Almega
ENVIRONMENTAL

November 18, 2010

Mr. "Shawn" Chanh Tieu
BP West Coast Products, LLC
2350 East 223rd Street
Carson, California 90810

Sub: Source test report for emissions testing of Tail Gas Unit Incinerator No.1 for CO, PM, and VOC at BP West Coast Products LLC, located in Carson, California (Facility ID: 131003).

Dear Mr. Tieu:

Please find enclosed three copies of the subject source test report. Additionally, a copy of this report has been sent to you electronically. Testing was conducted on October 18, 2010.

If you have any questions or comments regarding the enclosed package, please contact Mr. Charles Figueroa or myself at 714-889-4000.

Sincerely,

Surya Adhikari
Project Manager

SOURCE TEST REPORT

Emissions Testing of Tail Gas Unit Incinerator No.1 for CO, PM, and VOC

Facility ID: 131003
Device ID: C2413

Prepared for:

BP West Coast Products, LLC
2350 East 223rd Street
Carson, California 90810

Test Date(s): October 18, 2010

Report Date: November 18, 2010

Project: 9036

Prepared by:

Almega Environmental & Technical Services
5251 McFadden Avenue
Huntington Beach, CA 92649

Prepared by: _____
Surya Adhikari, Project Manager

Reviewed by: _____
Charles Figueroa, Sr. Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

Appendices

Attachments

1.0 EXECUTIVE SUMMARY

Key project information is provided in the summary below. Test results are summarized in Table 1-1.

Customer	BP West Coast Products, LLC. 2350 East 223rd Street Carson, California 90810 Contact: Mr. "Shawn" Chanh Tieu, tel. (310) 847-5644
Equipment Location	Same
Facility ID	131003
Equipment	Tail Gas Unit Incinerator No.1 (TGU-1)
Device ID Number	C2413
Test Objective	Measure emissions of carbon monoxide (CO), particulate matter (PM) and volatile organic compounds (VOCs) to satisfy the conditions of applicable SCAQMD permit requirements.
Test Requested by	Mr. "Shawn" Chanh Tieu of BP West Coast Products, LLC.
Test Date(s)	October 18, 2010
Testing Firm	Almega Environmental & Technical Services 5251 McFadden Avenue Huntington Beach, CA 92649 Contact: Mr. Surya Adhikari, tel (714) 889-4000
Test Personnel	Tom Tran and Bryan Harrison of Almega Environmental & Technical Services
Regulatory Agency	South Coast Air Quality Management District (SCAQMD) 21865 East Copley Drive Diamond Bar, CA 91765-4182 Contact: Mr. Mike Cecconi, tel: (909) 396-2244

TABLE 1-1. SUMMARY OF RESULTS

Facility: BP West Coast Products, LLC
City: Carson, CA
Source: No. 1 TGU
Location: Stack

TEST DATA	Units	Test Results	Allowed Limit
Test Date	m/d/y	10/18/10	
Test Time	hh:mm	11:01-12:21	
Process Data[1]			
Firing rate, Rated	MMBtu/hr	39.5	
Sampling Data[2]			
Stack Temperature	°F	1,319	
Moisture	%	9.01	
Gas Velocity	ft/sec	27.5	
Stack Flow Rate	acfm	99,292	
Stack Flow Rate	dscfm	26,424	
SCAQMD Method 100.1 - CEMS			
Stack Diluent Gases			
Oxygen, O2, as measured	%	5.04	
Carbon Dioxide, as measured	%	4.67	
Carbon Monoxide, CO			
Concentration, as measured	ppmv	125	**2000 (Rule 407)**
Concentration @ 3% O2	ppmv	141	
Emission Rate	lbs/hr	14.6	
SCAQMD Method 5.1 - Particulate Matter			
Total PM			
Total Catch	mg	21.5	
Concentration	gr/dscf	0.00715	**0.0550 (Rule 404)**
Concentration @ 12% CO2	gr/dscf @12%	0.0184	**0.1 (Rule 409)**
Emission Rate	lbs/hr	1.62	
SCAQMD Method 25.3 - Total Hydrocarbons			
TGNMO, as Methane			
Reported per AB2588 guidelines[3]			
Concentration,	ppmv	2.81	
Mass Emission Rate	lbs/hr (as hexane)	0.168	
Utilizing values observed below the reporting limit [4]			
Concentration,	ppmv	2.60	
Mass Emission Rate	lbs/hr (as hexane)	0.156	

