qsd =	35489.61	FTn =	1	Vmax =	199.950
Bws =	0.03500	At =	3.99377		

FLARE GAS COMPONENT	mole wt.	COMPONENT CONCENTRATION PPMv dry (Cjid)	PPMv wet (Cji)	NET HEAT of COMBUSTION (LHV) kcal/g-mole (Hjl)
Hydrogen	2.016	241170.0	232729.1	68.317
Methane	16.043	212980.0	205525.7	191.76
Ethane	30.070	53460.0	51588.9	341.26
Ethylene	28.054	8400.0	8106.0	316.19
Acetylene	26.038	0.0	0.0	300.1
Propane	44.097	44700.0	43135.5	488.52
Propene	42.081	2890.0	2788.9	460.43
Propadiene	40.065	0.0	0.0	443.67
Methylacetylene	40.065	0.0	0.0	442.07
i-Butane	58.124	13370.0	12902.1	633.04
n-Butane	58.124	16830.0	16241.0	635.04
1-Butene	56.108	590.0	569.4	607.37
i-Butylene	56.108	600.0	579.0	603.35
cis-2-Butene	56.108	1240.0	1196.6	605.73
trans-2-Butene	56.108	1190.0	1148.4	604.73
1,2-Butadiene	54.092	0.0	0.0	588.37
1,3-Butadiene	54.092	20.0	19.3	575.93
i-Pentane	72.151	9140.0	8820.1	780.13
n-Pentane	72.151	6480.0	6253.2	782.05
neo-Pentane	72.151	40.0	38.6	777.38
1-Pentene	70.135	330.0	318.5	782.05
C5 olefins as 1-Pentene	70.135	1580.0	1524.7	782.05
i-Hexanes as 3-methylpentane	86.179	7500.0	7237.5	927.89
n-Hexane	86.179	2520.0	2431.8	928.95
Cyclohexane	84.163	350.0	337.8	881.67
i-Heptanes as 3-ethylpentane	100.206	3760.0	3628.4	1075.44
n-Heptane	100.206	970.0	936.1	1075.87
i-Octanes as 3-ethylhexane	114.233	2980.0	2875.7	1222.2
n-Octane	114.233	380.0	366.7	1222.78
i-Nonanes as 4-ethylheptane	128.260	950.0	916.8	1369.34
n-Nonane	128.260	50.0	48.3	1369.86
i-Decanes as 4-propylheptane	142.287	170.0	164.1	1516.14
n-Decane	142.287	0.0	0.0	1516.63
Undecanes + as n-Undecane	156.314	0.0	0.0	1670.49
Benzene	78.115	6580.0	6349.7	757.49
Toluene (methylbenzene)	92.142	2760.0	2663.4	901.49
Ethylbenzene	106.169	210.0	202.7	1048.53
o,m,&p-Xylenes	106.169	710.0	685.2	1045.72
Carbon Monoxide	28.011	2000.0	1930.0	67.64
Oxygen	31.999	11570.0	11165.1	
Carbon Dioxide	44.010	2390.0	2306.4	
Water	18.015	-------	35000.0	
Nitrogen	28.015	339140.0	327270.1	
Nitrogen (balance)	28.013	0.0	0.0	
TOTALS		1000000.0	1000000.0	

Flare Gas, lb/lb-mole wet = 23.659

Combined Flare Gas Heat of Combustion, net (LLV), Ht = 27.7826 MJ/scm
(Ht)(26.84416025 [Btu/ft3]/[MJ/scm]) = 745.8015 Btu/ft3

CRLLC-CHAL-000293

ETS®
Emission Testing Services, Inc.

FLARE CALCULATIONS (steam-Assisted and non-Assisted Flares)

Chalmette Refining LLC
Chalmette Refinery

Flare No. 2
15-Jun-06 Run 2

At	- Cross-sectional area of the flare tip, ft2	F1	- Conversion factor, 3600 sec/hr	K1	- Conversion factor
Bws	- Moisture fraction of flare gas, vol%/100	F2	- Conversion factor, 3.2808 ft/m		- 1.740 X10-7 (l g-mole Mj)/(PPMv scm kcal)
Cji	- Flare gas component conc. i, PPMv wet	F3	- Conversion factor, 0.08333 ft/in.	Qsd	- Flare gas flow rate, dry std. ft3/hr
Cjid	- Flare gas component conc. i, PPMv dry	Hji	- Net heat of combustion, component i, kcal/g-mole	Qsw	- Flare gas flow rate, wet std. ft3/hr
Dia	- Diameter of flare tip, in.	Ht	- Net heat of combustion, flare gas, kcal/g-mole	Vmax	- Maximum permitted exit velocity, wet ft/sec
FTn	- Number of flare tips	pi	- Mathematical constant, 3.14159	Vx	- Flare gas exit velocity, wet ft/sec

Ht = k1 (Cj1 Hj1 + Cj2 Hj2 + ... + Cji Hji)
At = pi [(Dia F3 / 2)^0.5]

Vx = Qsd / [F1 At (1 - Bws)]
Vmax = (F2) (10 ^[(Ht + 28.8) / 31.7])

Cji = (Cjid)(1 - Bws)
Qsd = (Qsw)(1 - Bws)

Qsw =	39008.13	Dia =	27.06	Vx =	2.713
Qsd =	37447.80	FTn =	1	Vmax =	203.026
Bws =	0.04000	At =	3.99377		

FLARE GAS COMPONENT	mole wt.	COMPONENT CONCENTRATION PPMv dry (Cjid)	PPMv wet (Cji)	NET HEAT of COMBUSTION (LHV) kcal/g-mole (Hji)
Hydrogen	2.016	252820.0	242707.2	68.317
Methane	16.043	218640.0	209894.4	191.76
Ethane	30.070	54490.0	52310.4	341.26
Ethylene	28.054	8870.0	8515.2	316.19
Acetylene	26.038	0.0	0.0	300.1
Propane	44.097	46500.0	44640.0	488.52
Propene	42.081	3540.0	3398.4	460.43
Propadiene	40.065	0.0	0.0	443.67
Methylacetylene	40.065	0.0	0.0	442.07
i-Butane	58.124	11390.0	10934.4	633.04
n-Butane	58.124	16840.0	16166.4	635.04
1-Butene	56.108	820.0	787.2	607.37
i-Butylene	56.108	740.0	710.4	603.35
cis-2-Butene	56.108	630.0	604.8	605.73
trans-2-Butene	56.108	750.0	720.0	604.73
1,2-Butadiene	54.092	0.0	0.0	588.37
1,3-Butadiene	54.092	20.0	19.2	575.93
i-Pentane	72.151	9220.0	8851.2	780.13
n-Pentane	72.151	6690.0	6422.4	782.05
neo-Pentane	72.151	40.0	38.4	777.38
1-Pentene	70.135	440.0	422.4	782.05
C5 olefins as 1-Pentene	70.135	1690.0	1622.4	782.05
i-Hexanes as 3-methylpentane	86.179	8260.0	7929.6	927.89
n-Hexane	86.179	2620.0	2515.2	928.95
Cyclohexane	84.163	210.0	201.6	881.67
i-Heptanes as 3-ethylpentane	100.206	3000.0	2880.0	1075.44
n-Heptane	100.206	470.0	451.2	1075.87
i-Octanes as 3-ethylhexane	114.233	1530.0	1468.8	1222.2
n-Octane	114.233	260.0	249.6	1222.78
i-Nonanes as 4-ethylheptane	128.260	870.0	835.2	1369.34
n-Nonane	128.260	50.0	48.0	1369.86
i-Decanes as 4-propylheptane	142.287	220.0	211.2	1516.14
n-Decane	142.287	10.0	9.6	1516.63
Undecanes + as n-Undecane	156.314	40.0	38.4	1670.49
Benzene	78.115	8210.0	7881.6	757.49
Toluene (methylbenzene)	92.142	3970.0	3811.2	901.49
Ethylbenzene	106.169	210.0	201.6	1048.53
o,m,&p-Xylenes	106.169	760.0	729.6	1045.72
Carbon Monoxide	28.011	1900.0	1824.0	67.64
Oxygen	31.999	4780.0	4588.8	
Carbon Dioxide	44.010	2300.0	2208.0	
Water	18.015	———	40000.0	
Nitrogen	28.015	326200.0	313152.0	
Nitrogen (balance)	28.013	0.0	0.0	
TOTALS		1000000.0	1000000.0	

Flare Gas, lb/lb-mole wet = 23.215

Combined Flare Gas Heat of Combustion, net (LLV), Ht = 27.9928 MJ/scm
(Ht)(26.84416025 [Btu/ft3]/[MJ/scm]) = 751.4432 Btu/ft3

CRLLC-CHAL-000294

ETS®
Emission Testing Services, Inc.

FLARE CALCULATIONS (steam-Assisted and non-Assisted Flares)

Chalmette Refining LLC
Chalmette Refinery

Flare No. 2
15-Jun-06 Run 3

At	- Cross-sectional area of the flare tip, ft2	F1	- Conversion factor, 3600 sec/hr	K1	- Conversion factor
Bws	- Moisture fraction of flare gas, vol%/100	F2	- Conversion factor, 3.2808 ft/m		- 1.740 X10-7 (l g-mole Mj)/(PPMv scm kcal)
Cji	- Flare gas component conc. i, PPMv wet	F3	- Conversion factor, 0.08333 ft/in.	Qsd	- Flare gas flow rate, dry std. ft3/hr
Cjid	- Flare gas component conc. i, PPMv dry	Hji	- Net heat of combustion, component i, kcal/g-mole	Qsw	- Flare gas flow rate, wet std. ft3/hr
Dia	- Diameter of flare tip, in.	Ht	- Net heat of combustion, flare gas, kcal/g-mole	Vmax	- Maximum permitted exit velocity, wet ft/sec
FTn	- Number of flare tips	pi	- Mathematical constant, 3.14159	Vx	- Flare gas exit velocity, wet ft/sec

Ht = k1 (Cj1 Hj1 + Cj2 Hj2 + ... + Cji Hji)
At = pi [(Dia F3 / 2)^0.5]

Vx = Qsd / [F1 At (1 - Bws)]
Vmax = (F2) (10 ^[(Ht + 28.8) / 31.7])

Cji = (Cjid)(1 - Bws)
Qsd = (Qsw)(1 - Bws)

Qsw =	37256.00	Dia =	27.06	Vx =	2.591
Qsd =	35765.76	FTn =	1	Vmax =	206.493
Bws =	0.04000	At =	3.99377		

FLARE GAS COMPONENT	mole wt.	COMPONENT CONCENTRATION PPMv dry (Cjid)	PPMv wet (Cji)	NET HEAT of COMBUSTION (LHV) kcal/g-mole (Hji)
Hydrogen	2.016	257650.0	247344.0	68.317
Methane	16.043	209640.0	201254.4	191.76
Ethane	30.070	56860.0	54585.6	341.26
Ethylene	28.054	9900.0	9504.0	316.19
Acetylene	26.038	0.0	0.0	300.1
Propane	44.097	47760.0	45849.6	488.52
Propene	42.081	3810.0	3657.6	460.43
Propadiene	40.065	0.0	0.0	443.67
Methylacetylene	40.065	0.0	0.0	442.07
i-Butane	58.124	12140.0	11654.4	633.04
n-Butane	58.124	17720.0	17011.2	635.04
1-Butene	56.108	900.0	864.0	607.37
i-Butylene	56.108	800.0	768.0	603.35
cis-2-Butene	56.108	720.0	691.2	605.73
trans-2-Butene	56.108	850.0	816.0	604.73
1,2-Butadiene	54.092	0.0	0.0	588.37
1,3-Butadiene	54.092	30.0	28.8	575.93
i-Pentane	72.151	9190.0	8822.4	780.13
n-Pentane	72.151	6790.0	6518.4	782.05
neo-Pentane	72.151	40.0	38.4	777.38
1-Pentene	70.135	490.0	470.4	782.05
C5 olefins as 1-Pentene	70.135	1780.0	1708.8	782.05
i-Hexanes as 3-methylpentane	86.179	7720.0	7411.2	927.89
n-Hexane	86.179	2510.0	2409.6	928.95
Cyclohexane	84.163	210.0	201.6	881.67
i-Heptanes as 3-ethylpentane	100.206	2930.0	2812.8	1075.44
n-Heptane	100.206	470.0	451.2	1075.87
i-Octanes as 3-ethylhexane	114.233	1260.0	1209.6	1222.2
n-Octane	114.233	180.0	172.8	1222.78
i-Nonanes as 4-ethylheptane	128.260	820.0	787.2	1369.34
n-Nonane	128.260	70.0	67.2	1369.86
i-Decanes as 4-propylheptane	142.287	310.0	297.6	1516.14
n-Decane	142.287	10.0	9.6	1516.63
Undecanes + as n-Undecane	156.314	40.0	38.4	1670.49
Benzene	78.115	8250.0	7920.0	757.49
Toluene (methylbenzene)	92.142	4110.0	3945.6	901.49
Ethylbenzene	106.169	270.0	259.2	1048.53
o,m,&p-Xylenes	106.169	1050.0	1008.0	1045.72
Carbon Monoxide	28.011	1930.0	1852.8	67.64
Oxygen	31.999	4910.0	4713.6	
Carbon Dioxide	44.010	2120.0	2035.2	
Water	18.015	-------	40000.0	
Nitrogen	28.015	323760.0	310809.6	
Nitrogen (balance)	28.013	0.0	0.0	
TOTALS		1000000.0	1000000.0	

Flare Gas, lb/lb-mole wet = 23.262

Combined Flare Gas Heat of Combustion, net (LLV), Ht = 28.2259 MJ/scm
(Ht)(26.84416025 [Btu/ft3]/[MJ/scm]) = 757.7012 Btu/ft3

CRLLC-CHAL-000295

No. 2 Flare
Flare Operating Data
(Flare Pilot Record)

During the emission tests, Chalmette Refining recorded the status of the flare pilot flame. These data are presented beginning on page 6.2.3.

CRLLC-CHAL-000296

6/15/06 1:10 PM	CHL
6/15/06 2:00 PM	20BA002N

Date	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 1:10 PM	0
6/15/06 1:11 PM	0
6/15/06 1:12 PM	0
6/15/06 1:13 PM	0
6/15/06 1:14 PM	0
6/15/06 1:15 PM	0
6/15/06 1:16 PM	0
6/15/06 1:17 PM	0
6/15/06 1:18 PM	0
6/15/06 1:19 PM	0
6/15/06 1:20 PM	0
6/15/06 1:21 PM	0
6/15/06 1:22 PM	0
6/15/06 1:23 PM	0
6/15/06 1:24 PM	0
6/15/06 1:25 PM	0
6/15/06 1:26 PM	0
6/15/06 1:27 PM	0
6/15/06 1:28 PM	0
6/15/06 1:29 PM	0
6/15/06 1:30 PM	0
6/15/06 1:31 PM	0
6/15/06 1:32 PM	0
6/15/06 1:33 PM	0
6/15/06 1:34 PM	0
6/15/06 1:35 PM	0
6/15/06 1:36 PM	0
6/15/06 1:37 PM	0
6/15/06 1:38 PM	0
6/15/06 1:39 PM	0
6/15/06 1:40 PM	0
6/15/06 1:41 PM	0
6/15/06 1:42 PM	0
6/15/06 1:43 PM	0
6/15/06 1:44 PM	0
6/15/06 1:45 PM	0
6/15/06 1:46 PM	0
6/15/06 1:47 PM	0
6/15/06 1:48 PM	0
6/15/06 1:49 PM	0
6/15/06 1:50 PM	0
6/15/06 1:51 PM	0
6/15/06 1:52 PM	0
6/15/06 1:53 PM	0
6/15/06 1:54 PM	0
6/15/06 1:55 PM	0
6/15/06 1:56 PM	0
6/15/06 1:57 PM	0
6/15/06 1:58 PM	0
6/15/06 1:59 PM	0
6/15/06 2:00 PM	0

CRLLC-CHAL-000297

6/15/06 2:00 PM	CHL
6/15/06 3:00 PM	20BA002N

Date	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 2:00 PM	0
6/15/06 2:01 PM	0
6/15/06 2:02 PM	0
6/15/06 2:03 PM	0
6/15/06 2:04 PM	0
6/15/06 2:05 PM	0
6/15/06 2:06 PM	0
6/15/06 2:07 PM	0
6/15/06 2:08 PM	0
6/15/06 2:09 PM	0
6/15/06 2:10 PM	0
6/15/06 2:11 PM	0
6/15/06 2:12 PM	0
6/15/06 2:13 PM	0
6/15/06 2:14 PM	0
6/15/06 2:15 PM	0
6/15/06 2:16 PM	0
6/15/06 2:17 PM	0
6/15/06 2:18 PM	0
6/15/06 2:19 PM	0
6/15/06 2:20 PM	0
6/15/06 2:21 PM	0
6/15/06 2:22 PM	0
6/15/06 2:23 PM	0
6/15/06 2:24 PM	0
6/15/06 2:25 PM	0
6/15/06 2:26 PM	0
6/15/06 2:27 PM	0
6/15/06 2:28 PM	0
6/15/06 2:29 PM	0
6/15/06 2:30 PM	0
6/15/06 2:31 PM	0
6/15/06 2:32 PM	0
6/15/06 2:33 PM	0
6/15/06 2:34 PM	0
6/15/06 2:35 PM	0
6/15/06 2:36 PM	0
6/15/06 2:37 PM	0
6/15/06 2:38 PM	0
6/15/06 2:39 PM	0
6/15/06 2:40 PM	0
6/15/06 2:41 PM	0
6/15/06 2:42 PM	0
6/15/06 2:43 PM	0
6/15/06 2:44 PM	0
6/15/06 2:45 PM	0
6/15/06 2:46 PM	0
6/15/06 2:47 PM	0
6/15/06 2:48 PM	0
6/15/06 2:49 PM	0
6/15/06 2:50 PM	0
6/15/06 2:51 PM	0
6/15/06 2:52 PM	0
6/15/06 2:53 PM	0
6/15/06 2:54 PM	0
6/15/06 2:55 PM	0
6/15/06 2:56 PM	0
6/15/06 2:57 PM	0
6/15/06 2:58 PM	0
6/15/06 2:59 PM	0
6/15/06 3:00 PM	0

CRLLC-CHAL-000298

6/15/06 3:00 PM CHL
6/15/06 4:00 PM 20BA002N

Date	#2 FLARE PILOT FLAMEOUT NONE
6/15/06 3:00 PM	0
6/15/06 3:01 PM	0
6/15/06 3:02 PM	0
6/15/06 3:03 PM	0
6/15/06 3:04 PM	0
6/15/06 3:05 PM	0
6/15/06 3:06 PM	0
6/15/06 3:07 PM	0
6/15/06 3:08 PM	0
6/15/06 3:09 PM	0
6/15/06 3:10 PM	0
6/15/06 3:11 PM	0
6/15/06 3:12 PM	0
6/15/06 3:13 PM	0
6/15/06 3:14 PM	0
6/15/06 3:15 PM	0
6/15/06 3:16 PM	0
6/15/06 3:17 PM	0
6/15/06 3:18 PM	0
6/15/06 3:19 PM	0
6/15/06 3:20 PM	0
6/15/06 3:21 PM	0
6/15/06 3:22 PM	0
6/15/06 3:23 PM	0
6/15/06 3:24 PM	0
6/15/06 3:25 PM	0
6/15/06 3:26 PM	0
6/15/06 3:27 PM	0
6/15/06 3:28 PM	0
6/15/06 3:29 PM	0
6/15/06 3:30 PM	0
6/15/06 3:31 PM	0
6/15/06 3:32 PM	0
6/15/06 3:33 PM	0
6/15/06 3:34 PM	0
6/15/06 3:35 PM	0
6/15/06 3:36 PM	0
6/15/06 3:37 PM	0
6/15/06 3:38 PM	0
6/15/06 3:39 PM	0
6/15/06 3:40 PM	0
6/15/06 3:41 PM	0
6/15/06 3:42 PM	0
6/15/06 3:43 PM	0
6/15/06 3:44 PM	0
6/15/06 3:45 PM	0
6/15/06 3:46 PM	0
6/15/06 3:47 PM	0
6/15/06 3:48 PM	0
6/15/06 3:49 PM	0
6/15/06 3:50 PM	0
6/15/06 3:51 PM	0
6/15/06 3:52 PM	0
6/15/06 3:53 PM	0
6/15/06 3:54 PM	0
6/15/06 3:55 PM	0
6/15/06 3:56 PM	0
6/15/06 3:57 PM	0
6/15/06 3:58 PM	0
6/15/06 3:59 PM	0
6/15/06 4:00 PM	0

CRLLC-CHAL-000299

VII. APPENDIX

The following appendices are presented as supporting documentation to this test report.

A. Resumes of Test Personnel
B. Test Equipment Calibrations
C. Correspondence, Chalmette Refining and LDEQ
D. Flare Flow Meter Calibration

CRLLC-CHAL-000300

ETS®
Emission Testing Services, Inc.

Resume

RONALD L. McCABE, II
Assistant Manager
Senior Sampling Specialist

EDUCATION

Louisiana State University, B.S. Environmental Engineering

CERTIFICATIONS

- General Safety & Health Orientation Program
- Respiratory Equipment Medical Certification
- MSA Qualitative Fit Test Record
- EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

11/03/04 to Present Emission Testing Services, Inc. Assistant Office Manager

Responsibilities include planning and performing source testing projects; for overseeing all training of sampling technicians and for the hiring and firing of employees.

08/98 to 11/03/04 Emission Testing Services, Inc. Senior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to conduct and provide project management for all manual emission test methods including 40 CFR 60, Methods 5, 6, 7, 8, 11, 12, 18, 26 and 29. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

CRLLC-CHAL-000301

ETSR

EMISSION TESTING SERVICES, INC.

BAROMETER CALIBRATION SHEET

CLIENT: EXXONMOBIL CHALMETTE DATE: 6/15/2006

SOURCE ID: #2 FLARE

OPERATOR: RON MCCABE

**********BAROMETER**********

BAROMETER ID: UNIT #1

CALIBRATION DATA:

INITIAL CALIBRATION: 30.01 INITIAL 30.01 FINAL

ADJUSTMENT: ☐ Yes ☒ No

**********CALIBRATION REFERENCE**********

ID: PRINCO, HG

ELEVATION: BATON ROUGE ELEVATION DIFF: N/A

BAROMETER READING: 30.00

COMMENTS:_____

CRLLC-CHAL-000302

CHALMETTE REFINING, L.L.C.

P.O. BOX 1007
CHALMETTE, LA 70044
(504) 281-1212

May 16, 2006

VIA FACSIMILE 225-219-3474

Chris Roberie, Administrator
LA Department of Environmental Quality
Office of Environmental Assessment
Air Quality Assessment Division
P. O. Box 4314
Baton Rouge, LA 70821-4314

Chalmette Refining, L.L.C.
Agency Interest No. 1376
Notification of Performance Testing
for No. 2 Flare

Dear Mr. Roberie:

In accordance with Paragraph 60 of the Federal Consent Decree, Chalmette Refining, L.L.C. (CRLLC) hereby gives notice that it will conduct a performance test to confirm compliance with the velocity requirements of 40 CFR 60.18 at its No. 2 Flare. Testing will be conducted on June 15, 2006.

Should you have any questions concerning this testing, please contact Ms. Rebecca Bourg at (504) 281-1330 or by email at rebecca.j.bourg@exxonmobil.com.

Very truly yours,

Claudine Gorman
Environmental Group Leader

RJB

cc: Ms. Peggy Hatch – LDEQ
EPA Region 6
EPA Headquarters
LDEQ Southeast Regional Office

CRLLC FLARE METERS
FORM18518

Note: If using dry bath, can use 3 calibration points:60.5°F, 111°F & 161.5°F. Tolerance is 0.5°F.

Location: Flare Drums

TAG NUMBER	FUNCTION DESCRIPTION	INPUT RANGE	%	XMTR INPUT	XMTR SCALE	TOLERANCE	DESIRED PANAMETRICS READING	AS FOUND ACTUAL XMTR OUTPUT	AS FOUND CONSOLE READING	AS LEFT ACTUAL XMTR OUTPUT	AS LEFT CONSOLE READING	Pass / Failed (circle one) CALIBRATED BY/DATE
								As Found Reading	14.655 psia	As Left Reading	14.655 psia	(P) F
20P512	No. 2 Flare	14psia/-0.7psig to 34psia/19.3psig	0%	-0.7psig	4 mA	± .05 psia	14 psia	4.003 mA	14.000 psia	4.003 mA	14.000 psia	6-5-06
			25%	4.3psig	8 mA	± .05 psia	19 psia	7.998 mA	18.995 psia	7.998 mA	18.995 psia	MPF
			50%	9.3psig	12 mA	± .05 psia	24 psia	11.999 mA	23.997 psia	11.999 mA	23.997 psia	
			75%	14.3psig	16 mA	± .05 psia	29 psia	15.998 mA	28.997 psia	15.998 mA	28.997 psia	
			100%	19.3psig	20mA	± .05 psia	34 psia	19.999 mA	33.999 psia	19.999 mA	33.999 psia	
								As Found Reading	103.65 °F	As Left Reading	103.65 °F	(P) F
20T512	No. 2 Flare	10-212°F	0%	10°F	4 mA	±0.5°F	10°F	mA	°F	mA	°F	6-5-06
			25%	60.5°F	8 mA	±0.5°F	60.5°F	8.026 mA	60.88 °F	8.026 mA	60.88 °F	MPF
			50%	111°F	12 mA	±0.5°F	111°F	12.008 mA	111.25 °F	12.008 mA	111.25 °F	
			75%	161.5°F	16 mA	±0.5°F	161.5°F	16.001 mA	161.65 °F	16.001 mA	161.65 °F	
			100%	212°F	20mA	±0.5°F	212°F	mA	°F	mA	°F	
20F512 Diagnostics for GF868 Flow Meter no:7604660		SSUP	50-75			60.9		Diagnostics	P#UP	100-2300	363	
		SSDN	50-75			60.7			P#DN	100-2300	33-9	
		QUP	<-400 or >+400			689			AMPUP	19-29	24	
		QDN	<-400 or >+400			688			AMPDN	19-29	24	

TEST EQUIPMENT USED	MANUFACTURER	SERIAL NUMBER	CERTIFICATION DUE DATE
Multimeter	Fluke	8389007	6-14-06
Pressure Calibrator	Crystal	263697	11-18-06
Temp Dry Bath	Hart	A47506	3-27-07

Note: * Overrange / Underrange - Overrange, it fails at 34psia / Underrange, it fails at 14psia, so must check mA to verify not failed.

COMMENTS:

Rev. 0, 08/03

Page 1 of 1

APPENDIX D
7.5.1

TABLE I
EMISION TEST RESULTS

CHALMETTE REFINING LLC

REFORMER NO. 1

		Permitted Limit	RUN 1	RUN 2	RUN 3	AVERAGE
DATE			23-May-05	23-May-05	23-May-05	
TIME			0925-1031	1055-1201	1240-1346	
HYDROCHLORIC ACID	PPMv dry		2.35	2.03	2.11	2.17
(EPA Method 26)	PPMv dry @ 3% O2	30	2.12	1.83	1.89	1.95
	lb/hr		0.00375	0.00346	0.00371	0.00364
OXYGEN	vol% dry		1.0	1.0	0.9	1.0
CARBON DIOXIDE	vol% dry		17.0	16.6	16.7	16.8
STACK GAS DATA						
	Temperature, F		97	100	99	99
	Moisture, Vol%		5.30	4.22	4.59	4.71
	Velocity, ft/sec		14.89	15.78	16.34	15.67
	Flow Rate, acfm		311.87	330.52	342.13	328.17
	Flow Rate, dscfm		280.76	299.48	309.23	296.49

	TEST RUN 1		TEST RUN 2		TEST RUN 3	
	Date & Time	**HCl Concentration (ppmv) via colormetric tube[1]**	**Date & Time**	**HCl Concentration (ppmv) via colormetric tube[1]**	**Date & Time**	**HCl Concentration (ppmv) via colormetric tube[1]**
Beginning of Test Run	3/13/05 7:30AM	0	3/13/05 9:15AM	0.1	3/13/05 11:30AM	0.1
Middle of Test Run	3/13/05 8:00AM	0.2	3/13/05 9:55AM	0.1	3/13/05 12:00AM	0.04
End of Test Run	3/13/05 8:30AM	0.5	3/13/05 10:15AM	0.14	3/13/05 12:30AM	0.1
Average of Each Test Run	**0.23**		**0.11**		**0.08**	
Overall Average			**0.14**			

[1] The HCl concentration in the catalyst regenerator offgas must be measured using colormetric tube sampling at least 3 times during each test run.

By: M.Talmadge

CHALMETTE REFINING, LLC
CHALMETTE REFINERY
(LDEQ AI Number 1376)

P.O. BOX 1007

CHALMETTE, LOUISIANA 70044

ENGINEERING EMISSION TESTS

NO. 2 SRU

DECEMBER 11, 2009

ETS®
Emission Testing Services, Inc.
P.O. BOX 15075
BATON ROUGE, LOUISIANA 70895

Phone 225-925-8405 Fax 225-925-2343
Email: reporting@emissiontesting.com
www.emissiontesting.com

LELAP Certificate Number 02059 issued to ETS by LDEQ

ETS Project Number: 29152B

Draft Report: 25-Jan-2010, 102 Pages

CRLLC-CHAL-000307

CERTIFICATION of TEST REPORT

CHALMETTE REFINING LLC
CHALMETTE REFINERY

ENGINEERING EMISSION TESTS

NO. 2 SRU

DECEMBER 11, 2009

Testing Conducted by:

EMISSION TESTING SERVICES, INC.

Emission Testing Services, Inc. (ETS) is certified by the Louisiana Department of Environmental Quality (LDEQ), certificate number 02059, as a qualified environmental testing laboratory under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information; I believe the submitted information is true, accurate, and complete.

Jeff Bergeron
Chalmette Refining LLC
Plant Representative

Ronald McCabe
Emission Testing Services, Inc.
Project Leader

Barry Gipson
Emission Testing Services, Inc.
Manager

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STANDARD RESULT NOTATIONS

< None detected (less than or equal to). Result is the minimum detection limit. Actual result value may be less including the value zero (0).

! Result is the sum or average of multiple results where one or more of the results have a positive detection and one or more results are None Detected. The magnitude of the None Detected result(s) is significant (>30%) in comparison to the positive detection results. Actual result may be less; however, does not include the value zero (0) and is not less than the result calculated using the positive detection results with the None Detected result(s) as zero.

CRLLC-CHAL-000310

I. INTRODUCTION

Emission Testing Services, Inc. (ETS) was contracted by Chalmette Refining, LLC (Chalmette Refining) to conduct emission tests at the Chalmette Refinery located in St. Bernard Parish, Louisiana. Emissions at the No. 2 SRU Inlet 1, Inlet 2, and Outlet were tested to determine sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions at two temperature operating set-points. Tests were conducted as part of an engineering study.

All tests were conducted following EPA test methods. The emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined using EPA Methods 6C, 7E, and 10. EPA Methods 1 – 4 were used to determine the number and location of sample points and the velocity, moisture, molecular weight, and volumetric flow rate of the stack gas at the Outlet. Inlet flow rates were assumed ½ of the outlet flow rate.

The ETS emission test team consisted of Project Leader Ronald McCabe and test crew member Clint Rachal. Jeff Bergeron and Brent Tanner represented Chalmette Refining and coordinated testing with plant operations.

CRLLC-CHAL-000311

II. SUMMARY

Discussion of Tests

On December 11, 2009 emission tests were conducted on the No. 2 SRU at Chalmette Refining. Emissions at the Inlet 1 and 2 were tested to determine the inlet rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide and oxygen concentration. Emissions were also conducted at the Outlet to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide and carbon dioxide and oxygen concentration.

Emissions at all three test points were tested with the unit operating at set points of 1025 F and 1050 F. At each temperature set-point, a single, 20-minute duration test run was conducted.

Stack gas flow rate was measured at the Outlet and a single flow rate test was conducted at each temperature set-point. The average flow rate was used to calculate mass emission rates at the Outlet. Mass emission rates at the Inlet 1 and Inlet 2 were calculated using ½ the average Outlet flow rate.

CRLLC-CHAL-000312

II. SUMMARY

Discussion of Tests

On December 11, 2009 emission tests were conducted on the No. 2 SRU at Chalmette Refining. Emissions at the Inlet 1 and 2 were tested to determine the inlet rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide and oxygen concentration. Emissions were also conducted at the Outlet to determine the emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide and carbon dioxide and oxygen concentration.

Emissions at all three test points were tested with the unit operating at set points of 1025 F and 1050 F. At each temperature set-point, a single, 20-minute duration test run was conducted.

Stack gas flow rate was measured at the Outlet and a single flow rate test was conducted at each temperature set-point. The average flow rate was used to calculate mass emission rates at the Outlet. Mass emission rates at the Inlet 1 and Inlet 2 were calculated using ½ the average Outlet flow rate.

CRLLC-CHAL-000313

No. 2 SRU Inlet No. 1 Test Results

Results of the No. 2 SRU Inlet No. 1 tests are summarized in Table I. Sulfur dioxide emissions averaged 0.430 lb/hr at the 1025 F set-point and 0.457 lb/hr at the 1050 F set-point. Oxides of nitrogen emissions averaged 1.144 lb/hr at the 1025 F set-point and 1.100 lb/hr at the 1050 F set-point. Carbon monoxide emissions averaged 11.603 lb/hr at the 1025 F set-point and 11.160 lb/hr at the 1050 F set-point.

No. 2 SRU Inlet No. 2 Test Results

Results of the No. 2 SRU Inlet No. 2 tests are summarized in Table I. Sulfur dioxide emissions averaged 2.875 lb/hr at the 1025 F set-point and 3.205 lb/hr at the 1050 F set-point. Oxides of nitrogen emissions averaged 0.778 lb/hr at the 1025 F set-point and 0.749 lb/hr at the 1050 F set-point. Carbon monoxide emissions averaged 41.566 lb/hr at the 1025 F set-point and 42.949 lb/hr at the 1050 F set-point.

No. 2 SRU Outlet Test Results

Results of the No. 2 SRU Outlet tests are summarized in Table I. Sulfur dioxide emissions averaged 2.381 lb/hr at the 1025 F set-point and 3.617 lb/hr at the 1050 F set-point. Oxides of nitrogen emissions averaged 1.765 lb/hr at the 1025 F set-point and 1.721 lb/hr at the 1050 F set-point. Carbon monoxide emissions averaged 59.443 lb/hr at the 1025 F set-point and 59.742 lb/hr at the 1050 F set-point.

CRLLC-CHAL-000314

Notations and Conclusions

Test Method Modifications, Deviations, and Unusual Conditions

All tests were conducted using EPA test methods without modification. During the tests, there were no deviations from these methods and no unusual conditions were noted.

Test Conclusions

Quality assurance and quality control procedures meeting EPA and LDEQ requirements were used during the emission tests. All quality indicators were within the range of acceptable results demonstrating that these test data are accurate, complete, and representative of emissions conditions. Overall, the quality of data obtained during the tests are acceptable to meet project objectives.

CRLLC-CHAL-000315

TABLE I
EMISSION TEST RESULTS

CHALMETTE REFINING, LLC
CHALMETTE REFINERY

NO. 2 SRU

		Inlet No. 1		Inlet No. 2	
		RUN 2	RUN 4	RUN 1	RUN 3
DATE		11-Dec-09	11-Dec-09	11-Dec-09	11-Dec-09
TIME		1540-1559	1652-1711	1506-1525	1626-1645
SULFUR DIOXIDE	PPMv @ 0% O2	8.4	8.0	48.3	43.6
	lb/hr (1)	0.457	0.430	3.205	2.875
OXIDES of NITROGEN	PPMv	16.4	17.0	11.1	11.6
	lb/hr (1)	1.100	1.144	0.749	0.778
CARBON MONOXIDE	PPMv	272.3	283.1	1047.9	1014.2
	lb/hr (1)	11.160	11.603	42.949	41.566
OXYGEN	vol%	8.74	8.95	6.09	6.19
OPERATING SET-POINT	F	1050	1025	1050	1025

		Outlet		
		RUN 3	RUN 5	Average
		11-Dec-09	11-Dec-09	
		1408-1449	1725-1744	
SULFUR DIOXIDE	PPMv @ 0% O2	29.5	19.5	---------
	lb/hr (1)	3.617	2.381	---------
OXIDES of NITROGEN	PPMv	12.8	13.1	---------
	lb/hr (1)	1.721	1.765	---------
CARBON MONOXIDE	PPMv	728.8	725.2	---------
	lb/hr (1)	59.742	59.443	---------
OXYGEN	vol%	7.21	7.28	---------
CARBON DIOXIDE	vol%	4.100	4.200	---------
OPERATING SET-POINT	F	1050	1025	---------
STACK GAS DATA				
Temperature, F		547	535	---------
Moisture, Vol%		12.37	12.77	---------
Velocity, ft/sec		30.71	31.01	---------
Flow Rate, acfm		40204	40595	---------
Flow Rate, dscfm		18644	18965	(1) 18804

(1) Outlet emission rates based on average flow rate. Inlet flow rates based on 1/2 average flow rate.

CRLLC-CHAL-000316

III. PROCEDURE

Emission tests were conducted using EPA test methods documented in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A. A brief description of each method used during the tests follows.

LOCATION of SAMPLE POINTS

No. 2 SRU Inlet 1, Inlet 2
Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined on samples collected from a single sample point located near the center of the stack.

No. 2 SRU Outlet
Stack gas velocity, flow rate, and moisture were determined on samples collected from a series of sample traverse points selected per EPA Method 1.

Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined on samples collected from a series of three sample traverse points

Carbon dioxide was determined on samples collected from a single sample point located near the center of the stack.

EPA METHOD 1
SAMPLE and VELOCITY TRAVERSES for STATIONARY SOURCES

EPA Method 1 is applicable to stacks having a diameter greater than or equal to 12 inches. The method recommends that sample points be located 8 stack diameters downstream and 2 stack diameters upstream from the nearest flow disturbances; however, any distances greater than a minimum 2 stack diameters downstream and a minimum 0.5 stack diameters upstream from the nearest disturbances are acceptable. These distances help insure the collection of a representative sample in the absence of cyclonic flow. The absence of cyclonic flow is verified by measuring the flow yaw angle at each sample traverse point. An average yaw angle of 20 degrees or less is acceptable.

The No. 2 SRU Outlet has a stack diameter of 63.25 inches. The sampling point was located 10.59 stack diameters upstream and 6.07 stack diameters downstream from the nearest flow disturbances. Based on the upstream and downstream position of the sampling plane, 12 sample points were selected and laid out on 2 perpendicular traverses (diameters) of the stack with 6 sample points per traverse. Access to the sample points was obtained through 2 ports through the stack wall.

CRLLC-CHAL-000317

EPA METHOD 2
DETERMINATION of STACK GAS VELOCITY and VOLUMETRIC FLOW RATE
(Type S Pitot Tube)

Stack gas volumetric flow rate was determined from the velocity, moisture, pressure, and temperature of the stack gas and the cross-sectional area of the stack at the sampling point. Stack gas velocity was determined by measuring the velocity head pressure at each sample traverse point using a Type S pitot tube. The type S pitot tube was calibrated against a NIST traceable standard pitot tube prior to the tests.

EPA METHOD 3
GAS ANALYSIS for CARBON DIOXIDE, OXYGEN, EXCESS AIR, and DRY MOLECULAR WEIGHT

Molecular weight of the stack gas was calculated based on oxygen and carbon dioxide concentration data obtained using an Orsat analyzer with the balance of the gas components assumed to be nitrogen.

Orsat analysis was conducted in a stack gas sample that was continuously collected into a Tedlar gas sample bag (integrated sample) over the entire duration of each test run. Sample gas was collected using a stainless steel sample probe and routed through a Teflon sample line to the Tedlar bag.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1. Results from the analyzer were used to verify the absence of sample line leaks, as a stack gas oxygen reference, and as a basis for gaseous component concentration corrections to specific oxygen basis when required. Oxygen data obtained using this method was not used to determine stack gas molecular weight.

EPA METHOD 4
DETERMINATION of MOISTURE CONTENT in STACK GASES

Moisture of the stack gas was determined by continuously extracting a sample of the stack gas over the duration of the test run. Sample was extracted using a stainless steel nozzle and heated glass sample probe. Sample gas was transferred from the probe through a heated Teflon sample line to a set of four impingers, connected in series, which were immersed in an ice-water bath. The first two impingers initially contained a known mass of DI water, the third was empty, and the fourth contained a known mass of silica gel. Water vapor in the

CRLLC-CHAL-000318

sample gas was condensed and trapped in the impingers. The volume of dry gas exiting the impingers was measured using a dry gas meter.

After sampling, the impingers were weighed to determine the mass of moisture condensate collected.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the stack gas was continuously determined. A sample of the stack gas was extracted using a stainless steel sample probe. Sample was transferred from the probe through a heated Teflon sample line to a sample-conditioning unit. The sample-conditioning unit removed particulate and water vapor from the sample. Sample gas exiting the conditioning unit was routed directly to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE EMISSIONS from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined throughout the test period. A sample of the stack gas was extracted using a stainless steel probe and was transferred through a heated Teflon sample line to a sample-conditioning unit that removed particulate and moisture from the sample. From the sample-conditioning unit, the sample gas was routed to the test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000319

IV. ANALYTICAL TECHNIQUE

All samples collected during the emission tests were analyzed using EPA or EPA approved test methods. A brief description of each method used during the tests follows.

EPA METHOD 3
GAS ANALYSIS for CARBON DIOXIDE, OXYGEN, EXCESS AIR, and DRY MOLECULAR WEIGHT

Concentration of oxygen in the gas sample was determined using an Orsat gas analyzer. The analyzer utilizes the principle of differential sample volume on a sample measured before and after chemical absorption of oxygen in the sample.

EPA METHOD 3A
DETERMINATION of OXYGEN and CARBON DIOXIDE CONCENTRATIONS in EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

Concentration of oxygen in the gas sample was continuously determined using a test analyzer that utilizes an electrochemical cell detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 4
DETERMINATION of MOISTURE CONTENT in STACK GASES

Moisture of the stack gas was determined by gravimetric analysis of water vapor condensed from the sample gas.

EPA METHOD 6C
DETERMINATION of SULFUR DIOXIDE EMISSIONS from STATIONARY SOURCES
(Instrumental Analyzer Procedure)

The concentration of sulfur dioxide in the gas sample was continuously determined using a test analyzer that utilizes an ultraviolet absorbance detection principle. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000320

EPA METHOD 7E
DETERMINATION of NITROGEN OXIDES EMISSIONS from STATIONARY SOURCES

Concentration of oxides of nitrogen in the gas sample was continuously determined using a test analyzer that utilizes a chemiluminescence detector. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

EPA METHOD 10
DETERMINATION of CARBON MONOXIDE from STATIONARY SOURCES

Concentration of carbon monoxide in the gas sample was continuously determined using a nondispersive infrared test analyzer. The test analyzer was calibrated before and after each test using a set of calibration gas standards prepared per EPA Protocol 1.

CRLLC-CHAL-000321

V. QUALITY ASSURANCE/ QUALITY CONTROL

Test results were validated using rigorous quality assurance (QA) and quality control (QC) procedures documented in ETS' Standard Operating Procedures (SOP). Each SOP meets or exceeds EPA requirements and has been reviewed by the LDEQ under the Louisiana Environmental Laboratory Accreditation Program (LELAP).

The QA/QC programs ensure that the test data are representative of the source conditions by verifying the completeness, accuracy, and precision of the test data. QA/QC functions cover all aspects of the test including field-testing, sampling, sample analysis, sample storage and transport, and data processing and reporting.

Emission testing at Chalmette Refining included a series of QA/QC functions that were completed satisfactorily within the required limits. Therefore, data collected during testing should be considered accurate, precise, complete, and representative of stack conditions.

CRLLC-CHAL-000322

VI. TEST DATA and CALCULATIONS

Data Processing and Calculation Methods

All emission test data, laboratory analytical data, and unit operation data are presented in this section along with the associated data reduction calculations.

Data from the field data forms were manually input into a computer for data processing and calculation. Integrity of manual data input is maintained by using a double entry system. Accuracy of computer calculations is verified by processing a known set of data developed using manual calculation. Additional control of data input and processing is conducted through review of results by more than one individual.

CRLLC-CHAL-000323

No. 2 SRU Inlet No. 1

Emission tests were conducted on the No. 2 SRU Inlet No. 1 to determine the concentration of oxygen; and the concentration and emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions were tested using EPA Methods 3A, 6C, 7E, and 10 respectively. Gas flow rate at the inlet was not measured and was assumed to be ½ of the measured outlet flow rate.

Samples used to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were collected from a single sample point located near the center of the stack.

CRLLC-CHAL-000324

No. 2 SRU Inlet No. 1
Stack Gas Flow Rate

During the emission tests, stack gas velocity, flow rate, and moisture were measured at the No. 2 SRU Outlet during two test runs. Gas flow rate at the inlet was not measured and was assumed to be ½ of the average measured outlet flow rate. Outlet test data and calculations are presented in Section 6.4 of this report.

CRLLC-CHAL-000325

No. 2 SRU Inlet No. 1
EPA Methods 3A, 6C, 7E, and 10
(oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide)

Test Data and Calculations

During the emission tests, a sample of the stack gas was continuously drawn from the stack and analyzed to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide per EPA Methods 3A, 6C, 7E, and 10. Results of the tests are summarized on the following pages along with calculation of emission rates.

Test analyzer response was recorded using a computer data acquisition system. One minute average data were recorded on magnetic media and then printed in a format that aids interpretation of the data without editing or processing of the data. These data are presented following data summary and calculations.

Each test analyzer was calibrated before and after each test run by challenging the analyzer with a set of certified calibration gas standards. Analyzer response was recorded using the computer data acquisition system. Calibration data are presented on each page of applicable test data.

CRLLC-CHAL-000326

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 1

EPA METHOD 6C, DETERMINATION of SULFUR DIOXIDE EMISSION RATE

CSO2	SO2 concentration, PPMv actual O2	CSO2c	SO2 concentration, PPMv corrected to base O2
ESO2	SO2 emission rate, lb/hr	O2	Stack oxygen conc., vol% dry
F1	Conversion factor, 1 part/ 1.00E+06 PPMv	O2b	Base stack oxygen conc., vol% dry
MW	Molecular weight of SO2, 64.065 lb/lb-mole		
Qsd	Stack gas volumetric flow rate, dry std ft3/hr		
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg		

---- Run 2, 1050 F 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(4.88)(64.065)(564125.6)}{(385.546)(1.00E+06)} \right\} = 0.4574$$

CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (4.88)(20.9 - 0.00) / (20.9 - 8.74) = 8.39

---- Run 4, 1025 F 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(4.59)(64.065)(564125.6)}{(385.546)(1.00E+06)} \right\} = 0.4303$$

CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (4.59)(20.9 - 0.00) / (20.9 - 8.95) = 8.03

CRLLC-CHAL-000327

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 1

EPA METHOD 7E, DETERMINATION of OXIDES of NITROGEN EMISSION RATE

CNOx	NOx concentration, PPMv actual O2
ENOx	NOx emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of NO2, 46.006 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 2, 1050 F 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(16.35)(46.006)(564125.6)}{(385.546)(1.00E+06)} \right\} = 1.1003$$

---- Run 4, 1025 F 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(16.99)(46.006)(564125.6)}{(385.546)(1.00E+06)} \right\} = 1.1437$$

CRLLC-CHAL-000328

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 1

EPA METHOD 10, DETERMINATION of CARBON MONOXIDE EMISSION RATE

CCO	CO concentration, PPMv actual O2
ECO	CO emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of CO, 28.011 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 2, 1050 F 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(272.30)(28.011)(564125.6)}{(385.546)(1.00E+06)} \right\} = 11.1603$$

---- Run 4, 1025 F 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(283.10)(28.011)(564125.6)}{(385.546)(1.00E+06)} \right\} = 11.6029$$

CRLLC-CHAL-000329

ETS

EMISSION TESTING SERVICES INC.