Notes:
(1) Process data was provided by the facility. Unit was operating on natural gas.
(2) Performed during isokinetic sampling (e.g.SCAQMD Method 5.1).
(3) One-half value of the "reporting limit" is substituted for the ND results as specified in AB2588 guidelines.
(4) For qualitative purposes only.

2.0 INTRODUCTION

Almega Environmental & Technical Services (Almega) has been contracted by BP West Coast Products, LLC to conduct stationary source emissions testing of the Tail Gas Unit Incinerator No.1 (TGU-1) at its facility located in Carson, California. The purpose of the test was to measure emissions from the exhaust of this unit for carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOCs) to satisfy conditions of the applicable SCAQMD permit requirements.

The CO testing was conducted to satisfy the requirements of SCAQMD Rule 407 as detailed in Condition D328.1. Particulate testing was conducted to demonstrate compliance for SCAQMD Rules 404 and 409. Testing for VOC was conducted for internal reporting purposes.

Table 2-1 lists the test matrix employed during the test.

TABLE 2-1. TEST MATRIX

PARAMETER	LOCATION	TEST METHOD	# OF TEST RUNS	TEST TIME
Stack Traverse Points	Exhaust	SCAQMD Methods 1.1	As Required	--
Stack Gas Flow Rate	Exhaust	SCAQMD Method 2.1	1	72 min.
Molecular Weight and Excess Air	Exhaust	SCAQMD Method 3.1	1	≥ 60 min.
Moisture	Exhaust	SCAQMD Method 4.1	1	72 min.
CO, O_2, & CO_2	Exhaust	SCAQMD Method 100.1	1	≥ 60 min.
Particulate Matter (PM)	Exhaust	SCAQMD Method 5.1	1	72 min.
VOC as TGNMO	Exhaust	SCAQMD Method 25.3	1 (Dup)	60 min.

Almega performed source testing while the process was operated at its normal operating conditions. Sampling was performed at the exhaust stack. Testing was conducted as specified in the reference methods.

2.1 Document Outline

This report is organized as follows. Section 1.0 is a summary of the project and test results. Section 2.0 describes the project, its objectives and approach. Section 3.0 discusses test results. Section 4.0 describes the equipment tested and applicable sampling locations. Section 5.0 describes the sampling and analytical procedures used to conduct the testing. And Section 6.0 describes Quality Assurance and Quality Control activities performed. The Appendices contain

test results, calculated data, raw field data, facility process and test data, calibration records, certification documents, and laboratory data package.

3.0 TEST RESULTS AND DISCUSSION

The testing was conducted after the arrival of Almega's test personnel and set-up of test equipment. The source was operated by plant personnel during testing activities. The testing was conducted at normal operating conditions for the process. No unusual operating conditions were noted during the test periods.

3.1 Test Discussion

Test results are summarized in Table 1-1. Detailed test results are discussed below.

- The measured CO concentration was 125 ppmv, which is less than the limit of 2000 ppmv imposed by Rule 407. The corresponding CO mass emission rate was 14.6 lbs/hr. The CO testing was conducted for the duration of 64 minutes. Even though the CO concentration went below the reference method analytical range for continuous 4 minutes during the traverse sampling at port C, the average CO concentration did not have a substantial impact and considered a representative sampling.