NOX CONVERTER EFFICIENCY TEST

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**SLOPE:**	6.0001955
DATE:	12/10/2009	**INTERCEPT:**	0.1366
		CORRELATION:	1.0000
		SPAN RANGE:	60.1386

CALIBRATION STATISTICS

	CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR < 2%	FINAL VOLT	CONC %	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.18	0.00	0.11	0.00
MID	25.00	4.11	24.81	0.32	4.11	24.81	0.00
HIGH	55.10	9.17	55.19	0.15	9.17	55.19	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS < 5%	FINAL VOLT	CONC PPM	RESP BIAS < 5%	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.00	0.00	0.11	0.00	0.00
HIGH	55.10	9.17	55.19	0.00	9.17	55.19	0.00	0.00

TIME	NOX-PPM	CHALLENGE CONCENTRATION
10:10:05	43.85	48.60
10:11:05	44.52	
10:12:05	45.19	
10:13:06	45.69	
10:14:06	46.22	**% EFFICIENCY**
AVG	**45.09**	**92.79**

Acceptable efficiency is greater than or equal to 90%

This NO2 to NO converter efficiency test is a modified version of that specified in EPA Method 7E. This modified methodology has been approved and accepted by the LDEQ as the preferred methodology. The gas standard used in this test is not required to be certified per EPA Protocol No. 1.

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000330

ETS®

EMISSION TESTING SERVICES, INC.

RESPONSE TIME SHEET

Source:	#2 SRU	Date:	12/11/2009
Monitor:	MODEL 42i-HL	Location:	CHALMETTE, LA
Serial Number:	ETSNOX1B	Client:	EXXONMOBIL

High Level Gas Concentration: 55.1 PPM

TEST RUN

ACTUAL TIME BEGIN	ACTUAL TIME END	UPSCALE SECONDS	ACTUAL TIME BEGIN	ACTUAL TIME END	DOWNSCAI SECONDS
0.00	54.50	54.50	0.00	61.92	61.92
0.00	51.83	51.83	0.00	66.33	66.33
0.00	53.92	53.92	0.00	62.42	62.42
	AVERAGE	53.42		AVERAGE	63.56

System Response Time (slower of A or B) = 63.56 SEC.

COMMENTS:

ETS REFERENCE SOPS-007,020

CRLLC-CHAL-000331

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	2	**SLOPE:**	24.8244
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.1343
		CORRELATION:	1.00000
		SPAN RANGE:	248.3787

CALIBRATION STATISTICS

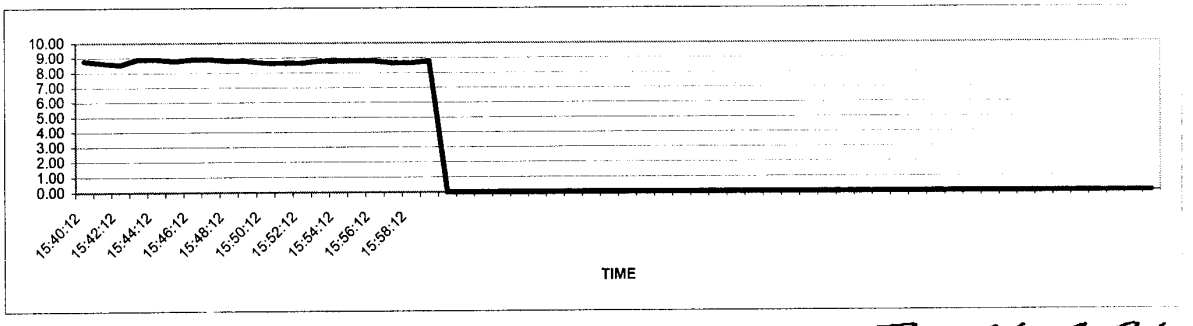
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	0.01	0.00
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.01	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.13	0.05	0.00	0.13	0.05	0.00
BIAS HIGH	20.00	0.79	19.77	0.10	0.79	19.77	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
15:40:12	8.77	15:55:12	8.77				
15:41:12	8.64	15:56:12	8.77				
15:42:12	8.52	15:57:12	8.64				
15:43:12	8.89	15:58:12	8.64				
15:44:12	8.89	15:59:12	8.77				
15:45:12	8.77						
15:46:12	8.89						
15:47:12	8.89						
15:48:12	8.77						
15:49:12	8.77						
15:50:12	8.64						
15:51:12	8.64						
15:52:12	8.64						
15:53:12	8.77						
15:54:12	8.77						
						AVG	**8.74**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000332

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	2	**SLOPE:**	12.1028
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.7320
		CORRELATION:	0.99997
		SPAN RANGE:	120.2964

CALIBRATION STATISTICS

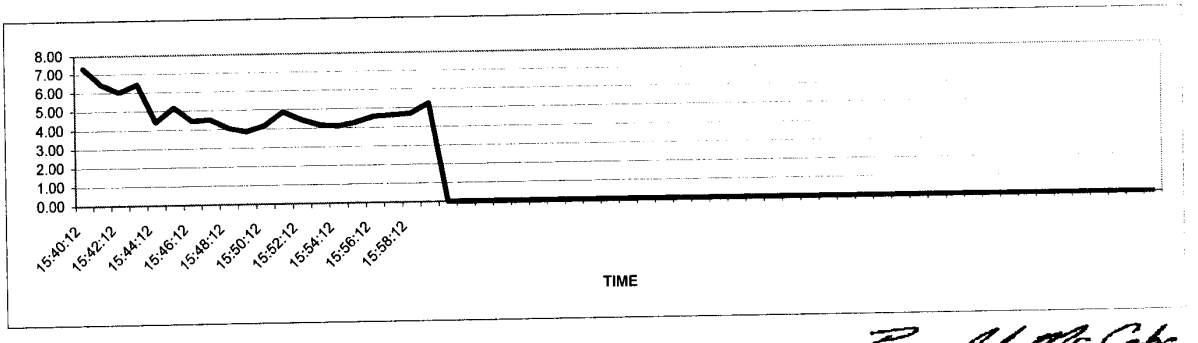
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.08	0.27	0.23	0.04	-0.20	0.39
ALM057798	LOW	54.40	4.51	53.87	0.44	4.51	53.81	0.05
AAL6085	HIGH	111.00	9.25	111.25	0.21	9.22	110.90	0.29

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.08	0.27	0.00	0.04	-0.26	0.05	0.44
BIAS HIGH	111.00	9.13	109.81	1.20	9.13	109.81	0.91	0.00

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
15:40:12	7.32	15:55:12	4.27				
15:41:12	6.42	15:56:12	4.57				
15:42:12	6.00	15:57:12	4.63				
15:43:12	6.42	15:58:12	4.69				
15:44:12	4.39	15:59:12	5.23				
15:45:12	5.17						
15:46:12	4.45						
15:47:12	4.51						
15:48:12	4.03						
15:49:12	3.85						
15:50:12	4.15						
15:51:12	4.87						
15:52:12	4.45						
15:53:12	4.15						
15:54:12	4.09						
						AVG	**4.88**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000333

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	2	**SLOPE:**	6.0751
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	0.0227
		CORRELATION:	0.99999
		SPAN RANGE:	60.7734

CALIBRATION STATISTICS

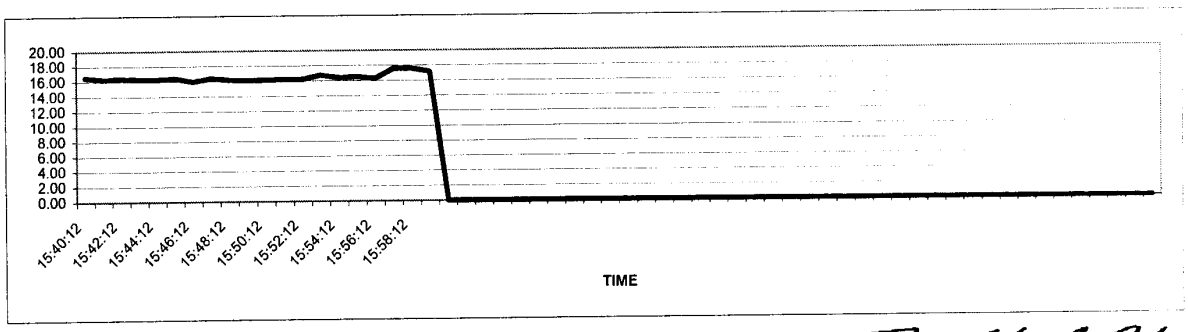
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.08	0.13	0.01	0.08	0.00
AAL069096	LOW	25.00	4.09	24.85	0.25	4.10	24.94	0.15
ALM000668	HIGH	55.10	9.08	55.17	0.11	9.11	55.34	0.29

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.17	0.15	0.02	0.17	0.15	0.00
BIAS HIGH	55.10	8.98	54.59	0.95	9.06	55.05	0.49	0.76

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
15:40:12	16.51	15:55:12	16.51				
15:41:12	16.24	15:56:12	16.21				
15:42:12	16.36	15:57:12	17.56				
15:43:12	16.24	15:58:12	17.53				
15:44:12	16.24	15:59:12	17.14				
15:45:12	16.39						
15:46:12	15.94						
15:47:12	16.39						
15:48:12	16.12						
15:49:12	16.06						
15:50:12	16.15						
15:51:12	16.18						
15:52:12	16.18						
15:53:12	16.72						
15:54:12	16.39						
						AVG	16.45



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000334

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	2	**SLOPE:**	217.2434
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.7454
		CORRELATION:	0.99999
		SPAN RANGE:	2171.6887

CALIBRATION STATISTICS

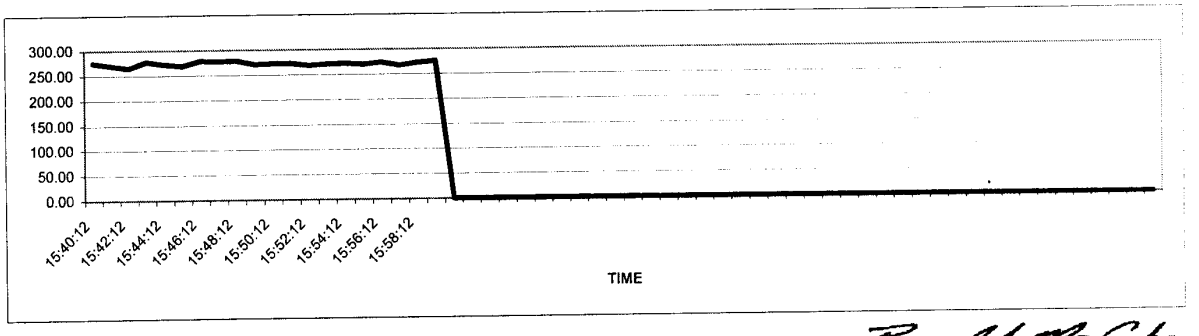
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	2.44	0.11	0.01	2.44	0.00
AAL9259	LOW	900.00	4.13	895.60	0.20	4.13	895.60	0.00
ALM054357	HIGH	2000.00	9.22	2001.97	0.09	9.23	2004.09	0.10

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	4.56	0.10	0.02	4.56	0.10	0.00
BIAS HIGH	2000.00	9.19	1995.60	0.29	9.19	1995.60	0.39	0.00

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
15:40:12	274.91	15:55:12	269.58				
15:41:12	269.58	15:56:12	273.84				
15:42:12	264.25	15:57:12	267.45				
15:43:12	277.04	15:58:12	272.78				
15:44:12	271.71	15:59:12	275.97				
15:45:12	268.51						
15:46:12	278.10						
15:47:12	277.04						
15:48:12	278.10						
15:49:12	270.64						
15:50:12	272.78						
15:51:12	272.78						
15:52:12	268.51						
15:53:12	270.64						
15:54:12	271.71						
						AVG	**272.30**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000335

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	4	**SLOPE:**	24.8244
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.1343
		CORRELATION:	1.00000
		SPAN RANGE:	248.3787

CALIBRATION STATISTICS

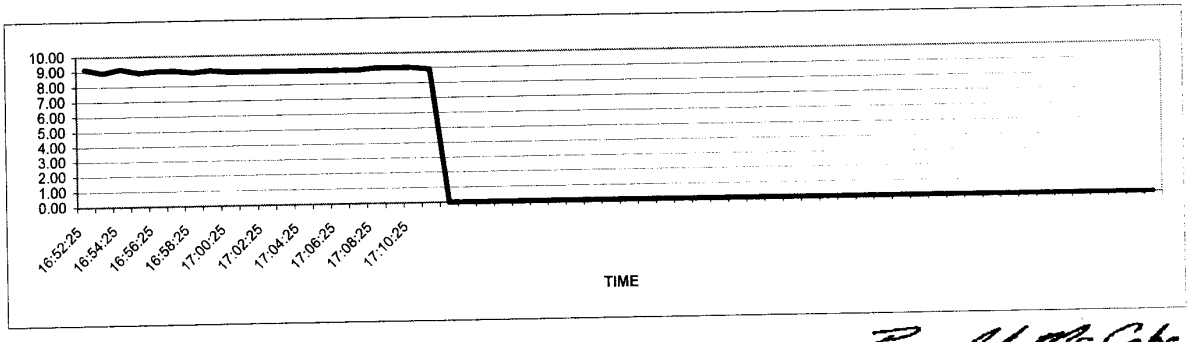
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	0.01	0.00
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.01	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.13	0.05	0.00	0.13	0.05	0.00
BIAS HIGH	20.00	0.79	19.77	0.10	0.79	19.77	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
16:52:25	9.14	17:07:25	8.89				
16:53:25	8.89	17:08:25	9.01				
16:54:25	9.14	17:09:25	9.01				
16:55:25	8.89	17:10:25	9.01				
16:56:25	9.01	17:11:25	8.89				
16:57:25	9.01						
16:58:25	8.89						
16:59:25	9.01						
17:00:25	8.89						
17:01:25	8.89						
17:02:25	8.89						
17:03:25	8.89						
17:04:25	8.89						
17:05:25	8.89						
17:06:25	8.89						
						AVG	8.95



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000336

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	4	**SLOPE:**	12.0910
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.3823
		CORRELATION:	0.99999
		SPAN RANGE:	120.5281

CALIBRATION STATISTICS

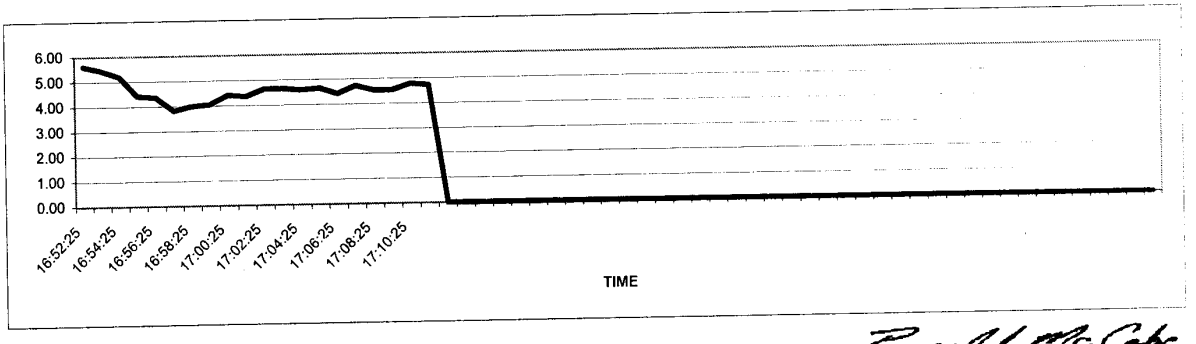
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.04	0.15	0.12	0.04	0.15	0.00
ALM057798	LOW	54.40	4.51	54.11	0.24	4.51	54.11	0.00
AAL6085	HIGH	111.00	9.22	111.14	0.12	9.21	110.96	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.09	0.05	0.04	0.09	0.05	0.00
BIAS HIGH	111.00	9.13	110.05	0.90	9.13	110.05	0.76	0.00

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
16:52:25	5.60	17:07:25	4.71				
16:53:25	5.42	17:08:25	4.53				
16:54:25	5.18	17:09:25	4.53				
16:55:25	4.41	17:10:25	4.77				
16:56:25	4.35	17:11:25	4.71				
16:57:25	3.81						
16:58:25	3.99						
16:59:25	4.05						
17:00:25	4.41						
17:01:25	4.35						
17:02:25	4.65						
17:03:25	4.65						
17:04:25	4.59						
17:05:25	4.65						
17:06:25	4.41						
						AVG	**4.59**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000337

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EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	4	**SLOPE:**	6.0556
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	0.0196
		CORRELATION:	0.99999
		SPAN RANGE:	60.5754

CALIBRATION STATISTICS

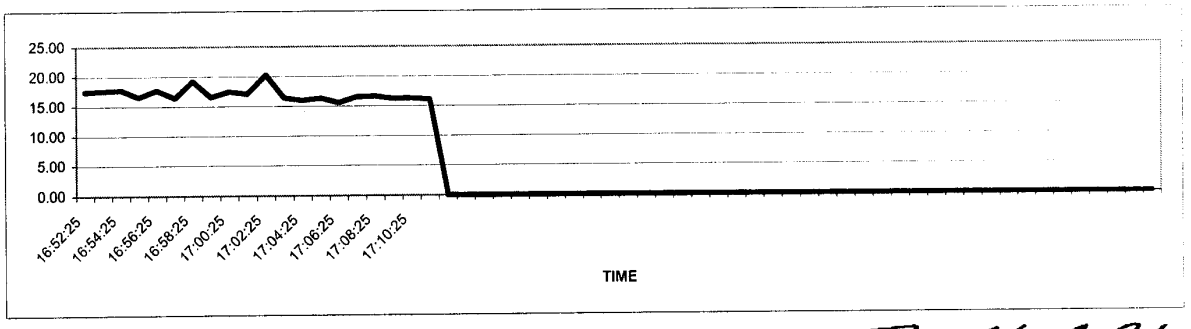
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.08	0.13	0.01	0.08	0.00
AAL069096	LOW	25.00	4.10	24.86	0.24	4.14	25.10	0.40
ALM000668	HIGH	55.10	9.11	55.16	0.11	9.19	55.70	0.88

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.17	0.15	0.02	0.17	0.15	0.00
BIAS HIGH	55.10	9.06	54.87	0.49	9.18	55.60	0.17	1.20

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
16:52:25	17.43	17:07:25	16.54				
16:53:25	17.57	17:08:25	16.60				
16:54:25	17.75	17:09:25	16.24				
16:55:25	16.54	17:10:25	16.27				
16:56:25	17.69	17:11:25	16.07				
16:57:25	16.39						
16:58:25	19.20						
16:59:25	16.54						
17:00:25	17.43						
17:01:25	17.07						
17:02:25	20.24						
17:03:25	16.36						
17:04:25	15.98						
17:05:25	16.30						
17:06:25	15.56						
						AVG	16.99



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000338

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #1	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	4	**SLOPE:**	217.0054
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.3917
		CORRELATION:	0.99999
		SPAN RANGE:	2169.6619

CALIBRATION STATISTICS

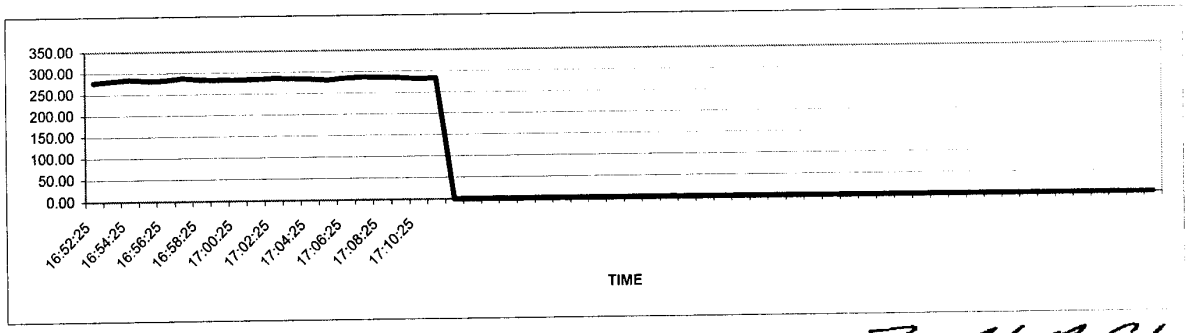
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	2.79	0.13	0.01	2.79	0.00
AAL9259	LOW	900.00	4.13	894.97	0.23	4.15	899.31	0.20
ALM054357	HIGH	2000.00	9.23	2002.25	0.10	9.29	2015.01	0.59

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	4.91	0.10	0.02	4.91	0.10	0.00
BIAS HIGH	2000.00	9.19	1993.77	0.39	9.27	2011.13	0.18	0.80

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
16:52:25	276.89	17:07:25	286.44				
16:53:25	281.14	17:08:25	285.38				
16:54:25	284.32	17:09:25	284.32				
16:55:25	281.14	17:10:25	281.14				
16:56:25	282.20	17:11:25	283.26				
16:57:25	287.50						
16:58:25	283.26						
16:59:25	282.20						
17:00:25	282.20						
17:01:25	283.26						
17:02:25	285.38						
17:03:25	284.32						
17:04:25	283.26						
17:05:25	280.08						
17:06:25	284.32						
						AVG	**283.10**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000339

No. 2 SRU Inlet No. 2

Emission tests were conducted on the No. 2 SRU Inlet No. 1 to determine the concentration of oxygen; and the concentration and emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions were tested using EPA Methods 3A, 6C, 7E, and 10 respectively. Gas flow rate at was assumed to be ½ of the measured outlet flow rate.

Samples used to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were collected from a sample point located near the center of the stack.

CRLLC-CHAL-000340

No. 2 SRU Inlet No. 2
Stack Gas Flow Rate

During the emission tests, stack gas velocity, flow rate, and moisture were measured at the No. 2 SRU Outlet during two test runs. Gas flow rate at the inlet was not measured and was assumed to be ½ of the average measured outlet flow rate. Outlet test data and calculations are presented in Section 6.4 of this report.

CRLLC-CHAL-000341

No. 2 SRU Inlet No. 2
EPA Methods 3A, 6C, 7E, and 10
(oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide)

Test Data and Calculations

During the emission tests, a sample of the stack gas was continuously drawn from the stack and analyzed to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide per EPA Methods 3A, 6C, 7E, and 10. Results of the tests are summarized on the following pages along with calculation of emission rates.

Test analyzer response was recorded using a computer data acquisition system. One minute average data were recorded on magnetic media and then printed in a format that aids interpretation of the data without editing or processing of the data. These data are presented following data summary and calculations.

Each test analyzer was calibrated before and after each test run by challenging the analyzer with a set of certified calibration gas standards. Analyzer response was recorded using the computer data acquisition system. Calibration data are presented on each page of applicable test data.

CRLLC-CHAL-000342

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 2

EPA METHOD 6C, DETERMINATION of SULFUR DIOXIDE EMISSION RATE

CSO2	SO2 concentration, PPMv actual O2	CSO2c	SO2 concentration, PPMv corrected to base O2
ESO2	SO2 emission rate, lb/hr	O2	Stack oxygen conc., vol% dry
F1	Conversion factor, 1 part/ 1.00E+06 PPMv	O2b	Base stack oxygen conc., vol% dry
MW	Molecular weight of SO2, 64.065 lb/lb-mole		
Qsd	Stack gas volumetric flow rate, dry std ft3/hr		
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg		

---- Run 1, 1050 F 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(34.19)(64.065)(564125.6)}{(385.546)(1.00E+06)} \right\} = 3.2049$$

$$CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (34.19)(20.9 - 0.00) / (20.9 - 6.09) = 48.25$$

---- Run 3, 1050 F 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(30.67)(64.065)(564125.6)}{(385.546)(1.00E+06)} \right\} = 2.8750$$

$$CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (30.67)(20.9 - 0.00) / (20.9 - 6.19) = 43.58$$

CRLLC-CHAL-000343

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 2

EPA METHOD 7E, DETERMINATION of OXIDES of NITROGEN EMISSION RATE

CNOx	NOx concentration, PPMv actual O2
ENOx	NOx emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of NO2, 46.006 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 2, 1050 F 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(11.13)(46.006)(564125.6)}{(385.546)(1.00E+06)} \right\} = 0.7492$$

---- Run 4, 1025 F 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(11.56)(46.006)(564125.6)}{(385.546)(1.00E+06)} \right\} = 0.7782$$

CRLLC-CHAL-000344

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Inlet 2

EPA METHOD 10, DETERMINATION of CARBON MONOXIDE EMISSION RATE

CCO	CO concentration, PPMv actual O2
ECO	CO emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of CO, 28.011 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 2, 1050 F 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(1047.90)(28.011)(564125.6)}{(385.546)(1.00E+06)} \right\} = 42.9485$$

---- Run 4, 1025 F 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(1014.17)(28.011)(564125.6)}{(385.546)(1.00E+06)} \right\} = 41.5661$$

CRLLC-CHAL-000345

ETS

EMISSION TESTING SERVICES INC.

NOX CONVERTER EFFICIENCY TEST

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**SLOPE:**	6.0001955
DATE:	12/10/2009	**INTERCEPT:**	0.1366
		CORRELATION:	1.0000
		SPAN RANGE:	60.1386

CALIBRATION STATISTICS

	CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR < 2%	FINAL VOLT	CONC %	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.18	0.00	0.11	0.00
MID	25.00	4.11	24.81	0.32	4.11	24.81	0.00
HIGH	55.10	9.17	55.19	0.15	9.17	55.19	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS < 5%	FINAL VOLT	CONC PPM	RESP BIAS < 5%	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.00	0.00	0.11	0.00	0.00
HIGH	55.10	9.17	55.19	0.00	9.17	55.19	0.00	0.00

TIME	NOX-PPM	CHALLENGE CONCENTRATION
10:10:05	43.85	48.60
10:11:05	44.52	
10:12:05	45.19	
10:13:06	45.69	
10:14:06	46.22	**% EFFICIENCY**
AVG	**45.09**	**92.79**

Acceptable efficiency is greater than or equal to 90%

This NO2 to NO converter efficiency test is a modified version of that specified in EPA Method 7E. This modified methodology has been approved and accepted by the LDEQ as the preferred methodology. The gas standard used in this test is not required to be certified per EPA Protocol No. 1.

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000346

ETS®

EMISSION TESTING SERVICES, INC.

RESPONSE TIME SHEET

Source:	#2 SRU	Date:	12/11/2009
Monitor:	MODEL 42i-HL	Location:	CHALMETTE, LA
Serial Number:	ETSNOX1B	Client:	EXXONMOBIL

High Level Gas Concentration: 55.1 PPM

TEST RUN

ACTUAL TIME BEGIN	ACTUAL TIME END	UPSCALE SECONDS	ACTUAL TIME BEGIN	ACTUAL TIME END	DOWNSCAI SECONDS
0.00	54.50	54.50	0.00	61.92	61.92
0.00	51.83	51.83	0.00	66.33	66.33
0.00	53.92	53.92	0.00	62.42	62.42
	AVERAGE	53.42		AVERAGE	63.56

System Response Time (slower of A or B) = 63.56 SEC.

COMMENTS:

ETS REFERENCE SOPS-007,020

CRLLC-CHAL-000347

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	1	**SLOPE:**	24.8244
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.1343
		CORRELATION:	1.00000
		SPAN RANGE:	248.3787

CALIBRATION STATISTICS

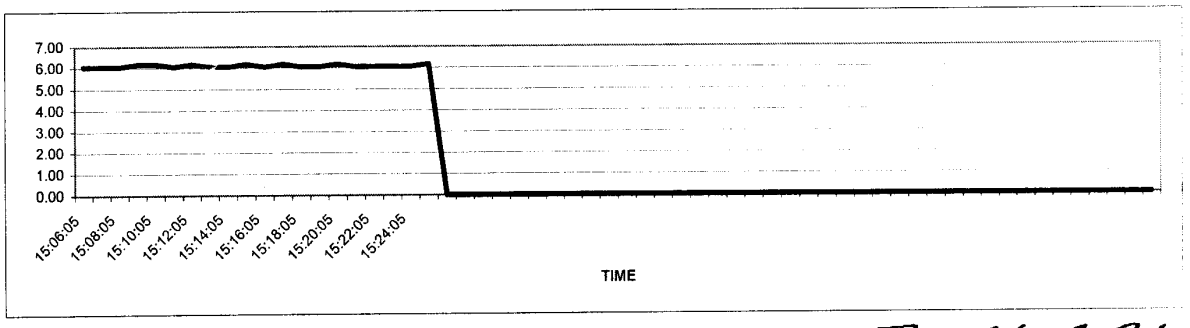
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	0.01	0.00
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.01	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.13	0.05	0.00	0.13	0.05	0.00
BIAS HIGH	20.00	0.79	19.77	0.10	0.79	19.77	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
15:06:05	6.05	15:21:05	6.05				
15:07:05	6.05	15:22:05	6.05				
15:08:05	6.05	15:23:05	6.05				
15:09:05	6.17	15:24:05	6.05				
15:10:05	6.17	15:25:05	6.17				
15:11:05	6.05						
15:12:05	6.17						
15:13:05	6.05						
15:14:05	6.05						
15:15:05	6.17						
15:16:05	6.05						
15:17:05	6.17						
15:18:05	6.05						
15:19:05	6.05						
15:20:05	6.17						
						AVG	6.09



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000348

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	1	**SLOPE:**	12.1028
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.7320
		CORRELATION:	0.99997
		SPAN RANGE:	120.2964

CALIBRATION STATISTICS

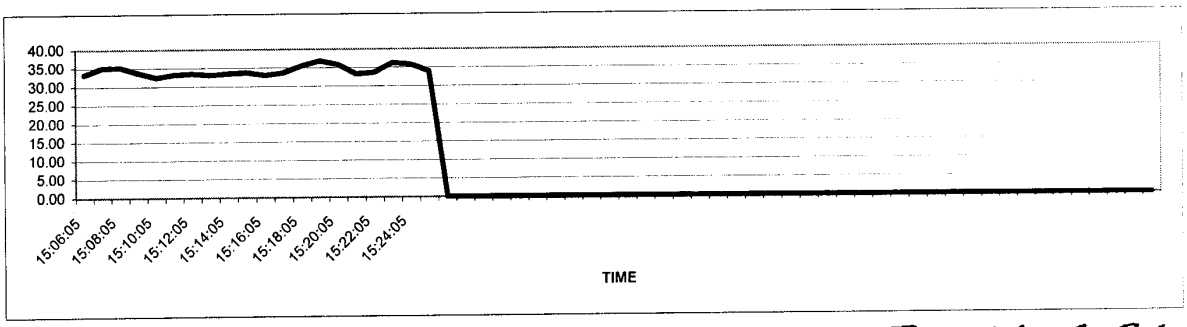
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.08	0.27	0.23	0.04	-0.20	0.39
ALM057798	LOW	54.40	4.51	53.87	0.44	4.51	53.81	0.05
AAL6085	HIGH	111.00	9.25	111.25	0.21	9.22	110.90	0.29

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.08	0.27	0.00	0.04	-0.26	0.05	0.44
BIAS HIGH	111.00	9.13	109.81	1.20	9.13	109.81	0.91	0.00

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
15:06:05	33.25	15:21:05	33.19				
15:07:05	34.98	15:22:05	33.60				
15:08:05	35.16	15:23:05	36.23				
15:09:05	33.66	15:24:05	35.81				
15:10:05	32.47	15:25:05	33.90				
15:11:05	33.19						
15:12:05	33.42						
15:13:05	33.07						
15:14:05	33.48						
15:15:05	33.66						
15:16:05	33.01						
15:17:05	33.60						
15:18:05	35.46						
15:19:05	36.83						
15:20:05	35.75						
						AVG	**34.19**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000349

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METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	1	**SLOPE:**	6.0751
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	0.0227
		CORRELATION:	0.99999
		SPAN RANGE:	60.7734

CALIBRATION STATISTICS

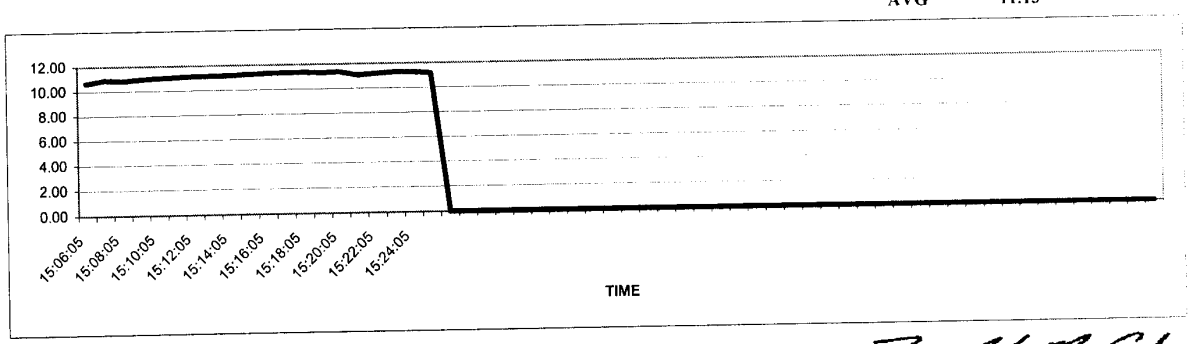
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.08	0.13	0.01	0.08	0.00
AAL069096	LOW	25.00	4.09	24.85	0.25	4.10	24.94	0.15
ALM000668	HIGH	55.10	9.08	55.17	0.11	9.11	55.34	0.29

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.17	0.15	0.02	0.17	0.15	0.00
BIAS HIGH	55.10	8.98	54.59	0.95	9.06	55.05	0.49	0.76

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
15:06:05	10.62	15:21:05	11.07				
15:07:05	10.89	15:22:05	11.19				
15:08:05	10.80	15:23:05	11.28				
15:09:05	10.92	15:24:05	11.25				
15:10:05	11.01	15:25:05	11.19				
15:11:05	11.07						
15:12:05	11.13						
15:13:05	11.13						
15:14:05	11.16						
15:15:05	11.25						
15:16:05	11.31						
15:17:05	11.34						
15:18:05	11.34						
15:19:05	11.31						
15:20:05	11.34						
						AVG	11.13



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000350

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EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	1050 DEGREES
RUN # :	1	**SLOPE:**	217.2434
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.7454
		CORRELATION:	0.99999
		SPAN RANGE:	2171.6887

CALIBRATION STATISTICS

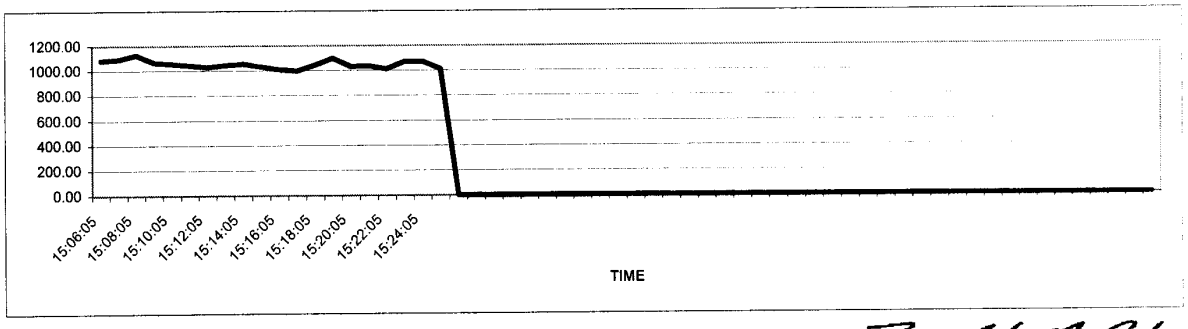
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	2.44	0.11	0.01	2.44	0.00
AAL9259	LOW	900.00	4.13	895.60	0.20	4.13	895.60	0.00
ALM054357	HIGH	2000.00	9.22	2001.97	0.09	9.23	2004.09	0.10

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	4.56	0.10	0.02	4.56	0.10	0.00
BIAS HIGH	2000.00	9.19	1995.60	0.29	9.19	1995.60	0.39	0.00

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
15:06:05	1081.51	15:21:05	1034.63				
15:07:05	1088.97	15:22:05	1007.99				
15:08:05	1125.20	15:23:05	1069.79				
15:09:05	1063.40	15:24:05	1068.73				
15:10:05	1051.68	15:25:05	1007.99				
15:11:05	1041.02						
15:12:05	1027.17						
15:13:05	1042.09						
15:14:05	1052.74						
15:15:05	1028.24						
15:16:05	1004.79						
15:17:05	994.14						
15:18:05	1042.09						
15:19:05	1096.43						
15:20:05	1029.30						
						AVG	**1047.90**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000351

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EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	3	**SLOPE:**	24.8244
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.1343
		CORRELATION:	1.00000
		SPAN RANGE:	248.3787

CALIBRATION STATISTICS

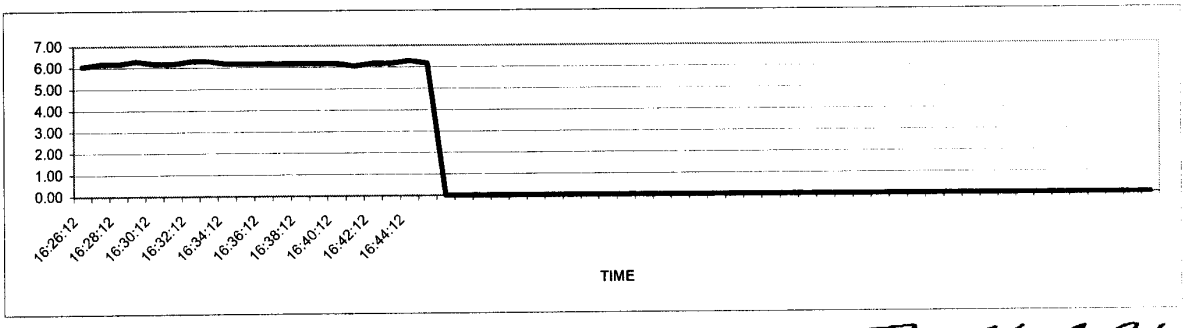
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	0.01	0.00
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.01	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.13	0.05	0.00	0.13	0.05	0.00
BIAS HIGH	20.00	0.79	19.77	0.10	0.79	19.77	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
16:26:12	6.05	16:41:12	6.05				
16:27:12	6.17	16:42:12	6.17				
16:28:12	6.17	16:43:12	6.17				
16:29:12	6.30	16:44:12	6.30				
16:30:12	6.17	16:45:12	6.17				
16:31:12	6.17						
16:32:12	6.30						
16:33:12	6.30						
16:34:12	6.17						
16:35:12	6.17						
16:36:12	6.17						
16:37:12	6.17						
16:38:12	6.17						
16:39:12	6.17						
16:40:12	6.17						
						AVG	**6.19**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000352

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	3	**SLOPE:**	12.0910
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.3823
		CORRELATION:	0.99999
		SPAN RANGE:	120.5281

CALIBRATION STATISTICS

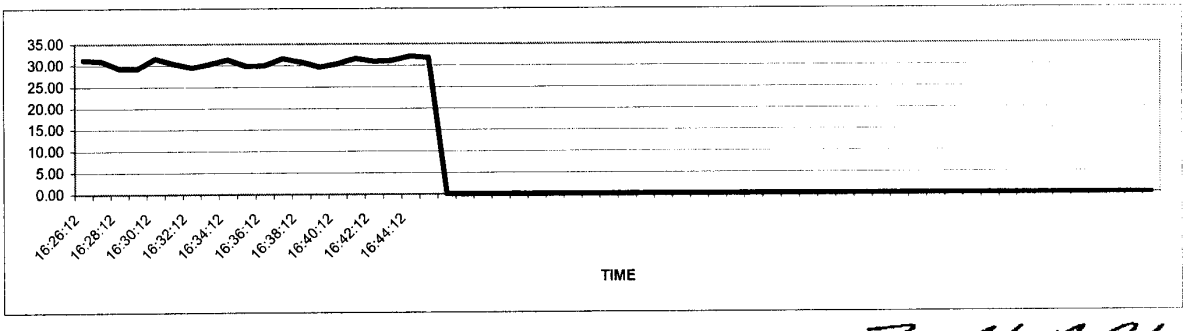
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.04	0.15	0.12	0.04	0.15	0.00
ALM057798	LOW	54.40	4.51	54.11	0.24	4.51	54.11	0.00
AAL6085	HIGH	111.00	9.22	111.14	0.12	9.21	110.96	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.09	0.05	0.04	0.09	0.05	0.00
BIAS HIGH	111.00	9.13	110.05	0.90	9.13	110.05	0.76	0.00

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
16:26:12	31.23	16:41:12	31.59				
16:27:12	30.99	16:42:12	30.93				
16:28:12	29.26	16:43:12	31.11				
16:29:12	29.20	16:44:12	32.12				
16:30:12	31.59	16:45:12	31.82				
16:31:12	30.33						
16:32:12	29.50						
16:33:12	30.27						
16:34:12	31.29						
16:35:12	29.80						
16:36:12	29.92						
16:37:12	31.59						
16:38:12	30.75						
16:39:12	29.62						
16:40:12	30.39						
						AVG	**30.67**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000353

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	3	**SLOPE:**	6.0556
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	0.0196
		CORRELATION:	0.99999
		SPAN RANGE:	60.5754

CALIBRATION STATISTICS

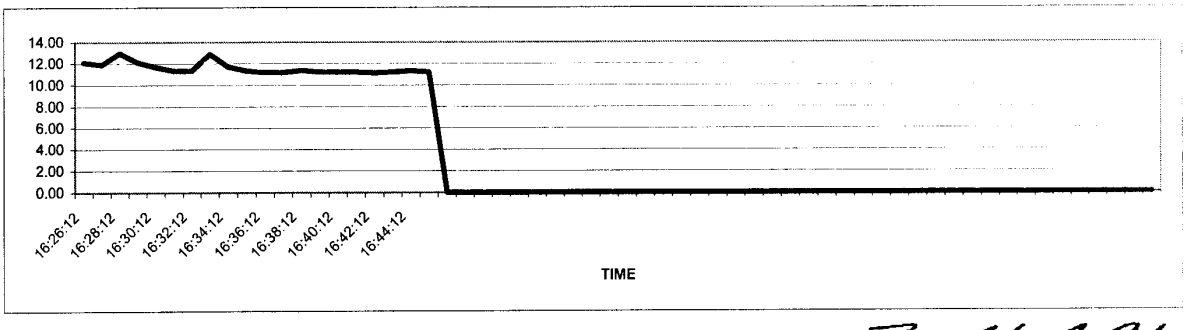
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.08	0.13	0.01	0.08	0.00
AAL069096	LOW	25.00	4.10	24.86	0.24	4.14	25.10	0.40
ALM000668	HIGH	55.10	9.11	55.16	0.11	9.19	55.70	0.88

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.17	0.15	0.02	0.17	0.15	0.00
BIAS HIGH	55.10	9.06	54.87	0.49	9.18	55.60	0.17	1.20

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
16:26:12	12.10	16:41:12	11.18				
16:27:12	11.86	16:42:12	11.10				
16:28:12	12.96	16:43:12	11.18				
16:29:12	12.10	16:44:12	11.30				
16:30:12	11.66	16:45:12	11.18				
16:31:12	11.30						
16:32:12	11.30						
16:33:12	12.87						
16:34:12	11.69						
16:35:12	11.30						
16:36:12	11.15						
16:37:12	11.15						
16:38:12	11.36						
16:39:12	11.18						
16:40:12	11.18						
						AVG	**11.56**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000354

ETS®

EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	SRU INLET #2	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	3	**SLOPE:**	217.0054
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.3917
		CORRELATION:	0.99999
		SPAN RANGE:	2169.6619

CALIBRATION STATISTICS

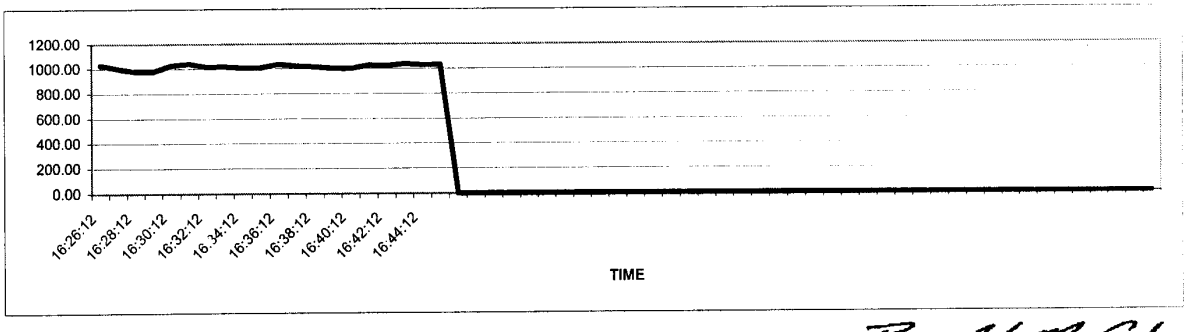
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	2.79	0.13	0.01	2.79	0.00
AAL9259	LOW	900.00	4.13	894.97	0.23	4.15	899.31	0.20
ALM054357	HIGH	2000.00	9.23	2002.25	0.10	9.29	2015.01	0.59

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	4.91	0.10	0.02	4.91	0.10	0.00
BIAS HIGH	2000.00	9.19	1993.77	0.39	9.27	2011.13	0.18	0.80

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
16:26:12	1026.95	16:41:12	1023.77				
16:27:12	998.31	16:42:12	1019.52				
16:28:12	974.97	16:43:12	1036.50				
16:29:12	974.97	16:44:12	1025.89				
16:30:12	1023.77	16:45:12	1030.13				
16:31:12	1038.62						
16:32:12	1013.16						
16:33:12	1016.34						
16:34:12	1005.73						
16:35:12	1005.73						
16:36:12	1034.38						
16:37:12	1020.59						
16:38:12	1013.16						
16:39:12	1001.49						
16:40:12	999.37						
						AVG	**1014.17**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000355

No. 2 SRU Outlet

Emission tests were conducted on the No. 2 SRU Outlet to determine the concentration of carbon dioxide and oxygen; and the concentration and emission rates of sulfur dioxide, oxides of nitrogen, and carbon monoxide. Carbon dioxide, oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide emissions were tested using EPA Methods 3, 3A, 6C, 7E, and 10 respectively. Stack gas velocity, molecular weight, and moisture were determined using EPA Methods 2, 3, and 4. Prior to the tests, EPA Method 1 was used to verify the absence of cyclonic flow.

Stack gas velocity and moisture were determined using a combined sample probe from a series of sample points, Figure I, selected per EPA Method 1. The concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide were determined on samples collected from a series of three sample points, Figure II. Carbon dioxide concentration was determined on samples collected from a sample point located near the center of the stack, Figure III.

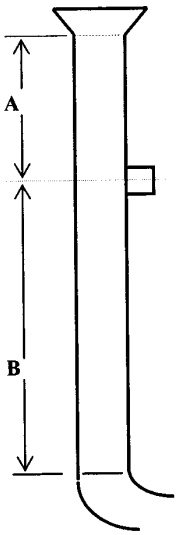
CRLLC-CHAL-000356

ETS

EMISSION TESTING SERVICES INC.

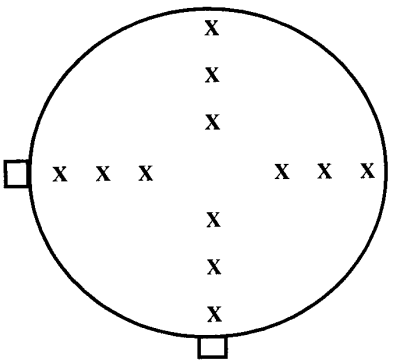
TRAVERSE POINT LAYOUT

METHODS-1-4



CLIENT:	EXXONMOBIL		
DATE:	12/11/2009		
UNIT TESTED:	#2 SRU OUTLET		
LOCATION:	CHALMETTE, LA.		
UPSTREAM DIST. (**A**): (INCHES)	670	DIAMETERS:	10.59
DOWNSTREAM DIST. (**B**): (INCHES)	384	DIAMETERS:	6.07
INSIDE DIAMETER (INCHES):	63.25		
COUPLING LENGTH (INCHES):	16.5		
COUPLING TYPE:	3" 4 BOLT FLANGE		

CROSS SECTIONAL LAYOUT



TOTAL TRAVERSE POINTS= 12

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	4.4	63.25	16.5	19.28
2	14.6	63.25	16.5	25.73
3	29.6	63.25	16.5	35.22
4	70.4	63.25	16.5	61.03
5	85.4	63.25	16.5	70.52
6	95.6	63.25	16.5	76.97

SIGNATURE: Ronald McCabe

FIGURE I
6.4.2

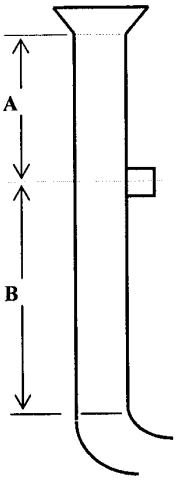
ETS-001

ETS

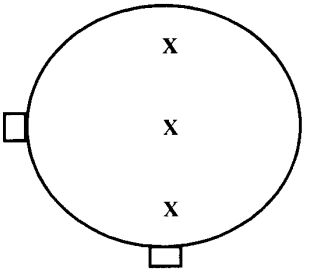
EMISSION TESTING SERVICES INC.