- The measured particulate matter (PM) concentrations were 0.00715 grains/dscf, and 0.0184 grains/dscf corrected to 12% CO2. These concentrations are less than the limit of 0.0550 and 0.1 grains/dscf imposed by Rule 404 and 409 respectively. The corresponding PM mass emission rate was 1.62 lbs/hr.

- 86% of the PM measured was collected in the back-up filter. Of this PM collected on the filter, 99% was analyzed to be a sulfate compound. A majority of this emission can therefore be attributed to a non- soluble sulfate compound (e.g. barium sulfate).

- The reported VOC concentration, TGNMO as methane, was 2.81 ppmv. The corresponding VOC emission rate, calculated as hexane, was 0.168 lbs/hr. Test results for VOC were reported in accordance with the guidelines for source test reporting under California's AB2588, Air Toxics Hot Spots Regulations, which reports the analysis results below the limit of detection (i.e. none detected or ND), substituting with one half of the detection limit.

- The VOC concentration below the reporting limit was also reported for qualitative purposes. The measured VOC concentration, TGNMO as methane, was reported as 2.60 ppmv, which included the analysis values observed below the reporting limit. This corresponding VOC emission rate, calculated as hexane, was 0.156 lbs/hr.

3.1.1 Others

- All measured concentrations were corrected for bias zero and bias calibration drifts according to SCAQMD Method 100.1 (See Appendix C1).

- All instruments performed properly during testing and their performance specifications were within the allowable limits specified in Method 100.1 (See Appendix C1).

- Reference Method CEMS probe was traversed across the stack for the representative sampling (See Strip chart and DAS).

- Cyclonic flow check was performed prior to the sampling. No cyclonic flow was found (See Appendix D2).

Testing was performed as specified in the reference methods. No modifications to proposed sampling and analysis procedures other than those noted above were required.

3.2 Test Chronology

Testing for CO, O_2, CO_2, PM, VOC, and other performance testing were conducted during the periods listed below:

Parameter-Measurement	Test Date
CO, PM, and VOC	October 18, 2010 (11:01-12:21)

4.0 EQUIPMENT AND PROCESS DESCRIPTION

BP West Coast Products, LLC is a petroleum refining company that refines oil and produces oil products. The process and equipment tested are described below.

4.1 Process Description

The hydrogen sulfide (H2S) and ammonia (NH3) from the DEA strippers and sour water strippers are burned in the Claus Plant muffle furnaces and further reacted in downstream catalyst beds to form sulfur, sulfur dioxide (SO_2), and water. Sulfur dioxide that is not converted to sulfur in the Claus Plant is sent to the Tail gas Unit (TGU) and is converted to hydrogen sulfide in the presence of a catalyst. The hydrogen sulfide is then absorbed using MDEA and sent back to the Claus Plant. Some unrecirculated hydrogen sulfide remains in the tail gas is sent to the incinerators.

The incinerators are used to oxidize the excess hydrogen sulfide in process gases from the gas absorber tower, the tail gas bypass from four Claus Sulfur Plants and the sulfur pit vent gases, to sulfur dioxide in the stack outlet gas.

The thermal oxidizer, No.1 is fired on refinery gas or natural gas with rated heat input of 39.5 MMBtu/hr. The unit was operating on natural gas during the test.

4.2 Operating Conditions During Test

The process was operated normally during the test period. The unit operates 24 hours a day. Supporting information for process conditions during the testing can be found in the respective Appendix.