TRAVERSE POINT LAYOUT

METHODS 3A & 6C



CLIENT:	EXXONMOBIL
DATE:	12/11/09
UNIT TESTED:	#2 SRU OUTLET
LOCATION:	CHALMETTE, LA.
UPSTREAM DIST. (**A**):	670
DOWNSTREAM DIST. (**B**):	384
INSIDE DIAMETER (INCHES):	63.25
COUPLING LENGTH (INCHES):	16.5
COUPLING TYPE:	3" 4 BOLT FLANGE



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 3

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.167	63.25	16.5	27.06
2	0.500	63.25	16.5	48.13
3	0.833	63.25	16.5	69.19

SIGNATURE: Ronald McCabe

FIGURE II
6.4.3

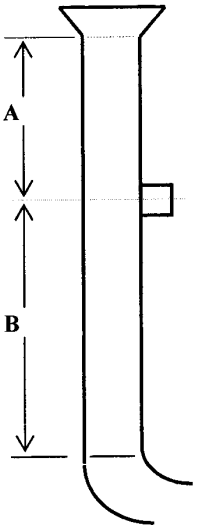
ETS-001

ETS

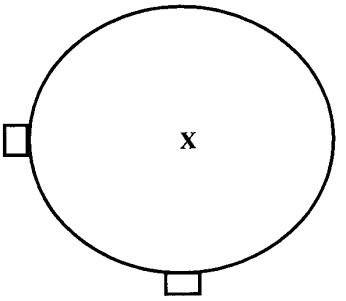
EMISSION TESTING SERVICES INC.

TRAVERSE POINT LAYOUT

METHOD 3



CLIENT:	EXXONMOBIL
DATE:	12/11/09
UNIT TESTED:	#2 SRU OUTLET
LOCATION:	CHALMETTE, LA.
UPSTREAM DIST. (**A**):	670
DOWNSTREAM DIST. (**B**):	384
INSIDE DIAMETER (INCHES):	63.25
COUPLING LENGTH (INCHES):	16.5
COUPLING TYPE:	3" 4 BOLT FLANGE



CROSS SECTIONAL LAYOUT

TOTAL TRAVERSE POINTS= 1

TRAVERSE POINT	DISTANCE % OF DIAMETER	STACK DIAMETER	COUPLING LENGTH	TRAVERSE POINTS
1	0.500	63.25	16.5	48.13

SIGNATURE: Ronald McCabe

FIGURE III
6.4.4

ETS-001

ETS
EMISSION TESTING SERVICES, INC.

VERIFICATION OF ABSENCE of CYCLONIC FLOW

COMPANY: Exxon
SOURCE: SRU
LOCATION: Chalmette

DATE: 12-11-09
STACK DIAMETER 65.5
OPERATOR: Clint Rachal

	REFERENCE ANGLE		REFERENCE ANGLE
1	6	13	
2	8	14	
3	8	15	
4	5	16	
5	4	17	
6	7	18	
7	10	19	
8	9	20	
9	9	21	
10	7	22	
11	6	23	
12	5	24	

AVERAGE 7° *

* THE AVERAGE IS THE ABSOLUTE VALUE OF EACH DEGREE POINT DIVIDED BY THE NUMBER OF POINTS.

REFERENCE ANGLE CANNOT EXCEED 20 DEGREES OF AVERAGE OVERALL VALUE.

ETS REFERENCE SOP - 002

FORMS:\2004\CYCLONIC

CRLLC-CHAL-000360

No. 2 SRU Outlet
EPA Methods 2, 3, and 4
(stack gas flow rate, mole wt., and moisture)

During the emission tests, stack gas velocity, flow rate, and moisture were determined using a combined sampling train. Test data and calculations are presented on the following pages.

Two test runs were conducted. The average flow rate from these tests was used to calculate all emission rates.

CRLLC-CHAL-000361

ETS®
EMISSION TESTING SERVICES, INC.

WEIGHT GAIN LOG SHEET

CLIENT: EXXONMOBIL CHALMETTE

OPERATOR: CLINT RACHAL

SOURCE: #2 SRU OUTLET STACK

BALANCE ID: BAL-2

RUN NUMBER: 1	SAMPLE BOX #: XC-1	DATE: 12/11/2009

	IMPINGER WEIGHT GAIN				LIQUID SAMPLE WEIGHTS			
	INITIAL VOLUME (ml)	INITIAL WEIGHT (grams)	FINAL WEIGHT (grams)	WEIGHT GAIN (grams)	SAMPLE ID	PRE WEIGHT (grams)	POST WEIGHT (grams)	TOTAL SAMPLE (grams)
IMP #1	100mls	574.3	653.1	78.8				
IMP #2	100mls	684.1	694.1	10.0				
IMP #3	Empty	517.2	517.9	0.7				
IMP #4	Silica	643.3	649.3	6.0				
IMP #5								
			TOTAL WT. GAIN:	95.5				

RUN NUMBER: 2	SAMPLE BOX #: XC-1	DATE: 12/11/2009

	IMPINGER WEIGHT GAIN				LIQUID SAMPLE WEIGHTS			
	INITIAL VOLUME (ml)	INITIAL WEIGHT (grams)	FINAL WEIGHT (grams)	WEIGHT GAIN (grams)	SAMPLE ID	PRE WEIGHT (grams)	POST WEIGHT (grams)	TOTAL SAMPLE (grams)
IMP #1	100mls	653.1	796.8	143.7				
IMP #2	100mls	694.1	644.6	-49.5				
IMP #3	Empty	517.9	518.4	0.5				
IMP #4	Silica	649.3	653.2	3.9				
IMP #5								
			TOTAL WT. GAIN:	98.6				

RUN NUMBER:	SAMPLE BOX #:	DATE:

	IMPINGER WEIGHT GAIN				LIQUID SAMPLE WEIGHTS			
	INITIAL VOLUME (ml)	INITIAL WEIGHT (grams)	FINAL WEIGHT (grams)	WEIGHT GAIN (grams)	SAMPLE ID	PRE WEIGHT (grams)	POST WEIGHT (grams)	TOTAL SAMPLE (grams)
IMP #1								
IMP #2								
IMP #3								
IMP #4								
IMP #5								
			TOTAL WT. GAIN:					

ETS REFERENCE SOPS -004,005,006,009, 010,012,013, 017

CRLLC-CHAL-000362

ETS® EMISSION TESTING SERVICES, INC., FIELD DATA, METHOD(S) 1-4

PLANT: Exxon Mobil
DATE: 12-11-09
LOCATION: Chalmette
STACK ID.: SRU
RUN NO.: #1

SAMPLE BOX NO.: ~~XC-1~~ CB-2
METER BOX NO.: XC-1
BAROMETRIC PRESSURE: 30.23
AMBIENT TEMP.:
OPERATOR: Clint Rachal

PITOT TUBE ID.: MX-7
PITOT TUBE FACTOR: .815
FILTER ID.: N-A
FILTER TYPE: N-A
NOZZLE DIAMETER, IN: N-A

STACK DIAMETER, in.:
METER Δ H@: 1.8102
METER D.G.M.F.: 1.0187
K-FACTOR: N-A
T-FACTOR: N-A

Traverse Point Number	Sampling Time (θ), min.	Static Pressure (in. H_2O)	Stack Temp. (Ts), °F	Velocity Head (ΔPs)	Velocity Head ($\sqrt{\Delta P_s}$)	Pressure Differential Across Orifice Meter (ΔH) in., H_2O Actual	Pressure Differential Across Orifice Meter (ΔH) in., H_2O Desired	Dry Gas Meter Volume (Vm), ft^3	Gas Sample Temperature at Dry Gas Meter (Tm), °F	Probe Temp. °F	Sample Box Temp. °F	Temp of Gas Leaving Last Impinger °F	Pump Vacuum in. Hg gauge
On@1	15:12		540	.150	.387	1.5	1.5	859.709	64	N-A	N-A	45	2.0
2	15:16		546	.170	.412			862.185	64			45	2.0
3	15:20		552	.180	.424			864.720	65			49	2.0
4	15:24		548	.170	.412			867.325	65			49	2.0
5	15:28		542	.160	.400			870.010	66			47	2.0
6	15:32		542	.140	.374			872.640	67			48	2.0
Off@	15:32							875.315					
On@1	15:39		548	.150	.387	1.5	1.5	875.315	68	NA	NA	50	2.0
2	15:43		551	.170	.412			877.900	69			47	2.0
3	15:47		552	.170	.412			880.490	70			47	2.0
4	15:51		552	.160	.400			883.120	71			48	2.0
5	15:55		549	.160	.400			885.600	71			49	2.0
6	15:59		543	.150	.387			887.970	72			50	
Off@	1603							890.585					
AVERAGE	48 min	-.40	547.08		.401	1.5		30.876	67.67				

6.4.8

Impinger Weight Gain: 95.5

ORSAT MEASUREMENT			
CO2	O2	CO	N2
4.1	6.4		

Orsat leak check ✓
Method (3 or 3A) 3
Barometer ID Unit #2

COMMENTS:

Pitot tube leak check, impact side Good @ 5.2
Pitot tube leak check, static side Good @ 4.7
Pre-leak Rate @ 10.0 in.Hg .004 ft3/min.
Post-leak Rate @ 10.0 in.Hg .004 ft3/min.

ETS REFERENCE SOPS – 002. 004, 005, 006. 009. 010. 012. 013. 017

CRLLC-CHAL-000363

ETS®
Emission Testing Services, Inc.

Client :	Chalmette Refining
Source :	No. 2 SRU Outlet
Test Date:	11-Dec-09
Run No. :	1

EPA METHOD 2, DETERMINATION of STACK GAS VELOCITY and VOLUMETRIC FLOW RATE
EPA METHOD 3, DETERMINATION of STACK GAS MOLECULAR WEIGHT
EPA METHOD 4, DETERMINATION of STACK GAS MOISTURE

A	Cross-sectional area of the stack, ft2
Acf	Stack gas flow rate, actual ft3/min
Bws	Stack gas moisture fraction, vol%/100 (Bws = SBws when Bws > SBws)
CCi	Component 1,2,3,... conc. vol%/100
Cp	Pitot tube calibration coefficient
D1	Diameter of round stack, in.
dH	Meter orifice press. diff., in.H2O
dP	Stack gas velocity head, in.H2O
ews	saturation vapor press, in.Hg @Ts
F1	Conversion factor, 13.6 in.H2O/ in.Hg
F2	Conversion factor, 453.59 g/lb
F3	Conversion factor, 12 in./ ft
F4	Conversion factor, 3600 sec/hr
F5	Conversion factor, 60 sec/hr
F4	Conversion factor, 3600 sec/hr
F5	Conversion factor, 60 sec/min
Kp	Pitot tube constant, 85.49
MCi	Mole wt of component, lb/lb-mole
Md	Stack gas mole weight, dry lb/lb-mole
MH2O	Mole weight of water, 18.015 lb/lb-mole
Ms	Stack gas mole weight, wet lb/lb-mole
Pa	Stack gas static pressure, in.H2O
Pbar	Barometric pressure, in.Hg
pi	Mathmatical constant, 3.14159
Ps	Stack gas absolute pressure, in.Hg
Pstd	Std. absolute pressure, 29.92 in.Hg
Qsd	Stack gas vol. flow rate, dry std. ft3/hr
R	Ideal gas constant, 21,85
SBws	Saturation moisture fraction @ Ts
Tm	Dry gas meter temp, F
Ts	Stack gas temp, F
Tstd	Standard temp, 528.0 R
Vi	Water vapor condensed, imp 1, g
Vii	Water vapor condensed, Imp 2, g
Viii	Water vapor condensed, imp 3, g
Viv	Water vapor condensed, imp 4, g
Vm	Sample volume indicated, dry ft3
Vmstd	Sample volume, dry standard ft3
Vs	Stack gas velocity, ft/sec
Vw	Total water vapor condensed, std ft3
Y	Dry gas meter calibration factor

$$Ps = (Pbar) + (Pa / F1) = (30.230) + (-0.4000 / 13.6) = 30.201$$

$$Vw = \left\{\frac{(Vi + Vii + Viii + Viv)(R)(Tstd)}{(F2)(Pstd)(MH2O)}\right\} = \left\{\frac{(78.8 + 10.00 + 0.70 + 6.00)(21.85)(528)}{(453.59)(29.92)(18.015)}\right\} = 4.50640$$

$$Vmstd = \left\{\frac{(Vm)(Y)(Pbar + (dH/F1))(Tstd)}{(Pstd)(Tm + 460)}\right\} = \left\{\frac{(30.876)(1.01870)(30.230 + (1.5000 / 13.6))(528.0)}{(29.92)(67.7 + 460.0)}\right\} = 31.91536$$

$$Bws = \left\{\frac{(Vw)}{(Vw + Vmstd)}\right\} = 0.12373$$

$$SBws = \left\{\frac{(esw)}{(Ps)}\right\} = \left\{\frac{(30.201)}{(30.201)}\right\} = 1.00000$$

$$Bws = 0.12373$$

$$Md = \left\{\begin{matrix} (MC1)(CC1) + & (MC2)(CC2) + \\ (MC3)(CC3) + & (MC4)(CC4) + \\ (MC5)(CC5) + & (MC6)(CC6) + \\ (MC7)(CC7) + & (MC8)(CC8) + \\ (MC9)(CC9) + & (MC10)(CC10) \end{matrix}\right\} = \left\{\begin{matrix} \text{Oxygen} & (31.999)(0.0640) + & \text{Carbon Dioxide} & (44.010)(0.0410) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & \text{Nitrogen} & (28.013)(0.8950) \end{matrix}\right\} = 28.924$$

$$Ms = (Md)(1 - Bws) + (MH2O)(Bws) = (28.924)(1 - 0.12373) + (18.015)(0.12373) = 27.574$$

$$A = \{(D1)/((F3)(2))\}^2\{pi\} = \{(63.250)/((12.000)(2))\}^2\{3.14159\} = 21.81967$$

$$Vs = \left\{(Kp)(Cp)(dP^{\frac{1}{2}})\right\}\left\{\frac{(Ts + 460)}{(Ps)(Ms)}\right\}^{\frac{1}{2}} = \left\{(85.49)(0.81500)(0.40080)\right\}\left\{\frac{(547.1 + 460)}{(30.201)(27.574)}\right\}^{\frac{1}{2}} = 30.7094$$

$$Acf = (F5)(Vs)(A) = (60)(30.7094)(21.81967) = 40204.09$$

$$Qsd = \left\{\frac{(F4)(1- Bws)(Vs)(A)(Tstd)(Ps)}{(Ts + 460)(Pstd)}\right\} = \left\{\frac{(3600)(1- 0.12373)(30.7094)(21.81967)(528)(30.201)}{(547.1 + 460)(29.92)}\right\} = \begin{matrix} 1118620.37 & \text{dscf/hr} \\ 18643.67 & \text{dscf/min} \end{matrix}$$

CRLLC-CHAL-000364

ETS® EMISSION TESTING SERVICES, INC., FIELD DATA, METHOD(S) 1-4

PLANT: Exxon Mobil
DATE: 12-11-09
LOCATION: Chalmette
STACK ID.: SRU
RUN NO.: 2

SAMPLE BOX NO.: CB-2
METER BOX NO.: XC-1
BAROMETRIC PRESSURE: 30.23
AMBIENT TEMP.:
OPERATOR: Clint Rachel

PITOT TUBE ID.: MV-7
PITOT TUBE FACTOR: .815
FILTER ID.: NA
FILTER TYPE: NA
NOZZLE DIAMETER, IN: NA

STACK DIAMETER, in.:
METER Δ H@: 1.8102
METER D.G.M.F.: 1.0187
K-FACTOR: N-A
T-FACTOR: NA

Traverse Point Number	Sampling Time (θ), min.	Static Pressure (in. H_2O)	Stack Temp. (Ts), °F	Velocity Head (ΔPs)	Velocity Head (√ΔPs)	Pressure Differential Across Orifice Meter (ΔH) in., H_2O Actual	Pressure Differential Across Orifice Meter (ΔH) in., H_2O Desired	Dry Gas Meter Volume (Vm), ft^3	Gas Sample Temperature at Dry Gas Meter (Tm), °F	Probe Temp. °F	Sample Box Temp. °F	Temp of Gas Leaving Last Impinger °F	Pump Vacuum in. Hg gauge
on@1	16:32		530	.150	.387	1.5	1.5	891.676	70	NA	NA	47	20
2	16:36		533	.170	.412			894.430	70			46	20
3	16:40		535	.180	.424			896.970	70			47	20
4	16:44		541	.170	.412			899.540	71			48	20
5	16:48		512	.170	.412			902.080	72			48	20
6	16:52		539	.150	.387			904.610	72			48	
off@	16:56							907.185					
			525										
on@1	16:57		~~525~~	.140	.374	1.5	1.5	907.185	73	NA	NA	50	20
2	17:01		530	.170	.412			909.770	73			49	20
3	17:05		531	.180	.424			912.340	74			49	20
4	17:09		538	.180	.424			914.930	74			49	20
5	17:13		541	.170	.412			917.520	75			48	20
6	17:17		536	.160	.400			920.080	75			47	
off@	17:21							922.610					
AVERAGE	48min		535.08		.407	1.5		31.024	72.42				

Impinger Weight Gain: 98.6

ORSAT MEASUREMENT			
CO2	O2	CO	N2
4.2	6.5		

Orsat leak check ✓
Method (3 or 3A) 3
Barometer ID Unit #2

COMMENTS:

Pitot tube leak check, impact side Good @ 5.1
Pitot tube leak check, static side Good @ 5.4
Pre-leak Rate @ 10.0 in.Hg .006 ft3/min.
Post-leak Rate @ 10.0 in.Hg .005 ft3/min.

ETS REFERENCE SOPS – 002. 004, 005, 006, 009. 010. 012. 013. 017

CRLLC-CHAL-000365

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Outlet
Test Date: 11-Dec-09
Run No. : 2

EPA METHOD 2, DETERMINATION of STACK GAS VELOCITY and VOLUMETRIC FLOW RATE
EPA METHOD 3, DETERMINATION of STACK GAS MOLECULAR WEIGHT
EPA METHOD 4, DETERMINATION of STACK GAS MOISTURE

A	Cross-sectional area of the stack, ft2	F4	Conversion factor, 3600 sec/hr	SBws	Saturation moisture fraction @ Ts
Acf	Stack gas flow rate, actual ft3/min	F5	Conversion factor, 60 sec/min	Tm	Dry gas meter temp, F
Bws	Stack gas moisture fraction, vol%/100	Kp	Pitot tube constant, 85.49	Ts	Stack gas temp, F
	(Bws = SBws when Bws > SBws)	MCi	Mole wt of component, lb/lb-mole	Tstd	Standard temp, 528.0 R
CCi	Component 1,2,3,... conc. vol%/100	Md	Stack gas mole weight, dry lb/lb-mole	Vi	Water vapor condensed, imp 1, g
Cp	Pitot tube calibration coefficient	MH2O	Mole weight of water, 18.015 lb/lb-mole	Vii	Water vapor condensed, Imp 2, g
D1	Diameter of round stack, in.	Ms	Stack gas mole weight, wet lb/lb-mole	Viii	Water vapor condensed, imp 3, g
dH	Meter orifice press. diff., in.H2O	Pa	Stack gas static pressure, in.H2O	Viv	Water vapor condensed, imp 4, g
dP	Stack gas velocity head, in.H2O	Pbar	Barometric pressure, in.Hg	Vm	Sample volume indicated, dry ft3
ews	saturation vapor press, in.Hg @Ts	pi	Mathmatical constant, 3.14159	Vmstd	Sample volume, dry standard ft3
F1	Conversion factor, 13.6 in.H2O/ in.Hg	Ps	Stack gas absolute pressure, in.Hg	Vs	Stack gas velocity, ft/sec
F2	Conversion factor, 453.59 g/lb	Pstd	Std. absolute pressure, 29.92 in.Hg	Vw	Total water vapor condensed, std ft3
F3	Conversion factor, 12 in./ ft	Qsd	Stack gas vol. flow rate, dry std. ft3/hr	Y	Dry gas meter calibration factor
F4	Conversion factor, 3600 sec/hr	R	Ideal gas constant, 21,85		
F5	Conversion factor, 60 sec/hr				

$$Ps = (Pbar) + (Pa / F1) = (30.230) + (-0.4200 / 13.6) = 30.199$$

$$Vw = \left\{ \frac{(Vi + Vii + Viii + Viv)(R)(Tstd)}{(F2)(Pstd)(MH2O)} \right\} = \left\{ \frac{(143.7 + -49.50 + 0.50 + 3.90)(21.85)(528)}{(453.59)(29.92)(18.015)} \right\} = 4.65268$$

$$Vmstd = \left\{ \frac{(Vm)(Y)(Pbar + (dH/F1))(Tstd)}{(Pstd)(Tm + 460)} \right\} = \left\{ \frac{(31.024)(1.01870)(30.230 + (1.5000 / 13.6))(528.0)}{(29.92)(72.4 + 460.0)} \right\} = 31.78225$$

$$Bws = \left\{ \frac{(Vw)}{(Vw + Vmstd)} \right\} = 0.12770$$

$$SBws = \left\{ \frac{(esw)}{(Ps)} \right\} = \left\{ \frac{(30.199)}{(30.199)} \right\} = 1.00000$$

$$Bws = 0.12770$$

$$Md = \left\{ \begin{matrix} (MC1)(CC1) + & (MC2)(CC2) + \\ (MC3)(CC3) + & (MC4)(CC4) + \\ (MC5)(CC5) + & (MC6)(CC6) + \\ (MC7)(CC7) + & (MC8)(CC8) + \\ (MC9)(CC9) + & (MC10)(CC10) \end{matrix} \right\} = \left\{ \begin{matrix} \text{Oxygen} & (31.999)(0.0650) + & \text{Carbon Dioxide} & (44.010)(0.0420) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & & (\quad)(\quad) + \\ & (\quad)(\quad) + & \text{Nitrogen} & (28.013)(0.8930) \end{matrix} \right\} = 28.944$$

$$Ms = (Md)(1 - Bws) + (MH2O)(Bws) = (28.944)(1 - 0.12770) + (18.015)(0.12770) = 27.548$$

$$A = \{(D1)/((F3)(2))\}^2 \{pi\} = \{(63.250)/((12.000)(2))\}^2 \{3.14159\} = 21.81967$$

$$Vs = \left\{ (Kp)(Cp)(dP^{\frac{1}{2}}) \right\} \left\{ \frac{(Ts + 460)}{(Ps)(Ms)} \right\}^{\frac{1}{2}} = \left\{ (85.49)(0.81500)(0.40693) \right\} \left\{ \frac{(535.1 + 460)}{(30.199)(27.548)} \right\}^{\frac{1}{2}} = 31.0079$$

$$Acf = (F5)(Vs)(A) = (60)(31.0079)(21.81967) = 40594.95$$

$$Qsd = \left\{ \frac{(F4)(1 - Bws)(Vs)(A)(Tstd)(Ps)}{(Ts + 460)(Pstd)} \right\} = \left\{ \frac{(3600)(1 - 0.12770)(31.0079)(21.81967)(528)(30.199)}{(535.1 + 460)(29.92)} \right\} = \begin{matrix} 1137881.85 & \text{dscf/hr} \\ 18964.70 & \text{dscf/min} \end{matrix}$$

CRLLC-CHAL-000366

No. 2 SRU Outlet
EPA Methods 3A, 6C, 7E, and 10
(oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide)

Test Data and Calculations

During the emission tests, a sample of the stack gas was continuously drawn from the stack and analyzed to determine the concentrations of oxygen, sulfur dioxide, oxides of nitrogen, and carbon monoxide per EPA Methods 3A, 6C, 7E, and 10. Results of the tests are summarized on the following pages along with calculation of emission rates.

Test analyzer response was recorded using a computer data acquisition system. One minute average data were recorded on magnetic media and then printed in a format that aids interpretation of the data without editing or processing of the data. These data are presented following data summary and calculations.

Each test analyzer was calibrated before and after each test run by challenging the analyzer with a set of certified calibration gas standards. Analyzer response was recorded using the computer data acquisition system. Calibration data are presented on each page of applicable test data.

CRLLC-CHAL-000367

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Outlet

EPA METHOD 6C, DETERMINATION of SULFUR DIOXIDE EMISSION RATE

CSO2	SO2 concentration, PPMv actual O2	CSO2c	SO2 concentration, PPMv corrected to base O2
ESO2	SO2 emission rate, lb/hr	O2	Stack oxygen conc., vol% dry
F1	Conversion factor, 1 part/ 1.00E+06 PPMv	O2b	Base stack oxygen conc., vol% dry
MW	Molecular weight of SO2, 64.065 lb/lb-mole		
Qsd	Stack gas volumetric flow rate, dry std ft3/hr		
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg		

---- Run 3, Normal 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(19.29)(64.065)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 3.6165$$

CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (19.29)(20.9 - 0.00) / (20.9 - 7.21) = 29.45

---- Run 5, 1025 F 11-Dec-09 ----------

$$ESO2 = \left\{ \frac{(CSO2)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(12.70)(64.065)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 2.3810$$

CSO2c = (CSO2)(20.9 - O2b) / (20.9 - O2) = (12.70)(20.9 - 0.00) / (20.9 - 7.28) = 19.49

CRLLC-CHAL-000368

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Outlet

EPA METHOD 7E, DETERMINATION of OXIDES of NITROGEN EMISSION RATE

CNOx	NOx concentration, PPMv actual O2
ENOx	NOx emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of NO2, 46.006 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 3, Normal 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(12.78)(46.006)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 1.7206$$

---- Run 5, 1025 F 11-Dec-09 ----------

$$ENOx = \left\{ \frac{(CNOx)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(13.11)(46.006)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 1.7650$$

CRLLC-CHAL-000369

ETS®
Emission Testing Services, Inc.

Client : Chalmette Refining
Source : No. 2 SRU Outlet

EPA METHOD 10, DETERMINATION of CARBON MONOXIDE EMISSION RATE

CCO	CO concentration, PPMv actual O2
ECO	CO emission rate, lb/hr
F1	Conversion factor, 1 part/ 1.00E+06 PPMv
MW	Molecular weight of CO, 28.011 lb/lb-mole
Qsd	Stack gas volumetric flow rate, dry std ft3/hr
Rvol	Volume of 1 lb-mole ideal gas at std conditions, 385.546 ft3/lb-mole @ 528 R & 29.92 in.Hg

---- Run 3, Normal 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(728.82)(28.011)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 59.7418$$

---- Run 5, 1025 F 11-Dec-09 ----------

$$ECO = \left\{ \frac{(CCO)(MW)(Qsd)}{(Rvol)(F1)} \right\} = \left\{ \frac{(725.18)(28.011)(1128251.1)}{(385.546)(1.00E+06)} \right\} = 59.4434$$

CRLLC-CHAL-000370

ETSR

EMISSION TESTING SERVICES INC.

NOX CONVERTER EFFICIENCY TEST

CLIENT:	EXXONMOBIL CHALMETTE	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**SLOPE:**	6.0001955
DATE:	12/10/2009	**INTERCEPT:**	0.1366
		CORRELATION:	1.0000
		SPAN RANGE:	60.1386

CALIBRATION STATISTICS

	CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR < 2%	FINAL VOLT	CONC %	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.18	0.00	0.11	0.00
MID	25.00	4.11	24.81	0.32	4.11	24.81	0.00
HIGH	55.10	9.17	55.19	0.15	9.17	55.19	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS < 5%	FINAL VOLT	CONC PPM	RESP BIAS < 5%	SPAN DRIFT < 3%
ZERO	0.00	0.00	0.11	0.00	0.00	0.11	0.00	0.00
HIGH	55.10	9.17	55.19	0.00	9.17	55.19	0.00	0.00

TIME	NOX-PPM	CHALLENGE CONCENTRATION
10:10:05	43.85	48.60
10:11:05	44.52	
10:12:05	45.19	
10:13:06	45.69	
10:14:06	46.22	**% EFFICIENCY**
AVG	**45.09**	**92.79**

Acceptable efficiency is greater than or equal to 90%

This NO2 to NO converter efficiency test is a modified version of that specified in EPA Method 7E. This modified methodology has been approved and accepted by the LDEQ as the preferred methodology. The gas standard used in this test is not required to be certified per EPA Protocol No. 1.

OPERATORS SIGNATURE Ronald McCabe

CRLLC-CHAL-000371

ETS®

EMISSION TESTING SERVICES, INC.

RESPONSE TIME SHEET

Source:	#2 SRU	Date:	12/11/2009
Monitor:	MODEL 42i-HL	Location:	CHALMETTE, LA
Serial Number:	ETSNOX1B	Client:	EXXONMOBIL

High Level Gas Concentration: 55.1 PPM

TEST RUN

ACTUAL TIME BEGIN	ACTUAL TIME END	UPSCALE SECONDS	ACTUAL TIME BEGIN	ACTUAL TIME END	DOWNSCAL SECONDS
0.00	54.50	54.50	0.00	61.92	61.92
0.00	51.83	51.83	0.00	66.33	66.33
0.00	53.92	53.92	0.00	62.42	62.42
	AVERAGE	53.42		AVERAGE	63.56

System Response Time (slower of A or B) = 63.56 SEC.

COMMENTS:

ETS REFERENCE SOPS-007,020

CRLLC-CHAL-000372

ETS®

EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	25.1290
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.0128
		CORRELATION:	1.00000
		SPAN RANGE:	251.3031

CALIBRATION STATISTICS

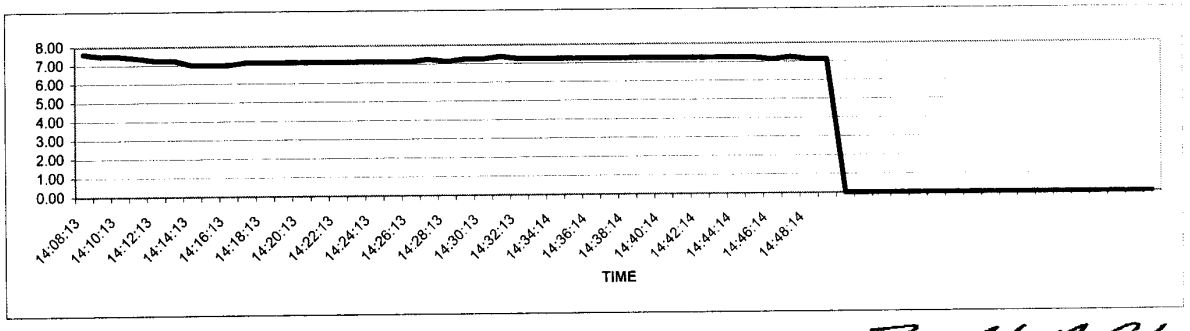
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	-0.11	0.05
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.14	0.05

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.14	0.05	0.00	0.01	0.05	0.05
BIAS HIGH	20.00	0.79	19.89	0.05	0.79	19.89	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
14:08:13	7.62	14:23:13	7.12	14:38:14	7.24		
14:09:13	7.49	14:24:13	7.12	14:39:14	7.24		
14:10:13	7.49	14:25:13	7.12	14:40:14	7.24		
14:11:13	7.37	14:26:13	7.12	14:41:14	7.24		
14:12:13	7.24	14:27:13	7.24	14:42:14	7.24		
14:13:13	7.24	14:28:13	7.12	14:43:14	7.24		
14:14:13	7.00	14:29:13	7.24	14:44:14	7.24		
14:15:13	7.00	14:30:13	7.24	14:45:14	7.24		
14:16:13	7.00	14:31:13	7.37	14:46:14	7.12		
14:17:13	7.12	14:32:13	7.24	14:47:14	7.24		
14:18:13	7.12	14:33:13	7.24	14:48:14	7.12		
14:19:13	7.12	14:34:14	7.24	14:49:14	7.12		
14:20:13	7.12	14:35:14	7.24				
14:21:13	7.12	14:36:14	7.24				
14:22:13	7.12	14:37:14	7.24				
						AVG	7.21



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000373

ETS®

EMISSION TESTING SERVICES INC.

METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	12.0135
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.7499
		CORRELATION:	0.99997
		SPAN RANGE:	119.3853

CALIBRATION STATISTICS

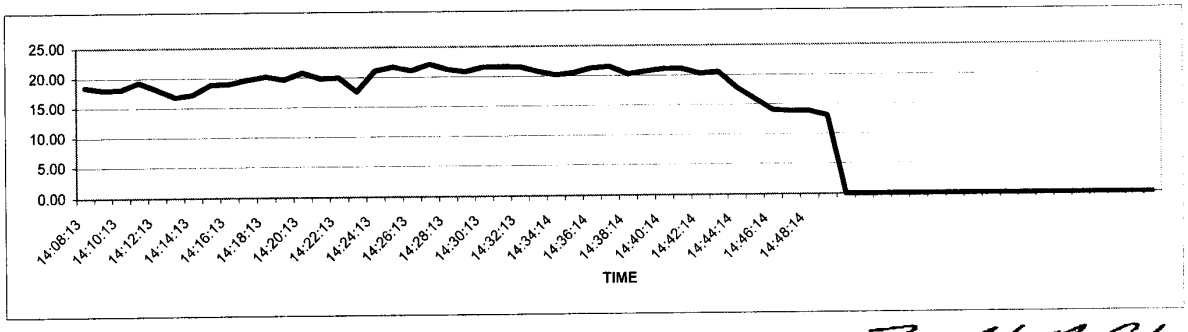
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.08	0.25	0.21	0.08	0.25	0.00
ALM057798	LOW	54.40	4.55	53.92	0.40	4.51	53.45	0.39
AAL6085	HIGH	111.00	9.32	111.23	0.19	9.25	110.41	0.69

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.08	0.25	0.00	0.08	0.25	0.00	0.00
BIAS HIGH	111.00	9.20	109.80	1.20	9.13	108.98	1.20	0.69

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
14:08:13	18.49	14:23:13	17.54	14:38:14	20.22		
14:09:13	18.02	14:24:13	21.00	14:39:14	20.64		
14:10:13	18.08	14:25:13	21.66	14:40:14	21.06		
14:11:13	19.27	14:26:13	21.00	14:41:14	21.06		
14:12:13	18.08	14:27:13	22.07	14:42:14	20.22		
14:13:13	16.82	14:28:13	21.18	14:43:14	20.52		
14:14:13	17.18	14:29:13	20.82	14:44:14	17.90		
14:15:13	18.85	14:30:13	21.54	14:45:14	15.99		
14:16:13	18.97	14:31:13	21.60	14:46:14	14.02		
14:17:13	19.63	14:32:13	21.54	14:47:14	13.84		
14:18:13	20.16	14:33:13	20.76	14:48:14	13.84		
14:19:13	19.63	14:34:14	20.16	14:49:14	13.07		
14:20:13	20.76	14:35:14	20.46				
14:21:13	19.81	14:36:14	21.24				
14:22:13	19.93	14:37:14	21.48				
						AVG	**19.29**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000374

ETS®

EMISSION TESTING SERVICES INC.

METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	6.0134
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	-0.0012
		CORRELATION:	0.99999
		SPAN RANGE:	60.1332

CALIBRATION STATISTICS

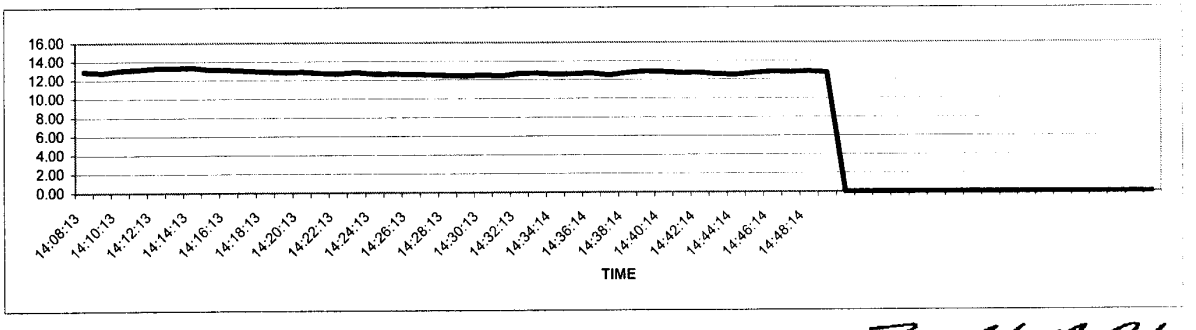
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.09	0.14	0.01	0.06	0.05
AAL069096	LOW	25.00	4.13	24.84	0.26	4.09	24.58	0.44
ALM000668	HIGH	55.10	9.17	55.17	0.12	9.08	54.58	0.98

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.15	0.10	0.02	0.15	0.15	0.00
BIAS HIGH	55.10	9.08	54.61	0.93	8.98	54.01	0.95	1.00

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
14:08:13	12.90	14:23:13	12.81	14:38:14	12.72		
14:09:13	12.78	14:24:13	12.63	14:39:14	12.87		
14:10:13	13.02	14:25:13	12.63	14:40:14	12.81		
14:11:13	13.14	14:26:13	12.60	14:41:14	12.69		
14:12:13	13.29	14:27:13	12.54	14:42:14	12.72		
14:13:13	13.29	14:28:13	12.48	14:43:14	12.54		
14:14:13	13.35	14:29:13	12.43	14:44:14	12.51		
14:15:13	13.14	14:30:13	12.51	14:45:14	12.69		
14:16:13	13.11	14:31:13	12.43	14:46:14	12.81		
14:17:13	12.99	14:32:13	12.66	14:47:14	12.78		
14:18:13	12.90	14:33:13	12.69	14:48:14	12.84		
14:19:13	12.81	14:34:14	12.57	14:49:14	12.72		
14:20:13	12.87	14:35:14	12.60				
14:21:13	12.72	14:36:14	12.69				
14:22:13	12.66	14:37:14	12.48				
						AVG	**12.78**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000375

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EMISSION TESTING SERVICES INC.

METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	NORMAL
RUN # :	3	**SLOPE:**	215.0964
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-2.7375
		CORRELATION:	1.00000
		SPAN RANGE:	2148.2264

CALIBRATION STATISTICS

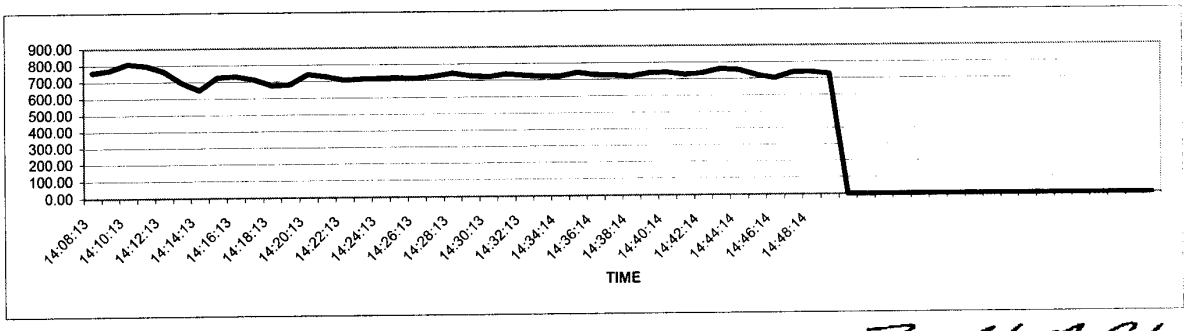
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.02	1.46	0.07	0.01	0.41	0.05
AAL9259	LOW	900.00	4.18	897.35	0.12	4.13	884.75	0.59
ALM054357	HIGH	2000.00	9.32	2001.19	0.06	9.22	1980.18	0.98

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	2.51	0.05	0.02	2.51	0.10	0.00
BIAS HIGH	2000.00	9.27	1991.58	0.45	9.19	1973.88	0.29	0.82

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
14:08:13	756.33	14:23:13	712.84	14:38:14	717.08		
14:09:13	770.12	14:24:13	716.02	14:39:14	737.23		
14:10:13	808.30	14:25:13	718.14	14:40:14	740.42		
14:11:13	796.64	14:26:13	713.90	14:41:14	725.56		
14:12:13	763.75	14:27:13	726.63	14:42:14	735.11		
14:13:13	692.68	14:28:13	743.60	14:43:14	759.51		
14:14:13	649.19	14:29:13	728.75	14:44:14	753.14		
14:15:13	724.50	14:30:13	721.32	14:45:14	721.32		
14:16:13	730.87	14:31:13	736.17	14:46:14	701.17		
14:17:13	712.84	14:32:13	727.69	14:47:14	736.17		
14:18:13	675.71	14:33:13	720.26	14:48:14	739.35		
14:19:13	679.95	14:34:14	719.20	14:49:14	726.63		
14:20:13	742.54	14:35:14	741.48				
14:21:13	728.75	14:36:14	727.69				
14:22:13	707.53	14:37:14	724.50				
						AVG	**728.82**



OPERATORS SIGNATURE Ronald McCabe

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EMISSION TESTING SERVICES INC.

METHOD-3A

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU OUTLET STACK	**PARAMETER:**	OXYGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	5	**SLOPE:**	24.8244
ANALYZER ID:	ETS-O2-1	**INTERCEPT:**	0.1343
		CORRELATION:	1.00000
		SPAN RANGE:	248.3787

CALIBRATION STATISTICS

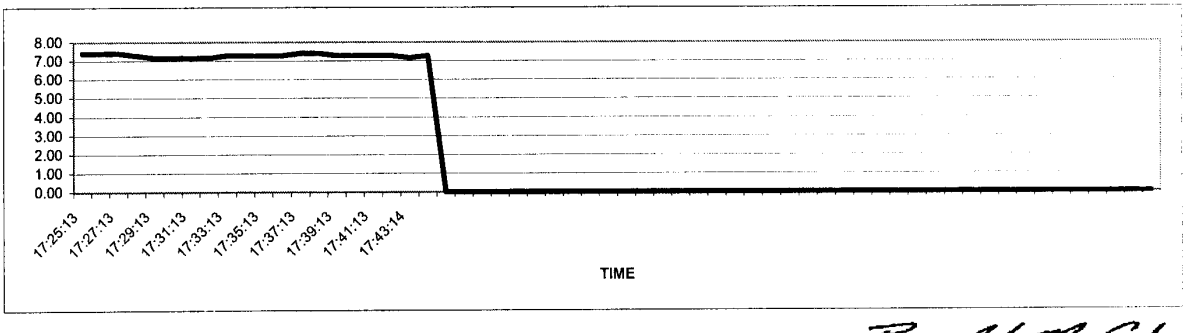
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.00	0.01	0.01	0.00	0.01	0.00
ALM039698	LOW	10.10	0.40	10.07	0.01	0.40	10.07	0.00
ALM045869	HIGH	20.00	0.80	20.01	0.01	0.80	20.01	0.00

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.00	0.13	0.05	0.00	0.13	0.05	0.00
BIAS HIGH	20.00	0.79	19.77	0.10	0.79	19.77	0.10	0.00

OXYGEN

TIME	O2-%	TIME	O2-%	TIME	O2-%	TIME	O2-%
17:25:13	7.41	17:40:13	7.28				
17:26:13	7.41	17:41:13	7.28				
17:27:13	7.41	17:42:14	7.28				
17:28:13	7.28	17:43:14	7.16				
17:29:13	7.16	17:44:14	7.28				
17:30:13	7.16						
17:31:13	7.16						
17:32:13	7.16						
17:33:13	7.28						
17:34:13	7.28						
17:35:13	7.28						
17:36:13	7.28						
17:37:13	7.41						
17:38:13	7.41						
17:39:13	7.28						
						AVG	7.28



OPERATORS SIGNATURE Ronald McCabe

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METHOD-6C

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU OUTLET STACK	**PARAMETER:**	SULFUR DIOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	5	**SLOPE:**	12.0910
ANALYZER ID:	ETS-SO2-1	**INTERCEPT:**	-0.3823
		CORRELATION:	0.99999
		SPAN RANGE:	120.5281

CALIBRATION STATISTICS

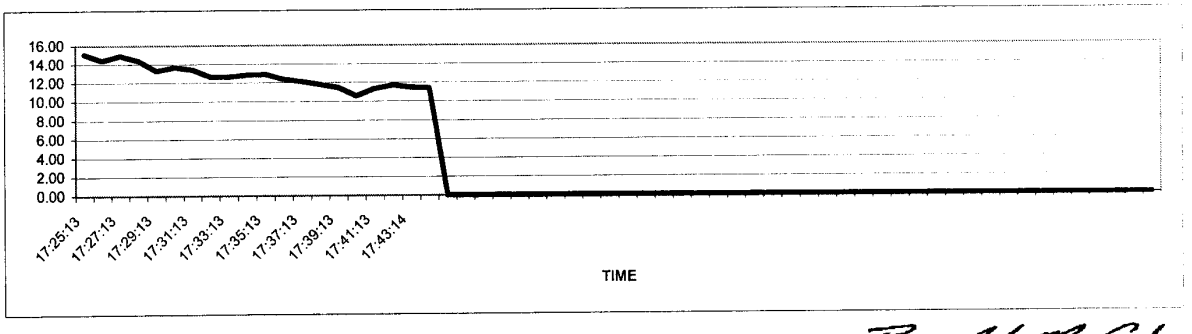
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.04	0.15	0.12	0.04	0.15	0.00
ALM057798	LOW	54.40	4.51	54.11	0.24	4.51	54.11	0.00
AAL6085	HIGH	111.00	9.22	111.14	0.12	9.21	110.96	0.15

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.04	0.09	0.05	0.04	0.09	0.05	0.00
BIAS HIGH	111.00	9.13	110.05	0.90	9.13	110.05	0.76	0.00

SULFUR DIOXIDE

TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM	TIME	SO2-PPM
17:25:13	15.08	17:40:13	10.55				
17:26:13	14.36	17:41:13	11.32				
17:27:13	14.90	17:42:14	11.68				
17:28:13	14.36	17:43:14	11.44				
17:29:13	13.29	17:44:14	11.38				
17:30:13	13.65						
17:31:13	13.41						
17:32:13	12.63						
17:33:13	12.63						
17:34:13	12.81						
17:35:13	12.87						
17:36:13	12.34						
17:37:13	12.10						
17:38:13	11.80						
17:39:13	11.44						
						AVG	**12.70**



OPERATORS SIGNATURE Ronald McCabe

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METHOD-7E

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU OUTLET STACK	**PARAMETER:**	OXIDES OF NITROGEN
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	5	**SLOPE:**	6.0556
ANALYZER ID:	ETSNOX1B	**INTERCEPT:**	0.0196
		CORRELATION:	0.99999
		SPAN RANGE:	60.5754

CALIBRATION STATISTICS

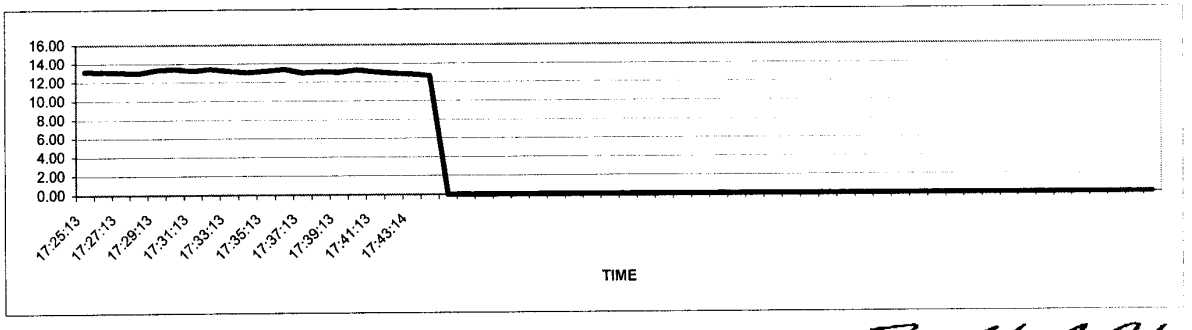
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	0.08	0.13	0.01	0.08	0.00
AAL069096	LOW	25.00	4.10	24.86	0.24	4.14	25.10	0.40
ALM000668	HIGH	55.10	9.11	55.16	0.11	9.19	55.70	0.88

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	0.17	0.15	0.02	0.17	0.15	0.00
BIAS HIGH	55.10	9.06	54.87	0.49	9.18	55.60	0.17	1.20

OXIDES OF NITROGEN

TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM	TIME	NOX-PPM
17:25:13	13.14	17:40:13	13.28				
17:26:13	13.11	17:41:13	13.08				
17:27:13	13.05	17:42:14	12.90				
17:28:13	12.99	17:43:14	12.81				
17:29:13	13.31	17:44:14	12.66				
17:30:13	13.40						
17:31:13	13.23						
17:32:13	13.40						
17:33:13	13.20						
17:34:13	13.05						
17:35:13	13.20						
17:36:13	13.37						
17:37:13	12.96						
17:38:13	13.11						
17:39:13	13.05						
						AVG	**13.11**



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

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METHOD-10

CLIENT:	CHALMETTE REFINING	**OPERATOR:**	RON MCCABE
SOURCE:	#2 SRU OUTLET STACK	**PARAMETER:**	CARBON MONOXIDE
DATE:	12/11/2009	**LOAD %:**	1025 DEGREES
RUN # :	5	**SLOPE:**	217.0054
ANALYZER ID:	ETSCO1B	**INTERCEPT:**	-0.3917
		CORRELATION:	0.99999
		SPAN RANGE:	2169.6619

CALIBRATION STATISTICS

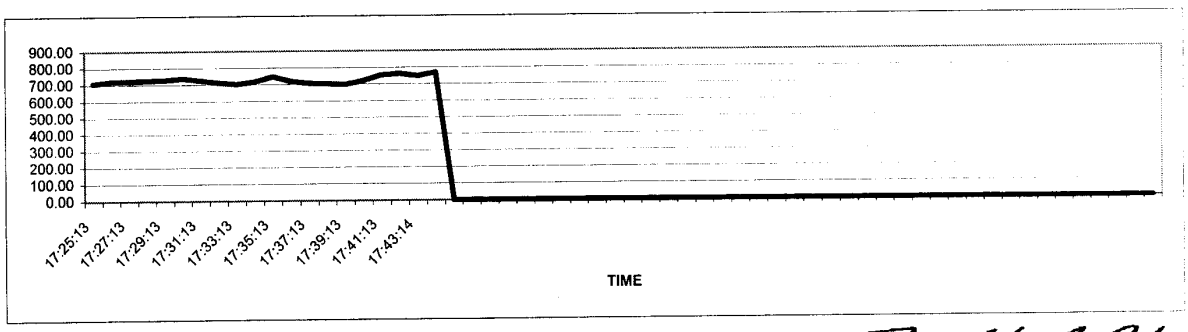
CYLINDER NUMBER		CYLINDER VALUE	INIT VOLT	CONC PPM	CAL ERROR +/-5%	FINAL VOLT	CONC PPM	SPAN DRIFT +/-3%
ALM041976	ZERO	0.00	0.01	2.79	0.13	0.01	2.79	0.00
AAL9259	LOW	900.00	4.13	894.97	0.23	4.15	899.31	0.20
ALM054357	HIGH	2000.00	9.23	2002.25	0.10	9.29	2015.01	0.59

CALIBRATION BIAS

	CYLINDER VALUE	INIT VOLT	CONC PPM	RESP BIAS +/-5%	FINAL VOLT	CONC PPM	RESP BIAS +/-5%	SPAN DRIFT +/-3%
BIAS LOW	0.00	0.02	4.91	0.10	0.02	4.91	0.10	0.00
BIAS HIGH	2000.00	9.19	1993.77	0.39	9.27	2011.13	0.18	0.80

CARBON MONOXIDE

TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM	TIME	CO-PPM
17:25:13	707.62	17:40:13	719.29				
17:26:13	719.29	17:41:13	752.18				
17:27:13	720.35	17:42:14	760.67				
17:28:13	724.59	17:43:14	746.87				
17:29:13	728.84	17:44:14	769.15				
17:30:13	736.26						
17:31:13	724.59						
17:32:13	709.74						
17:33:13	702.32						
17:34:13	715.05						
17:35:13	744.75						
17:36:13	717.17						
17:37:13	704.44						
17:38:13	702.32						
17:39:13	698.07						
						AVG	725.18



OPERATORS SIGNATURE Ronald McCabe

ETS REFERENCE SOP-007

CRLLC-CHAL-000380

No. 2 SRU
Unit Operating Data

During the emission tests, Chalmette Refining recorded unit operating data. These data are presented on the following pages.

CRLLC-CHAL-000381

VII. APPENDIX

The following appendices are presented as supporting documentation to this test report.

A. Resumes of Test Personnel
B. Test Equipment Calibrations
C. Test Analyzer Calibration Gas Certifications
D. Test Analyzer Descriptions and Specifications

CRLLC-CHAL-000382

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ETS®
Emission Testing Services, Inc.

Resume

RONALD L. McCABE, II
Assistant Manager
Senior Sampling Specialist

EDUCATION

Louisiana State University, B.S. Environmental Engineering
(1994 – 1998)

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record
EPA Certified Opacity Reader (EPA Method 9)

EXPERIENCE

11/03/04 to Present Emission Testing Services, Inc. Assistant Office Manager

Responsibilities include planning and overseeing of performance source testing projects. Being responsible for the training of sampling technicians. Being the ETS liaison for clients. Keeping current with all state and federal regulations. Writing proposals for ETS projects as requested by clients. Discussing the proper methods of testing with clients in the performance of emission testing. Answering questions regarding the emission testing, prior to and after report is issued.

08/98 to 11/03/04 Emission Testing Services, Inc. Senior Sampling Specialist

Performs EPA Approved reference methods for compliance testing as well as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and equipment maintenance. Assists in training Grade 1 and 2 technicians. Able to conduct and provide project management for all manual emission test methods including 40 CFR 60, Methods 5, 6, 7, 8, 11, 12, 18, 26 and 29. Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Assists in the calibration and maintenance of consoles, pitot tubes, thermocouples and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Able to setup and assist in leak check as well as weigh-in of a Method 4 sample train.

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ETS®
Emission Testing Services, Inc.

Resume

JAMES CLINT RACHAL
Sampling Technician Grade 2

EDUCATION

High School Graduate

CERTIFICATIONS

General Safety & Health Orientation Program
Respiratory Equipment Medical Certification
MSA Qualitative Fit Test Record

EXPERIENCE

06/09 to Present Emission Testing Services, Inc. Sampling Technician Grade 2

Able to perform all tests required in 40 CFR 60, Methods 2 and 4 without use of a computer. Able to prepare and load for an emission test that requires a sample train. Is proficient in completion of project field logs and data sheets. Responsible for the calibration and maintenance of consoles, pitot tubes, thermocouples, and barometers. Proficient in the collection of organic samples using EPA Method 18. Is well versed in the calculation of stack gas flow rates with and without the use of a computer. Helps in training Grade 1 technicians. Has accumulated at least 240 field hours as a Sampling Technician Grade 1.

06/08 to 06/09 Emission Testing Services, Inc. Sampling Technician Grade 1

Able to perform all procedures required in 40 CFR 60, Method 1 without use of a computer. Able to perform all procedures required in 40 CFR 60, Method 3 (Orsat analysis). Competent in the calibration of consoles, pitot tubes, thermocouples, and barometers. Able to setup and assist in leak check as-well-as weigh-in of a Method 4 sample train. Has accumulated at least 480 field hours as a Testing Trainee Technician.

10/07 to Present Emission Testing Services, Inc. Testing Trainee Technician

Supports in performing EPA approved reference methods for compliance testing as-well-as other non-routine source evaluations. Responsibilities also include job preparation, equipment calibration, and maintenance.

CRLLC-CHAL-000385

ETS
EMISSION TESTING SERVICES

METER BOX CALIBRATION DATA AND CALCULATIONS FORM
(English Units)

One Revolution of meter =	0.1	ft3	Wet Test Meter Cal Factor:	0.999
Leak Check Good @:	0.002		Meter Box Number:	XC-1
Barometric Pres., Pb:	29.96		Date Calibrated:	10/8/09

Orifice Setting ΔH in. H20	Wet Test Meter Reading (Vwm), ft3	Dry Gas Meter Readings			Wet Test Meter Reading (Twm), deg. F	Wet Test Meter Pressure (Pw) in. H2O	Dry Gas Meter			Run Time (Θ), Min.
		Initial (Vdi), ft3	Final (Vdf), ft3	Total (Vdm), ft3			Inlet (Tdi), deg. F	Outlet (Tdf), deg. F	Avg (Tdm), deg. F	
0.50	5	542.013	547.014	5.001	72	0.50	89.0	89.0	89.0	13.03
1.00	5	547.014	551.995	4.981	72	0.63	84.0	84.0	84.0	9.05
1.50	5	556.975	561.957	4.982	72	0.88	80.0	80.0	80.0	7.42
2.00	5	561.957	566.950	4.993	72	1.00	80.0	80.0	80.0	6.33
3.00	5	566.950	571.951	5.001	72	1.13	80.0	80.0	80.0	5.18

Dry Gas Meter Gauge Pressure in. H20 (Gp)	Dry Gas Meter Gp Pdm=------+ Pb / 13.6 (Pdm)	Wet Test Meter Pw Pwm=------+ Pb / 13.6 (Pwm)
0.5	29.9968	29.9968
1.0	30.0335	30.0060
1.5	30.0703	30.0243
2.0	30.1071	30.0335
3.0	30.1806	30.0427

$$Ydm = \frac{(Vwm)*(Pwm)*(Tdm+460)*(Ywm)}{(Vdm)*(Pdm)*(Twm+460)}$$

Ydm	Tolerance
1.0307	-0.0120
1.0245	-0.0058
1.0161	0.0026
1.0130	0.0057
1.0092	0.0095
Average	**1.0187**

$$\Delta H@ = \frac{0.0317*\Delta H}{Pb*(tda+460)} * \frac{(TW+460)*2}{VW}$$

ΔH@	Tolerance
1.8522	-0.0420
1.8034	0.0067
1.8319	-0.0218
1.7776	0.0325
1.7856	0.0245
Average	**1.8102**

Ydm = Ratio of reading of wet test meter to dry test meter; tolerance for individual values "0.02 from average.

ΔH@ = Orifice pressure differential that equates to 0.75 cfm of air @ 68oF and 29.92 inches of mercury, in H20: tolerance for individual values "0.20 from average.

Serial #: 52279

Calibration: ☑ Pass ☐ Fail
+/- 5% from previous

Calibrated by: [signature]

APPENDIX B
7.3.1

ETS REFERENCE SOP-030

ETS

EMISSION TESTING SERVICES, INC.

THERMOCOUPLE CALIBRATION

Meter Box Number: XC-1

Barometric Pressure: 29.96

Date: 10/08/09

Calibrated By: Timmy Torres

+\- 1.5% from previous: ☑ PASS ☐ FAIL

LOW CHECK POINT

Channel Type	Omga CL27 Reading Trial 1	Trial 2	Trial 3	Average	Thermocouple Reading Trial 1	Trial 2	Trial 3	Average
Stack	100	100	100	100	100	100	100	100.00
Probe	100	100	100	100	100	100	100	100.00
Hot Box	100	100	100	100	99	99	100	99.33
Umbilical	100	100	100	100	100	100	100	100.00

Channel Type	Average Reading Omega CL27	Thermocouple	Difference	% Error (Diff / Avg CL27) * 100 -1.5 % < %Error < +1.5 %
Stack	100	100.00	0.00	0.00
Probe	100	100.00	0.00	0.00
Hot Box	100	99.33	-0.67	-0.67
Umbilical	100	100.00	0.00	0.00

MID CHECK POINT

Channel Type	Omega CL27 Reading Trial 1	Trial 2	Trial 3	Average	Thermocouple Reading Trial 1	Trial 2	Trial 3	Average
Stack	500	500	500	500	499	499	499	499.00
Probe	500	500	500	500	499	499	499	499.00
Hot Box	500	500	500	500	500	500	500	500.00
Umbilical	500	500	500	500	499	499	499	499.00

Channel Type	Average Reading Omega CL27	Thermocouple	Difference	% Error (Diff / Avg CL27) * 100 -1.5 % < %Error < +1.5 %
Stack	500	499.00	-1.00	-0.20
Probe	500	499.00	-1.00	-0.20
Hot Box	500	500.00	0.00	0.00
Umbilical	500	499.00	-1.00	-0.20

HIGH CHECK POINT

Channel Type	Omega CL27 Reading Trial 1	Trial 2	Trial 3	Average	Thermocouple Reading Trial 1	Trial 2	Trial 3	Average
Stack	950	950	950	950	950	950	950	950.00
Probe	950	950	950	950	950	950	951	950.33
Hot Box	950	950	950	950	950	950	951	950.33
Umbilical	950	950	950	950	950	950	951	950.33

Channel Type	Average Reading Omega CL27	Thermocouple	Difference	% Error (Diff / Avg CL27) * 100 -1.5 % < %Error < +1.5 %
Stack	950	950.00	0.00	0.00
Probe	950	950.33	0.33	0.04
Hot Box	950	950.33	0.33	0.04
Umbilical	950	950.33	0.33	0.04

APPENDIX B
7.3.2

ETS

MISSION TESTING SERVICES, INC.

Pitot Tube Number: MX-7 | CP(std): STD - 0.99

Calibrated By: Ron McCabe | Date Calibrated: 10/16/09

Point Number	Stardard Pitot ªP (in. H2O)	"S" Type Pitot ªP, in H2O Impact Side	Static Side
Low	0.310	0.480	0.480
Mid	0.600	0.890	0.880
High	0.850	1.200	1.200

CALCULATIONS ==========

$$Cp(s) = Cp(std) \times \left[\frac{ª P(std)}{ª P(s)}\right]^{1/2}$$

$$Deviation = Cp(s) - CP \quad \text{(Impact Side or Static Side)}$$

$$Avg.\ Dev. = \frac{|Cp(s) - CP|}{3} \quad \text{(Impact Side or Static Side)}$$

Impact Side Cp (s)	Deviation	Static Side Cp(s)	Deviation
0.7956	0.018	0.7956	0.020
0.8129	0.001	0.8175	0.002
0.8332	0.019	0.8332	0.018
Cp = 0.8139		Cp = 0.8154	

Cp(Static Side) - Cp(Impact Side)	=	0.002	(Must be <= 0.01)
Average Deviation (Impact Side)	=	0.013	(Must be <= 0.01)
Average Deviation (Static Side)	=	0.013	(Must be <= 0.01)

Cp = 0.815

ɔt Tube Leak Check ☑ PASSED ☐ FAILED

ETS REFERENCE SOP-030

APPENDIX B
7.3.3

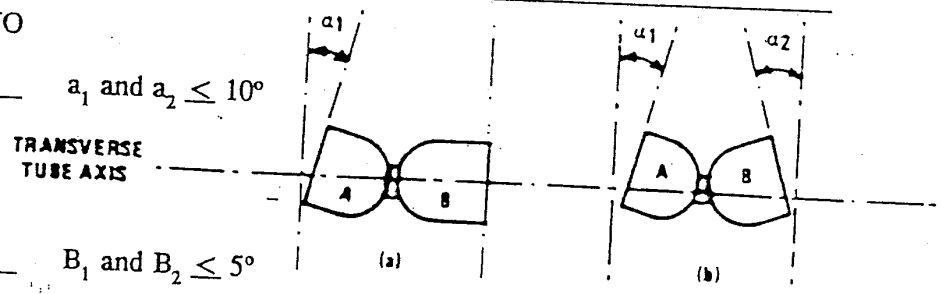
ETS

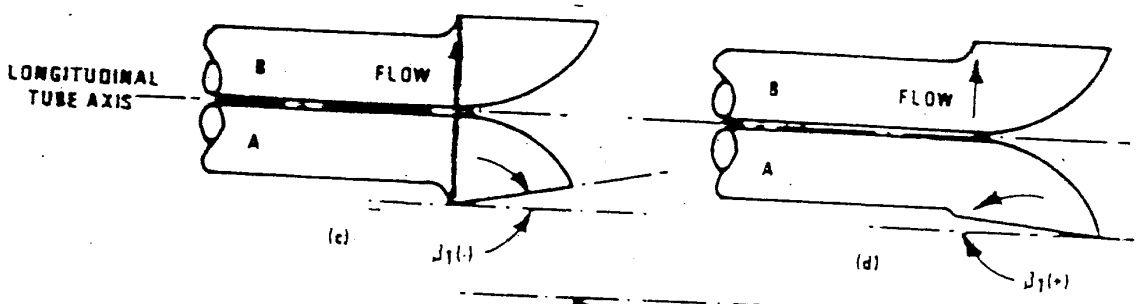
EMISSION TESTING SERVICES, INC.

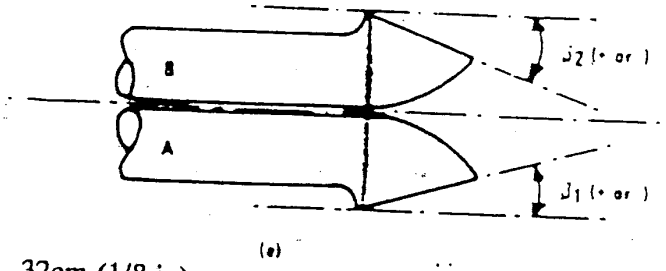
TUBE NUMBER MX-7 DATE 12-11-09

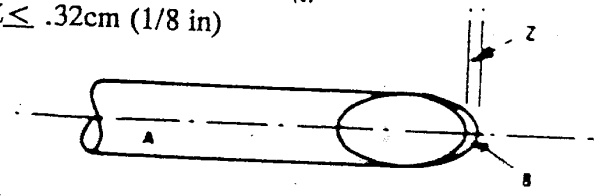
INSPECTOR NAME Clint Rachal

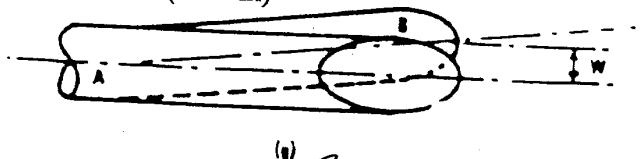
	YES	NO	
1	✓		a_1 and $a_2 \leq 10°$
2	✓		B_1 and $B_2 \leq 5°$
3	✓		$Z \leq$ .32cm (1/8 in)
4	✓		$W \leq$ .0.08cm (1/32 in)











SIGNATURE Clint Rachal

ETSR

EMISSION TESTING SERVICES, INC.

BAROMETER CALIBRATION SHEET

CLIENT: CHALMETTE REFINING DATE: 12/11/09

SOURCE ID: #2 SRU

OPERATOR: RON MCCABE

**********BAROMETER**********

BAROMETER ID: UNIT #2

CALIBRATION DATA:

INITIAL CALIBRATION: 30.11 INITIAL 30.11 FINAL

ADJUSTMENT: ☐ Yes ☒ No

**********CALIBRATION REFERENCE**********

ID: PRINCO, HG

ELEVATION: BATON ROUGE ELEVATION DIFF: N/A

BAROMETER READING: 30.11

COMMENTS:

ETS REFERENCE SOPS-002, 004, 005, 030

APPENDIX B
7.3.5

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

Shipped From:
9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800
Fax: 281-474-5857

C E R T I F I C A T E O F A N A L Y S I S

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075

BATON ROUGE LA 70895

PROJECT #: 04-72169-010
PO#: 20090305-RM01
ITEM #: 0401813 AL
DATE: 16Apr2009

CYLINDER #: ALM041976
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9

GRADE: ZERO GAS

PURITY: 99.998%

IMPURITY	MAXIMUM CONCENTRATIONS
THC	0.5 PPM

CRLLC-CHAL-000391

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20090319-RM01
Project No.: 04-72315-005

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM039698 **Certification Date:** 16Apr2009 **Exp. Date:** 16Apr2012
Cylinder Pressure*:** 1900 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	10.1 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2350	01Apr2012	A6820	23.51 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	23Mar2009	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis

OXYGEN

Date: 16Apr2009	Response Unit:%	
Z1=0.00000	R1=0.99030	T1=0.42840
R2=0.99040	Z2=0.00000	T2=0.42830
Z3=0.00000	T3=0.42810	R3=0.99040
Avg. Concentration:	10.15 %	

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=.9999978
Constants: A=-.00703813
B=23.71576885 C=
D= E=

APPROVED BY: Jamie Tolleson
JAMIE TOLLESON

APPENDIX C
7.4.2

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-014

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM045869 **Certification Date:** 13Feb2008 **Exp. Date:** 13Feb2011
Cylinder Pressure*:** 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	20.0 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2350	01May2009	K003567	23.48 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SERVOMEX/MODEL 244A/701/716	04Feb2008	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis

OXYGEN

Date: 13Feb2008	Response Unit:VOLTS	
Z1=0.00000	R1=0.98480	T1=0.84080
R2=0.98500	Z2=0.00000	T2=0.84100
Z3=0.00000	T3=0.84100	R3=0.98480
Avg. Concentration:	20.04 %	

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.9999996

Constants:	A=-.00540053
B=23.821333399	C=
D=	E=

APPROVED BY: DAVID KELLY

APPENDIX C
7.4.3

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20090305-RM01
Project No.: 04-72169-008

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM057798 **Certification Date:** 08Apr2009 **Exp. Date:** 08Apr2011
Cylinder Pressure*:** 1945 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	54.4	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	15Aug2009	ALM024377	50.79 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	11Mar2009	FTIR

ANALYZER READINGS

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

First Triad Analysis

SULFUR DIOXIDE *

Date: 01Apr2009	Response Unit:PPM	
Z1=0.01736	R1=51.01970	T1=54.66078
R2=51.11126	Z2=0.04827	T2=54.68263
Z3=0.06450	T3=54.72482	R3=51.11722
Avg. Concentration:	54.38	PPM

Second Triad Analysis

Date: 08Apr2009	Response Unit: PPM	
Z1=-0.06799	R1=50.93941	T1=54.56310
R2=50.97784	Z2=0.01258	T2=54.61544
Z3=0.01348	T3=54.62985	R3=51.04839
Avg. Concentration:	54.39	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99994E-1	
Constants:	A=0.00000E+0
B=9.92962E-1	C=0.00000E+0
D=0.00000E+0	E=0.00000E+0

APPROVED BY: Peter Brandon

APPENDIX C
7.4.4

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 030409-1RM01
Project No.: 04-73168-003

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: AAL6085 **Certification Date:** 21Apr2009 **Exp. Date:** 21Apr2011
Cylinder Pressure*:** 922 PSIG **Prev Certification Date:** 01Mar2007

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	111	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 0260	02Oct2012	ALM038515	254.4 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	16Apr2009	FTIR

ANALYZER READINGS

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

SULFUR DIOXIDE *

First Triad Analysis

Date: 01Mar2007 Response Unit:PPM

Z1=0.00000	R1=0.00000	T1=0.00000
R2=0.00000	Z2=0.00000	T2=0.00000
Z3=0.00000	T3=0.00000	R3=0.00000

Avg. Concentration: 111.0 PPM

Second Triad Analysis

Date: 21Apr2009 Response Unit: PPM

Z1=0.00177	R1=253.4861	T1=111.1280
R2=253.7028	Z2=0.02563	T2=111.2242
Z3=0.24586	T3=111.2264	R3=253.8326

Avg. Concentration: 111.5 PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99997E-1

Constants:	A=0.00000E+0
B=9.92992E-1	C=0.00000E+0
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
Ramien JR

APPENDIX C
7.4.5

CRLLC-CHAL-000395

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20090305-RM01
Project No.: 04-72169-002

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: AAL069096 **Certification Date:** 14Apr2009 **Exp. Date:** 14Apr2011
Cylinder Pressure*:** 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	24.8	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	25.0	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	15Aug2009	KAL003015	19.83 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
NOX ANALYZER/400-CLD/7M07001	23Mar2009	CHEMI

ANALYZER READINGS

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

First Triad Analysis

NITRIC OXIDE

Date: 31Mar2009	Response Unit:PPM	
Z1=0.00000	R1=19.80000	T1=24.55000
R2=19.83000	Z2=0.00000	T2=24.73000
Z3=0.00000	T3=24.95000	R3=19.83000
Avg. Concentration:	24.69	PPM

Second Triad Analysis

Date: 14Apr2009	Response Unit: PPM	
Z1=0.00000	R1=19.88000	T1=24.88000
R2=19.88000	Z2=0.00000	T2=24.90000
Z3=0.00000	T3=24.94000	R3=19.89000
Avg. Concentration:	24.85	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=.9999998	
Constants:	A=.032583468
B=1.000276561	C=
D=	E=

APPROVED BY: JAMIE TOLLESON

RATA CLASS

Dual-Analyzed Calibration Standard

11426 FAIRMONT PKWY, LA PORTE, TX 77571 Phone: 800-248-1427 Fax: 281-474-8419

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
11426 FAIRMONT PKWY
LA PORTE, TX 77571

P.O. No.: 200908.18-RM01
Project No.: 04-76702-001

Customer

EMISSION TESTING SERVICES
GAYLE POURCIAU
PO BOX 15075
BATON ROUGE LA 70895

ANALYTICAL INFORMATION

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

Cylinder Number: ALM000668 **Certification Date:** 24Sep2009 **Exp. Date:** 24Sep2011
Cylinder Pressure*:** 1843 PSIG **Batch No:** LAP0001348

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	55.1	PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	55.1	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1683	02Oct2009	KAL003460	46.90 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//MG-09-149	01Sep2009	FTIR

ANALYZER READINGS

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

NITRIC OXIDE

First Triad Analysis

Date: 17Sep2009 Response Unit: PPM

Z1 = -0.13188	R1 = 46.63640	T1 = 55.01296
R2 = 46.68149	Z2 = -0.09079	T2 = 55.06514
Z3 = 0.09185	T3 = 55.37518	R3 = 47.01583

Avg. Concentration: 55.29 PPM

Second Triad Analysis

Date: 24Sep2009 Response Unit: PPM

Z1 = -0.15124	R1 = 46.76213	T1 = 54.79702
R2 = 46.88907	Z2 = -0.11413	T2 = 54.95461
Z3 = 0.00393	T3 = 55.01298	R3 = 46.93866

Avg. Concentration: 54.95 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99998E-1

Constants:	
A = 0.00000E+0	
B = 9.55580E-1	C = 1.71000E-4
D = 0.00000E+0	E = 0.00000E+0

APPROVED BY: Gary Wright

AIR LIQUIDE Air Liquide America Specialty Gases LLC Scott™

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
500 WEAVER PARK RD
LONGMONT, CO 80501

P.O. No.: 030409-1RM01
Project No.: 08-75641-001

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: AAL071340 **Certification Date:** 07May2009 **Exp. Date:** 05Nov2009
Cylinder Pressure*:** 1900 PSIG **Prev Certification Date:** 01Apr2008

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITROGEN DIOXIDE	48.6	PPM	+/- 2%	NMi and NIST
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NMI PRM	15Dec2009	767376	50.00 PPM	NITROGEN DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA-220/D000423P	27Apr2009	CHEMILUMINESCENCE

APPROVED BY: JW
JON WITZAK

APPENDIX C
7.4.8

CRLLC-CHAL-000398

AIR LIQUIDE Scott Specialty Gases
Air Liquide America Specialty Gases LLC

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 20080121-RM01
Project No.: 04-61403-005

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: AAL9259 **Certification Date:** 19Feb2008 **Exp. Date:** 19Feb2011
Cylinder Pressure*:** 1969 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	900	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1681	02Oct2010	KAL003229	970.1 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	11Feb2008	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 11Feb2008 Response Unit:PPM

Z1=-0.09054	R1=968.0060	T1=898.6916
R2=969.9284	Z2=0.58396	T2=898.9754
Z3=0.60275	T3=899.8580	R3=970.2989

Avg. Concentration: 899.8 PPM

Second Triad Analysis

Date: 19Feb2008 Response Unit: PPM

Z1=0.08094	R1=970.8925	T1=900.8781
R2=973.0483	Z2=0.38065	T2=901.3708
Z3=0.46906	T3=903.5897	R3=973.0639

Avg. Concentration: 899.9 PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=1.00000E+0

Constants:	A=-3.95537E+3
B=1.79794E+0	C=0.00000E+0
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
RAMIEN JR

APPENDIX C
7.4.9

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 20070307-RM01
Project No.: 04-52896-003

Customer

EMISSION TESTING SERVICES

10461 MAMMOTH DRIVE
BATON ROUGE LA 70814

ANALYTICAL INFORMATION

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

Cylinder Number: ALM054357 **Certification Date:** 27Mar2007 **Exp. Date:** 26Mar2010
Cylinder Pressure*:** 1950 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	2,000	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2637	01Aug2009	ALM021671	2505. PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	28Feb2007	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 20Mar2007	Response Unit:PPM	
Z1=0.27324	R1=1022.615	T1=2011.973
R2=1024.208	Z2=0.33563	T2=2012.749
Z3=0.40511	T3=2019.780	R3=1024.804
Avg. Concentration:	1990.	PPM

Second Triad Analysis

Date: 27Mar2007	Response Unit: PPM	
Z1=-0.01592	R1=2521.541	T1=2012.875
R2=2522.339	Z2=0.37850	T2=2013.960
Z3=0.38377	T3=2014.804	R3=2522.392
Avg. Concentration:	2000.	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99999E-1	
Constants:	A=0.00000E+0
B=6.20320E-2	C=7.80000E-5
D=0.00000E+0	E=0.00000E+0

APPROVED BY: _____
Tom Nguyen

APPENDIX C
7.4.10

OXYGEN/ CARBON DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

SERVOMEX
MODEL NUMBER 1400B4 STD/FLS

I. PRINCIPLE of OPERATION

The Servomex oxygen/ carbon dioxide analyzer uses a magneto-dynamic paramagnetic technique for oxygen measurement and a single-beam, single-wave length infrared technique for carbon dioxide measurement.

II. SPECIFICATIONS

Ranges	
O2	0.1 to 100 vol%
CO2	0 to 1 vol%
	0 to 2 vol%
	0 to 5 vol%
	0 to 10 vol%
	0 to 25 vol%
	0 to 50 vol%
	0 to 100 vol%
Detection Limits	
O2 Minimum	0.1 vol%
O2 Maximum	100 vol%
CO2 Minimum	0.1 vol%
CO2 Maximum	100 vol%
Response Time, 90%	
O2	< 10 sec
CO2	< 30 sec
Interferences	
None	

Precision	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Linearity	
O2	+/- 0.1 vol%
CO2	+/- 1% FS
Drift	
Zero, 24-hr	+/- 0.2%
Span, 24-hr	+/- 0.2%

CRLLC-CHAL-000401

III. INTERFERENCE CHECK RESPONSE

Manufacturer:	Servomex	High Span Calibration Gas (b):	20.0
Monitor:	Model 1440	High Gas Cylinder Number:	ALM051449
Serial Number:	ETS-O2-1	High Gas Certification Date:	11/06/2007
Date:	06/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response Without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	02/06/2008	CO2	5.06%	0.01	0.00	0.010
CC139299	Air Liquide	12/13/2007	CO2	13.90%	0.02	0.00	0.020
AAL9663	Scott Gas	02/18/2008	NO	24.9 PPMv	0.00	0.01	0.010
AAL6541	Scott Gas	02/11/2008	NO2	49.3 PPMv	0.00	0.00	0.000
A4072	Scott Gas	10/03/2007	N2O	9.9 PPMv	0.00	0.00	0.000
ALM031361	Scott Gas	02/14/2008	CO	55.7 PPMv	0.02	0.01	0.020
ALM023311	Scott Gas	10/03/2007	NH3	10.37 PPMv	0.00	0.00	0.000
ALM036171	Scott Gas	04/14/2005	CH4	50.92 PPMv	0.00	0.00	0.000
ALM001797	Scott Gas	10/11/2007	SO2	25.7 PPMv	0.10	0.00	0.100
A10634	Scott Gas	10/04/2007	H2	50 PPMv	0.00	0.00	0.000

Sum of the Maximum Deviations (a)	0.160
2.5% of Span (b)	0.500
Pass if Sum of the Maximum Deviations (a) is less than 2.5% of Span (b)	PASS

Comments:

CRLLC-CHAL-000402

SULFUR DIOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

WESTERN RESEARCH
MODEL NUMBER 721AT

I. PRINCIPLE of OPERATION

The Western Research, Model 721AT, sulfur dioxide analyzer utilizes the principle of the unique and characteristic absorbsion of ultraviolet radiation for sulfur dioxide.

II. SPECIFICATIONS

Ranges	
SO2	0 to 500 PP Mv
	0 to 5000 PP Mv
Detection Limits	
Minimum	0.5 PP Mv
Maximum	5000 PP Mv
Response Time, 90%	
SO2	1 sec
Interferences	
Negligible	

APPENDIX D
7.5.3

CRLLC-CHAL-000403

III. INTERFERENCE CHECK RESPONSE

Manufacturer:	Bovar/ Ametek	High Span Calibration Gas (b):	111
Monitor:	Model 721-M	High Gas Cylinder Number:	AAL6085
Serial Number:	ETS-SO2-2	High Gas Certification Date:	03/01/2007
Date:	06/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response Without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	02/06/2008	CO2	5.06%	0.20	0.000	0.200
CC139299	Air Liquide	12/13/2007	CO2	13.90%	0.10	0.000	0.100
AAL9663	Scott Gas	02/18/2008	NO	24.9 PPMv	0.00	0.000	0.000
AAL6541	Scott Gas	02/11/2008	NO2	49.3 PPMv	-0.10	0.800	0.800
A4072	Scott Gas	10/03/2007	N2O	9.9 PPMv	0.00	0.000	0.000
ALM031361	Scott Gas	02/14/2008	CO	55.7 PPMv	0.20	0.000	0.200
ALM023311	Scott Gas	10/03/2007	NH3	10.37 PPMv	0.10	0.000	0.100
ALM036171	Scott Gas	04/14/2005	CH4	50.92 PPMv	0.00	0.000	0.000
ALM001797	Scott Gas	10/11/2007	SO2	25.7 PPMv	N/A	N/A	0.000
A10634	Scott Gas	10/04/2007	H2	50 PPMv	0.00	N/A	0.000

Sum of the Maximum Deviations (a)	1.400
2.5% of Span (b)	2.775
Pass if Sum of the Maximum Deviations (a) is less than 2.5% of Span (b)	PASS

Comments:

CRLLC-CHAL-000404

OXIDES of NITROGEN ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 10

I. PRINCIPLE of OPERATION

The model 10 NO-NOx analyzer utilizes the principle of chemiluminescence for the detection of nitrogen oxide (NO). Detection of NO in the sample gas is accomplished by blending ozone (O3) with the sample gas in a reaction chamber. The reaction produces a characteristic luminescence with an intensity that is linearly proportional to the concentration of NO. The luminescence intensity is measured using an optical filter and photomultiplier at a narrow wavelength band that is unique to the NO and O3 reaction. In order to measure NOx (NO plus NO2), the sample gas is diverted through a NO2 to NO converter prior to entering the reaction chamber.

II. SPECIFICATIONS

Ranges	
NO	0 to 2.5 PPMv
	0 to 10 PPMv
	0 to 25 PPMv
	0 to 100 PPMv
	0 to 250 PPMv
	0 to 1000 PPMv
	0 to 2500 PPMv
	0 to 10000 PPMv
Detection Limits	
Minimum	0.1% FS
Maximum	10000 PPMv
Response Time, 90%	
NO	1.5 sec
NO2	1.7 sec

Precision	
NO	+/- 1.0 PPMv
Linearity	
NO	+/- 1%
Drift	
Zero, 12-hr	< 1.2%
Span, 12-hr	< 1.2%
Noise	0.05 RMS
Sample Flow Rate	0.2 – 2 l/min

Interferences
Negligible for H20, carbon, and sulfur compounds

CRLLC-CHAL-000405

III. INTERFERENCE CHECK RESPONSE

Manufacturer:	Thermo Environmental	High Span Calibration Gas (b):	95.8
Monitor:	Model 10	High Gas Cylinder Number:	AAL5239
Serial Number:	ETSNOX4A/11B	High Gas Certification Date:	02/14/2008
Date:	06/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response Without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	02/06/2008	CO2	5.06%	0.0	0.000	0.010
CC139299	Air Liquide	12/13/2007	CO2	13.90%	-0.1	0.000	0.100
AAL9663	Scott Gas	02/18/2008	NO	24.9 PPMv	N/A	N/A	0.000
AAL6541	Scott Gas	02/11/2008	NO2	49.3 PPMv	N/A	N/A	0.000
A4072	Scott Gas	10/03/2007	N2O	9.9 PPMv	0.1	0.015	0.100
ALM031361	Scott Gas	02/14/2008	CO	55.7 PPMv	-0.1	0.000	0.100
ALM023311	Scott Gas	10/03/2007	NH3	10.37 PPMv	0.9	0.000	0.900
ALM036171	Scott Gas	04/14/2005	CH4	50.92 PPMv	0.0	0.000	0.000
ALM001797	Scott Gas	10/11/2007	SO2	25.7 PPMv	-0.1	0.050	0.100
A10634	Scott Gas	10/04/2007	H2	50 PPMv	-0.2	0.010	0.200

Sum of the Maximum Deviations (a)	1.500
2.5% of Span (b)	2.395
Pass if Sum of the Maximum Deviations (a) is less than 2.5% of Span (b)	PASS

Comments:

CRLLC-CHAL-000406

CARBON MONOXIDE ANALYZER
PRINCIPLE of OPERATION and SPECIFICATIONS

THERMO ENVIRONMENTAL INSTRUMENTS
MODEL NUMBER 48

I. PRINCIPLE of OPERATION

The model 48 CO analyzer utilizes non-dispersive infrared (NDIR) detection of CO enhanced by gas filter correlation (GFC). Sample gas is passed through an optical White Cell in which an IR beam passes. The White Cell provides a long beam path length in a relatively small cell by utilizing optical mirrors to produce multiple passes of the IR beam through the cell. The IR beam is first passed through a GFC chopper wheel and a narrow bandpass interference filter before entering the cell. The CO molecules in the cell absorb IR proportional to the CO concentration. The IR beam exiting the cell is measured using an IR detector.

II. SPECIFICATIONS

Ranges		Precision	
CO	0 to 1 PPMv	CO	+/- 0.1 PPMv
	0 to 2 PPMv		
	0 to 5 PPMv		
	0 to 10 PPMv	Linearity	
	0 to 20 PPMv	CO	+/- 1%
	0 to 50 PPMv		
	0 to 100 PPMv		
	0 to 200 PPMv	Drift	
	0 to 500 PPMv	Zero, 24-hr	+/- 0.2 PPMv
	0 to 1000 PPMv	Span, 24-hr	+/- 1% FS
Detection Limits		Sample Flow Rate	0.5 – 2 l/min
Minimum	0.1 PPMv		
Maximum	1000 PPMv	Noise	0.05 RMS
Response Time	1 min		

Interferences
Negligible for H2O and CO2

CRLLC-CHAL-000407

III. INTERFERENCE CHECK RESPONSE

Manufacturer:	Thermo Environmental	High Span Calibration Gas (b):	95.8
Monitor:	Model 48i	High Gas Cylinder Number:	ALM002244
Serial Number:	ETS-CO-2	High Gas Certification Date:	02/14/2008
Date:	06/17/2008	High Gas Cylinder Manufacturer:	Scott Gas

Cylinder Number	Cylinder Manufacturer	Certification Date	Potential Interferent	Sample Conditioning Dry Basis	Analyzer Response with Pollutant	Analyzer Response Without Pollutant	Absolute Maximum Deviation of Responses (a)
ALM003244	Scott Gas	02/06/2008	CO2	5.06%	0.0	-0.012	0.012
CC139299	Air Liquide	12/13/2007	CO2	13.90%	0.1	0.004	0.100
AAL9663	Scott Gas	02/18/2008	NO	24.9 PPMv	0.0	-0.010	0.000
AAL6541	Scott Gas	02/11/2008	NO2	49.3 PPMv	-0.2	0.015	0.200
A4072	Scott Gas	10/03/2007	N2O	9.9 PPMv	0.1	-0.090	0.100
ALM031361	Scott Gas	02/14/2008	CO	55.7 PPMv	N/.A	N/A	0.000
ALM023311	Scott Gas	10/03/2007	NH3	10.37 PPMv	0.1	0.000	0.100
ALM036171	Scott Gas	04/14/2005	CH4	50.92 PPMv	0.0	0.110	0.100
ALM001797	Scott Gas	10/11/2007	SO2	25.7 PPMv	0.3	0.496	0.496
A10634	Scott Gas	10/04/2007	H2	50 PPMv	0.1	0.000	0.100

Sum of the Maximum Deviations (a)	1.228
2.5% of Span (b)	2.395
Pass if Sum of the Maximum Deviations (a) is less than 2.5% of Span (b)	PASS

Comments:

CRLLC-CHAL-000408

Department of Environmental Quality Office of Environmental Services Air Permits Division P.O. Box 4313 Baton Rouge, LA 70821-4313 (225) 219-3181	**LOUISIANA** **Engineering Review** **Activity Form**	DEQ LOUISIANA

PLEASE TYPE OR PRINT
Attach to Original and one or more Copies of the document being submitted
Submittals without the form attached will be considered incomplete and not received.

1. Facility Information

Facility Name Chalmette Refinery	**Agency Interest Number (AI #)** 1376
Company - Name of Owner ExxonMobil - Chalmette Refining, LLC	
Company - Name of Operator (if different from Owner) N/A	
Parent Company (if Company – Name of Owner given above is a division) ExxonMobil	
Parish(es) where facility is located: St. Bernard Parish	

2. Type of Submittal

Check the boxes that indicate the type of submittal being made

Notification Type		**Requirement**
☐ Stack Test	☐ Initial ☐ Engineering Study ☐ Engine Overhaul ☐ Periodic	
☐ Monitor Certification	☐ Initial CEMS ☐ Annual RATA ☐ Initial COMS ☐ Quarterly CGA	
☐ Fugitive Testing	☐ Annual ☐ Semiannual ☐ Quarterly	
☐ Construction/Reconstruction (non-tank)		
☐ Startup (non-tank)		
☐ Tank Seal	☐ Inspection ☐ Repair ☐ Gap Measurements	
☐ Tank	☐ Refilling ☐ Startup ☐ Reconstruction	
☐ Other (Please specify)		

CRLLC-CHAL-000409

2. Type of Submittal (Cont)

Check the boxes that indicate the type of submittal being made

Report Type		Requirement
☒ Stack Test	☐ Initial ☐ Engineering Study ☐ Engine Overhaul ☒ Periodic	AMP, signed 12/29/08
☐ Monitor Certification	☐ Initial CEMS ☐ Annual RATA ☐ Initial COMS ☐ Quarterly CGA	Permit No. 3022-V4
☐ Fugitive Testing	☐ Annual ☐ Semiannual ☐ Quarterly	
☐ CEMS Downtime and Excess Emissions	☐ Annual ☐ Semiannual ☐ Quarterly	
☐ Tank Seal	☐ Inspection ☐ Repair ☐ Gap Measurements	
☐ Non-Methane Organic Carbon (NMOC) Emission Rate		
☐ Tier 2 Test Results		
☐ NSPS Report		
☐ Other (Please specify)		
Modeling		
☐ Protocol		
☐ Report		

3. Equipment Information

1. Equipment Description	WGS
Subject Item ID	EQT184
Currently Effective Permit Number	3022-V4
Activity Number ☒ Yes ☐ No	PER20100001

2. Equipment Description	
Subject Item ID	
Currently Effective Permit Number	
Activity Number ☐ Yes ☐ No	

3. Equipment Description	
Subject Item ID	
Currently Effective Permit Number	
Activity Number ☐ Yes ☐ No	

CRLLC-CHAL-000410

4. Contact Information

a. Person to contact with written correspondence					
Name		Mr. Jeff Bergeron, P.E.			
Title		Environmental Advisor			
Company		ExxonMobil – Chalmette Refining, LLC			
Suite, mail drop, or division		N/A			
Street or P.O. Box		500 W. St. Bernard Highway			
City	Chalmette	State	LA	Zip	70044
Business phone		504.281.1934			
Email address		jeff.bergeron@exxonmobil.com			

b. Person who prepared this report					
Name		Mr. Richard Ishikawa			
Title		Project Manager			
Company		Shaw Environmental, Inc.			
Suite, mail drop, or division		N/A			
Street or P.O. Box		4171 Essen Lane			
City	Baton Rouge	State	LA	Zip	70809
Business phone		225.932.2745			
Email address		richard.ishikawa@shawgrp.com			

CRLLC-CHAL-000411

SOURCE TEST REPORT

EXXONMOBIL – CHALMETTE REFINING, LLC
FLUID CATALYTIC CRACKING UNIT (FCCU)
WET GAS SCRUBBER (WGS) (EQT184)

Particulate Matter (PM_{10}) Emission Compliance Test

Prepared for:

ExxonMobil – Chalmette Refining, LLC
Chalmette, St. Bernard Parish, Louisiana
Agency Interest No. 1376
Permit No. 3022-V4

Facility Contact:

Mr. Jeff Bergeron
Office: (504) 281-1934

Prepared by:

Shaw® Shaw Environmental, Inc.

4171 Essen Lane
Baton Rouge, Louisiana 70809
Office: 225.932.2745
Fax: 225.987.3040

Test Date: April 21, 2011
Shaw Project No. 141145

STATEMENT OF CERTIFICATION

ExxonMobil – Chalmette Refining, LLC
Fluid Catalytic Cracking Unit (FCCU) Wet Gas Scrubber (WGS) (EQT184)
Particulate Matter (PM_{10})
Emission Compliance Test
Conducted: April 21, 2011

Shaw Environmental, Inc. (Shaw) is a commercial laboratory that operates in compliance with the Louisiana Environmental Laboratory Accreditation Program (LELAP), Certificate No. 04113. Shaw provides defensible air quality assessment data as a certified emission source testing firm. Agency Interest No. 122938 has been assigned to Shaw Environmental by the Louisiana Department of Environmental Quality (LDEQ) in accordance with Louisiana Administrative Code of LAC 33.I. Chapter 45.

I certify that I have examined and approve the contents of this document. Based on the information contained within, and procedures pursuant to EPA 40 CFR 60, Appendix A and/or B, other approved test methods, and test data obtained on-site by Shaw personnel, I believe the contents of this report to be true, accurate, and complete to the best of my knowledge.

5/19/2011

Shaw Environmental, Inc. Representative — Date

Facility Representative — Date

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CRLLC-CHAL-000414

1.0 INTRODUCTION

Shaw Environmental, Inc. (Shaw) was retained by ExxonMobil – Chalmette Refining, LLC (ExxonMobil – Chalmette Refining) to conduct an emission compliance test at the facility in Chalmette, St. Bernard Parish, Louisiana. The objective of the sampling event was to conduct a particulate matter (PM_{10}) emission compliance test for the Fluid Catalytic Cracking Unit (FCCU) Wet Gas Scrubber (WGS). The test program was coordinated through Mr. Jeff Bergeron of ExxonMobil – Chalmette Refining and conducted on April 21, 2011 by Messrs. Blake Fogleman, Jett Rink, and Shane Vincent of Shaw.

1.1 Source Description

Chalmette owns and operates a Fluid Catalytic Cracking Unit (FCCU) which is used to reduce heavier organic compounds into smaller chain products. The exhaust from the FCCU is directed through a wet gas scrubber (WGS) which controls particulate matter (PM) emissions to the atmosphere.

1.2 Applicable State and/or Federal Regulations

The PM test program was conducted pursuant to an approved Alternative Monitoring Plan (AMP) for the FCCU dated December 29, 2008 and Louisiana Department of Environmental Quality (LDEQ) Title V Permit No. 3022-V4.

1.3 Test Results and Discussions

Shaw conducted three one hundred-twenty (120) minute test runs on the FCCU WGS on April 21, 2011. For each test run, the particulate matter (PM_{10}) was measured using reference method 5B (RM 5B), and the three test runs were averaged. Process data were provided by the facility to assist in the calculations.

The maximum allowable emission limits for PM_{10} are 49.32 lb/hr and 73.37 ton/yr. The summary of results and compliance status is presented on Table 1. A comprehensive summary of the test results are presented on Table 2. Documentation supporting results of this test program are presented in the appendices. The results obtained during testing are only applicable to the date and time noted in this report. Results are not guaranteed for other dates, times, or operational differences.