4.3 Sampling Locations

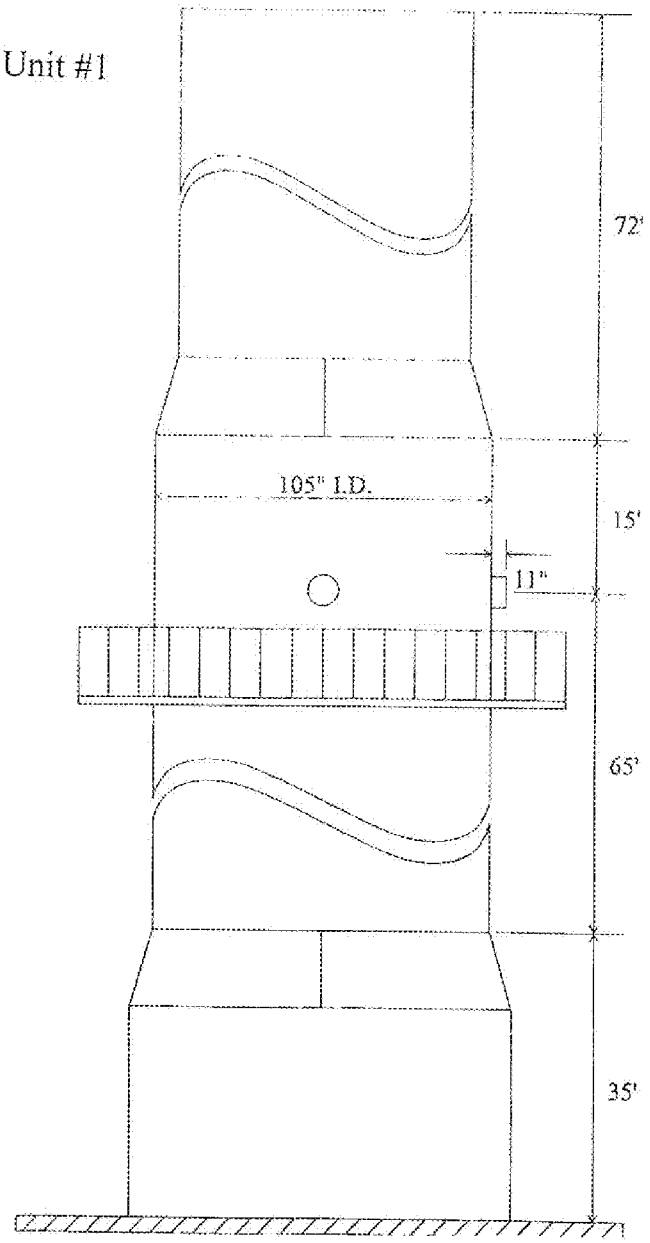
The reference method sampling locations are located on the exhaust stack. A schematic of the stack with sampling locations are shown in Figure 4-1. The reference method sampling locations meet the following specifications:

Sampling Location Configuration for Reference Method CEMS Probe:	
Upstream	780 in. (7.43 duct diameter)
Downstream	180 in. (1.71 duct diameter)
Port Length	11 in. (measured from outside wall)
Port Inside Diameter	4 in. Port Inside Diameter
Number of sampling ports	4 (located at 90° intervals)
Stack Diameter	105 in. (internal diameter)

The sampling location complies with the requirements of SCAQMD Method 1.1.

Figure 4-1. Stack Schematic

BP Carson Refinery
South Side
Unit: Tail Gas Unit #1



5.0 SAMPLING AND ANALYTICAL PROCEDURES

Test measurements were performed according to sampling and analysis procedures promulgated by the South Coast Air Quality Management District (SCAQMD), California Air Resources Board (CARB), or US Environmental Protection Agency (EPA). The sampling and analysis procedures used for this test program are summarized below. Any modifications or deviations not addressed herein are discussed in Section 3 of this report.

5.1 SCAQMD Methods 1.1-4 .1– Determination of Stack Gas Volumetric Flow Rate, Molecular Weight, and Moisture Content
5.1.1 SCAQMD Method 1.1 – Sampling Traverse Points
5.1.2 SCAQMD Method 2.1 – Stack Gas Flow Rate
5.1.3 SCAQMD Method 3.1 – Stack Gas Molecular Weight
5.1.4 SCAQMD Method 4.1 – Stack Gas Moisture Content
5.2 SCAQMD Method 100.1 – Continuous Monitoring of Gaseous Emissions, CEMS
5.3 SCAQMD Method 5.1 – Particulate Matter
5.4 SCAQMD Method 25.3 – VOC, as TGNMO (Low-level)