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Table 1 FCCU WGS - Summary of Results

PM_{10} Results (lb/hr)	PM_{10} Permit Limit (lb/hr)	PM_{10} Emission Status	PM_{10} Results (ton/yr)	PM_{10} Permit Limit (ton/yr)	PM_{10} Emission Status
6.52	49.32	Pass	28.57	73.37	Pass

Table 2 FCCU WGS - Performance Test Results

Sampling Parameters

Test No.		1	2	3	Average
Date		04/21/11	04/21/11	04/21/11	
Test Period		10:42-13:10	14:05-16:15	16:55-19:05	
Sampling Duration	min	120	120	120	120
Sample Volume	dscf	68.553	77.668	80.733	75.651
Isokinetic Sampling Rate	%	88.33	97.47	96.92	94.24
Particulate Matter as PM_{10}	g	0.033	0.037	0.035	0.035
	gr	0.51	0.56	0.53	0.54

Unit Operating Parameters

Excess Oxygen (O_2)	vol%	1.00	1.00	1.00	1.00
Carbon Dioxide (CO_2)	vol%	12.00	12.00	12.50	12.17
Moisture Content	vol%	25.42	26.04	25.24	25.57
Molecular Weight (wet)	lb/lb·mol	26.92	26.85	27.00	26.92
Exhaust Temperature	°F	149.6	148.7	147.5	148.60
Effluent Velocity	ft/sec	48.85	50.70	52.37	50.64
Volumetric Flow Rate	acfm	159,870	165,902	171,396	165,723
	dscfm	103,480	106,244	111,065	106,930

Pollutants

PM_{10} Equivalent	gr/dscf	0.007	0.007	0.007	0.01
	lb/hr	6.65	6.62	6.30	6.52
	ton/yr	29.12	29.01	27.58	28.57

Note: Analyses were conducted by Enthalpy Analytical, Inc.

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1.4 Test Program Chronology

The FCCU WGS test program was conducted on April 21, 2011. A comprehensive chronology of events outlining the test period is presented below in Table 3.

Table 3 Chronology of Events

Date	Time	Activity
04/19/11	07:30	Arrive at plant and equipment setup.
04/19/11	19:30	Departed facility.
04/20/11	07:45	Arrive at plant.
04/20/11	08:45	Standby.
04/20/11	13:00	Departed facility.
04/21/11	07:30	Arrive at plant.
04/21/11	10:42	Begin Testing, Run 1.
04/21/11	14:05	Begin Testing, Run 2.
04/21/11	16:55	Begin Testing, Run 3.
04/21/11	19:05	Complete Run 3.
04/21/11	20:45	Complete testing.
04/21/11	21:00	Departed facility.

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2.0 REFERENCE TEST METHODS AND PROCEDURES

Shaw employed standard reference methods to conduct this test program. Reference test methods specified by applicable federal and/or state regulations were performed with strict adherence to the method unless a deviation was approved in advance by the appropriate regulatory agency. Descriptions of the approved test methods employed to conduct this test program are presented below.

2.1 Sample Traverse Points

Shaw used 40 CFR 60, Appendix A, Reference Method 1 (RM 1) *Determination of Sample and Velocity Traverses for Stationary Sources* to determine traverse points for representative sampling of the stack gas. The sampling plane was located approximately 87.5 feet upstream of the exhaust (A distance) and 68.5 feet downstream of the closest disturbance (B distance). The internal diameter of the stack was 100 inches. Two four-inch sample ports were located at the sampling plane with 15-inch port extensions. The south and west ports were configured at 90 degrees of each other. The minimum number of traverse points calculated for this stack configuration and utilized for this test was twelve; six points per port. A cross-sectional diagram of the stack, which approximates the configuration of the sample ports and traverse points, is presented below in Figure 1.

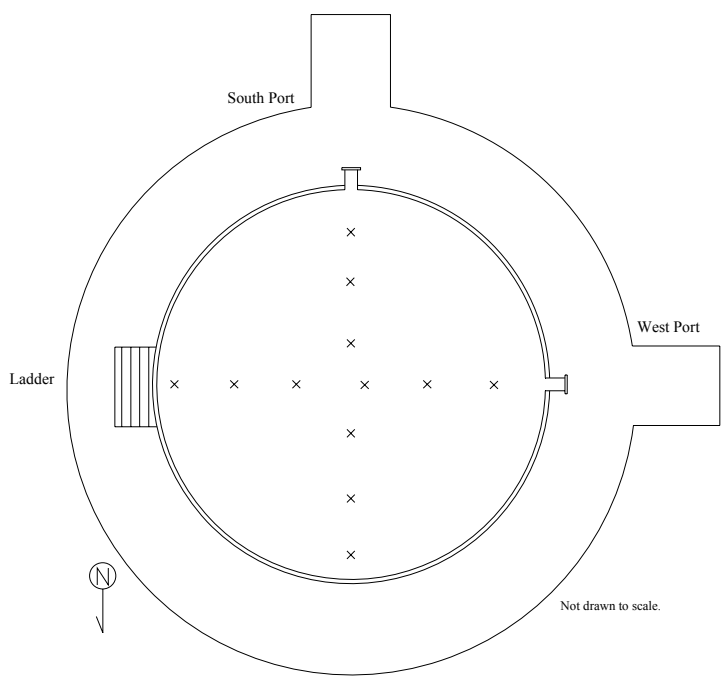

Figure 1 Traverse Point Configuration

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2.2 Velocity and Volumetric Flow Rate

Shaw used 40 CFR 60, Appendix A, Reference Method 2 (RM 2) *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube)*, to determine the stack gas velocity and volumetric flow rate. A Type-S pitot tube, with an assigned coefficient of 0.84, and an inclined manometer will be used to measure the differential pressure (ΔP) of the stack gas. The "A"-side of the pitot tube measures the stack gas impact pressure and the "B"-side of the pitot tube measures the static pressure. Unit of measure is in inches of water ("H_2O). Differential pressure, molecular weight, physical properties of the stack gas, and the stack ID are used to calculate the stack gas velocity and volumetric flow rate.

2.3 Molecular Weight

Shaw used 40 CFR 60, Appendix A, Reference Method 3 (RM 3) *Gas Analysis for the Determination of Dry Molecular Weight*, to determine the oxygen (O_2) and carbon dioxide (CO_2) content of the stack gas. During each test run, an integrated flue gas sample was collected in a Tedlar® and analyzed for O_2 and CO_2 with an Orsat Gas Analyzer. The O_2 and CO_2 concentration are used to calculate the molecular weight of the flue gas.

2.4 Particulate Matter (PM_{10})

Shaw employed 40 CFR 60, Appendix A, Reference Method 5B (RM 5B) *Determination of Nonsulfuric Acid Particulate Matter Emissions From Stationary Sources*, to determine the PM_{10} content of the stack gas. RM 5 sampling equipment was used to collect stack gas samples isokinetically. During sampling, the probe and filter temperatures were maintained at 320 ±25°F. The front-half wash and filter were recovered after each test. At the end of the test period, the samples were sent to a contract laboratory for PM gravimetric analysis.

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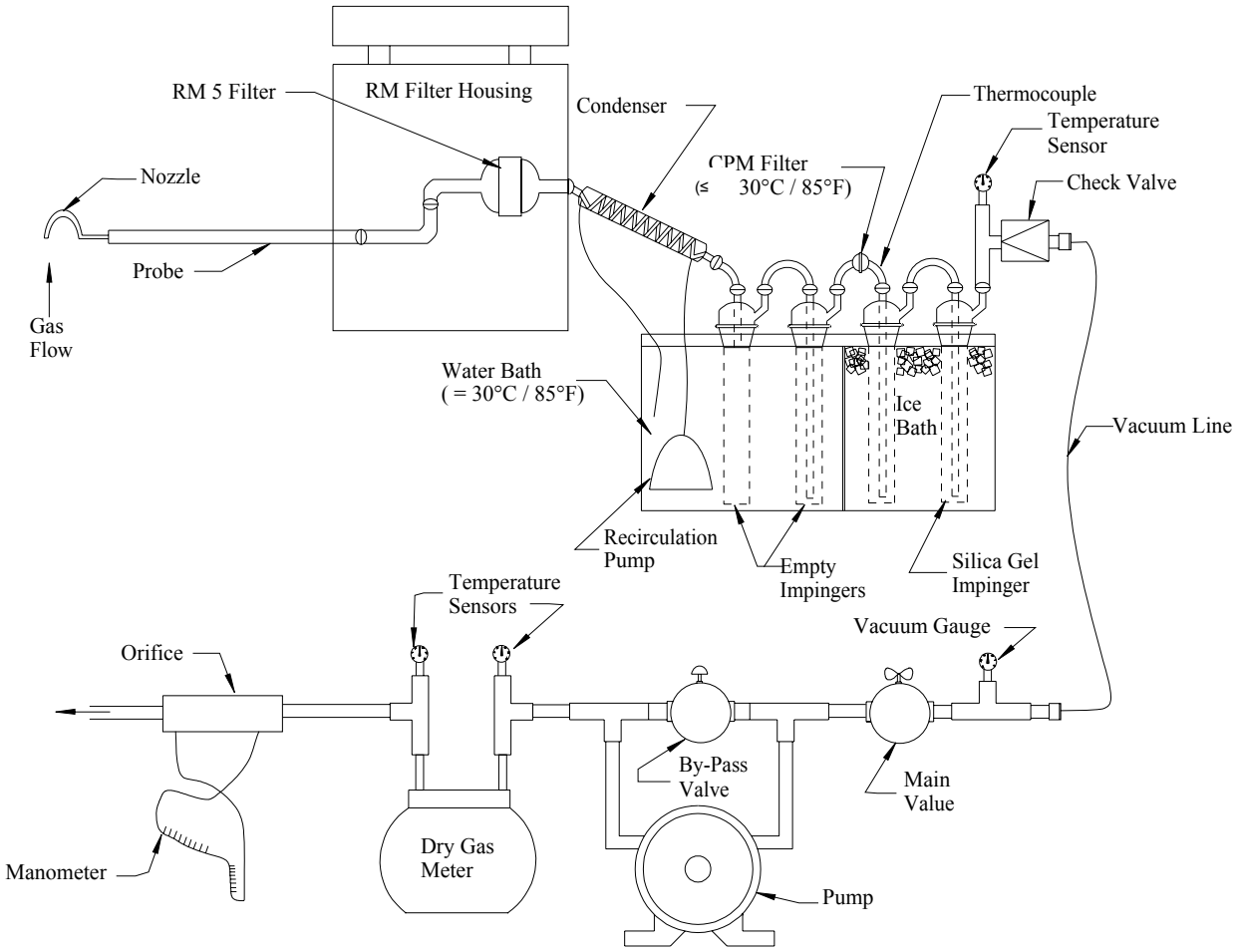

Figure 2 Reference Methods 5B Sampling Equipment

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3.0 STANDARD TEST METHOD DEVIATIONS

No test method deviations were employed during this test program.

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Appendix A
Raw Field Data

Shaw® Shaw E & I

Probe/Pitot Tube Traverse Layout Calculation Spreadsheet
40 CFR 60, Appendix A Method 1

Project Name	Chalmette WGS
Project Site	
Emission Source ID	
Stack/duct inside diameter (inches)	100"
Stack/duct inside diameter (ft)	8.33'
Stack Area (in2)	7,854 in.2
Stack Area (ft2)	54.54 ft.2
Required number of traverse points (stack total)	12
Req. traverse points on a diameter	6
Port Length (inches)	

A = 87.5' 1050" B = 68.5' 822"

Location of Traverse Point (Measured from Outside Edge of Sample Port)

Traverse Point number on a diameter	2	4	6	8	10	12	14	16	18	20	22	24
1			19.4									
2			29.6									
3			44.6									
4			85.4									
5			100.4									
6			110.6									
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

Shaw The Shaw Group Inc.

Plant and City	Date	Sampling Location	Sample Type	Run Number
Chalmette Refinery, Chalmette, La.	4/19/11	FCCU Stack	Moisture	Run

Operator(s)	Bar. Press. (in.Hg)	Static Press. (in.H_2O)	Amb. Temp. (°F)	Filter Number(s)	Probe Length and Type	Nozzle Dia. (in.)	Nozzle Number
J. Kirk	29.96	-0.100	89	N/A	10' Glass	N/A	N/A

Moisture (%)	Meter Box No.	Meter ΔH@	Meter Cal. Factor (Y)	K Factor	Probe Heat (°F)	Box Heat (°F)	Therm. No.	Pitot No.	Imp. Therm. No.	Gas Bag Sys. Leak Check	Train Leak Check (initial) in.Hg	Train Leak Check (initial) cfm	Train Leak Check (final) in.Hg	Train Leak Check (final) cfm	Pitot Leak Check Initial	Pitot Leak Check Final
	LA-A04	1.962	1.024	N/A	250	N/A		N/A	LA-10170	N/A	29.5	0.002			N/A	N/A

Traverse Point No.	Sampling Time (min.)	Clock Time (24-h)	Gas Meter Reading (Vm), ft^3	Velocity Head* (ΔP), in.H_2O	Orifice Pressure Differential (ΔH), in.H_2O Desired	Orifice Pressure Differential (ΔH), in.H_2O Actual	Temperature (°F) Probe	Temperature (°F) Stack (Ts)	Temperature (°F) Dry Gas Meter	Temperature (°F) Filter	Temperature (°F) Exit	Temperature (°F) Aux.	Pump Vac. (in.Hg)	Gas Bag Sample Data
	0	1455	973.250											
	5	1500	976.980	N/A	1.95	1.95	244	N/A	88	N/A	58	N/A	1.0	N/A
	10	1505	980.470		1.95	1.95	242		88		55		1.0	
	15	1510	984.055		1.95	1.95	243		89		57		1.0	
	20	1515	987.625		1.95	1.95	244		89.90		59		1.0	
	25	1520	991.155		1.95	1.95	243		89		62		1.0	
	30	1525	994.854		1.95	1.95	245		91				1.0	
			21.604						89.2					

* Record pressure differentials to 2 significant figures, e.g., 0.315, 0.88, 1.2, etc. Comments: VMSTD = 21.39 28.58% moisture
mol. weight = 26.54

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11/09/2004

CRLLC-CHAL-000424

Shaw® Shaw Environmental, Inc.

Preliminary Velocity and Cyclonic Flow Check

Client: Chalmette Refinery
Location: Chalmette La.
Unit:
Source: FCCU Scrubber Stack
EPN:
Date: 4-19-11
Personnel: J. Kuhl S. Vincent

Traverse Point	ΔP (in. H_2O)	$\sqrt{\Delta P}$ (in. H_2O)	Stack Temperature (°F)	Yaw Angle (°)
1	~~0.400~~ 0.580	0.742	147	0
2	0.590	0.768	147	2
3	0.720	0.849	148	1
4	0.820	0.906	148	3
5	0.810	0.900	148	0
6	0.780	0.883	148	2
7	0.650	0.806	153	5
8	0.750	0.866	154	6
9	0.820	0.906	154	3
10	0.780	0.883	152	0
11	0.710	0.843	152	1
12	0.730	0.854	153	1
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
	0.7258			
Average =		0.8505	150.3	<20°

West Port

Static = ~~0.20~~ 0.20 JR

Signature: [illegible]
Date: 4-20-11

O_2 1
CO_2 12
28.5% Moisture

Wet Mol. Weight 26.55
53.48 ft/sec

KF = 2.21

Shaw® Shaw Environmental, Inc.

TEST LAB DATA COLLECTION SHEET

Project Name: Chalmette Refining
Project No.: 141945
Source ID: Scrubber
Site Location: Chalmette, La
Test Location: Stack
Sample Run No.: Preliminary Moisture
Sample Date: 4/14/11

CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	H_2O	730.4	877.3	146.9
2	H_2O	724.3	749.5	25.2
3	—	603.3	606.8	3.5
4	SILICA	852.4	858.3	5.9
5				
6				
7				
8				
Total				181.5

PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

Meter Temp = 89.2
Ave. ΔH = 1.95
P_{bar} = 30.0
Y = 1.024
Volume 21.604
V_{std} 21.42
T_{gain} 181.5
% moisture: 28.5%

TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)		
Particulate Collected (including impinger catch)		

VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

QA PROBE WASH(as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments: H_2O lot #: D1811
Shaw ID DI-1811-01 LA-Ohaus02 Scale
Hexane: HX-50260-01 LA-FM02 Flowmeter
Acetone: A-50204-02
N_2: 43-107620149-2

Shaw Environmental, Inc.

Field Data Sheet

Client: Chalmette Refining
Location: Chalmette, LA.
Unit: Cat
Source: Scrubber Stack
Project No: 14445

Meter Box ID: LA-A04
ΔH @: 1.962 in H_2O
DGM (Y): 1.024
JR
Probe ID: CA-P115-01
Thermocouple ID: CA-T115-01
Pitot ID: CA-PID3
Cp: 0.840

Stack Diameter: 100 inches
Stack Area: 54.54 ft²
Barometric Pressure (P_m): 30.00 in Hg
Static Pressure (P_s): -0.20 in H_2O
Ambient Temperature: 89.8 °F

Run No: 1
Date: 9-21-11
Personnel: J. Rink S. Vincent B. Foster
Exit Thermocouple ID: CA-TMP02
Nozzle ID: 250C
Nozzle Size: 0.250 inches
Filter ID: 3554

	Traverse Point	Clock Time	Meter Volume (ft³)	ΔP (in H_2O)	SQRT ΔP (in H_2O)	ΔH (in H_2O)	Vacuum (in Hg)	Temperatures: Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	
		1042	995.710										77 JR 9-21-11
West Port	1	1047	998.395	0.530	0.728	1.20	1.0	152	298	310	61	86	77
	1	1052	1001.490	0.530	0.728	1.20	1.0	152	311	314	54	87	75
	2	1057	1004.440	0.620	0.787	1.40	1.0	150	320	312	54	87	75
	2	1102	1007.280	0.630	0.794	1.45	1.0	150	328	314	54	89	77
	3	1107	1010.785	0.730	0.854	1.65	1.0	151	323	311	57	90	79
	3	1112	1014.130	0.730	0.854	1.65	1.0	152	311	313	59 JR	91	80
	4	1117	1017.375	0.700	0.837	1.60	1.0	152	298	311	62	92	83 added ice
	4	1122	1020.800	0.700	0.837	1.60	1.0	152	302	314	64	93	84
	5	1127	1023.—	0.600	0.775	1.40	1.0	153	297	324	64	94	82
	5	1132	1026.955	0.600	0.775	1.40	1.0	150	298	325	57	95	80
	6	1137	1029.820	0.500	0.707	1.15	1.0	150	312	324	57	95	78
	6	1142	1032.545	0.500	0.707	1.15	1.0	150	302 JR	321	57	96	78
		1210	1032.595										
South Port	1	1215	1035.225	0.650	0.806	1.20	1.0	148	333	292	61	92	84
	1	1220	1038.055	0.660	0.812	1.25	1.0	148	341	316	50	92	81
	2	1225	1040.780	0.660	0.812	1.25	1.0	148	330	318	51	92	81
	2	1230	1043.505	0.660	0.812	1.25	1.0	148	335	318	52	92	82
	3	1235	1046.670	0.720	0.849	1.35	1.0	148	337	324	53	93	81
	3	1240	1049.525	0.720	0.849	1.35	1.0	148	337	316	54	93	82 added ice
	4	1245	1052.350	0.650	0.806	1.20	1.0	148	328	328	56	94	83
	4	1250	1055.270	0.670	0.819	1.30	1.0	148	335	316	56	94	82
	5	1255	1058.180	0.560	0.748	1.10	1.0	148	336	325	57	95	84 added ice
	5	1300	1060.685	0.560	0.749	1.10	1.0	148	338	324	57	95	84
	6	1305	1063.—	0.450	0.671	0.865	1.0	148	340	320	57	95	84
	6	1310	1065.607	0.450	0.671	0.865	1.0	148	336	319	58	96	83

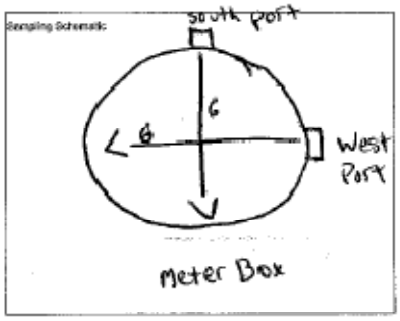
Total Sampling Time (min)	Total Meter Volume (ft³)	Average ΔP (in H_2O)	Average SQRT ΔP (in H_2O)	Average ΔH (in H_2O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)
120	69.867	0.6158	0.7828	1.2888	149.6	92.4

Leak Checks
Pitot leak: Good @ 3" H_2O for 15 seconds
Pitot static: Good @ 3" H_2O for 15 seconds
Train initial: 0.000 ft³ @ 11.0 Hg for 1 minute
Train Final: 0.000 ft³ @ 13.5 Hg for 1 minute

Observations: KF = 2.2 O_2 = 1.0%
CO_2 = 10.0%
= 49.28 ft/sec
26.9 mol. weight
9896 ft/sec

Operator Signature: Jeff Rink

Sampling Schematic



Shaw® Shaw Environmental, Inc.

TEST LAB DATA COLLECTION SHEET

Project Name: Chalmette Refining
Project No.: 14145
Source ID: Scrubber
Site Location: Chalmette, La.
Test Location: Stack
Sample Run No.: C-1 Run 1
Sample Date: 4/21/11

CONDENSATION

No neck

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	352.2	790.7	438.5
2	—	616.5	620.6	4.1
3	H_2O	713.8	746.8	33.0
4	SILICA	919.6	939.6	20.0
5				
6				
7				
8				
Total				495.6

PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter 3554			
Blank Filter			
Corrected Filter Weight			

Meter temp. = 92.4
Ave ΔH = 1.288
P_{BAR} = 30.00
Y = 1.024
V_{STD} = 68.756
T_{gain} = 495.6
25.37%

TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)		
Particulate Collected (including impinger catch)		

VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

QA PROBE WASH(as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:
Hexane: HX-50260-01 PURGE BST 14:30 - 15:30
Acetone: A-50204-02
Water: DI-1811-01 scale: LA-CHAUS02
N_2: 43-1876201149-2 Flowmeter: LA-FM02

Shaw Shaw Environmental, Inc.

Field Data Sheet

Client: Chalmette Refining
Location: Chalmette, La.
Unit: CAT
Source: Scrubber stack
Project No: 141145

Run No: 2
Date: 4-21-11
Personnel: J. Rink, S. Vincent, B. Fosenian

Meter Box ID: CA-A03
ΔH@: 1.962 in H2O
DGM (Y): 1.029

Probe ID: CA-9'MS-01
Thermocouple ID: CA-9'MS-01
Pitot ID: CA-P103
Cp: 0.840

Ext Thermocouple ID: CA-IMP02

Stack Diameter: 100 inches
Stack Area: 54.54 ft²

Barometric Pressure (Pbar): 29.88 in Hg
Static Pressure (Pg): -0.10 in H2O
Ambient Temperature: 89.4 °F

Nozzle ID: 0.250C
Nozzle Diam: 0.250 inches
Filter ID: 3555

	Traverse Point	Clock Time	Meter Volume (ft³)	ΔP (in H2O)	SQRT ΔP (in H2O)	ΔH (in H2O)	Vacuum (in Hg)	Temperatures: Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	CPM Filter Temp °F	
		1405	65.914											
South Port	1	1410	69.175	0.680	0.825	1.55	1.0	148	320	317	67	91	85	
	1	1415	72.395	0.700	0.837	1.60	1.0	148	327	318	65	92	83	
	2	1420	75.810	0.680	0.825	1.55	1.0	148	325	321	60	92	80	
	2	1425	79.075	0.700	0.837	1.60	1.0	148	334	322	62	93	82	
	3	1430	82.675	0.780	0.883	1.80	1.0	148	331	322	60	93	83	added ice
	3	1435	86.350	0.780	0.883	1.80	1.0	150	332	321	61	93	83	
	4	1440	89.475	0.700	0.837	1.60	1.0	152	339	320	63	95	84	added ice
	4	1445	92.—	0.700	0.837	1.60	1.0	152	338	327	61	96	88	
	5	1450	96.140	0.620	0.787	1.55	1.0	152	330	324	62	97	85	added ice
	5	1455	99.420	0.620	0.787	1.55	1.0	153	307	318	62	97	84	
	6	1500	102.500	0.490	0.700	1.20	1.0	152	336	323	62	98	82	
	6	1505	105.584	0.490	0.700	1.20	1.0	153	337	320	63	98	81	
		1515	105.584											added ice
West Port	1	1520	108.810	0.600	0.775	1.50	1.0	147	338	323	57	97	81	
	1	1525	111.985	0.620	0.787	1.55	1.0	147	339	323	56	96	80	
	2	1530	115.285	0.640	0.800	1.60	1.0	147	302	318	56	97	78	
	2	1535	118.575	0.640	0.800	1.60	1.0	148	298	320	57	98	79	
	3	1540	122.290	0.740	0.860	1.85	1.0	147	314	324	59	100	81	
	3	1545	125.650	0.740	0.860	1.85	1.0	147	317	319	59	99	82	
	4	1550	129.210	0.720	0.849	1.80	1.0	147	325	323	59	99	84	added ice
	4	1555	132.725	0.730	0.854	1.80	1.0	147	312	317	58	100	83	
	5	1600	136.250	0.640	0.800	1.60	1.0	147	298	323	56	99	80	
	5	1605	139.590	0.640	0.800	1.60	1.0	147	299	324	56	99	79	
	6	1610	142.735	0.580	0.762	1.45	1.0	147	300	323	56	100	81	
	6	1615	145.994	0.580	0.762	1.45	1.0	147	303	324	57	100	81	

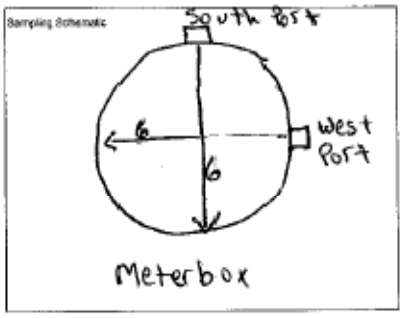
Total Sampling Time (min)	Total Meter Volume (ft³)	Average ΔP (in H2O)	Average SQ RT ΔP (in H2O)	Average ΔH (in H2O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)
120	80.080	0.6589	0.810.3	1.5938	148.7	96.6

Leak Checks
Pitot impact: Good @ 3" H2O for 15 seconds
Pitot static: Good @ 3" H2O for 15 seconds
Train initial: 0.012 ft³ @ 13.0 Hg for 1 minute
Train final: 0.009 ft³ @ 12.0 Hg for 1 minute

Observations: KF = 2.35 O_2 = 1.0% CO_2 = 14.0%

Operator Signature: Jeff Rink

Sampling Schematic



Shaw® Shaw Environmental, Inc.

TEST LAB DATA COLLECTION SHEET

Project Name: Chalmette Refining
Project No.: 141145
Source ID: Scrubber
Site Location: Chalmette, La
Test Location: Stack
Sample Run No.: CT R2
Sample Date: 4/21/11

CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	350.7	865.3	514.6
2	—	614.7	615.6	0.9
3	H_2O	739.2	773.7	40.5
4	SILICA	907.4	931.4	24.0
5				
6				
7				
8				
Total				580.0

PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

Meter: 96.6
ΔH: 1.59
P = 29.88
Y = 1.024
V_{std} = 77.96

TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)		
Particulate Collected (including impinger catch)		

VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

QA PROBE WASH(as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:
H_2O Lot# (Shaw ID) DI-1811-01 R2 Purge 5:03 - 6:03
Hexane: Hx-50260-01 FTRB Purge ~~6:52~~ 6:32 - 7:32
Acetone: A-50204-03 scale La-Ohaus02
N_2: 43-107620149-2 flowmeter LA-FM08

Shaw® Shaw Environmental, Inc.

Field Data Sheet

Client: Chalmette Refining
Location: Chalmette, LA.
Unit: Cat
Source: Scrubber Stack
Project No: 141145

Meter Box ID: 4A-M09
ΔH@: 1.962 in H2O
DGM (Y): 1.024

Probe ID: 4A-9'MS-01
Thermocouple ID: 4A-9'MS-01
Pitot ID: 4A-PT03
Cp: 0.840

Stack Diameter: 100 inches
Stack Area: 54.54 ft²

Barometric Pressure (Pbar): 29.85 in Hg
Static Pressure (Pg): -0.10 in H2O
Ambient Temperature: 86.0 °F

Nozzle ID: .250C
Nozzle Size: 0.250 inches
Filter ID: A

Run No: 3
Date: 4-21-11
Personnel: J. Rink, S. Vincent, B. Fogleman
Exit Thermocouple ID: 4A-IMP02

Traverse Point	Clock Time	Meter Volume (ft³)	ΔP (in H2O)	SQRT ΔP (in H2O)	ΔH (in H2O)	Vacuum (in Hg)	Temperatures: Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	CPM Filter Temp °F
	1635	146.371										
1	1700	149.675	0.720	0.849	1.80	1.0	147	309	318	52	97	77
1	1705	153.—	0.720	0.849	1.80	1.0	147	311	317	51	96	77
2	1710	156.690	0.730	0.854	1.80	1.0	147	314	317	52	98	78
2	1715	160.150	0.730	0.854	1.80	1.0	147	315	320	52	98	78
3	1720	163.975	0.800	0.894	1.95	1.0	147	329	323	53	99	80
3	1725	167.515	0.800	0.894	1.95	1.0	147	337	325	54	99	81
4	1730	172.115	0.790	0.889	1.95	1.0	147	310	328	56	98	81
4	1735	174.770	0.710	0.889	1.95	1.0	147	300	329	57	98	80
5	1740	178.320	0.700	0.837	1.75	1.0	147	302	322	59	97	80
5	1745	181.790	0.700	0.837	1.75	1.0	147	300	323	60	97	82
6	1750	185.970	0.560	0.748	1.40	1.0	147	306	325	60	96	83 - added ice
6	1755	188.090	0.560	0.748	1.40	1.0	147	311	323	60	96	82
	1805											
1	1810	191.790	0.750	0.866	1.85	1.0	147	303	319	52	90	76
1	1815	195.280	0.750	0.866	1.85	1.0	147	312	324	53	92	76
2	1820	198.810	0.760	0.872	1.90	1.0	147	306	319	54	92	76
2	1825	202.430	0.770	0.878	1.90	1.0	149	296	320	55	91	77
3	1830	206.150	0.790	0.889	1.95	1.0	149	308	323	57	90	79
3	1835	209.725	0.790	0.889	1.95	1.0	149	319	321	57	90	80
4	1840	213.305	0.740	0.860	1.80	1.0	148	308	321	58	91	82 - added ice
4	1845	216.825	0.740	0.860	1.80	1.0	148	303	322	58	90	81
5	1850	220.015	0.630	0.794	1.55	1.0	148	296	313	57	90	81
5	1855	223.370	0.640	0.800	1.55	1.0	148	301	313	59	89	83 added ice
6	1900	226.320	0.520	0.721	1.30	1.0	148	303	317	58	89	83
6	1905	229.290	0.520	0.721	1.30	1.0	148	309	322	59	89	82

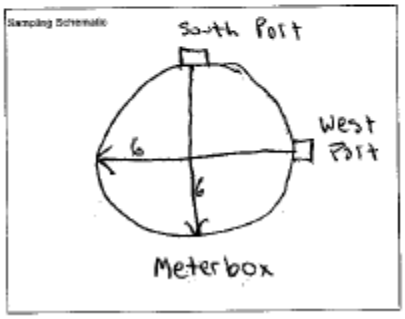
Total Sampling Time (min)	Total Meter Volume (ft³)	Average ΔP (in H2O)	Average SQRT ΔP (in H2O)	Average ΔH (in H2O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)
120	82.919	0.7053	0.8379	1.6708	147.5	93.9

Leak Checks
Pitot impact: Good @ 3" H2O for 15 seconds
Pitot static: Good @ 3" H2O for 15 seconds
Train initial: 0.009 ft³ @ 8.0 Hg for 1 minute
Train final: 0.009 ft³ @ 11.0 Hg for 1 minute

Observations: O2 = 1.0%
CO2 = 12.5%

Operator Signature: Jeff Rink

Sampling Schematic



Shaw® Shaw Environmental, Inc.

TEST LAB DATA COLLECTION SHEET

Project Name: Chalmette Refining
Project No.: 141145
Source ID: Scrubber Stack
Site Location: Chalmette, La.
Test Location: Stack
Sample Run No.: C-1, R3
Sample Date: 4/21/11

CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	354.3	856.9	502.6
2	—	617.9	629.4	11.5
3	H_2O	746.8	785.4	38.6
4	SILICA	910.8	936.1	25.3
5				
6				
7				
8				
Total				578.0

PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)		
Particulate Collected (including impinger catch)		

VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

QA PROBE WASH(as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:
H_2O Shaw ID DI-1811-01 Purge: 745-845
Hexane: Hx-50260-01
Acetone: A-50204-02 CA-Ohaus02 (Scale)
N_2: 43-10762049-2 CA-FM02 (Flowmeter)

Appendix B
Laboratory Report
Enthalpy Analytical, Inc. – 0411-44

Shaw Environmental, Inc.

Air Measurements Division - 4171 Essen Lane
Baton Rouge, LA 70809

ExxonMobil, Chalmette Refining
FCCU WGS

Project # 141145

Analytical Report
(0411-44)

EPA Method 5
Particulate Matter

EPA Method 5B Type
Particulate Matter

EPA Method 202
Condensable Particulate Matter

ASTM D5907-90
Particulate Matter for Total Dissolved Solids

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

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

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 27 pages.

QA Review performed by: Steven J. Eckard

Report Issued: 05/13/2011

CRLLC-CHAL-000435

Summary of Results

CRLLC-CHAL-000436

Company	Shaw Environmental
Analyst	KTH / JDB
Parameters	EPA Method 5

Client #	141145
Job #	0411-44
# Samples	3 Runs, Blanks

Compound	Sample ID / Particulate Matter (PM) Weight (mg)		
	42111 RM5-1-1	***42111 RM5-1-2***	***42111 RM5-1-3***
Net Filter Catch	35.1	37.8	35.3
Net Front Rinse	3.0	6.9	2.6
Total Particulate	38.1	44.7	37.9
	42111 RM5-F3557-B		
Net Filter Catch	1.8		

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	141145
Job #	0411-44
# Samples	3 Runs, Proof/Rec./RB Blanks

Compound	Sample ID / Condensible Particulate Matter (CPM) Weight (mg)		
	42111 CPM-1-1	***42111 CPM-1-2***	***42111 CPM-1-3***
Net Organic Catch	7.4	11.1	6.8
Corrected Inorganic	5.7	13.4	14.2
TB Corrected CPM	11.1	22.5	19.0
	42111 CPM-Filter Blank	***41911 CPM-FTPB***	
Net Organic Catch	1.2	6.8	
Corrected Inorganic	2.9	1.7	
Non-TB Corrected CPM	4.1	8.5	
	42111 Train Blank		
Organic Catch	9.2	If Train Blank Corrected CPM is >2.0 mg,	
Inorganic Catch	6.2	then sample correction is 2.0 mg.	
CPM	15.4		

Company	Shaw Environmental
Analyst	KTH / JDB
Parameters	EPA Method 5B Type

Client #	141145
Job #	0411-44
# Samples	3 Runs, Blanks

Compound	Sample ID / Particulate Matter (PM) Weight (mg)		
	42111 RM5-1-1	***42111 RM5-1-2***	***42111 RM5-1-3***
Net Filter Catch	33.3	36.6	34.6
	42111 RM5-F3557-B		
Net Filter Catch	0.3		

Company	Shaw Environmental
Analyst	KTH
Parameters	ASTM 5907

Client #	141145
Job #	0411-44
# Samples	3

Compound	Sample ID / Particulate Matter (PM) Weight (mg)		
	042111-SW-1-1	***042111-SW-1-2***	***042111-SW-1-3***
Total Particulate, mg	90,816.2	81204.4	86,188.3

Results

CRLLC-CHAL-000441

EPA Method 5 - Particulate Determination - Data Analysis

Company	Shaw Environmental	Client #	141145
Analyst	KTH / JDB	Job #	0411-44
Parameters	EPA Method 5	# Samples	3 Runs, Blanks

Analysis of Particulate Recovery

Sample ID	*RM5-1-1*		*RM5-1-2*		*RM5-1-3*		*RM5-F3557-B*	
Filter ID	3554		3555		3556		3557	
Filter tare (g)	0.3256		0.3282		0.3284		0.3272	
Total tare (g)	0.3256	Dates	0.3282	Dates	0.3284	Dates	0.3272	Dates
Final wt. (g) 1st	0.3604	5/5/11	0.3656	5/5/11	0.3633	5/5/11	0.3289	5/5/11
Final wt. (g) 2nd	0.3607	5/6/11	0.3661	5/6/11	0.3637	5/6/11	0.3290	5/6/11
Net filter catch (mg)	35.1		37.8		35.3		1.8	

Beaker number	*8987*	Dates	*8988*	Dates	*8989*	Dates
Final wt (g) 1st	2.2423	5/10/11 A	2.2435	5/10/11 A	2.2608	5/10/11 A
Final wt (g) 2nd	2.2419	5/10/11 P	2.2434	5/10/11 P	2.2607	5/10/11 P
Beaker tare (g)	2.2368		2.2352		2.2563	
Acetone blank (g)	0.0021		0.0013		0.0018	
Acetone vol (mL)	260		170		230	
Net front rinse (mg)	3.0		6.9		2.6	
Total particulate (mg)	38.1		44.7		37.9	

Blank Acetone Analysis

Blank beaker number	*8990*			Dates
Blank volume (mL)	210	Final wt (g) 1st	2.2576	5/10/11 A
Beaker tare (g)	2.2557	Final wt (g) 2nd	2.2575	5/10/11 P
Max acetone residue (g)	0.0017	Acetone residue (g)	0.0019	

In-House Blank Acetone Analysis

Blank beaker number	*8985*			Dates
Blank volume (mL)	200	Final wt (g) 1st	2.2410	5/10/11 A
Beaker tare (g)	2.2404	Final wt (g) 2nd	2.2410	5/10/11 P
Max acetone residue (g)	0.0016	Acetone residue (g)	0.0006	

CRLLC-CHAL-000442

Company	Shaw Environmental	Client #	141145
Analyst	KTH	Job #	0411-44
Parameters	EPA Method 202	# Samples	3 Runs, Proof/Rec./RB Blanks

Analysis of Condensible Particulate Recovery

Sample ID Number	Train Blank		CPM-1-1		CPM-1-2		CPM-1-3	
Organic								
Beaker Number	***8980***		***8977***		***8978***		***8979***	
Initial Hexane/Acetone Volume, mL	102		194		162		152	
Lab Hexane Volume, mL	165	Dates	165	Dates	165	Dates	165	Dates
Final Weight, g	2.2511	5/10/11 A	2.2527	5/10/11 A	2.2370	5/10/11 A	2.2762	5/10/11 A
Reweigh, Final, g	2.2511	5/10/11 P	2.2526	5/10/11 P	2.2371	5/10/11 P	2.2762	5/10/11 P
Beaker Tare, g	2.2419	5/2/11	2.2453	5/2/11	2.2260	5/2/11	2.2693	5/2/11
Net Organic Catch, mg	9.2		7.4		11.1		6.8	
Inorganic								
Beaker Number	***9099***	Dates	***9096***	Dates	***9097***	Dates	***9098***	Dates
Final Weight, g	2.2293	5/10/11 A	2.2256	5/10/11 A	2.2160	5/10/11 A	2.2166	5/10/11 A
Reweigh, Final, g	2.2294	5/10/11 P	2.2257	5/10/11 P	2.2163	5/10/11 P	2.2168	5/10/11 P
Beaker Tare, g	2.2224	5/6/11	2.2188	5/6/11	2.1993	5/6/11	2.1994	5/6/11
Sample H2O volume, mL	350		760		880		760	
Added H2O, Filter Extraction, mL	75		75		75		75	
Removed Pre-aliquot, mL	0.5		0.5		0.5		0.5	
Pre-aliquot CF	1.001		1.001		1.001		1.001	
Resuspended Volume, mL	100.0		100.0		100.0		100.0	
Removed Post-aliquot, mL	0.5		0.5		0.5		0.5	
Post-aliquot CF	1.01		1.01		1.01		1.01	
Net Inorganic, mg	7.1		7.0		17.0		17.5	
Ammonium Correction, mg	0.9		1.3		3.6		3.3	
Corrected Inorganic, mg	6.2		5.7		13.4		14.2	
Condensible Particulate Matter, mg	15.4		13.1		24.5		21.0	
TB Corrected CPM, mg			11.1		22.5		19.0	

Client Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	***8982***	Dates	Beaker Number	***9102***	Dates	Beaker Number	***8984***	Dates
Tare weight, g	2.2521	5/2/11	Tare weight, g	2.2533	5/7/11	Tare weight, g	2.2666	5/2/11
Dry Residue Weight, g	2.3684	5/10/11 A	Dry Residue Weight, g	2.2550	5/10/11 A	Dry Residue Weight, g	2.2677	5/10/11 A
Reweigh, Final, g	2.3680	5/10/11 P	Reweigh, Final, g	2.2550	5/10/11 P	Reweigh, Final, g	2.2677	5/10/11 P
Hexane Residue, g	0.1159		Water Residue, g	0.0017		Acetone Residue, g	0.0011	
Hexane Volume, mL	162		Water Volume, mL	206		Acetone Volume, mL	244	
Max. Hexane Residue, g	0.0016		Max. Water Residue, g	0.0021		Max. Acetone Residue, g	0.0019	

In-House Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	***8983***	Dates	Beaker Number	***9103***	Dates	Beaker Number	***8985***	Dates
Tare weight, g	2.2368	5/2/11	Tare weight, g	2.2480	5/7/11	Tare weight, g	2.2404	5/2/11
Dry Residue Weight, g	2.2385	5/10/11 A	Dry Residue Weight, g	2.2483	5/10/11 A	Dry Residue Weight, g	2.2410	5/10/11 A
Reweigh, Final, g	2.2385	5/10/11 P	Reweigh, Final, g	2.2483	5/10/11 P	Reweigh, Final, g	2.2410	5/10/11 P
Hexane Residue, g	0.0017		Water Residue, g	0.0003		Acetone Residue, g	0.0006	
Hexane Volume, mL	225		Water Volume, mL	250		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0022		Max. Water Residue, g	0.0025		Max. Acetone Residue, g	0.0016	

CRLLC-CHAL-000443

Company	Shaw Environmental	Client #	141145
Analyst	KTH	Job #	0411-44
Parameters	EPA Method 202	# Samples	3 Runs, Proof/Rec./RB Blanks

Analysis of Condensible Particulate Recovery

Sample ID Number	Train Blank		CPM-Filter Blank		CPM-FTPB	
Organic						
Beaker Number	***8980***		***8986***		***8981***	
Initial Hexane/Acetone Volume, mL	102		0		172	
Lab Hexane Volume, mL	165	Dates	165	Dates	165	Dates
Final Weight, g	2.2511	5/10/11 A	2.2586	5/10/11 A	2.2330	5/10/11 A
Reweigh, Final, g	2.2511	5/10/11 P	2.2586	5/10/11 P	2.2330	5/10/11 P
Beaker Tare, g	2.2419	5/2/11	2.2574	5/2/11	2.2262	5/2/11
Net Organic Catch, mg	9.2		1.2		6.8	
Inorganic						
Beaker Number	***9099***	Dates	***9100***	Dates	***9101***	Dates
Final Weight, g	2.2293	5/10/11 A	2.2384	5/10/11 A	2.2389	5/10/11 A
Reweigh, Final, g	2.2294	5/10/11 P	2.2384	5/10/11 P	2.2389	5/10/11 P
Beaker Tare, g	2.2224	5/6/11	2.2356	5/7/11	2.2373	5/7/11
Sample H2O volume, mL	350		0		205	
Added H2O, Filter Extraction, mL	75		75		75	
Removed Pre-aliquot, mL	0.5		0.5		0.5	
Pre-aliquot CF	1.001		1.007		1.002	
Resuspended Volume, mL	100.0		100.0		100.0	
Removed Post-aliquot, mL	0.5		0.5		0.5	
Post-aliquot CF	1.01		1.01		1.01	
Net Inorganic, mg	7.1		2.9		1.7	
Ammonium Correction, mg	0.9		0.0		0.0	
Corrected Inorganic, mg	6.2		2.9		1.7	
Condensible Particulate Matter, mg	15.4		4.1		8.5	

Client Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	***8982***	Dates	Beaker Number	***9102***	Dates	Beaker Number	***8984***	Dates
Tare weight, g	2.2521	5/2/11	Tare weight, g	2.2533	5/7/11	Tare weight, g	2.2666	5/2/11
Dry Residue Weight, g	2.3684	5/10/11 A	Dry Residue Weight, g	2.2550	5/10/11 A	Dry Residue Weight, g	2.2677	5/10/11 A
Reweigh, Final, g	2.3680	5/10/11 P	Reweigh, Final, g	2.2550	5/10/11 P	Reweigh, Final, g	2.2677	5/10/11 P
Hexane Residue, g	0.1159		Water Residue, g	0.0017		Acetone Residue, g	0.0011	
Hexane Volume, mL	162		Water Volume, mL	206		Acetone Volume, mL	244	
Max. Hexane Residue, g	0.0016		Max. Water Residue, g	0.0021		Max. Acetone Residue, g	0.0019	

In-House Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	***8983***	Dates	Beaker Number	***9103***	Dates	Beaker Number	***8985***	Dates
Tare weight, g	2.2368	5/2/11	Tare weight, g	2.2480	5/7/11	Tare weight, g	2.2404	5/2/11
Dry Residue Weight, g	2.2385	5/10/11 A	Dry Residue Weight, g	2.2483	5/10/11 A	Dry Residue Weight, g	2.2410	5/10/11 A
Reweigh, Final, g	2.2385	5/10/11 P	Reweigh, Final, g	2.2483	5/10/11 P	Reweigh, Final, g	2.2410	5/10/11 P
Hexane Residue, g	0.0017		Water Residue, g	0.0003		Acetone Residue, g	0.0006	
Hexane Volume, mL	225		Water Volume, mL	250		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0022		Max. Water Residue, g	0.0025		Max. Acetone Residue, g	0.0016	

CRLLC-CHAL-000444

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	141145
Job #	0411-44
# Samples	3 Runs, Proof/Rec./RB Blanks

MDL 0.09 (mg Ammonium)
MDL 0.26 (mg Sulfate)
Blank titrant amount (Vtb) 0.04
NH4OH normality 0.1 Lot # Sigma Aldrich 318620

Sample ID.	Volume Resuspended (mL)	Titration Aliquot Vol (mL)	NH_4OH Titration Vol (mL)	Aliquot Factor (mL rec'd/aliq mL)	SO4 Catch (mg)	Ammonium equivalent (mg)
Train Blank	100	99.5	0.58	1.01	2.61	0.92
CPM-1-1	100	99.5	0.81	1.01	3.72	1.32
CPM-1-2	100	99.5	2.14	1.01	10.14	3.59
CPM-1-3	100	99.5	1.98	1.01	9.37	3.32
CPM-Filter Blank	100	99.5	0.00	1.01	0.26 ND	0.09 ND
CPM-FTPB	100	99.5	0.00	1.01	0.26 ND	0.09 ND

CRLLC-CHAL-000445

EPA Method 5B - Particulate Determination - Data Analysis

Company	Shaw Environmental	Client #	141145
Analyst	KTH / JDB	Job #	0411-44
Parameters	EPA Method 5B Type	# Samples	3 Runs, Blanks

Analysis of Particulate Recovery

Sample ID	*RM5-1-1*		*RM5-1-2*		*RM5-1-3*		*RM5-F3557-B*	
Filter ID	3554		3555		3556		3557	
Filter tare (g)	0.3256		0.3282		0.3284		0.3272	
Total tare (g)	0.3256	Dates	0.3282	Dates	0.3284	Dates	0.3272	Dates
Final wt. (g) 1st	0.3592	5/9/11 A	0.3649	5/9/11 A	0.3631	5/9/11 A	0.3276	5/9/11 A
Final wt. (g) 2nd	0.3589	5/9/11 P	0.3649	5/9/11 P	0.3629	5/9/11 P	0.3275	5/9/11 P
Net filter catch (mg)	33.3		36.6		34.6		0.3	

CRLLC-CHAL-000446

ASTM 5907 - Particulate Determination - Data Analysis

Company	Shaw Environmental	Client #	141145
Analyst	KTH	Job #	0411-44
Parameters	ASTM 5907	# Samples	3

Analysis of Particulate Recovery

Sample ID	*042111-SW-1-1*		*042111-SW-1-2*		*042111-SW-1-3*	
Beaker number	*Glass R1*	Dates	*Glass R2*	Dates	*Glass R3*	Dates
Final wt (g) 1st	205.4399	5/10/11	197.4092	5/10/11	196.8118	5/10/11
Final wt (g) 2nd	205.1865	5/11/11	197.2012	5/11/11	196.7785	5/11/11
Beaker tare (g)	114.3703		115.9968		110.5902	
H2O vol (mL)	500		470		530	
Total particulate (mg)	90,816.2		81,204.4		86,188.3	

In-House Blank H2O Analysis

Blank beaker number	*9103*			Dates
Blank volume (mL)	250	Final wt (g) 1st	2.2483	5/10/11
Beaker tare (g)	2.2480	Final wt (g) 2nd	2.2483	5/10/11
Max H2O residue (g)	0.0025	H2O residue (g)	0.0003	

CRLLC-CHAL-000447

Narrative Summary

CRLLC-CHAL-000448

Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.
Analyst	KTH / JDB
Parameters	EPA Method 5

Client #	141145
Job #	0411-44
# Samples	3 Runs, Blanks

Custody

Heather Tarjeft received the samples on 4/27/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 13.3°C in good condition.Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The samples were analyzed for particulate matter using the analytical procedures in EPA Method 5, Determination of Particulate Matter Emissions from Stationary Sources (40 CFR Part 60, Appendix A).

Filter samples were weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

Rinse samples were weighed on Balance-8, a Sartorius Model ME 5-F balance (SN 23104965) certified by Security Scale Service, Inc. through July 15, 2011.

QC Notes

A filter blank and an acetone blank were received and analyzed with these samples.

The catch weights are adjusted by a corresponding reagent blank correction value. A mathematically determined (theoretical) maximum value is calculated and compared with the actual value measured for the blank. The lower of the two values is used as the blank correction value, which is then factored by the sample volume divided by the blank volume, and subtracted from the sample catch weight.

Gravimetric analyses are typically accurate to ±0.5 mg. Therefore, negative catch weights between 0 and –0.5 mg are set to zero and no investigation is undertaken. Negative catch weights < -0.5 mg are investigated. All catches were greater than zero.

All sample preparation and analytical holding times specified in the method were met.

CRLLC-CHAL-000449

Enthalpy Analytical Narrative Summary
(continued)

Reporting Notes

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

The results presented in this report are representative of the samples as provided to the laboratory.

CRLLC-CHAL-000450

Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.
Analyst	KTH
Parameters	EPA Method 202

Client #	141145
Job #	0411-44
# Samples	3 Runs, Proof/Rec./RB Blanks

Custody

Heather Tarjeft received the samples on 4/27/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 13.3°C in good condition.Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The samples were analyzed for condensable particulate matter using the analytical procedures in EPA Method 202, Dry Impinger Method For Determining of Condensable Particulate Emissions from Stationary Sources (40 CFR Part 51, Appendix M).

Samples were weighed on Balance-8, a Sartorius Model ME 5-F balance (SN 23104965) certified by Security Scale Service, Inc. through July 15, 2011.

QC Notes

A proof blank, recovery blank (train blank), filter blank, acetone blank, water blank, and hexane blank were received and analyzed with these samples.

The method specifies blank corrections are accomplished by subtracting the particulate mass determined in the 'Field Train Blank' or 2 mg (whichever is less) from the sample weight.

The inorganic results for the samples were corrected for the ammonium ions used to precipitate the sulfate, per the formula in the method (Section 12.2.1).

When the pH of the samples was measured to be 7.0 or greater with the pH meter, no titrant was added.

Gravimetric analyses are typically accurate to ±0.5 mg. Therefore, negative catch weights between 0 and –0.5 mg are set to zero and no investigation is undertaken. Negative catch weights < -0.5 mg are investigated. All catches were greater than zero.

All sample preparation and analytical holding times specified in the method were met.

CRLLC-CHAL-000451

Enthalpy Analytical Narrative Summary
(continued)

Reporting Notes

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

The results presented in this report are representative of the samples as provided to the laboratory.

CRLLC-CHAL-000452

Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.
Analyst	KTH / JDB
Parameters	EPA Method 5B Type

Client #	141145
Job #	0411-44
# Samples	3 Runs, Blank

Custody

Heather Tarjeft received the samples on 4/27/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 13.3°C in good condition.Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The samples were analyzed for particulate matter using the general analytical procedures in EPA Method 5B, Determination Of Nonsulfuric Acid Particulate Matter Emissions From Stationary Sources.

Filter samples were baked and desiccated prior to being weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

QC Notes

Gravimetric analyses are typically accurate to ±0.5 mg. Therefore, negative catch weights between 0 and –0.5 mg are set to zero and no investigation is undertaken. Negative catch weights < -0.5 mg are investigated. All catches were greater than zero.

All sample preparation and analytical holding times specified in the method were met.

Reporting Notes

The results presented in this report are representative of the samples as provided to the laboratory.

CRLLC-CHAL-000453

Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.
Analyst	KTH
Parameters	ASTM D5907

Client #	141145
Job #	0411-44
# Samples	3

Custody

Heather Tarjeft received the samples on 4/27/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 13.3°C in good condition.Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The samples were analyzed for particulate for calculating total dissolved solids using the general analytical procedures in EPA Method 5, Determination of Particulate Matter Emissions from Stationary Sources (40 CFR Part 60, Appendix A) and ASTM D5907-09, Standard Test Method for Filterable and Nonfilterable Matter in Water.

All samples were weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

QC Notes

None.

Reporting Notes

Gravimetric analyses are considered to be accurate to ±0.5 mg. Therefore, negative catch weights between 0 and –0.5 mg are set to zero and no investigation is undertaken. Negative catch weights less than -0.5 mg are investigated. All catches were greater than zero.

The results presented in this report are representative of the samples as provided to the laboratory.

CRLLC-CHAL-000454

General Reporting Notes

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

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

CRLLC-CHAL-000455

General Reporting Notes

(continued)

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

CRLLC-CHAL-000456

Sample Custody

CRLLC-CHAL-000457

Shaw® Shaw Environmental, Inc.
4171 Essen Lane, Baton Rouge, LA 70809
Phone: 225-932-2745

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS (COC/RFA)

Date 4/21/11 Page 1 of 2

PROJECT INFORMATION	PRESERVATIVE
Project Number: 141145	
Project Name: Chalmette Refining – FCCU WGS	
Purchase Order Number:	
Delivered Via:	
TAT: ☐ 24 hr. ☐ 48 hr. ☐ 5 days ☐ 21 days	

COMMENTS

Contact: Richard Ishikawa 225-241-9584

Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	CPM – RM 202	PM – RM 5	TDS – ASTM D5909						
141145-041911-CPM9-FTPB-IR	4/19/11	14:00	Liquid	1 / 500 ml	X								
141145-041911-CPM10-FTPB-OR	4/19/11	14:00	Liquid	1 / 500 ml	X								
141145-042111-CPM-Fil-B	4/21/11	10:00	Filter	1 / petri	X								
141145-042111-RM5-F3557-B	4/21/11	10:00	Filter	1 / petri		X							
141145-042111-RM5-PW-B	4/21/11	19:48	Liquid	1 / 500 ml		X							
141145-042111-CPM1-1-1 1 of 2	4/21/11	15:35	Liquid	1 / 500 ml	X			Combine & Analyze					
141145-042111-CPM1-1-1 2 of 2	4/21/11	15:35	Liquid	1 / 500 ml	X								
141145-042111-CPM2-1-1	4/21/11	15:35	Liquid	1 / 500 ml	X								
141145-042111-CPM3-1-1	4/21/11	15:35	Filter	1 / petri	X								
141145-042111-RM5-PW-1-1	4/21/11	14:00	Liquid	1 / 500 ml		X							
141145-042111-RM5-F3554-1-1	4/21/11	14:00	Filter	1 / petri		X							
141145-042111-CPM1-FTRB	4/21/11	19:50	Liquid	1 / 500 ml	X								
141145-042111-CPM2-FTRB	4/21/11	19:50	Liquid	1 / 500 ml	X								
141145-042111-CPM3-FTRB	4/21/11	19:50	Filter	1 / petri	X								
141145-042111-CPM6-Ace-B	4/21/11	11:15	Liquid	1 / 500 ml	X								
141145-042111-CPM7-Wat-B	4/21/11	11:15	Liquid	1 / 500 ml	X								
141145-042111-CPM8-Hex-B	4/21/11	11:15	Liquid	1 / 500 ml	X								
141145-042111-CPM1-1-2 1 of 2	4/21/11	18:03	Liquid	1 / 500 ml	X			Combine & Analyze					

CRLLC-CHAL-000458

Shaw Environmental, Inc.
4171 Essen Lane, Baton Rouge, LA 70809
Phone: 225-932-2745

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS (COC/RFA)

Date 4/21/11 Page 2 of 2

141145-042111-CPM1-1-2 2 of 2	4/21/11	18:03	Liquid	1 / 500 ml	X									
141145-042111-CPM2-1-2	4/21/11	18:03	Liquid	1 / 500 ml	X									
141145-042111-CPM3-1-2	4/21/11	18:03	Filter	1 / petri	X									
141145-042111-RM5-PW-1-2	4/21/11	17:03	Liquid	1 / 500 ml		X								
141145-042111-RM5-F3555-1-2	4/21/11	17:03	Filter	1 / petri		X								
141145-042111-CPM1-1-3 1of 2	4/21/11	20:54	Liquid	1 / 500 ml	X			Combine & Analyze						
141145-042111-CPM1-1-3 2 of 2	4/21/11	20:54	Liquid	1 / 500 ml	X									
141145-042111-CPM2-1-3	4/21/11	20:54	Liquid	1 / 500 ml	X									
141145-042111-CPM3-1-3	4/21/11	20:54	Filter	1 / petri	X									
141145-042111-RM5-PW-1-3	4/21/11	20:24	Liquid	1 / 500 ml		X								
141145-042111-RM5-F3556-1-3	4/21/11	20:24	Filter	1 / petri		X								
141145-042111-SW-1-1	4/21/11	11:15	Liquid	1 / 500 ml			X							
141145-042111-SW-1-2	4/21/11	14:53	Liquid	1 / 500 ml			X							
141145-042111-SW-1-3	4/21/11	18:20	Liquid	1 / 500 ml			X							

* Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: B. Fogleman Time: 8:30AM	Signature: B. Fogleman Time: 8:00AM	Signature: Time:	Signature: Time:	Signature: Time:	Signature: Time: 9:31AM
Printed Name: Blake Fogleman Date: 4/22/11	Printed Name: Blake Fogleman Date: 4/26/11	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Heather Lajeft Date: 4/27/11
Company: Shaw E&I	Company: Shaw E&I	Company: UPS	Company:	Company:	Laboratory: Entrainy

* To a locked sample refrigerator

Tracking# 1Z A83 1R5 15 9590 1231

Temp= 13.3°C Raytek gun#2

CRLLC-CHAL-000459

This Is The Last Page Of This Report.

CRLLC-CHAL-000460

Appendix C
Facility Process Data

4/21/2011
4/22/2011

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 9:00	97585.3	58.4	65.0	3944.5
4/21/2011 9:01	97558.6	58.3	65.1	3944.5
4/21/2011 9:02	97668.6	57.7	65.0	3944.5
4/21/2011 9:03	97444.7	57.6	65.0	3944.5
4/21/2011 9:04	97316.6	57.8	65.0	3944.5
4/21/2011 9:05	97588.6	58.4	65.1	3944.5
4/21/2011 9:06	97682.8	58.5	65.0	3944.5
4/21/2011 9:07	97911.3	57.9	65.0	3944.5
4/21/2011 9:08	98143.9	57.5	65.1	3944.5
4/21/2011 9:09	97701.3	57.3	65.0	3944.5
4/21/2011 9:10	97460.5	57.9	65.0	3944.5
4/21/2011 9:11	97582.0	58.6	65.0	3944.5
4/21/2011 9:12	97700.5	58.5	65.0	3944.5
4/21/2011 9:13	97550.9	57.8	65.0	3944.5
4/21/2011 9:14	97369.5	57.4	65.0	3944.5
4/21/2011 9:15	97479.1	57.5	64.9	3944.5
4/21/2011 9:16	98086.9	58.1	65.0	3944.5
4/21/2011 9:17	97895.7	58.7	65.0	3944.5
4/21/2011 9:18	97924.0	58.5	65.1	3944.5
4/21/2011 9:19	98059.1	57.7	65.0	3944.5
4/21/2011 9:20	98782.6	57.3	65.0	3944.5
4/21/2011 9:21	98985.3	57.7	65.0	3944.5
4/21/2011 9:22	98644.0	58.5	65.1	3944.5
4/21/2011 9:23	98728.6	58.6	65.1	3944.5
4/21/2011 9:24	98805.9	58.3	64.9	3944.5
4/21/2011 9:25	98562.0	57.5	65.0	3944.5
4/21/2011 9:26	98583.5	57.5	65.1	3944.5
4/21/2011 9:27	98570.9	57.9	65.1	3944.5
4/21/2011 9:28	98373.4	58.5	65.0	3944.5
4/21/2011 9:29	98282.8	58.4	65.0	3944.5
4/21/2011 9:30	98152.0	58.1	65.0	3944.5
4/21/2011 9:31	98261.3	57.6	65.0	3944.5
4/21/2011 9:32	98566.0	57.5	65.0	3944.5
4/21/2011 9:33	98207.0	58.2	65.0	3944.5
4/21/2011 9:34	98343.9	59.7	64.9	3944.5
4/21/2011 9:35	98859.2	60.8	64.9	3944.5
4/21/2011 9:36	98660.4	61.4	65.0	3944.5
4/21/2011 9:37	98380.1	61.4	64.9	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 9:38	98656.2	61.3	65.0	3944.5
4/21/2011 9:39	98567.0	61.4	65.0	3944.5
4/21/2011 9:40	98605.9	62.0	65.0	3944.5
4/21/2011 9:41	98596.0	62.5	65.0	3944.5
4/21/2011 9:42	98605.0	62.4	65.0	3944.5
4/21/2011 9:43	98343.6	62.1	65.1	3944.5
4/21/2011 9:44	97990.5	62.0	65.1	3944.5
4/21/2011 9:45	98070.9	61.9	65.0	3944.5
4/21/2011 9:46	97692.4	61.9	65.0	3944.5
4/21/2011 9:47	97909.5	61.6	65.0	3944.5
4/21/2011 9:48	98571.5	61.8	65.0	3944.5
4/21/2011 9:49	98498.1	62.3	65.0	3944.5
4/21/2011 9:50	98239.9	62.6	65.0	3944.5
4/21/2011 9:51	98499.1	62.4	65.0	3944.5
4/21/2011 9:52	98863.3	62.0	65.0	3944.5
4/21/2011 9:53	98549.0	61.4	65.0	3944.5
4/21/2011 9:54	98683.0	61.5	65.0	3944.5
4/21/2011 9:55	98897.5	62.1	65.0	3944.5
4/21/2011 9:56	98615.2	62.1	65.0	3944.5
4/21/2011 9:57	98207.6	61.9	65.0	3944.5
4/21/2011 9:58	98114.4	61.1	65.0	3944.5
4/21/2011 9:59	98223.3	60.3	65.0	3944.5
4/21/2011 10:00	98220.5	60.5	65.0	3944.5
4/21/2011 10:01	98448.4	61.1	65.0	3944.5
4/21/2011 10:02	98368.8	61.5	64.9	3944.5
4/21/2011 10:03	98462.7	61.5	65.1	3944.5
4/21/2011 10:04	98691.2	60.9	65.0	3944.5
4/21/2011 10:05	98791.6	60.4	64.9	3944.5
4/21/2011 10:06	98686.0	59.8	65.0	3944.5
4/21/2011 10:07	98455.8	59.7	65.0	3944.5
4/21/2011 10:08	98982.2	60.4	65.1	3944.5
4/21/2011 10:09	98518.3	60.7	65.1	3944.5
4/21/2011 10:10	98083.3	60.5	65.2	3944.5
4/21/2011 10:11	98192.9	59.9	65.2	3944.5
4/21/2011 10:12	98242.9	59.5	65.2	3944.5
4/21/2011 10:13	98922.9	59.5	65.2	3944.5
4/21/2011 10:14	98925.1	60.0	65.2	3944.5
4/21/2011 10:15	98337.8	60.7	65.2	3944.5
4/21/2011 10:16	98228.0	62.4	65.3	3944.5
4/21/2011 10:17	98379.9	63.4	65.3	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 10:18	98587.4	63.6	65.3	3944.5
4/21/2011 10:19	98824.6	63.9	65.3	3944.5
4/21/2011 10:20	98530.8	65.0	65.4	3944.5
4/21/2011 10:21	98546.8	66.5	65.4	3944.5
4/21/2011 10:22	98981.8	67.3	65.4	3944.5
4/21/2011 10:23	98805.0	67.0	65.5	3944.5
4/21/2011 10:24	98543.6	66.4	65.6	3944.5
4/21/2011 10:25	98365.6	67.3	65.7	3944.5
4/21/2011 10:26	98287.4	68.9	65.7	3944.5
4/21/2011 10:27	98322.9	70.0	65.8	3944.5
4/21/2011 10:28	98176.2	70.4	65.9	3944.5
4/21/2011 10:29	98350.4	69.8	66.0	3944.5
4/21/2011 10:30	98925.7	69.1	66.0	3944.5
4/21/2011 10:31	98797.3	69.2	66.0	3944.5
4/21/2011 10:32	99080.1	70.2	66.1	3944.5
4/21/2011 10:33	98938.5	70.6	66.5	3944.5
4/21/2011 10:34	98398.5	70.4	66.4	3944.5
4/21/2011 10:35	98390.8	70.0	66.3	3944.5
4/21/2011 10:36	98880.7	72.0	66.3	3944.5
4/21/2011 10:37	98822.0	79.4	66.3	3944.5
4/21/2011 10:38	98480.6	88.8	66.3	3944.5
4/21/2011 10:39	98597.8	95.7	66.3	3944.5
4/21/2011 10:40	99077.2	98.3	66.5	3944.5
4/21/2011 10:41	98521.9	99.2	66.6	3944.5
4/21/2011 10:42	98415.6	98.9	66.5	3944.5
4/21/2011 10:43	98803.8	98.8	66.5	3944.5
4/21/2011 10:44	99304.3	99.7	66.6	3944.5
4/21/2011 10:45	99208.9	100.6	66.6	3944.5
4/21/2011 10:46	98905.5	100.8	66.6	3944.5
4/21/2011 10:47	98484.7	100.8	66.6	3944.5
4/21/2011 10:48	98594.0	103.1	66.7	3944.5
4/21/2011 10:49	98678.8	105.3	66.7	3944.5
4/21/2011 10:50	98437.6	107.0	66.7	3944.5
4/21/2011 10:51	98449.0	108.9	66.6	3944.5
4/21/2011 10:52	98621.8	110.8	66.7	3944.5
4/21/2011 10:53	98623.4	111.1	66.8	3944.5
4/21/2011 10:54	98516.5	109.8	66.8	3944.5
4/21/2011 10:55	98598.8	108.8	66.9	3944.5
4/21/2011 10:56	98801.4	108.8	66.8	3944.5
4/21/2011 10:57	98815.6	109.9	66.8	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 10:58	98510.7	110.9	66.9	3944.5
4/21/2011 10:59	98082.2	111.0	66.9	3944.5
4/21/2011 11:00	98094.9	110.3	66.8	3944.5
4/21/2011 11:01	98193.7	109.3	66.9	3944.5
4/21/2011 11:02	97770.5	108.8	66.9	3944.5
4/21/2011 11:03	98260.7	108.0	66.8	3944.5
4/21/2011 11:04	98211.4	107.4	66.8	3944.5
4/21/2011 11:05	97742.4	107.0	66.8	3944.5
4/21/2011 11:06	97734.7	106.3	66.9	3944.5
4/21/2011 11:07	98070.5	105.4	66.9	3944.5
4/21/2011 11:08	98379.2	104.1	66.9	3944.5
4/21/2011 11:09	98461.7	103.9	67.2	3944.5
4/21/2011 11:10	98230.4	104.9	67.2	3944.5
4/21/2011 11:11	98065.8	106.4	67.2	3944.5
4/21/2011 11:12	98289.7	105.9	67.2	3944.5
4/21/2011 11:13	98365.3	104.6	67.3	3944.5
4/21/2011 11:14	98243.7	103.8	67.3	3944.5
4/21/2011 11:15	98352.8	103.9	67.3	3944.5
4/21/2011 11:16	98427.0	105.6	67.3	3944.5
4/21/2011 11:17	98386.0	106.7	67.4	3944.5
4/21/2011 11:18	98782.2	105.8	67.3	3944.5
4/21/2011 11:19	99022.0	104.3	67.5	3944.5
4/21/2011 11:20	98652.1	103.8	67.9	3944.5
4/21/2011 11:21	98078.1	104.4	67.7	3944.5
4/21/2011 11:22	98097.7	106.0	67.5	3944.5
4/21/2011 11:23	98202.9	109.2	67.5	3944.5
4/21/2011 11:24	98374.3	111.7	67.6	3944.5
4/21/2011 11:25	98223.8	115.0	67.6	3944.5
4/21/2011 11:26	97896.5	122.9	67.6	3944.5
4/21/2011 11:27	97668.3	126.9	67.6	3944.5
4/21/2011 11:28	97896.6	129.0	67.7	3944.5
4/21/2011 11:29	97485.8	130.4	67.7	3944.5
4/21/2011 11:30	96946.4	132.9	67.7	3944.5
4/21/2011 11:31	97558.2	136.9	67.7	3944.5
4/21/2011 11:32	97947.0	138.6	67.7	3944.5
4/21/2011 11:33	97830.5	139.3	67.8	3944.5
4/21/2011 11:34	97371.8	139.8	67.8	3944.5
4/21/2011 11:35	96905.9	139.7	67.8	3944.5
4/21/2011 11:36	96816.4	140.0	67.8	3944.5
4/21/2011 11:37	97141.3	140.3	67.7	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 11:38	97348.8	142.1	67.8	3944.5
4/21/2011 11:39	97547.1	146.1	67.8	3944.5
4/21/2011 11:40	97180.6	150.5	67.8	3944.5
4/21/2011 11:41	97610.0	155.5	68.0	3944.5
4/21/2011 11:42	97462.1	160.4	67.9	3944.5
4/21/2011 11:43	97457.4	165.0	67.9	3944.5
4/21/2011 11:44	97354.4	168.5	67.9	3944.5
4/21/2011 11:45	97585.4	171.3	67.9	3944.5
4/21/2011 11:46	97426.0	174.0	67.9	3944.5
4/21/2011 11:47	97444.6	176.3	68.0	3944.5
4/21/2011 11:48	97528.8	178.1	67.9	3944.5
4/21/2011 11:49	97557.9	180.3	68.0	3944.5
4/21/2011 11:50	97736.4	183.3	68.1	3944.5
4/21/2011 11:51	97424.4	186.1	68.0	3944.5
4/21/2011 11:52	97277.5	188.8	68.0	3944.5
4/21/2011 11:53	97703.2	191.0	67.9	3944.5
4/21/2011 11:54	98035.9	193.1	67.9	3944.5
4/21/2011 11:55	98419.7	194.5	68.0	3944.5
4/21/2011 11:56	98518.3	195.4	68.0	3944.5
4/21/2011 11:57	98576.7	196.1	68.0	3944.5
4/21/2011 11:58	98475.8	197.3	67.9	3944.5
4/21/2011 11:59	97543.9	198.5	68.0	3944.5
4/21/2011 12:00	97220.5	199.4	68.1	3944.5
4/21/2011 12:01	97080.7	199.8	68.1	3944.5
4/21/2011 12:02	97421.4	199.8	68.1	3944.5
4/21/2011 12:03	97774.6	199.2	68.2	3944.5
4/21/2011 12:04	97068.0	198.9	68.3	3944.5
4/21/2011 12:05	97147.6	192.8	68.3	3944.5
4/21/2011 12:06	97321.3	187.4	68.4	3944.5
4/21/2011 12:07	97562.3	184.8	68.5	3944.5
4/21/2011 12:08	97353.4	183.0	68.6	3944.5
4/21/2011 12:09	97817.2	179.4	68.7	3944.5
4/21/2011 12:10	98282.2	175.6	68.8	3944.5
4/21/2011 12:11	97480.6	169.4	68.9	3944.5
4/21/2011 12:12	97275.8	164.8	69.0	3944.5
4/21/2011 12:13	97778.7	162.3	69.0	3944.5
4/21/2011 12:14	97921.8	160.8	69.0	3944.5
4/21/2011 12:15	97290.4	160.2	69.1	3944.5
4/21/2011 12:16	97299.4	159.9	69.3	3944.5
4/21/2011 12:17	97946.9	160.1	69.3	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 12:18	97773.8	160.7	69.3	3944.5
4/21/2011 12:19	97400.9	160.8	69.3	3944.5
4/21/2011 12:20	97248.8	160.4	69.3	3944.5
4/21/2011 12:21	97533.3	160.0	69.5	3944.5
4/21/2011 12:22	97423.2	159.7	69.5	3944.5
4/21/2011 12:23	98087.4	159.9	69.4	3944.5
4/21/2011 12:24	98693.8	159.9	69.3	3944.5
4/21/2011 12:25	98475.7	159.6	69.4	3944.5
4/21/2011 12:26	98083.6	159.4	69.4	3944.5
4/21/2011 12:27	97897.7	159.6	69.7	3944.5
4/21/2011 12:28	97413.0	159.4	70.0	3944.5
4/21/2011 12:29	97334.9	159.7	69.8	3944.5
4/21/2011 12:30	97474.9	160.2	69.6	3944.5
4/21/2011 12:31	97697.4	160.1	69.6	3944.5
4/21/2011 12:32	97557.2	159.8	69.6	3944.5
4/21/2011 12:33	97444.0	161.4	69.6	3944.5
4/21/2011 12:34	97323.4	163.9	69.7	3944.5
4/21/2011 12:35	97606.6	166.7	69.8	3944.5
4/21/2011 12:36	97728.9	169.9	69.8	3944.5
4/21/2011 12:37	97161.3	172.6	69.7	3944.5
4/21/2011 12:38	97175.4	174.5	69.6	3944.5
4/21/2011 12:39	97712.1	177.0	69.6	3944.5
4/21/2011 12:40	97947.6	179.7	69.4	3944.5
4/21/2011 12:41	97658.5	182.2	69.3	3944.5
4/21/2011 12:42	97563.0	184.3	69.0	3944.5
4/21/2011 12:43	97729.0	186.5	68.8	3944.5
4/21/2011 12:44	97464.3	188.9	68.6	3944.5
4/21/2011 12:45	97586.7	191.2	68.5	3944.5
4/21/2011 12:46	97856.4	192.9	68.5	3944.5
4/21/2011 12:47	97636.7	193.4	68.5	3944.5
4/21/2011 12:48	97718.3	194.0	68.7	3944.5
4/21/2011 12:49	97438.6	194.1	68.5	3944.5
4/21/2011 12:50	97148.7	194.3	68.5	3944.5
4/21/2011 12:51	97145.1	194.6	68.6	3944.5
4/21/2011 12:52	97268.0	194.4	68.6	3944.5
4/21/2011 12:53	97297.0	192.4	68.5	3944.5
4/21/2011 12:54	97507.7	191.0	68.5	3944.5
4/21/2011 12:55	97228.4	190.7	68.6	3944.5
4/21/2011 12:56	96915.3	191.1	68.6	3944.5
4/21/2011 12:57	96872.6	191.4	68.5	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 12:58	97046.0	191.2	68.6	3944.5
4/21/2011 12:59	97236.1	190.8	68.5	3944.5
4/21/2011 13:00	97173.2	190.2	68.5	3944.5
4/21/2011 13:01	97298.3	189.6	68.6	3944.5
4/21/2011 13:02	97617.2	189.9	68.6	3944.5
4/21/2011 13:03	97736.4	190.1	68.6	3944.5
4/21/2011 13:04	97726.5	190.1	68.6	3944.5
4/21/2011 13:05	97713.4	189.9	68.5	3944.5
4/21/2011 13:06	97415.7	188.1	68.5	3944.5
4/21/2011 13:07	96942.4	185.7	68.4	3944.5
4/21/2011 13:08	97205.1	183.2	68.1	3944.5
4/21/2011 13:09	96927.3	182.3	68.1	3944.5
4/21/2011 13:10	96524.9	181.2	68.1	3944.5
4/21/2011 13:11	96682.9	178.1	67.8	3944.5
4/21/2011 13:12	96787.9	176.0	67.8	3944.5
4/21/2011 13:13	97250.1	173.9	67.9	3944.5
4/21/2011 13:14	97365.3	167.3	67.9	3944.5
4/21/2011 13:15	97053.6	159.0	67.9	3944.5
4/21/2011 13:16	97046.3	154.7	68.0	3944.5
4/21/2011 13:17	97231.1	152.7	68.1	3944.5
4/21/2011 13:18	96969.4	150.6	68.1	3944.5
4/21/2011 13:19	96692.5	149.2	68.0	3944.5
4/21/2011 13:20	96759.6	150.4	68.0	3944.5
4/21/2011 13:21	96935.7	147.3	67.9	3944.5
4/21/2011 13:22	97183.2	144.4	67.7	3944.5
4/21/2011 13:23	97469.2	142.1	67.5	3944.5
4/21/2011 13:24	97093.8	136.7	67.4	3944.5
4/21/2011 13:25	96921.2	132.1	67.4	3944.5
4/21/2011 13:26	96992.2	131.8	67.4	3944.5
4/21/2011 13:27	96559.8	131.9	67.3	3944.5
4/21/2011 13:28	96715.1	131.0	67.4	3944.5
4/21/2011 13:29	97127.2	129.5	67.5	3944.5
4/21/2011 13:30	96965.5	129.0	67.5	3944.5
4/21/2011 13:31	97278.5	129.8	67.5	3944.5
4/21/2011 13:32	97608.0	130.4	67.5	3944.5
4/21/2011 13:33	97397.4	126.2	67.6	3944.5
4/21/2011 13:34	96486.8	122.7	67.6	3944.5
4/21/2011 13:35	96546.5	120.4	67.6	3944.5
4/21/2011 13:36	96862.9	119.8	67.6	3944.5
4/21/2011 13:37	96921.1	119.4	67.6	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 13:38	97063.1	120.3	67.7	3944.5
4/21/2011 13:39	96768.9	121.3	67.7	3944.5
4/21/2011 13:40	96647.8	120.6	67.7	3944.5
4/21/2011 13:41	96828.2	119.5	67.8	3944.5
4/21/2011 13:42	97444.3	118.8	67.7	3944.5
4/21/2011 13:43	97915.6	119.1	67.8	3944.5
4/21/2011 13:44	98267.9	120.5	67.8	3944.5
4/21/2011 13:45	98351.6	121.2	67.8	3944.5
4/21/2011 13:46	97444.1	120.2	67.8	3944.5
4/21/2011 13:47	97400.5	119.3	67.8	3944.5
4/21/2011 13:48	97399.7	119.1	67.8	3944.5
4/21/2011 13:49	97440.3	120.6	67.7	3944.5
4/21/2011 13:50	96676.1	121.3	67.8	3944.5
4/21/2011 13:51	97376.1	120.6	67.8	3944.5
4/21/2011 13:52	97339.2	120.0	67.8	3944.5
4/21/2011 13:53	97339.6	119.6	67.9	3944.5
4/21/2011 13:54	97355.5	119.7	67.8	3944.5
4/21/2011 13:55	97217.5	119.7	67.8	3944.5
4/21/2011 13:56	97257.4	119.5	67.8	3944.5
4/21/2011 13:57	96929.8	119.8	67.8	3944.5
4/21/2011 13:58	97257.9	120.9	67.9	3944.5
4/21/2011 13:59	97303.5	120.8	67.9	3944.5
4/21/2011 14:00	97532.4	119.9	67.8	3944.5
4/21/2011 14:01	97278.5	119.8	67.8	3944.5
4/21/2011 14:02	96842.9	119.6	67.8	3944.5
4/21/2011 14:03	96590.5	119.5	67.9	3944.5
4/21/2011 14:04	96955.9	119.7	67.9	3944.5
4/21/2011 14:05	97280.0	120.3	67.8	3944.5
4/21/2011 14:06	97176.2	121.2	67.8	3944.5
4/21/2011 14:07	96889.9	120.3	67.8	3944.5
4/21/2011 14:08	96731.9	119.8	67.8	3944.5
4/21/2011 14:09	97272.9	120.3	67.7	3944.5
4/21/2011 14:10	97275.7	120.1	67.8	3944.5
4/21/2011 14:11	97202.8	119.1	67.8	3944.5
4/21/2011 14:12	97463.3	118.8	67.7	3944.5
4/21/2011 14:13	97456.8	120.2	67.6	3944.5
4/21/2011 14:14	97424.8	121.2	67.7	3944.5
4/21/2011 14:15	97236.9	120.6	67.8	3944.5
4/21/2011 14:16	97042.3	119.6	67.7	3944.5
4/21/2011 14:17	97204.2	119.1	67.7	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 14:18	97334.6	120.0	67.7	3944.5
4/21/2011 14:19	97335.4	121.2	67.8	3944.5
4/21/2011 14:20	97228.0	120.7	67.8	3944.5
4/21/2011 14:21	97053.7	119.8	67.7	3944.5
4/21/2011 14:22	97136.4	119.4	67.6	3944.5
4/21/2011 14:23	97250.8	119.3	67.5	3944.5
4/21/2011 14:24	96644.0	120.2	67.4	3944.5
4/21/2011 14:25	96885.2	120.5	67.4	3944.5
4/21/2011 14:26	97204.4	120.2	67.2	3944.5
4/21/2011 14:27	97041.1	119.7	67.3	3944.5
4/21/2011 14:28	97073.3	120.3	67.4	3944.5
4/21/2011 14:29	97050.4	120.0	67.4	3944.5
4/21/2011 14:30	96911.9	120.0	67.5	3944.5
4/21/2011 14:31	97010.6	119.9	67.6	3944.5
4/21/2011 14:32	97116.3	120.3	67.5	3944.5
4/21/2011 14:33	96692.8	119.9	67.5	3944.5
4/21/2011 14:34	96519.3	119.0	67.5	3944.5
4/21/2011 14:35	96692.9	118.7	67.5	3944.5
4/21/2011 14:36	96868.0	120.0	67.6	3944.5
4/21/2011 14:37	97163.1	120.5	67.6	3944.5
4/21/2011 14:38	96750.3	116.0	67.6	3944.5
4/21/2011 14:39	96948.1	112.7	67.7	3944.5
4/21/2011 14:40	97131.6	110.5	67.7	3944.5
4/21/2011 14:41	97477.1	109.2	67.6	3944.5
4/21/2011 14:42	97138.0	109.7	67.6	3944.5
4/21/2011 14:43	96643.2	111.4	67.7	3944.5
4/21/2011 14:44	96828.1	111.5	67.7	3944.5
4/21/2011 14:45	96879.5	109.9	67.7	3944.5
4/21/2011 14:46	97232.1	108.7	67.7	3944.5
4/21/2011 14:47	97193.5	108.8	67.7	3944.5
4/21/2011 14:48	96981.2	110.3	67.9	3944.5
4/21/2011 14:49	96961.7	111.4	67.8	3944.5
4/21/2011 14:50	96577.9	111.0	67.9	3944.5
4/21/2011 14:51	96354.9	109.4	67.8	3944.5
4/21/2011 14:52	96391.8	108.5	67.9	3944.5
4/21/2011 14:53	96555.4	109.1	67.8	3944.5
4/21/2011 14:54	96631.3	110.6	67.8	3944.5
4/21/2011 14:55	96597.2	111.5	67.9	3944.5
4/21/2011 14:56	96607.6	110.9	67.9	3944.5
4/21/2011 14:57	96784.1	109.0	67.8	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 14:58	97044.7	108.3	67.9	3944.5
4/21/2011 14:59	96834.6	109.5	67.9	3944.5
4/21/2011 15:00	96609.5	110.9	67.9	3944.5
4/21/2011 15:01	96912.8	111.5	67.8	3944.5
4/21/2011 15:02	97016.1	110.3	67.9	3944.5
4/21/2011 15:03	96845.8	108.6	68.0	3944.5
4/21/2011 15:04	96758.3	108.5	67.9	3944.5
4/21/2011 15:05	96727.8	109.7	67.9	3944.5
4/21/2011 15:06	96984.7	110.6	67.9	3944.5
4/21/2011 15:07	96760.3	111.0	67.9	3944.5
4/21/2011 15:08	97305.5	110.9	68.0	3944.5
4/21/2011 15:09	97127.6	110.1	67.9	3944.5
4/21/2011 15:10	96980.5	108.9	67.8	3944.5
4/21/2011 15:11	97626.5	108.6	67.9	3944.5
4/21/2011 15:12	98201.8	109.6	68.0	3944.5
4/21/2011 15:13	98313.2	110.7	68.0	3944.5
4/21/2011 15:14	97641.2	111.2	68.0	3944.5
4/21/2011 15:15	97250.1	110.5	67.9	3944.5
4/21/2011 15:16	97520.0	109.3	67.9	3944.5
4/21/2011 15:17	97493.2	108.5	67.9	3944.5
4/21/2011 15:18	96777.2	109.0	67.9	3944.5
4/21/2011 15:19	96766.5	110.7	68.0	3944.5
4/21/2011 15:20	97197.8	110.4	68.0	3944.5
4/21/2011 15:21	97151.9	110.3	67.9	3944.5
4/21/2011 15:22	97116.6	110.2	68.0	3944.5
4/21/2011 15:23	97018.1	110.2	67.9	3944.5
4/21/2011 15:24	97200.2	110.3	67.9	3944.5
4/21/2011 15:25	97223.6	110.0	68.0	3944.5
4/21/2011 15:26	97241.8	109.5	68.0	3944.5
4/21/2011 15:27	97438.1	109.2	67.9	3944.5
4/21/2011 15:28	97306.2	109.9	67.9	3944.5
4/21/2011 15:29	97299.0	110.4	67.9	3944.5
4/21/2011 15:30	97359.0	110.5	68.0	3944.5
4/21/2011 15:31	97491.1	110.4	67.9	3944.5
4/21/2011 15:32	97538.8	110.0	67.9	3944.5
4/21/2011 15:33	97191.4	109.8	68.0	3944.5
4/21/2011 15:34	96977.9	109.8	68.0	3944.5
4/21/2011 15:35	96965.1	109.6	68.0	3944.5
4/21/2011 15:36	96954.3	109.9	68.0	3944.5
4/21/2011 15:37	97121.4	110.4	67.9	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 15:38	97151.4	110.8	68.0	3944.5
4/21/2011 15:39	96857.3	113.3	68.1	3944.5
4/21/2011 15:40	96940.5	116.2	68.0	3944.5
4/21/2011 15:41	97182.5	118.0	67.9	3944.5
4/21/2011 15:42	97019.1	118.9	67.9	3944.5
4/21/2011 15:43	97045.8	119.9	68.0	3944.5
4/21/2011 15:44	96946.3	120.3	67.9	3944.5
4/21/2011 15:45	96607.4	119.6	67.9	3944.5
4/21/2011 15:46	96951.0	119.5	67.9	3944.5
4/21/2011 15:47	97057.6	120.7	68.0	3944.5
4/21/2011 15:48	97589.8	121.2	68.0	3944.5
4/21/2011 15:49	97971.3	119.3	68.0	3944.5
4/21/2011 15:50	97638.5	118.6	68.0	3944.5
4/21/2011 15:51	97146.9	119.1	68.0	3944.5
4/21/2011 15:52	96884.7	120.9	68.0	3944.5
4/21/2011 15:53	97579.7	121.5	67.9	3944.5
4/21/2011 15:54	97625.1	119.4	67.9	3944.5
4/21/2011 15:55	97211.1	118.4	67.9	3944.5
4/21/2011 15:56	96881.1	119.4	68.0	3944.5
4/21/2011 15:57	96785.2	121.0	68.0	3944.5
4/21/2011 15:58	96744.8	121.2	68.0	3944.5
4/21/2011 15:59	97272.5	119.2	68.0	3944.5
4/21/2011 16:00	97681.0	118.6	68.0	3944.5
4/21/2011 16:01	97730.0	119.6	68.0	3944.5
4/21/2011 16:02	97778.3	120.9	68.0	3944.5
4/21/2011 16:03	97753.0	121.2	68.0	3944.5
4/21/2011 16:04	97266.1	120.0	68.0	3944.5
4/21/2011 16:05	96819.5	119.4	68.0	3944.5
4/21/2011 16:06	96948.7	119.2	67.9	3944.5
4/21/2011 16:07	96889.0	119.8	67.9	3944.5
4/21/2011 16:08	97105.9	121.1	68.0	3944.5
4/21/2011 16:09	97124.9	120.6	68.1	3944.5
4/21/2011 16:10	97507.1	120.0	68.0	3944.5
4/21/2011 16:11	98042.1	119.8	67.9	3944.5
4/21/2011 16:12	97306.1	120.2	67.9	3944.5
4/21/2011 16:13	96897.5	120.2	68.1	3944.5
4/21/2011 16:14	97151.6	119.4	68.0	3944.5
4/21/2011 16:15	97279.9	119.2	68.0	3944.5
4/21/2011 16:16	97136.3	120.1	68.0	3944.5
4/21/2011 16:17	97156.0	120.7	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 16:18	97361.1	120.4	68.0	3944.5
4/21/2011 16:19	97389.3	120.0	68.0	3944.5
4/21/2011 16:20	97416.0	119.8	68.0	3944.5
4/21/2011 16:21	97715.1	120.5	67.9	3944.5
4/21/2011 16:22	97838.8	120.1	68.0	3944.5
4/21/2011 16:23	97761.0	119.7	68.0	3944.5
4/21/2011 16:24	97420.9	119.6	68.1	3944.5
4/21/2011 16:25	97350.9	119.9	68.0	3944.5
4/21/2011 16:26	97416.7	121.0	68.0	3944.5
4/21/2011 16:27	97563.4	120.5	68.1	3944.5
4/21/2011 16:28	97542.5	119.8	68.1	3944.5
4/21/2011 16:29	97338.3	119.9	68.1	3944.5
4/21/2011 16:30	97334.4	119.3	68.0	3944.5
4/21/2011 16:31	97906.1	119.2	68.0	3944.5
4/21/2011 16:32	98375.2	120.0	68.0	3944.5
4/21/2011 16:33	98584.2	121.1	67.9	3944.5
4/21/2011 16:34	98471.2	120.9	67.9	3944.5
4/21/2011 16:35	98292.6	119.8	68.0	3944.5
4/21/2011 16:36	98207.0	119.8	68.0	3944.5
4/21/2011 16:37	98123.3	119.4	67.9	3944.5
4/21/2011 16:38	98202.3	119.3	67.9	3944.5
4/21/2011 16:39	98381.3	119.8	68.0	3944.5
4/21/2011 16:40	98086.3	121.1	68.0	3944.5
4/21/2011 16:41	97955.9	121.1	67.9	3944.5
4/21/2011 16:42	97521.9	119.6	67.9	3944.5
4/21/2011 16:43	98165.7	119.1	68.0	3944.5
4/21/2011 16:44	98503.2	119.1	68.0	3944.5
4/21/2011 16:45	98021.3	120.8	68.0	3944.5
4/21/2011 16:46	98160.4	121.7	68.0	3944.5
4/21/2011 16:47	98508.4	119.9	67.9	3944.5
4/21/2011 16:48	98058.6	118.9	68.0	3944.5
4/21/2011 16:49	97321.6	119.0	68.1	3944.5
4/21/2011 16:50	97216.8	120.9	68.0	3944.5
4/21/2011 16:51	97224.9	122.0	67.9	3944.5
4/21/2011 16:52	97579.1	120.0	68.0	3944.5
4/21/2011 16:53	97554.8	118.6	68.0	3944.5
4/21/2011 16:54	97887.1	118.8	68.0	3944.5
4/21/2011 16:55	98181.1	121.0	67.9	3944.5
4/21/2011 16:56	97821.3	121.8	68.0	3944.5
4/21/2011 16:57	97677.9	119.8	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 16:58	97971.1	118.6	68.1	3944.5
4/21/2011 16:59	98179.3	118.8	68.0	3944.5
4/21/2011 17:00	98253.4	120.9	67.9	3944.5
4/21/2011 17:01	97956.9	121.6	67.9	3944.5
4/21/2011 17:02	97800.7	119.9	68.0	3944.5
4/21/2011 17:03	97889.6	118.9	68.0	3944.5
4/21/2011 17:04	97751.4	118.8	68.0	3944.5
4/21/2011 17:05	97679.8	120.6	68.0	3944.5
4/21/2011 17:06	97745.3	121.3	68.0	3944.5
4/21/2011 17:07	97648.0	120.6	68.0	3944.5
4/21/2011 17:08	97910.1	119.8	67.9	3944.5
4/21/2011 17:09	98160.3	119.4	67.9	3944.5
4/21/2011 17:10	97949.0	119.1	68.0	3944.5
4/21/2011 17:11	98110.9	119.7	67.9	3944.5
4/21/2011 17:12	98285.9	121.1	68.0	3944.5
4/21/2011 17:13	98023.5	120.7	67.9	3944.5
4/21/2011 17:14	98045.2	119.9	67.9	3944.5
4/21/2011 17:15	98554.6	119.6	68.0	3944.5
4/21/2011 17:16	98460.7	119.2	68.0	3944.5
4/21/2011 17:17	98107.3	119.3	67.9	3944.5
4/21/2011 17:18	97902.8	120.8	68.0	3944.5
4/21/2011 17:19	98011.4	121.1	68.0	3944.5
4/21/2011 17:20	98119.5	120.0	68.0	3944.5
4/21/2011 17:21	98097.8	119.8	68.0	3944.5
4/21/2011 17:22	98295.9	119.7	68.0	3944.5
4/21/2011 17:23	98155.5	119.4	68.0	3944.5
4/21/2011 17:24	97930.1	120.1	68.0	3944.5
4/21/2011 17:25	97375.6	121.1	68.1	3944.5
4/21/2011 17:26	97722.2	120.8	68.1	3944.5
4/21/2011 17:27	98325.1	120.1	68.0	3944.5
4/21/2011 17:28	98312.6	120.0	68.0	3944.5
4/21/2011 17:29	98126.9	119.9	68.0	3944.5
4/21/2011 17:30	98045.6	119.0	68.0	3944.5
4/21/2011 17:31	98033.8	119.3	68.0	3944.5
4/21/2011 17:32	98187.5	121.0	68.0	3944.5
4/21/2011 17:33	97894.4	121.3	68.0	3944.5
4/21/2011 17:34	97915.9	120.4	68.0	3944.5
4/21/2011 17:35	98073.6	119.1	68.0	3944.5
4/21/2011 17:36	98360.3	118.9	68.0	3944.5
4/21/2011 17:37	98470.9	120.7	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 17:38	98330.1	121.4	68.0	3944.5
4/21/2011 17:39	98412.2	120.1	68.0	3944.5
4/21/2011 17:40	98475.5	119.1	68.0	3944.5
4/21/2011 17:41	98210.8	119.0	67.9	3944.5
4/21/2011 17:42	97807.6	120.7	68.0	3944.5
4/21/2011 17:43	97923.1	121.6	68.0	3944.5
4/21/2011 17:44	98125.8	120.1	67.9	3944.5
4/21/2011 17:45	98167.7	118.8	67.9	3944.5
4/21/2011 17:46	98297.7	118.8	68.0	3944.5
4/21/2011 17:47	98481.9	120.9	68.0	3944.5
4/21/2011 17:48	98429.4	121.7	68.0	3944.5
4/21/2011 17:49	98228.9	120.1	68.0	3944.5
4/21/2011 17:50	98455.3	118.6	68.0	3944.5
4/21/2011 17:51	98269.3	118.6	67.9	3944.5
4/21/2011 17:52	98350.8	120.2	68.0	3944.5
4/21/2011 17:53	98397.3	121.6	68.0	3944.5
4/21/2011 17:54	98381.3	120.6	67.9	3944.5
4/21/2011 17:55	98126.3	119.1	68.0	3944.5
4/21/2011 17:56	98060.8	118.5	68.0	3944.5
4/21/2011 17:57	97802.3	120.0	68.0	3944.5
4/21/2011 17:58	97735.4	121.5	68.0	3944.5
4/21/2011 17:59	98114.9	120.6	68.0	3944.5
4/21/2011 18:00	98565.0	119.4	68.0	3944.5
4/21/2011 18:01	98742.5	118.7	68.0	3944.5
4/21/2011 18:02	98893.5	119.7	67.9	3944.5
4/21/2011 18:03	98396.7	121.4	68.0	3944.5
4/21/2011 18:04	98257.8	120.8	68.0	3944.5
4/21/2011 18:05	98155.6	119.2	67.9	3944.5
4/21/2011 18:06	98261.2	118.7	68.0	3944.5
4/21/2011 18:07	98399.7	119.2	68.1	3944.5
4/21/2011 18:08	98223.3	121.2	68.0	3944.5
4/21/2011 18:09	97985.4	121.2	68.0	3944.5
4/21/2011 18:10	98403.6	120.3	68.0	3944.5
4/21/2011 18:11	98440.0	119.4	68.0	3944.5
4/21/2011 18:12	98582.5	118.9	68.0	3944.5
4/21/2011 18:13	98356.2	119.3	68.0	3944.5
4/21/2011 18:14	98574.8	120.9	68.0	3944.5
4/21/2011 18:15	99013.7	121.3	68.0	3944.5
4/21/2011 18:16	98901.5	120.5	68.0	3944.5
4/21/2011 18:17	98601.9	119.6	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 18:18	98434.8	119.0	67.9	3944.5
4/21/2011 18:19	98822.5	119.0	68.0	3944.5
4/21/2011 18:20	98502.4	120.5	68.0	3944.5
4/21/2011 18:21	98463.8	121.4	68.0	3944.5
4/21/2011 18:22	98674.4	120.5	67.9	3944.5
4/21/2011 18:23	98882.3	119.4	68.0	3944.5
4/21/2011 18:24	98709.6	119.0	68.0	3944.5
4/21/2011 18:25	98824.3	119.3	67.9	3944.5
4/21/2011 18:26	98482.4	120.7	68.0	3944.5
4/21/2011 18:27	98302.1	121.4	68.0	3944.5
4/21/2011 18:28	98596.9	120.5	68.0	3944.5
4/21/2011 18:29	98887.7	119.3	67.9	3944.5
4/21/2011 18:30	98825.9	118.6	68.0	3944.5
4/21/2011 18:31	98837.5	119.3	68.0	3944.5
4/21/2011 18:32	98891.9	120.9	67.9	3944.5
4/21/2011 18:33	98625.5	121.5	67.9	3944.5
4/21/2011 18:34	98726.1	120.0	68.0	3944.5
4/21/2011 18:35	98658.4	118.7	68.0	3944.5
4/21/2011 18:36	98376.9	118.9	68.0	3944.5
4/21/2011 18:37	98381.4	120.4	68.1	3944.5
4/21/2011 18:38	98521.8	121.8	68.0	3944.5
4/21/2011 18:39	98422.5	120.5	68.1	3944.5
4/21/2011 18:40	98486.4	119.2	68.0	3944.5
4/21/2011 18:41	98606.6	118.8	67.9	3944.5
4/21/2011 18:42	98488.5	119.9	68.0	3944.5
4/21/2011 18:43	98523.1	121.3	68.1	3944.5
4/21/2011 18:44	98540.4	121.4	68.0	3944.5
4/21/2011 18:45	98444.7	119.4	68.0	3944.5
4/21/2011 18:46	98518.5	118.5	68.0	3944.5
4/21/2011 18:47	98701.9	119.3	68.0	3944.5
4/21/2011 18:48	98885.2	120.6	68.0	3944.5
4/21/2011 18:49	99067.3	121.6	68.0	3944.5
4/21/2011 18:50	99137.7	120.3	68.0	3944.5
4/21/2011 18:51	99408.0	119.1	68.0	3944.5
4/21/2011 18:52	99239.0	118.8	68.0	3944.5
4/21/2011 18:53	98866.3	119.8	68.0	3944.5
4/21/2011 18:54	98953.2	121.2	68.0	3944.5
4/21/2011 18:55	98895.2	120.6	68.0	3944.5
4/21/2011 18:56	98783.4	119.5	68.0	3944.5
4/21/2011 18:57	98581.2	119.4	67.9	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 18:58	98565.2	119.7	68.0	3944.5
4/21/2011 18:59	98756.4	119.5	68.0	3944.5
4/21/2011 19:00	98714.4	119.3	68.0	3944.5
4/21/2011 19:01	98642.7	120.3	68.0	3944.5
4/21/2011 19:02	98362.9	120.9	68.0	3944.5
4/21/2011 19:03	98478.1	120.7	68.0	3944.5
4/21/2011 19:04	98831.1	120.6	67.9	3944.5
4/21/2011 19:05	98680.3	120.5	68.0	3944.5
4/21/2011 19:06	98614.5	119.8	67.9	3944.5
4/21/2011 19:07	98774.0	119.1	68.0	3944.5
4/21/2011 19:08	98496.7	119.1	68.0	3944.5
4/21/2011 19:09	98122.8	120.3	68.0	3944.5
4/21/2011 19:10	98596.9	120.4	68.0	3944.5
4/21/2011 19:11	98588.9	120.8	68.0	3944.5
4/21/2011 19:12	98547.0	120.7	68.0	3944.5
4/21/2011 19:13	98880.4	120.2	68.0	3944.5
4/21/2011 19:14	98473.4	120.0	68.0	3944.5
4/21/2011 19:15	98472.9	119.0	67.9	3944.5
4/21/2011 19:16	98613.5	118.7	68.0	3944.5
4/21/2011 19:17	98622.8	119.6	68.0	3944.5
4/21/2011 19:18	98731.7	121.0	68.0	3944.5
4/21/2011 19:19	98840.6	121.3	67.9	3944.5
4/21/2011 19:20	98946.8	120.2	67.9	3944.5
4/21/2011 19:21	98815.0	119.2	67.9	3944.5
4/21/2011 19:22	98531.9	118.8	68.0	3944.5
4/21/2011 19:23	98481.3	119.9	68.0	3944.5
4/21/2011 19:24	98770.5	121.3	67.9	3944.5
4/21/2011 19:25	98809.5	120.8	67.9	3944.5
4/21/2011 19:26	98775.1	119.4	67.9	3944.5
4/21/2011 19:27	98993.7	118.9	67.9	3944.5
4/21/2011 19:28	99046.6	119.2	67.9	3944.5
4/21/2011 19:29	99202.2	120.8	67.9	3944.5
4/21/2011 19:30	99178.3	121.2	67.9	3944.5
4/21/2011 19:31	99073.7	119.8	68.0	3944.5
4/21/2011 19:32	98843.8	119.1	68.0	3944.5
4/21/2011 19:33	99114.9	119.2	68.0	3944.5
4/21/2011 19:34	98575.2	120.1	68.0	3944.5
4/21/2011 19:35	98504.0	121.5	68.0	3944.5
4/21/2011 19:36	98743.2	120.6	68.0	3944.5
4/21/2011 19:37	98931.4	119.3	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 19:38	98842.6	118.9	67.9	3944.5
4/21/2011 19:39	98722.6	119.5	67.9	3944.5
4/21/2011 19:40	98783.5	121.5	67.9	3944.5
4/21/2011 19:41	99209.4	121.0	67.9	3944.5
4/21/2011 19:42	99312.3	119.3	67.9	3944.5
4/21/2011 19:43	99343.1	118.7	67.9	3944.5
4/21/2011 19:44	99267.7	119.4	67.9	3944.5
4/21/2011 19:45	99005.8	120.9	67.9	3944.5
4/21/2011 19:46	99354.1	121.6	68.0	3944.5
4/21/2011 19:47	99454.3	119.7	67.9	3944.5
4/21/2011 19:48	98970.7	118.7	68.0	3944.5
4/21/2011 19:49	98385.9	118.9	68.0	3944.5
4/21/2011 19:50	98346.3	120.7	67.9	3944.5
4/21/2011 19:51	98520.4	121.4	67.9	3944.5
4/21/2011 19:52	98763.2	120.3	68.0	3944.5
4/21/2011 19:53	98804.0	119.2	67.9	3944.5
4/21/2011 19:54	99120.3	119.0	67.9	3944.5
4/21/2011 19:55	98658.4	119.7	68.0	3944.5
4/21/2011 19:56	98257.1	120.7	67.9	3944.5
4/21/2011 19:57	98151.8	120.7	68.0	3944.5
4/21/2011 19:58	98333.0	120.3	67.9	3944.5
4/21/2011 19:59	99036.0	119.8	67.9	3944.5
4/21/2011 20:00	99379.6	119.4	67.9	3944.5
4/21/2011 20:01	98941.4	119.4	68.0	3944.5
4/21/2011 20:02	98964.5	119.3	67.9	3944.5
4/21/2011 20:03	98698.6	120.0	67.9	3944.5
4/21/2011 20:04	98544.6	120.5	67.8	3944.5
4/21/2011 20:05	98796.6	120.5	67.9	3944.5
4/21/2011 20:06	99295.8	119.8	68.0	3944.5
4/21/2011 20:07	99389.7	120.5	68.0	3944.5
4/21/2011 20:08	99379.0	119.8	68.0	3944.5
4/21/2011 20:09	99120.1	119.1	67.9	3944.5
4/21/2011 20:10	99020.1	119.1	67.9	3944.5
4/21/2011 20:11	99199.1	119.8	68.0	3944.5
4/21/2011 20:12	99123.4	121.0	68.0	3944.5
4/21/2011 20:13	99236.2	120.7	67.9	3944.5
4/21/2011 20:14	99234.1	120.0	67.9	3944.5
4/21/2011 20:15	99010.6	119.9	67.9	3944.5
4/21/2011 20:16	99097.9	120.2	68.0	3944.5
4/21/2011 20:17	98934.9	119.7	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 20:18	98949.3	118.9	67.9	3944.5
4/21/2011 20:19	99470.7	119.3	67.9	3944.5
4/21/2011 20:20	99612.5	120.9	67.9	3944.5
4/21/2011 20:21	99152.1	121.0	67.8	3944.5
4/21/2011 20:22	98828.1	120.2	67.9	3944.5
4/21/2011 20:23	98967.2	119.3	67.8	3944.5
4/21/2011 20:24	98868.9	119.1	67.8	3944.5
4/21/2011 20:25	98831.8	120.1	68.0	3944.5
4/21/2011 20:26	99003.7	121.3	68.0	3944.5
4/21/2011 20:27	98891.4	120.7	68.0	3944.5
4/21/2011 20:28	99109.6	119.3	68.0	3944.5
4/21/2011 20:29	98762.8	118.8	68.0	3944.5
4/21/2011 20:30	98909.2	119.6	68.1	3944.5
4/21/2011 20:31	98972.2	121.2	68.0	3944.5
4/21/2011 20:32	98880.2	121.1	68.0	3944.5
4/21/2011 20:33	99021.7	119.3	68.1	3944.5
4/21/2011 20:34	99160.2	118.6	68.0	3944.5
4/21/2011 20:35	99036.8	119.2	68.0	3944.5
4/21/2011 20:36	98621.5	121.1	68.0	3944.5
4/21/2011 20:37	98805.2	121.3	68.0	3944.5
4/21/2011 20:38	98541.5	119.6	68.0	3944.5
4/21/2011 20:39	98784.9	118.8	68.1	3944.5
4/21/2011 20:40	99299.4	118.9	68.1	3944.5
4/21/2011 20:41	98833.7	120.5	68.0	3944.5
4/21/2011 20:42	98840.0	121.7	68.1	3944.5
4/21/2011 20:43	98812.7	120.3	68.0	3944.5
4/21/2011 20:44	98720.0	119.1	68.0	3944.5
4/21/2011 20:45	98530.6	118.8	68.1	3944.5
4/21/2011 20:46	98136.3	120.0	68.0	3944.5
4/21/2011 20:47	98310.3	121.1	68.1	3944.5
4/21/2011 20:48	98569.9	121.3	68.0	3944.5
4/21/2011 20:49	98378.8	120.2	68.0	3944.5
4/21/2011 20:50	98417.9	119.2	68.0	3944.5
4/21/2011 20:51	98398.2	118.6	68.0	3944.5
4/21/2011 20:52	98499.8	120.1	68.0	3944.5
4/21/2011 20:53	98446.3	121.0	68.0	3944.5
4/21/2011 20:54	98366.2	120.8	68.0	3944.5
4/21/2011 20:55	98244.6	120.3	67.9	3944.5
4/21/2011 20:56	98382.1	119.2	68.0	3944.5
4/21/2011 20:57	98759.9	118.7	68.0	3944.5