5.1 SCAQMD Methods 1.1-4.1 – Determination of Stack Gas Volumetric Flow Rate, Molecular Weight, and Moisture Content

The fuel gas flow characteristics (i.e. flow rate, molecular weight, and moisture content) were determined according to SCAQMD Methods 1.1 through 4.1. The testing was conducted as follows:

5.1.1 SAMPLING AND VELOCITY TRAVERSE POINTS

The number and location of traverse points were determined according to SCAQMD Method 1 based on the physical dimensions of the sampling location and process parameters. In principle, the stack cross-section is divided into equal areas, each of which was represented by a “traverse point”. Generally, the number of traverse points diminished as the flow profile at the sampling location became uniform. In most cases, the maximum number of sampling points is 24 for particulate testing and 16 for velocity traverses. Fewer traverse points were permitted as described in the method.

5.1.2 STACK GAS VELOCITY AND FLOW RATE

The velocity and volumetric flow rate of the stack gas was determined according to SCAQMD Method 2. In this method, the velocity head (differential pressure) and temperature are measured at the required traverse points. The stack gas differential pressure head was determined using an "S" type pitot tube and inclined manometer as differential pressure gauge. The temperature was measured using a type "K" thermocouple (TC) and digital temperature readout.

Prior to testing, the measurement system was set-up and leak-checked. Then the velocity head and temperature were recorded at predetermined traverse points. After the last traverse was completed, the system was again leak-checked. After completion of the traverse, the static pressure in the stack was determined in the centroid of the stack. The stack gas velocity was calculated using the velocity head, and stack gas temperature, pressure and molecular weight.

QA/QC for the method included field performance checks, and periodic calibrations of test equipment including the pitot tube, differential pressure gauge, TC and TC-readout. A swirl check was also performed to assess cyclonic flow.

5.1.3 STACK GAS MOLECULAR WEIGHT

The stack gas molecular weight (MW) was calculated based on the fraction of its major constituents including: oxygen (O_2), carbon dioxide, (CO_2), nitrogen (N_2), carbon monoxide (CO), and water (H_2O). The dry MW was calculated based on the partial fractions of O_2, CO_2, N_2, and CO. Specifically, the O_2 and CO_2 fractions were determined by CEMS, integrated sampling, or grab sampling, and the balance was assumed to be N_2 and CO. The wet MW was calculated based on the fractions of dry gas and water vapor. The dry and wet MW were calculated according to the following equations:

$$MW_{DRY} = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (\%N_2 + \%CO)$$

$$MW_{WET} = 0.18 \times \%H_2O + MW_{DRY} \times (1 - \%H_2O/100)$$

where:
- MW_{DRY} = stack gas molecular weight, dry-basis
- MW_{WET} = stack gas molecular weight, wet-basis
- 0.32 = molecular weight fraction for O_2
- 0.44 = molecular weight fraction for CO_2
- 0.28 = molecular weight fraction for N_2 and CO
- 0.18 = molecular weight fraction for H_2O (water vapor)
- %X = fraction of X in stack gas, dry basis, where X = O_2, CO_2, N_2, CO
- $\%H_2O$ = fraction of water vapor in stack gas, wet-basis

5.1.4 SCAQMD METHOD 4.1- STACK GAS MOISTURE CONTENT

The stack gas moisture content was determined according to SCAQMD Method 4.1. In this method, water vapor is collected in a condenser while the dry stack gas volume is measured using a dry gas meter. The volume of water vapor was calculated from the amount of water condensed and the total gas volume was the sum of water vapor plus dry stack gas. The moisture content was determined as a fraction of the total wet stack gas volume. The following calculations were used.