Timestamp	78FC167D DSCFM Main Air Flow 78FC167D - Average	Oxygen enrichment flow (92% O2) 78FC986 KSCFH REGEN O2 ENRICHMENT 78FC986 - Average	Charge rate 78FC509 KBPD PREHT FURN TOTAL CHARGE 78FC509 - Average	78FI980X GPM SOXSCBR RECIR FLOW HP 78FI980X - Average
4/21/2011 20:58	98637.7	119.3	68.0	3944.5
4/21/2011 20:59	98599.5	120.5	68.0	3944.5
4/21/2011 21:00	99035.1	121.2	68.0	3944.5

Appendix D
Emission Calculations

Shaw Environmental, Inc.

Field Sampling Summary

Company:	Chalmette Refining	Test Date:	04/21/11
Location:	Chalmette, LA	Test Number:	1
Unit:	CAT		
Source:	WGS Stack		
Unit Load	Normal		

Source Parameters

Sampling Elevation		225.0	feet
Barometric Pressure (@ grade)	P_{bar}	30.22	in. Hg
Barometric Pressure (@ dry gas meter)	P_m	30.00	in. Hg
Stack Internal Diameter	D	100.000	inches
Cross-sectional Area at Sampling Plane	A_r	54.542	ft^2

Sampling Parameters

Nozzle Diameter (inches)		0.250	inches
Nozzle Area (ft^2)	A_n	3.41E-04	ft^2
Pitot Tube Coefficient	C_p	0.84	
Control Box ΔH Standard	ΔH@	1.962	in. H_2O
Dry Gas Meter Correction Factor	Y	1.024	
Average ΔH	ΔH	1.289	in. H_2O
Average Square Root ΔP	$\sqrt{\Delta P}_{avg}$	0.7828	in. H_2O
Average Meter Temperature	T_m	92.4	°F
Sampling Time	Θ	120.0	min
Moisture Measured by Weight	$(W_f - W_i)$	495.6	g
Dry Gas Meter Volume (actual)	V_m	69.867	dcf
Dry Gas Meter Volume (@ dry std conditions)	$V_{m(std)}$	68.553	dscf

Effluent Parameters

Excess Oxygen	$\%O_2$	1.00	vol%
Carbon Dioxide	$\%CO_2$	12.00	vol%
Nitrogen	$\%N_2$	87.00	vol%
Temperature	T_s	149.6	°F
Molecular Weight, dry	M_d	29.96	lb/lb*mol
Molecular Weight, wet	M_s	26.92	lb/lb*mol
Moisture Fraction (Impinger Analysis)	B_{ws}	0.2542	
Stack Static Pressure	P_g	-0.20	in. H_2O
Absolute Stack Pressure	P_s	29.98	in. Hg
Average Velocity	V_s	48.85	ft/sec
Volumetric Flow Rate	Q_{sd}	9,592,180	acfh
		159,870	acfm
		6,208,781	dscfh
		103,480	dscfm
Isokinetic Sampling Rate	I	88.33	%

	Initials	Date
Data Input	PH	4/26/2011
Data Review	DTB	4/29/2011

Shaw Environmental, Inc.

Field Sampling Summary

Company:	Chalmette Refining	Test Date:	04/21/11
Location:	Chalmette, LA	Test Number:	2
Unit:	CAT		
Source:	WGS Stack		
Unit Load	Normal		

Source Parameters

Sampling Elevation		225.0	feet
Barometric Pressure (@ grade)	P_{bar}	30.10	in. Hg
Barometric Pressure (@ dry gas meter)	P_m	29.88	in. Hg
Stack Internal Diameter	D	100.000	inches
Cross-sectional Area at Sampling Plane	A	54.542	ft^2

Sampling Parameters

Nozzle Diameter (inches)		0.250	inches
Nozzle Area (ft^2)	A_n	3.41E-04	ft^2
Pitot Tube Coefficient	C_p	0.84	
Control Box ΔH Standard	ΔH@	1.962	in. H_2O
Dry Gas Meter Correction Factor	Y	1.024	
Average ΔH	ΔH	1.594	in. H_2O
Average Square Root ΔP	$\sqrt{\Delta P_{avg}}$	0.8102	in. H_2O
Average Meter Temperature	T_m	96.6	°F
Sampling Time	Θ	120.0	min
Moisture Measured by Weight	$(W_f - W_i)$	580.0	g
Dry Gas Meter Volume (actual)	V_m	80.080	dcf
Dry Gas Meter Volume (@ dry std conditions)	$V_{m(std)}$	77.668	dscf

Effluent Parameters

Excess Oxygen	O_2	1.00	vol%
Carbon Dioxide	CO_2	12.00	vol%
Nitrogen	N_2	87.00	vol%
Temperature	T_s	148.7	°F
Molecular Weight, dry	M_d	29.96	lb/lb*mol
Molecular Weight, wet	M_s	26.85	lb/lb*mol
Moisture Fraction (Impinger Analysis)	B_{ws}	0.2604	
Stack Static Pressure	P_g	-0.10	in. H_2O
Absolute Stack Pressure	P_s	29.87	in. Hg
Average Velocity	V_s	50.70	ft/sec
stack Static Pressure	Q_{sd}	9,954,115	acfh
		165,902	acfm
		6,374,665	dscfh
		106,244	dscfm
Isokinetic Sampling Rate	I	97.47	%

	Initials	Date
Data Input	PH	4/26/2011
Data Review	DTB	4/29/2011

Shaw Environmental, Inc.

Field Sampling Summary

Company:	Chalmette Refining	Test Date:	04/21/11
Location:	Chalmette, LA	Test Number:	3
Unit:	CAT		
Source:	WGS Stack		
Unit Load	Normal		

Source Parameters

Sampling Elevation		225.0	feet
Barometric Pressure (@ grade)	P_{bar}	30.07	in. Hg
Barometric Pressure (@ dry gas meter)	P_m	29.85	in. Hg
Stack Internal Diameter	D	100.000	inches
Cross-sectional Area at Sampling Plane	A	54.542	ft^2

Sampling Parameters

Nozzle Diameter (inches)		0.250	inches
Nozzle Area (ft^2)	A_n	3.41E-04	ft^2
Pitot Tube Coefficient	C_p	0.84	
Control Box ΔH Standard	ΔH@	1.962	in. H_2O
Dry Gas Meter Correction Factor	Y	1.024	
Average ΔH	ΔH	1.750	in. H_2O
Average Square Root ΔP	$\sqrt{\Delta P}_{avg}$	0.8399	in. H_2O
Average Meter Temperature	T_m	93.9	°F
Sampling Time	Θ	120.0	min
Moisture Measured by Weight	$(W_f - W_i)$	578.0	g
Dry Gas Meter Volume (actual)	V_m	82.919	dcf
Dry Gas Meter Volume (@ dry std conditions)	$V_{m(std)}$	80.733	dscf

Effluent Parameters

Excess Oxygen	O_2	1.00	vol%
Carbon Dioxide	CO_2	12.50	vol%
Nitrogen	N_2	86.50	vol%
Temperature	T_s	147.5	°F
Molecular Weight, dry	M_d	30.04	lb/lb*mol
Molecular Weight, wet	M_s	27.00	lb/lb*mol
Moisture Fraction (Impinger Analysis)	B_{ws}	0.2524	
Stack Static Pressure	P_g	-0.10	in. H_2O
Absolute Stack Pressure	P_s	29.84	in. Hg
Average Velocity	V_s	52.37	ft/sec
Volumetric Flow Rate	Q_{sd}	10,283,758	acfh
		171,396	acfm
		6,663,892	dscfh
		111,065	dscfm
Isokinetic Sampling Rate	I	96.92	%

	Initials	Date
Data Input	PH	4/27/2011
Data Review	DTB	4/29/2011

Shaw Environmental, Inc.

Company:	Chalmette Refining, LLC
Location:	Chalmette, LA
Unit:	Fluid Catalytic Cracking Unit (FCCU)
Source:	Wet Gas Scrubber
Source ID:	EQT184

PM Lab Results Summary

Test Date		4/21/2011			Average
Run No.		1	2	3	
RM 5B PM Collected	mg	33.3	36.6	34.6	34.8
Total PM Collected (equivalent PM_{10})	mg	33.3	36.6	34.6	34.8
	g	0.0333	0.0366	0.0346	0.0348

Note: Analyses were conducted by Enthalpy Analytical, Inc.

	Initials	Date
Data Entry	DTB	5/17/2011
Review	PH	5/17/2011

Company:	Chalmette Refining, LLC
Location:	Chalmette, LA
Unit:	Fluid Catalytic Cracking Unit (FCCU)
Source:	Wet Gas Scrubber
Source ID:	EQT184
Unit Load	Normal
Test Date:	4/21/2011
Permit No.	3022-V4

Sampling Parameters

Test No.		1	2	3	Average
Date		04/21/11	04/21/11	04/21/11	
Test Period		10:42-13:10	14:05-16:15	16:55-19:05	
Sampling Duration	min	120	120	120	120
Sample Volume	dscf	68.553	77.668	80.733	75.651
Isokinetic Sampling Rate	%	88.33	97.47	96.92	94.24
Particulate Matter as PM_{10}	g	0.033	0.037	0.035	0.035
	gr	0.51	0.56	0.53	0.54

Unit Operating Parameters

Excess Oxygen (O_2)	vol%	1.00	1.00	1.00	1.00
Carbon Dioxide (CO_2)	vol%	12.00	12.00	12.50	12.17
Moisture Content	vol%	25.42	26.04	25.24	25.57
Molecular Weight (wet)	lb/lb·mol	26.92	26.85	27.00	26.92
Exhaust Temperature	°F	149.6	148.7	147.5	148.60
Effluent Velocity	ft/sec	48.85	50.70	52.37	50.64
Volumetric Flow Rate	acfm	159,870	165,902	171,396	165,723
	dscfm	103,480	106,244	111,065	106,930

Pollutants

PM_{10} Equivalent	gr/dscf	0.007	0.007	0.007	0.007
	lb/hr	6.65	6.62	6.30	6.52
	ton/yr	29.12	29.01	27.58	28.57

Note: Analyses were conducted by Enthalpy Analytical, Inc.

	Initials	Date
Data Entry	DTB	5/17/2011
Review	PH	5/17/2011

WGS

Reference Method 4 - Determination of Moisture Content in Stack Gases

Nomenclature:

$H2O$	=	Moisture content of gas stream, vol%.
B_{ws}	=	Proportion of water vapor, by volume, in the gas stream.
M_w	=	Molecular weight of water, 18.0 lb/lb-mole.
P_m	=	Absolute pressure (for this method, same as barometric pressure) at the dry gas meter, in. Hg.
P_{std}	=	Standard absolute pressure, 29.92 in. Hg.
R_i	=	Ideal gas constant, 21.85 (in. Hg)(ft 3)/(lb-mole)(°R).
T_{mf}	=	Temperature at meter, °F.
T_m	=	Absolute temperature at meter, °R.
T_{std}	=	Standard absolute temperature, 528 °R.
V_f	=	Final volume of condenser water, ml.
V_i	=	Initial volume, if any, of condenser water, ml.
V_m	=	Dry gas volume measured by dry gas meter, dcf.
V_{mstd}	=	Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscf.
V_{wcstd}	=	Volume of water vapor condensed, corrected to standard conditions, scf.
V_{wsgstd}	=	Volume of water vapor collected in silica gel, corrected to standard conditions, scf.
W_f	=	Final weight of silica gel or silica gel plus impinger, g.
W_i	=	Initial weight of silica gel or silica gel plus impinger, g.
Y	=	Dry gas meter calibration factor.
ρ_w	=	Density of water, 0.002201 lb/ml.

Variables:

Run 1:

$V_{m1} := 69.867 \cdot ft^3$ $\quad P_{m1} := 30.0 \cdot in_Hg$

$W_{i1} := 0.0 \cdot g$ $\quad T_{mf1} := 92.4 \cdot °F$

$W_{f1} := 495.6 \cdot g$ $\quad Y_1 := 1.024$

$V_{f1} := 0$ $\quad V_{i1} := 0$

Run 2:

$V_{m2} := 80.080 \cdot ft^3$ $\quad P_{m2} := 29.88 \cdot in_Hg$

$W_{i2} := 0.0 \cdot g$ $\quad T_{mf2} := 96.6 \cdot °F$

$W_{f2} := 580.0 \cdot g$ $\quad Y_2 := 1.024$

$V_{f2} := 0$ $\quad V_{i2} := 0$

Run 3:

$V_{m3} := 82.919 \cdot ft^3$ $\quad P_{m3} := 29.85 \cdot in_Hg$

$W_{i3} := 0.0 \cdot g$ $\quad T_{mf3} := 93.9 \cdot °F$

$W_{f3} := 578.0 \cdot g$ $\quad Y_3 := 1.024$

$V_{f3} := 0$ $\quad V_{i3} := 0$

Constants:

$M_w := 18.0 \cdot \frac{lb}{lb \cdot mol}$ $\quad K_1 := 0.04706 \cdot \frac{ft^3}{ml}$

$P_{std} := 29.92 \cdot in_Hg$ $\quad K_2 := 453.6 \cdot \frac{g}{lb}$

$T_{std} := 528 \cdot °R$

$\rho_w := 0.002201 \cdot \frac{lb}{ml}$ $\quad K_3 := 0.04715 \cdot \frac{ft^3}{g}$

$R_i := 21.85 \cdot \frac{in_Hg \cdot ft^3}{lb \cdot mol \cdot °R}$ $\quad K_4 := 17.64 \cdot \frac{°R}{in_Hg}$

Calculations:

Run 1:

$$V_{wcstd1} := \frac{(V_{f1} - V_{i1}) \cdot \rho_w \cdot R \cdot T_{std}}{P_{std} \cdot M_w}$$ *Eq. 4-1*

$$V_{wcstd1} := K_1(V_{f1} - V_{i1})$$

$$V_{wcstd1} = 0.000\ scf$$

$$V_{wsgstd1} := \frac{(W_{f1} - W_{i1}) \cdot R_i \cdot T_{std}}{P_{std} \cdot M_w \cdot K_2}$$ *Eq. 4-2*

$$V_{wsgstd1} := K_3(W_{f1} - W_{i1})$$

$$V_{wsgstd1} = 23.405\ scf$$

$$V_{mstd1} := \frac{V_{m1} \cdot Y_1 \cdot P_{m1} \cdot T_{std}}{P_{std} \cdot (T_{mf1} + 460)}$$ *Eq. 4-3*

$$V_{mstd1} := K_4 Y_1 (V_{m1} P_{m1}) / T_{m1}$$

$$\boxed{V_{mstd1} = 68.6\ dscf}$$

$$B_{ws1} := \frac{V_{wcstd1} + V_{wsgstd1}}{V_{wcstd1} + V_{wsgstd1} + V_{mstd1}}$$ *Eq. 4-4*

$$B_{ws1} = 0.2545$$

$$H2O1 := B_{ws1} \cdot 100 \cdot vol\%$$

$$\boxed{H2O1 = 25.45\ vol\%}$$

Run 2:

$$V_{wcstd2} := \frac{(V_{f2} - V_{i2}) \cdot \rho_w \cdot R \cdot T_{std}}{P_{std} \cdot M_w}$$ *Eq. 4-1*

$$V_{wcstd2} := K_1(V_{f2} - V_{i2})$$

$$V_{wcstd2} = 0.000\ scf$$

$$V_{wsgstd2} := \frac{(W_{f2} - W_{i2}) \cdot R_i \cdot T_{std}}{P_{std} \cdot M_w \cdot K_2}$$ *Eq. 4-2*

$$V_{wsgstd2} := K_3(W_{f2} - W_{i2})$$

$$V_{wsgstd2} = 27.391\ scf$$

$$V_{mstd2} := \frac{V_{m2} \cdot Y_2 \cdot P_{m2} \cdot T_{std}}{P_{std} \cdot (T_{mf2} + 460)}$$ *Eq. 4-3*

$$V_{mstd2} := K_4 Y_2 (V_{m2} P_{m2}) / T_{m2}$$

$$\boxed{V_{mstd2} = 77.7\ dscf}$$

$$B_{ws2} := \frac{V_{wcstd2} + V_{wsgstd2}}{V_{wcstd2} + V_{wsgstd2} + V_{mstd2}}$$ *Eq. 4-4*

$$B_{ws2} = 0.2607$$

$$H2O2 := B_{ws2} \cdot 100 \cdot vol\%$$

$$\boxed{H2O2 = 26.07\ vol\%}$$

Run 3:

$$V_{wcstd3} := \frac{(V_{f3} - V_{i3}) \cdot \rho_w \cdot R \cdot T_{std}}{P_{std} \cdot M_w}$$ *Eq. 4-1*

$$V_{wsgstd3} := \frac{(W_{f3} - W_{i3}) \cdot R_i \cdot T_{std}}{P_{std} \cdot M_w \cdot K_2}$$ *Eq. 4-2*

$$V_{wcstd3} := K_1(V_{f3} - V_{i3})$$

$$V_{wsgstd3} := K_3(W_{f3} - W_{i3})$$

$$V_{wcstd3} = 0.000\ scf$$

$$V_{wsgstd3} = 27.296\ scf$$

$$V_{mstd3} := \frac{V_{m3} \cdot Y_3 \cdot P_{m3} \cdot T_{std}}{P_{std} \cdot (T_{mf3} + 460)}$$ *Eq. 4-3*

$$B_{ws3} := \frac{V_{wcstd3} + V_{wsgstd3}}{V_{wcstd3} + V_{wsgstd3} + V_{mstd3}}$$ *Eq. 4-4*

$$V_{mstd3} := K_4 Y_3 (V_{m3} P_{m3}) / T_{m3}$$

$$B_{ws3} = 0.2526$$

$$\boxed{V_{mstd3} = 80.7\ dscf}$$

$$H2O3 := B_{ws3} \cdot 100 \cdot vol\%$$

$$\boxed{H2O3 = 25.26\ vol\%}$$

Reference Method 3 - Gas Analysis for the Determination of Dry Molecular Weight

Nomenclature:

M_d	=	Dry molecular weight, lb/lb-mole.
M_s	=	Wet molecular weight, lb/lb-mole.
$\%CO_2$	=	Percent CO_2 by volume, dry basis.
$\%O_2$	=	Percent O_2 by volume, dry basis.
$\%CO$	=	Percent CO by volume, dry basis.
$\%N_2$	=	Percent N_2 by volume, dry basis.
Bal	=	$\%N_2$+%CO.
28	=	Molecular weight of N_2 or CO, lb/lb-mol.
32	=	Molecular weight of O_2, lb/lb-mol.
44	=	Molecular weight of CO_2, lb/lb-mol.

Variables:

$\%O2_1 := 1 \cdot vol\%$ $\%O2_2 := 1 \cdot vol\%$ $\%O2_3 := 1 \cdot vol\%$

$\%CO2_1 := 12 \cdot vol\%$ $\%CO2_2 := 12 \cdot vol\%$ $\%CO2_3 := 12.5 \cdot vol\%$

$Bal_1 := 100 \cdot vol\% - (\%O2_1 + \%CO2_1)$ $Bal_2 := 100 \cdot vol\% - (\%O2_2 + \%CO2_2)$

$Bal_1 = 87.00\ vol\%$ $Bal_2 = 87.00\ vol\%$

$Bal_3 := 100 \cdot vol\% - (\%O2_3 + \%CO2_3)$

$Bal_3 = 86.50\ vol\%$

Calculations:

$$M_{d1} := 44 \cdot \frac{lb}{lb \cdot mol} \cdot \%CO2_1 + 32 \cdot \frac{lb}{lb \cdot mol} \cdot \%O2_1 + 28 \cdot \frac{lb}{lb \cdot mol} (Bal_1) \qquad Eq.\ 3\text{-}1$$

$$\boxed{M_{d1} = 29.96 \frac{lb}{lb \cdot mol}}$$

$$M_{d2} := 44 \cdot \frac{lb}{lb \cdot mol} \cdot \%CO2_2 + 32 \cdot \frac{lb}{lb \cdot mol} \cdot \%O2_2 + 28 \cdot \frac{lb}{lb \cdot mol} (Bal_2) \qquad Eq.\ 3\text{-}1$$

$$\boxed{M_{d2} = 29.96 \frac{lb}{lb \cdot mol}}$$

$$M_{d3} := 44 \cdot \frac{lb}{lb \cdot mol} \cdot \%CO2_3 + 32 \cdot \frac{lb}{lb \cdot mol} \cdot \%O2_3 + 28 \cdot \frac{lb}{lb \cdot mol} (Bal_3) \qquad Eq.\ 3\text{-}1$$

$$\boxed{M_{d3} = 30.04 \frac{lb}{lb \cdot mol}}$$

Reference Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate

Nomenclature:

A_s	=	Cross-sectional area of stack, ft^2.
B_{ws}	=	Water vapor in the gas stream from Method 4, proportion by volume.
C_p	=	Pitot tube coefficient, dimensionless.
K_p	=	Velocity equation constant.
M_d	=	Molecular weight of stack gas, dry basis, lb/lb-mol.
M_s	=	Molecular weight of stack gas, wet basis, lb/lb-mol.
P_m	=	Barometric pressure at measurement site, in. Hg.
P_g	=	Stack static pressure, in. H_2O.
P_s	=	Absolute stack pressure (P_{bar} + P_g), in. Hg.
P_{std}	=	Standard absolute pressure, 29.92 in. Hg.
Q_{sd}	=	Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr, dscf/min.
T_s	=	Stack temperature, °F.
T_{sabs}	=	Absolute stack temperature (460 + T_s), °R.
T_{std}	=	Standard absolute temperature, 528 °R.
V_s	=	Average stack gas velocity, ft/sec.
$\Delta p_{avgsqrt}$	=	Average square root of Δp, in. H_2O.
3600	=	Conversion factor, sec/hr.
18.0	=	Molecular weight of water, lb/lb-mol.

Constants:

$$K_p := 85.49 \cdot \frac{ft}{sec} \cdot \left[\frac{\left(\frac{lb}{lb \cdot mol}\right) \cdot (in_Hg)}{(°R) \cdot (in_H2O)} \right]^{\frac{1}{2}}$$

Variables:

$A_s := 54.542 \cdot ft^2$

$C_p := 0.84$

$\Delta p_{avgsqrt1} := 0.7828 \cdot in_H2O^{\frac{1}{2}}$

$T_{s1} := 149.6 \cdot °F$

$P_{g1} := -0.20 \cdot in_H2O$

$\Delta p_{avgsqrt2} := 0.8102 \cdot in_H2O^{\frac{1}{2}}$

$T_{s2} := 148.7 \cdot °F$

$P_{g2} := -0.20 \cdot in_H2O$

$\Delta p_{avgsqrt3} := 0.8399 \cdot in_H2O^{\frac{1}{2}}$

$T_{s3} := 147.5 \cdot °F$

$P_{g3} := -0.20 \cdot in_H2O$

Calculations:

Run 1:

$T_{sabs1} := T_{s1} + 460$ $\quad T_{sabs1} = 609.6\ ^{\circ}R$ $\quad P_{s1} := P_{m1} + \dfrac{P_{g1}}{13.6 \cdot \dfrac{in_H2O}{in_Hg}}$ $\quad P_{s1} = 29.99\ in_Hg$

$M_{s1} := M_{d1} \cdot (1 - B_{ws1}) + 18.0 \cdot \dfrac{lb}{lb \cdot mol} \cdot B_{ws1}$ $\quad$ *Eq. 2-6* $\quad M_{s1} = 26.92\ \dfrac{lb}{lb \cdot mol}$

$V_{s1} := K_p \cdot C_p \cdot \Delta p_{avgsqrt1} \cdot \sqrt{\dfrac{T_{sabs1}}{P_{s1} \cdot M_{s1}}}$ $\quad$ *Eq. 2-7* $\quad \boxed{V_{s1} = 48.85\ \dfrac{ft}{sec}}$

$Q_{sd1} := 3600\ \dfrac{sec}{hr} (1 - B_{ws1}) \cdot V_{s1} \cdot A_s \cdot \left(\dfrac{T_{std} \cdot P_{s1}}{T_{sabs1} \cdot P_{std}} \right)$ $\quad$ *Eq. 2-8*

$\boxed{Q_{sd1} = 6207732.15\ \dfrac{dscf}{hr}}$ $\quad \boxed{Q_{sd1} = 103462.20\ \dfrac{dscf}{min}}$

Run 2:

$T_{sabs2} := T_{s2} + 460$ $\quad T_{sabs2} = 608.7\ ^{\circ}R$ $\quad P_{s2} := P_{m2} + \dfrac{P_{g2}}{13.6 \cdot \dfrac{in_H2O}{in_Hg}}$ $\quad P_{s2} = 29.87\ in_Hg$

$M_{s2} := M_{d2} \cdot (1 - B_{ws2}) + 18.0 \cdot \dfrac{lb}{lb \cdot mol} \cdot B_{ws2}$ $\quad$ *Eq. 2-6* $\quad M_{s2} = 26.84\ \dfrac{lb}{lb \cdot mol}$

$V_{s2} := K_p \cdot C_p \cdot \Delta p_{avgsqrt2} \cdot \sqrt{\dfrac{T_{sabs2}}{P_{s2} \cdot M_{s2}}}$ $\quad$ *Eq. 2-7* $\quad \boxed{V_{s2} = 50.70\ \dfrac{ft}{sec}}$

$Q_{sd2} := 3600\ \dfrac{sec}{hr} (1 - B_{ws2}) \cdot V_{s2} \cdot A_s \cdot \left(\dfrac{T_{std} \cdot P_{s2}}{T_{sabs2} \cdot P_{std}} \right)$ $\quad$ *Eq. 2-8*

$\boxed{Q_{sd2} = 6372325.42\ \dfrac{dscf}{hr}}$ $\quad \boxed{Q_{sd2} = 106205.42\ \dfrac{dscf}{min}}$

Run 3:

$T_{sabs3} := T_{s3} + 460$ $\quad T_{sabs3} = 607.5\ ^{\circ}R$ $\quad P_{s3} := P_{m3} + \dfrac{P_{g3}}{13.6 \cdot \dfrac{in_H2O}{in_Hg}}$ $\quad P_{s3} = 29.84\ in_Hg$

$M_{s3} := M_{d3} \cdot (1 - B_{ws3}) + 18.0 \cdot \dfrac{lb}{lb \cdot mol} \cdot B_{ws3}$ *Eq. 2-6* $\quad M_{s3} = 27.00\ \dfrac{lb}{lb \cdot mol}$

$V_{s3} := K_p \cdot C_p \cdot \Delta p_{avgsqrt3} \cdot \sqrt{\dfrac{T_{sabs3}}{P_{s3} \cdot M_{s3}}}$ *Eq. 2-7* $\quad \boxed{V_{s3} = 52.38\ \dfrac{ft}{sec}}$

$Q_{sd3} := 3600\ \dfrac{sec}{hr} (1 - B_{ws3}) \cdot V_{s3} \cdot A_s \cdot \left(\dfrac{T_{std} \cdot P_{s3}}{T_{sabs3} \cdot P_{std}} \right)$ *Eq. 2-8*

$\boxed{Q_{sd3} = 6661677.26\ \dfrac{dscf}{hr}}$ $\quad \boxed{Q_{sd3} = 111027.95\ \dfrac{dscf}{min}}$

Reference Method 5B - Isokinetic Sampling Rate

Nomenclature:

An	=	Cross-sectional area of nozzle, ft^2.
B_{ws}	=	Water vapor in the gas stream from Method 4, proportion by volume.
I	=	Percent of isokinetic sampling.
N_d	=	Nozzle diameter, in.
P_s	=	Absolute stack pressure ($P_{bar} + P_g$), in. Hg.
P_{std}	=	Standard absolute pressure, 29.92 in. Hg.
T_{sabs}	=	Absolute stack temperature (460 + T_s), °R.
T_{std}	=	Standard absolute temperature, 528 °R.
V_s	=	Average stack gas velocity, ft/sec.
V_{mstd}	=	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Θ_t	=	Total sampling time, min.
60	=	Conversion factor, sec/min.
100	=	Conversion to percent.

Variables:

$\Theta_t := 120 \cdot min$ $\quad N_d := 0.25 \cdot in$

$$An := \pi \cdot \left(\frac{N_d}{\frac{2}{12 \cdot \frac{in}{ft}}} \right)^2 \qquad An = 3.41 \times 10^{-4}\ ft^2$$

Constants:

$$K_5 := 0.09450 \cdot \frac{in_Hg \cdot \% \cdot min}{sec \cdot °R}$$

$$T_{std} = 528\ °R$$

$$P_{std} = 29.92\ in_Hg$$

Calculations:

$$I_1 := \frac{T_{sabs1} \cdot V_{mstd1} \cdot P_{std} \cdot 100 \cdot \%}{T_{std} \cdot V_{s1} \cdot \Theta_t \cdot An \cdot P_{s1} \cdot 60 \frac{sec}{min} \cdot (1 - B_{ws1})} \qquad \text{Eq. 5-8} \qquad \boxed{I_1 = 88.36\ \%}$$

$$I_2 := \frac{T_{sabs2} \cdot V_{mstd2} \cdot P_{std} \cdot 100 \cdot \%}{T_{std} \cdot V_{s2} \cdot \Theta_t \cdot An \cdot P_{s2} \cdot 60 \frac{sec}{min} \cdot (1 - B_{ws2})} \qquad \text{Eq. 5-8} \qquad \boxed{I_2 = 97.53\ \%}$$

$$I_3 := \frac{T_{sabs3} \cdot V_{mstd3} \cdot P_{std} \cdot 100 \cdot \%}{T_{std} \cdot V_{s3} \cdot \Theta_t \cdot An \cdot P_{s3} \cdot 60 \frac{sec}{min} \cdot (1 - B_{ws3})} \qquad \text{Eq. 5-8} \qquad \boxed{I_3 = 96.97\ \%}$$

Reference Method 5B - Particulate Matter Mass Emissions

Nomenclature:

mnf	=	Mass of noncondensable PM collected by filter using RM 5, mg.
mnr	=	Mass of noncondensable PM collected by front rinse using RM 5, mg.
mc	=	Mass of condensable PM collected using method 202, mg.
tds	=	Mass of PM collected for TDS analyses, mg.
vtds	=	Volume of scrubber water used in the TDS analyses, ml.
K_6	=	Volume percent of CO2 in the atmosphere, vol%.
m_n	=	Net amount of particulate matter collected, g and gr.
C_s	=	Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Constants:

$K_6 := 0.039 vol\%$

Variables:

$m_1 := 33.3 mg$

$m_2 := 36.6 mg$

$m_3 := 34.6 mg$

Calculations:

Run 1:

$m_1 = 0.513\, gr$

$C_{s1} := \frac{m_1}{V_{mstd1}}$ *Eq. 5-6*

$C_{s1} = 0.00748 \frac{gr}{dscf}$

$C_{s.1} := \frac{C_{s1} \cdot Q_{sd1}}{7000 \frac{gr}{lb}}$

$C_{s.1} = 6.6327 \frac{lb}{hr}$

$C_{s..1} := \frac{C_{s.1}}{2000 \frac{lb}{ton}}$ $C_{s..1} = 29.07 \frac{ton}{yr}$

Run 2:

$m_2 = 0.564\, gr$

$C_{s2} := \frac{m_2}{V_{mstd2}}$ *Eq. 5-6*

$C_{s2} = 0.00726 \frac{gr}{dscf}$

$C_{s.2} := \frac{C_{s2} \cdot Q_{sd2}}{7000 \frac{gr}{lb}}$

$C_{s.2} = 6.6049 \frac{lb}{hr}$

$C_{s..2} := \frac{C_{s.2}}{2000 \frac{lb}{ton}}$ $C_{s..2} = 28.95 \frac{ton}{yr}$

Run 3:

$m_3 = 0.533\,gr$

$$C_{s3} := \frac{m_3}{V_{mstd3}} \qquad Eq.\ 5\text{-}6$$

$$\boxed{C_{s3} = 0.00660\,\frac{gr}{dscf}}$$

$$C_{s.3} := \frac{C_{s3} \cdot Q_{sd3}}{7000\,\frac{gr}{lb}}$$

$$\boxed{C_{s.3} = 6.2798\,\frac{lb}{hr}}$$

$$C_{s..3} := \frac{C_{s.3}}{2000\,\frac{lb}{ton}} \qquad \boxed{C_{s..3} = 27.52\,\frac{ton}{yr}}$$

$$PM := \frac{C_{s1} + C_{s2} + C_{s3}}{3}$$

$$\boxed{PM = 0.0071\,\frac{gr}{dscf}}$$

$$PM := \frac{C_{s.1} + C_{s.2} + C_{s.3}}{3}$$

$$\boxed{PM = 6.51\,\frac{lb}{hr}}$$

$$PM_{.} := \frac{C_{s..1} + C_{s..2} + C_{s..3}}{3}$$

$$\boxed{PM_{.} = 28.51\,\frac{ton}{yr}}$$

Appendix E
Calibrations and Certifications

Date: 11/03+A1/2010

USING CALIBRATED CRITICAL ORIFICES

5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	XC-522
Console Serial Number	904018
DGM Model Number	S-110
DGM Serial Number	SN953379

Calibration Conditions			
Date	**Time**	11/03/10	11:00
Barometric Pressure		29.83	in Hg
Theoretical Critical Vacuum[1]		14.1	in Hg
Calibration Technician		KC	LA-A04

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 * {}^oR^{1/2})/(in.Hg*min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
10.0	0.33	942.695	945.594	70	71	TE-40	0.2323	69.0	69.0	14.0
10.0	0.66	945.594	949.862	71	72	TE-48	0.3349	69.0	70.0	18.0
10.0	1.10	949.862	955.398	72	74	TE-55	0.4316	70.0	69.0	16.0
10.0	2.05	955.398	963.023	71	71	TE-63	0.5938	70.0	69.0	15.0
10.0	3.45	963.023	973.024	71	73	TE-73	0.7821	69.0	70.0	12.0

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
2.879	0.288	3.013	0.301	1.046	0.022	0.301	2.034	0.072
4.234	0.423	4.341	0.434	1.025	0.001	0.434	1.959	-0.003
5.482	0.548	5.595	0.560	1.021	-0.004	0.560	1.964	0.003
7.597	0.760	7.698	0.770	1.013	-0.011	0.770	1.950	-0.011
9.980	0.998	10.139	1.014	1.016	-0.008	1.014	1.901	-0.060
				1.024	Y Average		1.962	ΔH@ Average

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature Kelly Campbell Date: 3/14/11

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION

USING WET-TEST METER LA-AL20

5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	XC-522
Console Serial Number	904018
DGM Model Number	S-110
DGM Serial Number	SN953379

Calibration Conditions			
Date	Time	14-Dec-10	10:45
Barometric Pressure		30.12	in Hg
Calibration Technician		HW	
Calibration Meter Gamma		1.000	LA-A04

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

Calibration Data

Run Time	Metering Console					Calibration Meter			
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})	(Vw_i)	(Vw_f)	(t_{wi})	(t_{wf})
min	in H_2O	cubic feet	cubic feet	°F	°F	cubic feet	cubic feet	°F	°F
15.00	0.5	167.427	172.984	77	76	913.975	919.514	72	72
10.00	1.0	172.984	178.338	76	77	919.524	924.830	72	72
7.00	2.0	178.338	183.675	76	77	924.830	930.158	72	72
6.00	3.0	183.675	189.330	77	77	930.158	935.780	72	71
5.00	5.0	189.330	195.414	77	78	935.780	941.839	71	71

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Calibration Meter		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vw_{(std)}$)	($Qw_{(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
5.512	0.367	5.537	0.369	1.004	0.005	0.369	2.052	0.079
5.317	0.532	5.301	0.530	0.997	-0.002	0.530	1.994	0.022
5.313	0.759	5.323	0.760	1.002	0.003	0.760	1.948	-0.025
5.638	0.940	5.622	0.937	0.997	-0.002	0.937	1.932	-0.041
6.090	1.218	6.065	1.213	0.996	-0.003	1.213	1.938	-0.035
				0.999	Y Average		1.973	ΔH@ Average

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

Note: For $\Delta H_@$, orifice pressure differential that equates to 0.75cfm (0.0212m^3/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +-0.2inches (5.1mm) H_20.

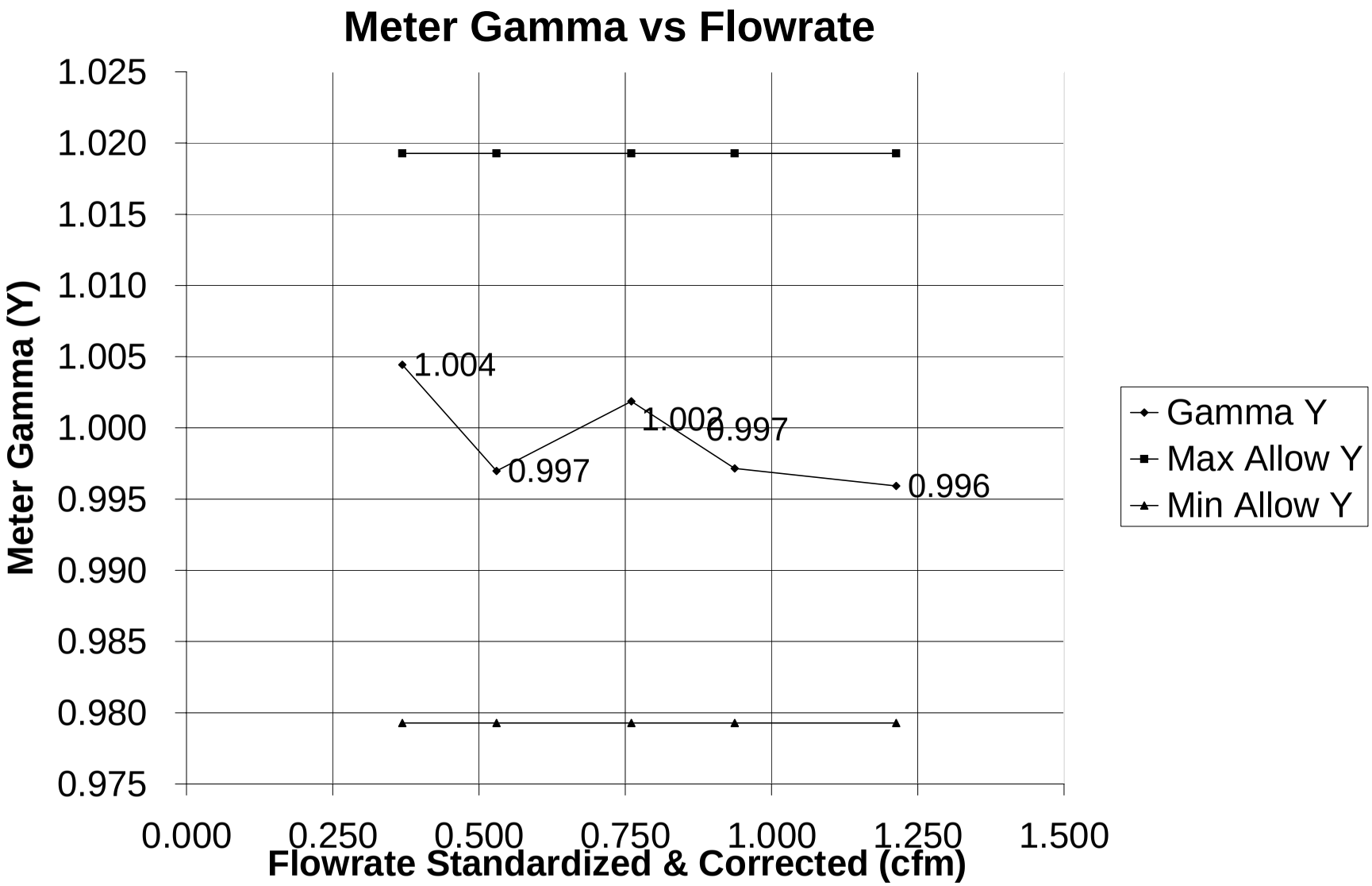
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the American Wet Test Meter # P-3218, which in turn was calibrated using the American Bell Prover # 1763, which is traceable to the National Bureau of Standards (N.I.S.T.) reference number 12169734.

Signature _____ Henry Walton Date _____ 12/14/2010

CRLLC-CHAL-000499

Calibration Date: 12-14-2010

Calibration Technician: HW



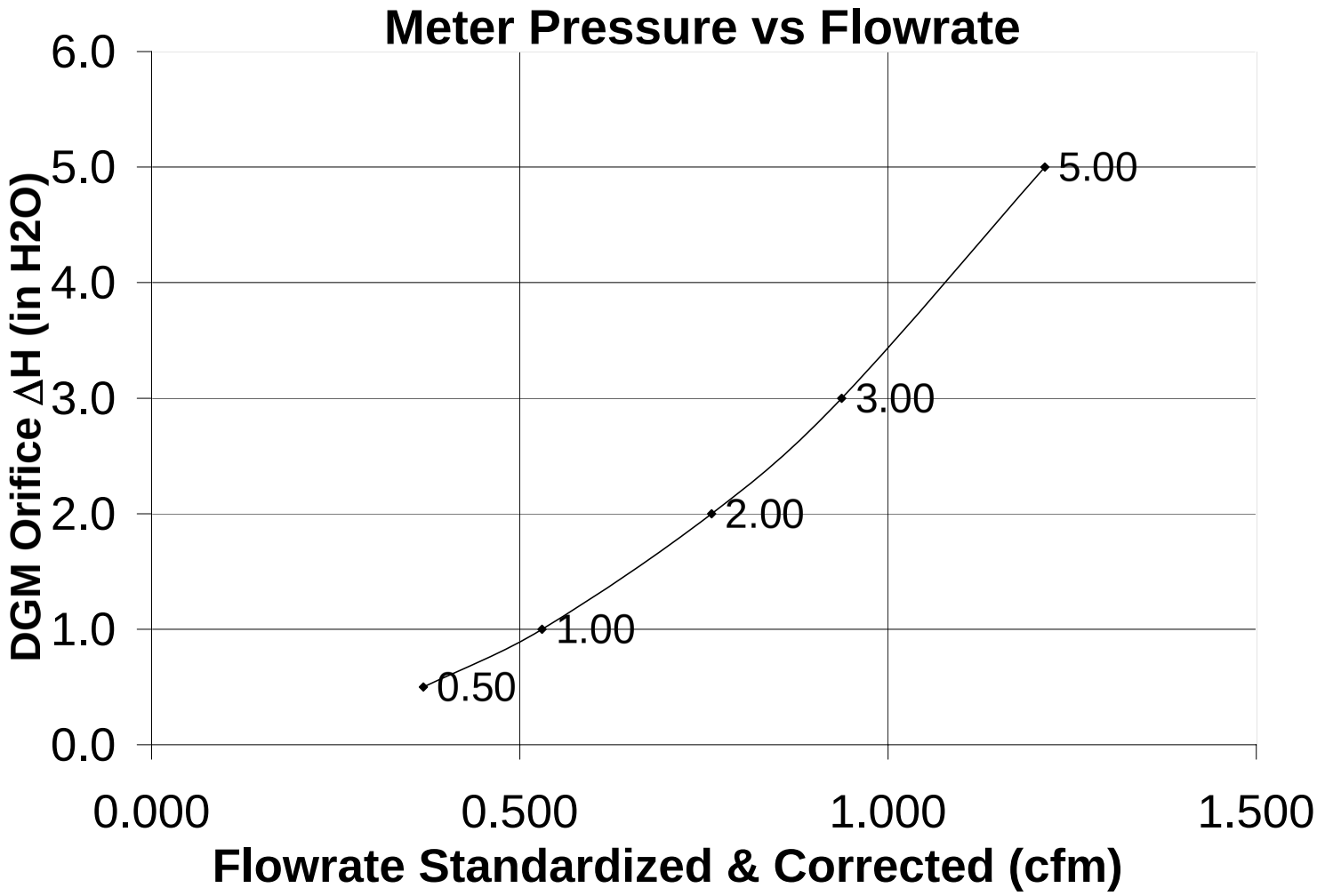
Console Serial: 904018

Console Model: XC-522

CRLLC-CHAL-000500

Calibration Date: 12-14-2010

Calibration Technician: HW



Console Serial: 904018

Console Model: XC-522

CRLLC-CHAL-000501

APEX INSTRUMENTS METHOD 5 CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	XC-522
Console Serial Number	904019
DGM Model Number	S-110
DGM Serial Number	SN363670

Calibration Conditions			
Date	Time	02/23/11	8:05
Barometric Pressure		30.00	in Hg
Theoretical Critical Vacuum[1]		14.2	in Hg
Calibration Technician		sv	LA-A03

Factors/Conversions		
Std Temp	528	^{o}R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 * {}^oR^{1/2})/(in.Hg*min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	^oF	^oF		see above2		^oF	in Hg
10.0	0.34	198.837	201.762	60	60	TE-40	0.2280	60.0	60.0	23.5
10.0	0.70	201.762	205.987	61	61	TE-48	0.3294	60.0	61.0	22.5
10.0	1.10	205.987	211.458	61	62	TE-55	0.4253	61.0	61.0	21.5
10.0	2.10	211.458	219.018	62	63	TE-63	0.5855	61.0	61.0	19.5
10.0	3.50	219.018	229.013	63	65	TE-73	0.7718	61.0	61.0	17.3

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
2.980	0.298	3.000	0.300	1.006	0.004	0.300	2.169	0.100
4.301	0.430	4.331	0.433	1.007	0.005	0.433	2.142	0.073
5.569	0.557	5.590	0.559	1.004	0.001	0.559	2.023	-0.046
7.699	0.770	7.695	0.770	0.999	-0.003	0.770	2.044	-0.025
10.185	1.018	10.144	1.014	0.996	-0.007	1.014	1.968	-0.101
				1.003	Y Average		2.069	ΔH@ Average

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature_____ Shane Vincent Date: 02/23/2011

CRLLC-CHAL-000502

Shaw Environmental Inc

Temperature Sensor Verification
Data Sheet

Date: 4-29-09

Thermocouple I.D.: LA-09P01

Technician: Jarad Wall

Console I.D.: LA-A03

NIST Temperature Sensor Probe I.D.: LA-TRT01

NIST Thermometer I.D.: LA-SSKP01

Reference NIST:	Display			Average
Ambient Temperature:	79.5	80.6	82.4	80.83333
Freezing Water:	32.5	32.9	33.1	32.83333
Boiling Water:				0
Hot Oil:				0

Thermocouple in:	Thermocouple Display:			Thermocouple Average:
Ambient Temperature	76	78	76	76.66666667
Freezing Water	32	32	32	32
Boiling Water				0
Hot Oil				0

Error Percent Difference		
Ambient Temperature	0.770886396	Pass
Freezing Water	0.169203593	Pass
Boiling Water	0	Pass
Hot Oil	0	Pass

Tolerance must be within 1.5 %

Technician Signature:

Shaw Environmental

Date: 1/10/2011

Type S Pitot Tube Inspection Form

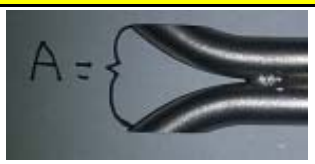
Pitot Tube: LA-PT03 | Passed

Micrometer: LA-CP03

Dt= Diameter of each Tube

Outside Diameter of Pitot?: 3/8"

A= Distance between Tubes



a1 and a2= Angle of Openings

B1 and B2= Angle of Openings

Parameter	Value	Tolerances	
Assembly Level?	Yes	Yes	Pass
Ports Damaged?	No	No	Pass
Dt	0.375	.188" to .375"	Pass
A	0.9145	for 1/4" OD: .525" to .750" for 3/8" OD: .788" to 1.125"	Pass
a1	0.9	Greater than -10 Less than +10	Pass
a2	1.4	Greater than -10 Less than +10	Pass
B1	0.2	Greater than -5 Less than +5	Pass
B2	0.6	Greater than -5 Less than +5	Pass
y	0.4	No Tolerance	
0	0.8	No Tolerance	
Z=A tan y	0.006748	Z < or = .125 "	Pass
W= A tan 0	0.016434	W < or = .031"	Pass

y= Angle of Top of Pitot Tubes

0= Angle of Side of Pitot Tubes

Technician: Kelly Campbell

Shaw Environmental Inc

Temperature Sensor Verification Data Sheet

Date: 4-28-09

Thermocouple I.D.: LA-IMP02

Technician: Jarad Wall

NIST Temperature Sensor Probe I.D.: LA-TRT01

NIST Thermometer I.D.: LA-SSKP01

Reference NIST:	Display			Average
Ambient Temperature:	79.7	77.7	79.5	78.96667
Freezing Water:	31.3	34.3	34	33.2
Boiling Water:				0
Hot Oil:				0

Thermocouple in:	Thermocouple Display:			Thermocouple Average:
Ambient Temperature	75	72	75	74
Freezing Water	30	31	31	30.66666667
Boiling Water				0
Hot Oil				0

Error Percent Difference		
Ambient Temperature	0.922081056	Pass
Freezing Water	0.513996253	Pass
Boiling Water	0	Pass
Hot Oil	0	Pass

Tolerance must be within 1.5 %

Technician Signature:

Appendix F
Applicable Permit Excerpt

File: AI. TIV. PLN. 2.01

BOBBY JINDAL
GOVERNOR

HAROLD LEGGETT, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

Certified Mail No. 7009 2820 0001 8249 7636

Agency Interest No. 1376
Activity No.: PER20100001

Mr. Richard A. Igercich
Refinery Manager
PO Box 1007
Chalmette,
LA 700441007

RE: Part 70 Operating Permit No. 3022-V4 Administrative Amendment, Chalmette Refinery, Chalmette Refining LLC, Chalmette, St. Bernard Parish, Louisiana

Dear Mr. Richard A. Igercich:

On further review of the above referenced permit and the associated Prevention of Significance Deterioration (PSD) permit, Permit No. PSD-LA-199 (M-8) dated September 15, 2009 it was determined that inadvertently the NOx emissions limits for the Alky Isostripper Reboiler, Emission Point 49, were incorrectly proposed as 0.0864 lb/MM BTU instead of 0.0914 lb/MM BTU.

The increase in the NOx emissions limit will not change the current permitted annual NOx emissions limit of 42.04 tons per year from the Alky Isostripper Reboiler. The increase in the short term limit for NOx emissions will not trigger any new regulations or requirements.

The aforementioned change is hereby approved pursuant to LAC 33:III.521.A. The attached permit document replaces the previously approved permit, Permit No. 3022-V4 dated December 15, 2009, in its entirety and retains the same permit number.

Sincerely,

Cheryl Sonnier Nolan
Assistant Secretary

12 January 2010
Date

SGQ
c: EPA Region VI

Post Office Box 4313 • Baton Rouge, Louisiana 70821-4313 • Phone 225-219-3181 • Fax 225-219-3309
www.deq.louisiana.gov

BOBBY JINDAL
GOVERNOR

HAROLD LEGGETT, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

Certified Mail No. 7009 1410 0001 6727 8847

Agency Interest No. 1376
Activity No.: PER20090032

Mr. Richard A. Igercich
Refinery Manager
Chalmette Refining, L.L.C.
Post Office Box 1007
Chalmette, Louisiana 70044

RE: Part 70 Operating Permit Modification, Fluidized Catalytic Cracking Unit and Alkylation Unit, Chalmette Refinery, Chalmette Refining, L.L.C., Chalmette, St. Bernard Parish, Louisiana

Dear Mr. Igercich:

This is to inform you that the permit modification for the above referenced facility has been approved under LAC 33:III.501. The permit is both a state preconstruction and Part 70 Operating Permit. The submittal was approved on the basis of the emissions reported and the approval in no way guarantees the design scheme presented will be capable of controlling the emissions as to the types and quantities stated. A new application must be submitted if the reported emissions are exceeded after operations begin. The synopsis, data sheets and conditions are attached herewith.

It will be considered a violation of the permit if all proposed control measures and/or equipment are not installed and properly operated and maintained as specified in the application.

Operation of this facility is hereby authorized under the terms and conditions of this permit. This authorization shall expire at midnight on the 30th of January, 2012, unless a timely and complete renewal application has been submitted six months prior to expiration. Terms and conditions of this permit shall remain in effect until such time as the permitting authority takes final action on the application for permit renewal. The permit number and agency interest number cited above should be referenced in future correspondence regarding this facility.

Please be advised that pursuant to provisions of the Environmental Quality Act and the Administrative Procedure Act, the Department may initiate review of a permit during its term. However, before it takes any action to modify, suspend or revoke a permit, the Department shall, in accordance with applicable statutes and regulations, notify the permittee by mail of the facts or operational conduct that warrant the intended action and provide the permittee with the opportunity to demonstrate compliance with all lawful requirements for the retention of the effective permit.

Done this 15 day of December, 2009

Permit No.: 3022-V4

Sincerely,

Cheryl Sonnier Nolan
Assistant Secretary
SGQ
cc: EPA Region VI

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

FLUIDIZED CATALYTIC CRACKING UNIT & ALKYLATION UNIT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	LAC 33:III.Chapter																	
		5▲	9	11	13	15	2103	2111	2113	2121	2115	2141	17	2301	29*	51*	52	56	59
UNF007	FCC-Alky Units	1	1	1	1	1			1			1			1	1		1	1
EQT183	45, FCC Heater (F-7801)			1	1	1										2			
EQT184	47, FCC Regenerator Flue Gas Scrubber Vent				1	1					2		1			1			
EQT185	48, FCC Regenerator Auxiliary Burner (F-7802 , Start Up Only)			1	1	1										2			
EQT186	49, Alky Isostripper Reboiler (F-7901)			1	1	1										2			
EQT187	71, FCC/Alky Catalyst (C-7804, C-7818, C-7829, C-7801)				1											1			
EQT188	TK-7911, Chemical Tank						2												
EQT189	FCC-Miscellaneous Process Vents					1					2					1			
EQT190	C-7948, Disulfide Separator Vent					1					2					1			
EQT264	TK-7891, Chemical Tank						2												
FUG008	FE-FCC, FCC/Alky Process Fugitives							1		1						1			

CRLLC-CHAL-000509

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

FLUIDIZED CATALYTIC CRACKING UNIT & ALKYLATION UNIT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	LAC 33:III.Chapter																	
		5▲	9	11	13	15	2103	2111	2113	2121	2115	2141	17	2301	29*	51*	52	56	59

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

* The regulations indicated above are State Only regulations except for LAC 33:III.501.C.6 Limitations that specifically state that the regulation is Federally Enforceable.

* The regulations indicated above are State Only regulations.

▲ All LAC 33:III.Chapter 5 citations are federally enforceable including LAC 33:III.501.C.6 citations, except when the requirement found in the "Specific Requirements" report specifically states that the regulation is State Only.

CRLLC-CHAL-000510

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

FLUIDIZED CATALYTIC CRACKING UNIT & ALKYLATION UNIT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	XX	GGGa	NNN	QQQ	A	J	M	V	FF	A	F	5 Gs	CC	UUU	5Ds	68	82
UNF007	FCC-Alky Units	1									1		1		1	1		1					1
EQT183	45, FCC Heater (F-7801)				1																		
EQT184	47, FCC Regenerator Flue Gas Scrubber Vent				1															1			
EQT185	48, FCC Regenerator Auxiliary Burner (F-7802				1																		
EQT186	49, Alky Isostripper Reboiler (F-7901)				1																		
EQT187	71, FCC/Alky Catalyst (C-7804, C-7818, C-7829, C-7801)																						
EQT188	TK-7911, Chemical Tank																		1				
EQT189	FCC-Miscellaneous Process Vents																		1				
EQT190	C-7948, Disulfide Separator Vent																						
EQT264	TK-789 , Chemical Tank					2				2									2				
FUG008	FE-FCC, FCC/Alky Process Fugitives							1		1/2				2					1				

CRLLC-CHAL-000511

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

FLUIDIZED CATALYTIC CRACKING UNIT & ALKYLATION UNIT
AGENCY INTEREST NO. 1376
CHALMETTE REFINING, L.L.C., CHALMETTE REFINERY
CHALMETTE, ST. BERNARD PARISH, LOUISIANA

X. Applicable Louisiana and Federal Air Quality Requirements

ID No.:	Description	40 CFR 60 NSPS									40 CFR 61					40 CFR 63 NESHAP						40 CFR	
		A	Db	Dc	J	Kb	XX	GGGa	NNN	QQQ	A	J	M	V	FF	A	F	5 Gs	CC	UUU	5Ds	68	82

KEY TO MATRIX

1 - The regulations have applicable requirements which apply to this particular emission source.
- The emission source may have an exemption from control stated in the regulation. The emission source may not have to be controlled but may have monitoring, recordkeeping, or reporting requirements.

2 - The regulations have applicable requirements which apply to this particular emission source but the source is currently exempt from these requirements due to meeting a specific criteria, such as it has not been constructed, modified or reconstructed since the regulations have been in place. If the specific criteria changes the source will have to comply at a future date.

3 - The regulations apply to this general type of emission source (i.e. vents, furnaces, and fugitives) but do not apply to this particular emission source.

Blank – The regulations clearly do not apply to this type of emission source.

CRLLC-CHAL-000512

INVENTORIES

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20100001
Permit Number: 3022-V4
Air - Title V Regular Permit Admin Amendment

Subject Item Inventory:

ID	Description	Tank Volume	Max. Operating Rate	Normal Operating Rate	Contents	Operating Time
FCC-Alky Units						
EQT 0183	45 - FCC Heater (F-7801)		70 MM BTU/hr	65 MM BTU/hr		8760 hr/yr
EQT 0184	47 - FCC Regenerator Flue Gas Scrubber Vent		625000 lb/hr	615000 lb/hr		8760 hr/yr
EQT 0185	48 - FCC Regenrator Aux. Burner (F-7802)		55 MM BTU/hr	3 MM BTU/hr		672 hr/yr
EQT 0186	49 - Alky Isostripper Reboiler (F-7901)		144 MM BTU/hr	105 MM BTU/hr		8760 hr/yr
EQT 0187	71 - FCC-Alky Catalyst Handling		27.1 MM lbs/yr			2200 hr/yr
EQT 0188	TK-7911 - Chemical Tank	88075 gallons				8760 hr/yr
EQT 0189	FCC-Misc - FCC - Miscellaneous Process Vents				Emissions routed to Flare No. 2, Permit No. 3016-V0	8760 hr/yr
EQT 0190	C-7948 - Disulfide Separator Vent				Emissions routed to Alky Isostripper Reboiler, EQT186	8760 hr/yr
EQT 0264	TK-7891 - Chemical Tank	7640 gallons				8760 hr/yr
FUG 0008	FE-FCC - FCC-Alky Process Fugitives					8760 hr/yr

Stack Information:

ID	Description	Velocity (ft/sec)	Flow Rate (cubic ft/min-actual)	Diameter (feet)	Discharge Area (square feet)	Height (feet)	Temperature (oF)
FCC-Alky Units							
EQT 0183	45 - FCC Heater (F-7801)	22.3	62750	5.25		149.9	650
EQT 0184	47 - FCC Regenerator Flue Gas Scrubber Vent	46.6	170650	8.33		213.3	145
EQT 0185	48 - FCC Regenrator Aux. Burner (F-7802)	46.6	170650	8.33		213.3	145
EQT 0186	49 - Alky Isostripper Reboiler (F-7901)	41.3	96250	5.68		190	460
EQT 0188	TK-7911 - Chemical Tank			24		25	
EQT 0264	TK-7891 - Chemical Tank			10		15	

Relationships:

Subject Item Groups:

ID	Group Type	Group Description
UNF 0007	Unit or Facility Wide	FCCALKY - FCC-Alky Units

Group Membership:

NOTE: The UNF group relationship is not printed in this table. Every subject item is a member of the UNF group

Annual Maintenance Fee:

Fee Number	Air Contaminant Source	Multiplier	Units Of Measure

TPDR0149

CRLLC-CHAL-000513

EMISSION RATES FOR CRITERIA POLLUTANTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20100001
Permit Number: 3022-V4
Air - Title V Regular Permit Admin Amendment

Subject Item	CO			NOx			PM10			SO2			VOC		
	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year	Avg lb/hr	Max lb/hr	Tons/Year
FCC-Alky Units															
EQT 0183 45	2.60	5.77	11.39	13.30	15.14	58.26	0.48	0.56	2.13	1.30	2.45	5.70	0.35	0.40	1.54
EQT 0184 47	167.31	300.25	732.80	36.64	246.70	160.50	16.75	49.32	73.37	12.28	68.14	53.79	0.84	1.89	3.69
EQT 0185 48	3.90	11.00	1.31	0.67	9.37	2.24	0.30	0.43	0.10	0.77	1.93	0.26	0.21	0.31	0.07
EQT 0186 49	4.20	11.87	18.40	9.6	16.52	42.04	0.78	1.13	3.43	2.10	5.74	9.20	0.57	0.82	2.48
EQT 0187 71							0.42	0.53	0.46				1.43	5.01	1.57
EQT 0188 TK-7911													0.01		0.04
EQT 0264 TK-7991													0.01		0.03
FUG 0008 FE-FCC													13.85		60.67

Note: Emission rates in bold are from alternate scenarios and are not included in permitted totals unless otherwise noted in a footnote.

TFOR0145

CRLLC-CHAL-000514

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20100001
Permit Number: 3022-V4
Air - Title V Regular Permit Admin Amendment

EQT 0184 47 - FCC Regenerator Flue Gas Scrubber Vent

11	[40 CFR 52.21]	Nitrogen oxides <= 80 ppmv (dry basis) at 0% oxygen and Nitrogen oxides <= 40 ppmv (dry basis) at 0% oxygen on a 365-day rolling average [Consent Decree, PSD-LA-199(M-7)]. Which Months: All Year Statistical Basis: Seven-day rolling average
12	[40 CFR 60.102(a)(1)]	Total suspended particulate <= 1 kg/Mg (2.0 lb/ton) of coke burn-off, except as specified in 40 CFR 60.102(b). Subpart J. [40 CFR 60.102(a)(1), 40 CFR 63.1564(a)(1)] Which Months: All Year Statistical Basis: None specified
13	[40 CFR 60.102(a)(2)]	Opacity <= 30 percent, except for one six-minute average opacity reading in any one hour period. Subpart J. [40 CFR 60.102(a)(2), 40 CFR 63.1564(a)(1)] Which Months: All Year Statistical Basis: Six-minute average
14	[40 CFR 60.103(a)]	Carbon monoxide <= 500 ppmv (dry basis) at 0% oxygen and Carbon monoxide <= 300 ppmv (dry basis) at 0% oxygen on a 365-day rolling average. Compliance with this requirement is considered compliance with 40 CFR 60, Subpart J [Consent Decree, PSD-LA-199(M-7)]. [40 CFR 60.103(a), 40 CFR 63.1565(a)(1), 40 CFR 52.21] Which Months: All Year Statistical Basis: Hourly average
15	[40 CFR 60.104(b)(1)]	Sulfur dioxide <= 50 ppmv (dry basis) at 0% oxygen and Sulfur dioxide <= 25 ppmv (dry basis) at 0% oxygen on a 365-day rolling average. Compliance with this requirement is considered compliance with 40 CFR 60, Subpart J [Consent Decree]. [40 CFR 60.104(b)(1)] Which Months: All Year Statistical Basis: Seven-day rolling average
16	[40 CFR 60.105(a)(12)]	Use the procedures in 40 CFR 60.105(a)(12)(i) and (ii) to evaluate the continuous monitoring systems under 40 CFR 60.105(a)(8), (a)(9), and (a)(10). Subpart J. [40 CFR 60.105(a)(12)]
17	[40 CFR 60.105(c)]	Rc & operating hours recordkeeping by electronic or hard copy daily. Record the average coke burn-off rate (Mg (tons) per hour) and hours of operation. Subpart J. [40 CFR 60.105(c)]
18	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
19	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.
20	[40 CFR 60.107(b)]	Equipment/operational data recordkeeping by electronic or hard copy continuously. Keep records of the information specified in 40 CFR 60.107(b)(1) through (b)(4), as applicable. Subpart J. [40 CFR 60.107(b)]
21	[40 CFR 60.107(c)]	Submit exceedance report: Due semiannually, except as specified in 40 CFR 60.107(d). Include the information specified in 40 CFR 60.107(c)(1) through (c)(6). Subpart J. [40 CFR 60.107(c)]
22	[40 CFR 60.107]	Permittee shall comply with all the applicable recordkeeping and reporting requirements of 40 CFR 60.107.
23	[40 CFR 60.108(d)]	After conducting the initial performance test prescribed under 40 CFR 60.8, conduct a performance test for each successive 24-hour period thereafter, according to the appropriate procedures specified under 40 CFR 60.106. Subpart J. [40 CFR 60.108(d)]
24	[40 CFR 60.108(e)]	Begin conducting daily performance tests as specified under 40 CFR 60.108(d) immediately upon electing to become subject to one of the provisions of 40 CFR 60.104(b), if initially demonstrating compliance with one of the provisions of 40 CFR 60.104(b) but at a later date seeks to comply with another of the provisions of 40 CFR 60.104(b). Furnish DEQ with a written notification of the change in the semiannual report required by 40 CFR 60.107(e). Subpart J. [40 CFR 60.108(e)]

CRLLC-CHAL-000515

SPECIFIC REQUIREMENTS

AI ID: 1376 - Chalmette Refining LLC - Chalmette Refinery
Activity Number: PER20100001
Permit Number: 3022-V4
Air - Title V Regular Permit Admin Amendment

EQT 0184 47 - FCC Regenerator Flue Gas Scrubber Vent

25	[40 CFR 60.13(i)]	As approved by EPA the permittee shall demonstrate compliance with the opacity standard as per the requirements of NSPS, 40 CFR 60.102(a)(2) by continuously monitoring the parameters on a daily basis and the excess emissions are based on the following: a) Regenerator air supply rate of 119,091 dscfm (flowmeter reading); b) Liquid to gas ratio in the wet gas scrubber of 0.0175 gpm/dscfm or greater(3-hour average); c) Any period in which the wet gas scrubber is shut down or bypassed; and d) Upon approval stack test shall be performed annually to ensure compliance with PM emissions. Any other relevent parameters monitored to show compliance. Daily records shall be kept on site and available for inspection by the DEQ personnel. Any excess emissions shall be reported to the Office of Compliance, Enforcement Division. [40 CFR 60.13(i), 40 CFR 60.105(a)(1)]
26	[LAC 33:III.1311.D]	Opacity <= 30 percent, except for one six-minute average opacity reading in any one hour period. Which Months: All Year Statistical Basis: Six-minute average
27	[LAC 33:III.1503.C]	Compliance with NSPS 40 CFR 60.104(b)(1) has been determined to be compliance with the requirements of LAC 33:III. 503.Ca.
28	[LAC 33:III.1705]	Do not emit the carbon monoxide waste gas stream from any catalyst regeneration of a petroleum cracking system, petroleum fluid coker, or other petroleum process into the atmosphere unless the waste gas stream is burned in a direct flame afterburner or boiler or is controlled by other means approved by DEQ.
29	[LAC 33:III.2115.K]	Equipment/operational data recordkeeping by electronic or hard copy as needed. Maintain records to demonstrate that the criteria are being met for any exemption claimed. Maintain records on the premises for at least two years and make such information available to representatives of the Louisiana Department of Environmental Quality and the Environmental Protection Agency upon request.
30	[LAC 33:III.501.C.6]	Permittee shall maintain and operate NOx, SO2, CO and O2 Continuous Emission Monitoring Systems (CEMS) in accordance with the quantity assurance and quality control measures as per NSPS, 40 CFR 60 Appendix F. In lieu of NSPS, 40 CFR 60, Appendix F, 5.1.1, 5.1.3, and 5.1.4 the permittee shall conduct either a Relative Accuracy Audit (RAA) or Relative Accuracy Test Audit (RATA) once every three years, provided that a Cylinder Gas Audit (CGA) is conducted each calendar quarter in which RAA or RATA is not performed [Consent Decree]. [LAC 33:III.501.C.6, 40 CFR 52.21]
31	[LAC 33:III.5109.A]	Compliance with all the applicable requirements of 40 CFR 63, Subpart UUU has been determined to be compliance with the requirements in accordance with LAC 33.III.5109.A.

EQT 0185 48 - FCC Regenrator Aux. Burner (F-7302)

32	[40 CFR 52.21]	Nitrogen oxides <= 2.2222 lb/MMBTU, annual average. [PSD-LA-199(M-7)]. [40 CFR 52.21, LAC 33:III.509] Which Months: All Year Statistical Basis: Annual average
33	[40 CFR 52.21]	Carbon monoxide <= 1.2996 lb/MMBTU, 30-day average [PSD-LA-199(M-7)]. [40 CFR 52.21, LAC 33:III.509] Which Months: All Year Statistical Basis: Thirty-day average
34	[40 CFR 60.104(a)(1)]	Fuel gas: Hydrogen sulfide <= 0.10 grdscf (230 mg/dscm) or less than 160 ppm on a three hour rolling average. Subpart J. [40 CFR 60.104(a)(1)] Which Months: All Year Statistical Basis: Three-hour rolling average
35	[40 CFR 60.106(a)]	Use as reference methods and procedures the test methods in 40 CFR 60 appendix A or other methods and procedures as specified in 40 CFR 60.106, except as provided in 40 CFR 60.8(b), in conducting the performance tests required in 40 CFR 60.8. Subpart J. [40 CFR 60.106(a)]
36	[40 CFR 60.106]	Determine compliance with standards using the test methods and procedures specified in 40 CFR 60.106(a) through (k). Subpart J.

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Appendix G
Agency Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202-2733

December 29, 2008

Charlie Kominas
Environmental Group Leader
Chalmette Refining, L.L.C.
P.O. Box 1007
Chalmette, Louisiana 70044

Re: Modifications to Approved Alternative Monitoring Plan (AMP) –Wet Gas Scrubber (WGS) Parametric Monitoring in lieu of Continuous Opacity Monitoring System (COMS) required for Fluid Catalytic Cracking Unit (FCCU) Catalyst Regenerator ("Regenerator") under New Source Performance Standards (NSPS) Part 60 Subpart J and also under National Emission Standards for Hazardous Air Pollutants (NESHAP) Part 63, Subpart UUU; Chalmette Refining; see also Civil Action Case No. 05-4662.

Dear Mr. Kominas:

This letter is in response to your AMP request, dated August 5, 2008, as referenced above. Your request involves parametric monitoring of the FCCU WGS in lieu of monitoring opacity via COMS, due to moisture interference on opacity readings in the stack. *Specifically, your request merely incorporates revisions necessary to the prior AMP approval already granted by the United States Environmental Protection Agency (EPA) on January 31, 2006, due to physical changes being implemented to the FCCU in accordance with your Consent Decree (CD).* Based upon the particular design of your FCCU WGS and based upon that process specific information and/or data provided in your request, we are granting conditional approval of the modifications proposed to the existing AMP, as delineated within this letter. As part of this conditional approval, you must conduct a representative performance test for FCCU Regenerator and WGS operations and submit your process-specific data and information to both the State permitting authority and this office in order to obtain final evaluation and approval of your AMP.

Your request is specific to Chalmette's FCCU- Reactor C-7801 and Regenerator C-7802 and associated WGS. The physical changes to the FCCU include the following:

1. Installation of ExxonMobil Thermal DeNOx technology to reduce nitrogen oxide (NOx) emissions (i.e., ammonia is used to react with the NOx in the Regenerator effluent gases), and
2. Installation of oxygen enrichment to the FCCU (i.e., oxygen injected directly into the FCCU itself) to improve efficiency.

In addition, your letter indicated that during turndown operations, the gas flow rate from the FCCU Regenerator to the WGS decreases. Your particular scrubber design is an ExxonMobil High Energy Venturi (HEV) WGS. In order to maintain effectiveness in the scrubber during turndown operations, you initially proposed to car seal open the four venturi jets where the

PM 12-31-08

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Regenerator exhaust gases mix with caustic liquid prior to entering the WGS. You also requested that pressure drop be removed as a compliance parameter since this measurement is not independent of the gas flow rate through the WGS.

After discussions with my staff on regional guidance being developed specifically for setting WGS monitoring parameters in lieu of COMS at FCCU facilities, you proposed via e-mail dated November 26, 2008, that rather than car-sealing the exhaust valves open, setting a maximum gas flow rate per number of functioning venturi jets would be indicative of continued effective scrubber performance during both typical and turndown operations. In order to set a maximum gas flow rate per functioning venturi jet, you proposed performance testing where you would operate at full FCCU capacity and then decrease the number of venturi jets while maintaining compliance.

Therefore, the following specific modifications to the approved AMP can be summarized as follows:

1. Continuous Emission Monitors (CEMS) for CO and O_2 (Tag Nos. 78AI770 and 78AI771, respectively) will be used to obtain data for calculation of the coke burn-off rate (Rc) in lieu of the CO and O_2 data from the regenerator process analyzers (Tag No. 78I102 for CO and Tag No. 78AI104 for O_2). The CO and O_2 CEMS are located in the stack of the FCCU and are used for compliance with the NSPS CO and CD limits. The process analyzers providing CO and O_2 data monitor the flue gas between the regenerator and the WGS. There are no combustion sources or other dilution air, which would impact the CO and O_2 readings at the stack CEMS locations. In addition, a performance test will be conducted to determine the coke burn-off rate with these new analyzers.

2. The oxygen enrichment terms in the equations for coke burn-off rate (Rc) and exhaust flowrate (e.g., Qgas and Qr) will be included in the compliance calculations and recorded. See Equation 1 of 40 CFR 63.1564 and Equation 2 of 40 CFR 63.1573 {NESHAP Subpart UUU}, 40 CFR 60.106(b)(3) {NSPS Subpart J}. The term "$\%O_{oxy}$ dry" will initially be established at 92% as per the current contract for purchased oxygen. A copy of the current purchase agreement or product specification for the oxygen used in the FCCU will be maintained, and the value in the equations will be adjusted based upon any changes in the contract or specification for oxygen purity.

3. Continued monitoring and reporting of Liquid-to-Gas Ratio (L/G), via Data Tag No. 78LG101: defined as total liquid flowrate (L) divided by total gas flowrate (G). L values are reported in gallons per minute (gpm) via Data Tag No. 78F1980X {approved computerized pump curve: liquid supply flow measurement is based upon the direct relationship between pump HP from electric power supply values and discharge flow} and G values are reported in dry standard cubic feet per minute (dscfm) via Data Tag No. 78FC167E {approved computerized calculations: Regenerator flue gas calculated from measured air supply rates and measured flue gas composition values of CO, CO_2, and $\%O_2$}. A new value for L/G will be determined by a performance test. Until that time, the existing approved value for L/G will be maintained (0.0175 gpm/dscfm).

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4. Establish Maximum Flue Gas Flow Rate per Number of Operating Venturi Jets (dscfm/#): a range of values may be demonstrated by performance testing for various flue gas flow rates and number of functioning venturi jets, assuming L/G is held constant.

Based upon that information submitted in your request and follow-up communications with my staff, EPA hereby conditionally approves the proposed modifications to your AMP as outlined above in accordance with 40 CFR §60.8, as specified below:

1. A performance test will be conducted at representative operating conditions for the FCCU Regenerator and WGS, whereby worst-case emissions are anticipated.

2. Parameters to be measured in the performance test will include, but not be limited to, those operating parameters listed above for the WGS as well as those operating parameters and emission monitoring parameters required for demonstrating compliance with the emission standards for the FCCU Regenerator.

3. Notice of the performance test must be submitted to the permitting authority and EPA a minimum of 30 days prior to conducting the performance test so that agency representatives may plan to observe the testing.

4. A summary of all test conditions proposed for performance testing, along with a concise summary of anticipated operating limits to be determined from the test program (with basis of operating limit – e.g., hourly rolling average basis) should also be provided with the notification of testing. If multiple test conditions are proposed, please provide a rationale for each test condition (e.g., operational flexibility, etc.).

If you have any questions or concerns about this AMP conditional approval, please do not hesitate to contact either Ms. Cynthia Kaleri of my staff at (214) 665-6772, or Mr. John Jones of my staff at (214) 655-7233.

Sincerely yours,

Esteban Herrera

for David F. Garcia
Associate Director
Air/Toxics & Inspection
Coordination Branch

cc: Robert Lucas (OAQPS)
Maria Marlave (OECA)
Jane Lacour (LDEQ)

CRLLC-CHAL-000520

Appendix H
Personnel Resumes

Last Updated: 02 Jan 2007

Richard H. Ishikawa

Professional Qualifications

Mr. Ishikawa has over 14 years of experience as an air quality professional managing large, multi-task programs. He is very knowledgeable about federal and state environmental laws and regulations.

Education

Bachelor of Science, Biology/Chemistry, Texas State University, San Marcos, Texas, 1985
Postgraduate Studies, Chemistry, University of Houston - Clear Lake, Houston, Texas

Additional Training/Continuing Education

Basic Plus Safety, Houston, TX, 2006
Respirator Training, Houston, TX, 2005
40-Hour Hazardous Waste Operations and Emergency Response Training (29CFR1910.120), Houston, TX, 1995

Experience and Background

06/2006 - Present
Project Manager, Shaw Environmental & Infrastructure, Inc., Baton Rouge, Louisiana

Responsibilities include providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Air Permit Support, Little Gypsy 3 Repowering Project, 120581, Entergy Louisiana, LLC, Baton Rouge, LA, 07/2006 - 08/2006
Submit Title V air permit application.

11/1996 - 06/2006
Project Manager, Entech Engineering Inc., League City, Texas

Responsibilities included providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Project Manager, Wet -Scrubber Removal Efficiency Test Program, , Lubrizol Corporation, Deer Park, Texas, $50,000.00, 05/2006 - 06/2006
Quantify HRVOC/VOC and HCL/Cl2 emissions during worst-case operations at multiple wet scrubbers. Determine HCl/Cl2 removal efficiencies.

Project Manager, HRVOC Source Inventory, , Chevron Phillips Chemical Company, Pasadena, TX, $1,000,000.00, 10/2005 - 06/2006
Identify and quantify all potential sources of HRVOC/VOC emissions during worst-case operations at multiple polymer plants within the Pasadena Plastics Plant. The project involved multiple crews working two twelve-hour shifts over several months.

Other Comments:
Project was long-term and was still continuing when I departed. The revenue for this one project was year-to-date.

Project Manager, Ambient H2S Monitoring, , MeadWestvaco Paper Plant, Vidor, Texas, $30,000.00, 04/2006 - 04/2006
12-Hour fenceline monitoring of ambient H2S concentrations. The data was to support plant claim that TCEQ measurements were inconclusive.

Project Manager, Fuel Gas H2S Monitoring Project, , ExxonMobil Chemical Company, Beaumont, Texas, $40,000.00, 12/2005 - 02/2006
Long-term project involving the continuous measurement of H2S content of fuel gas.

04/1992 - 11/1996
Principal Environmental Scientist, Tenerx Corporation, Friendswood, Texas

Responsibilities included providing support to client projects and office staff as a technical consultant. Also responsible for business development, preparing technical portions of major project proposals.

The following is a summary of key projects:
Principal Environmental Scientist, Burner Optimization Project, , Tennessee Valley Authority, Knoxville, TN, $150,000.00, 10/1995 - 10/1995
Long-term project to facilitate the optimization of the burners for minimizing fuel usage.

Accomplishments:
Fuel saving over a year estimated between 0.8 to 1 million dollars.

Professional Affiliations
Air and Waste Management Association, 1992

Last Updated: 04 Dec 2008

Blake Fogleman

Professional Qualifications

Blake Fogleman has over a year of engineering consulting experience, providing technical assistance, engineering design, and project support. He has performed engineering calculations, report and presentation generation, as well as daily support in several civil and environmental engineering projects throughout the United States. He has been specifically involved in wetland and vegetation surveying, dredging design, roadway design, geotechnical design, and site development. Blake is most recently involved in providing technical assistance, in the field and office, on numerous air emission testing projects.

Education

Bachelor of Science, Civil and Environmental Engineering, Louisiana State University, Baton Rouge, Louisiana, 2007

Additional Training/Continuing Education

Basic Plus Safety, Baton Rouge Safety Council, 2008

Registrations/Certifications/Licenses

Engineering Intern, 2007, 0028729, Active, Louisiana, 03/2010

Security Clearance

Transportation Worker Identification Credential, Department of Homeland Security/FEMA, 2008, Active, 04/2013

Experience and Background

01/2008 - Present
Engineer 1, Shaw Environmental & Infrastructure, Inc., Engineering and National Air Measurement Group, Baton Rouge, Louisiana

Responsibilities include assistance with engineering calculations, graphing, and report generation. Daily activities include working alongside mid-level civil and environmental engineers and scientists, under direct supervision of the Program Manager.

05/2007 - 12/2007
Intern / Co-Op, Shaw Environmental & Infrastructure, Inc., Engineering, Baton Rouge, Louisiana

Assisted in engineering calculations, graphing, and project report preparations. Daily activities included working alongside mid-level civil and environmental engineers under the direct supervision of the Program Manager

06/2000 - 01/2007
General Assistant, BCI Louisiana, Mermentau, Louisiana

Assisted in development of process flows and piping for pilot plant expansion project. Participated in operations of Biomass to Ethanol R and D facility. Pipe fabricator's assistant. Ground keeper and maintenance in a fifty acre refinery. Handled all accounting functions for the plant: AR, payroll, GL, etc.

07/2001 - 07/2006
Louisiana Youth Seminar Counselor and Staff Assistant, Louisiana Seminars of America, Baton Rouge, Louisiana

One of four high school delegates chosen out of 200 to return and honor a four year commitment as a leader of LYS.
Staff (junior counselor and counselor) 4 years, Head Table (2 years)

Planned and organized 2005 and 2006's week long program. Assisted in executive duties during program. Political Party Coordinator. Responsible for daily leadership activities of 15-20 high school delegates. Mentor for Junior Counselor.

08/2001 - 06/2006
Louisiana Boys State Counselor and Staff member, Louisiana Boys State, Baton Rouge, Louisiana

Chosen out of 600 high school juniors to lead Louisiana Boys State as a counselor.
Requested to serve every year from 2001 to 2006.

Logistics and Operations supervisor. Organization and supervision of daily activities of up to 600 Boys State citizens and 60 counselors. Development and organization of Louisiana Boys State 2006

Professional Affiliations

Air & Waste Management Association, fellow, 2008
Louisiana Engineering Society, fellow, 2008
Louisiana Water Environment Association, fellow, 2006
WEF, fellow, 2005
Louisiana Water Environment Association at LSU, fellow, 2003

Last Updated: 13 Oct 2008

James D. Rink

Professional Qualifications

Mr. Rink is an environmental technician with experience in air sampling, and the measuring of gaseous and particulate pollutants. He performs various test methods according to the Code of Federal Regulations(CFR), promulgated by the Environmental Protection Agency(EPA). Such methods include the determination of gas velocities, and volumetric flow rates, as well as the measurement of pollutant concentrations in gas streams. He has worked extensively on emission sources such as gas turbines, boilers, and engines. Mr. Rink also has experience maintaining and repairing different air sampling equipment.

Education

Bachelor of Science, Geography, Louisiana State University, Baton Rouge, Louisiana, 2006

Additional Training/Continuing Education

24-Hour Hazerdous Waste Operations and Emergency Response (29CFR1910.120) , Baton Rouge Safety Council, 2007

Experience and Background

09/2008 - Present
Engineering Technician 1, Shaw Environmental & Infrastructure, Inc., Baton Rouge, Louisiana

Responsibilities include maintaining and calibration of equipment, as well as performing on site QA/QA, job safety analysis, and data reduction.

The following is a summary of key projects:
Sampling Technician, Compliance Tests of Gas Turbines, 590166, Astoria Power, Astoria, New York, 09/2008 - 10/2008
Setup sampling equipment in order to perform various EPA tests. However, testing could not be performed due to problems in the facility.

Sampling Technician, Compliance Testing of Hot Oil Heater and Regenerative Thermal Oxidizer, Enterprise Products Company, Meeker, Colorado, 09/2008 - 09/2008
Particulate matter was sampled isokinetically by using a vacuum pump to pull the effluants though a glass fiber filter.

09/2006 - 09/2008
Environmental Technician, Schwartz Environmental Testing Company, Baton Rouge, Louisiana

Responsibilities include maintaining and calibration of equipment as well as on site QA/QC, job

safety analysis and data reduction.

Appendix I
Contact Information

Contact Information

The ExxonMobil contact for additional information is Mr. Jeff Bergeron. The testing organization is Shaw Environmental, Inc. and the contact at Shaw is Mr. Richard Ishikawa. The names and addresses of these contacts are as follows:

Mr. Jeff Bergeron, P.E.
Environmental Advisor
ExxonMobil – Chalmette Refining, LLC
500 W. St. Bernard Highway
Chalmette, LA 70044
Bus: (504) 281-1934
E-mail: jeff.bergeron@exxonmobil.com

Mr. Richard Ishikawa
Project Manager
Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, LA 70809
Bus: 225.932.2745
Fax: 225.213.1274
E-mail: richard.ishikawa@shawgrp.com