$$B_{WS} = \frac{V_{W,Std}}{V_{M,Std} + V_{W,Std}}$$

$$V_{W,Std} = K_1 \mathbf{x} V_{H2O}$$

$$V_{M,Std} = T_{Std}/P_{Std} \mathbf{x} Y_M \mathbf{x} V_M \mathbf{x} P_M/T_M$$

where:
B_{WS} = Fraction of water vapor in stack gas
$V_{W,Std}$ = Volume of water vapor (scf)
$V_{M,Std}$ = Volume of stack gas sampled (dscf)
K_1 = Unit volume of water vapor (0.04707 scf @68^{o}F or 0.0464 scf @60^{o}F)
T_{Std} = Standard Temperature (528^{o}R or 520^{o}R)
P_{Std} = Standard Pressure, 29.92 in. Hg
Y_M = Dry gas meter calibration factor
V_M = Measured volume of stack gas sampled
P_M = Dry gas meter pressure (in. Hg)
T_M = Dry gas meter temperature (^{o}R)

Moisture content was determined simultaneously with isokinetic sampling of particulate matter.

5.2 SCAQMD Method 100.1 - Continuous Monitoring of Gaseous Emissions, CEMS

In this method, gaseous components of the stack gas (e.g. NO_X, SO_2, O_2, CO) are measured continuously according to SCAQMD Method 100.1 using Almega's mobile continuous emissions monitoring system (CEMS). Figure 5-1 is a schematic of Almega's CEMS.

The CEMS extracts and conditions a representative stack gas sample and analyzed the gas using one or more analytical instruments. Typical CEMS instrumentation is described in Table 5-1. The extraction and conditioning system consists of a stainless steel heated probe, a short heated TFE sample line, a conditioning system, a TFE-diaphragm pump and a TFE transport (sample) line. The sample conditioning system, consisting of water knockout impingers and/or a thermoelectric condenser, removed moisture before the gas was delivered to the analyzers. Sample flow and delivery are controlled using a flow control panel that included valves, pressure gauges, and flow meters (rotameters). The flow control panel allows the user to deliver sample gas to any and all instruments. Instrument readings are recorded using a real-time strip chart and an electronic data acquisition system (DAS). Other pertinent data such as calibration gas cylinder numbers and concentrations, test location, dates, times, and operator identification are also recorded on the strip chart and on the field data form.

Sampling included pretest and post-test calibration and bias checks for each sampling run. Raw concentration data were corrected for sampling system bias according to Method 100.1 using the following equation:

$$C_{CORR} = C_{MA} \times \frac{(C_i - BIAS_{ZERO})}{(BIAS_{SPAN} - BIAS_{ZERO})}$$

Where:
- C_{CORR} = Concentration, corrected for drift and bias
- C_i = Average measured concentration (raw value)
- $BIAS_{ZERO}$ = Average instrument response during zero bias check
- C_{MA} = Certified concentration of applicable span gas
- $BIAS_{SPAN}$ = Average instrument response during span bias check

The following QA/QC activities were performed during testing.

- Prior to testing, each individual analyzer was calibrated (adjusted) by introducing zero, hi-span and mid-span gases directly into each analyzer and by making corresponding adjustments.

- Prior to testing, calibration error, linearity and system bias checks were performed on each analyzer. Calibration error and linearity checks were performed by injecting known calibration gases directly to each instrument. System bias checks were performed by injecting calibration gases at the sampling-probe/junction or at the sampling probe tip.

- The system response time for each parameter was determined at the moment when the calibration gas for the bias check reached 95% of its expected concentration value.

- A leak check was conducted before sampling and periodically thereafter to ensure that no leakage occurred in the entire sampling apparatus. The leak check was performed on the vacuum side by sealing the probe tip and increasing vacuum to above 20 inches of mercury. After the vacuum stabilized, it should have held constantly at about 20 in. Hg On the pressure side, the pressure gauge indicator should have dropped to zero and flow to each individual rotameter also should have dropped to zero to indicate a successful leak check.

- Calibration gases used to span instrumentation conformed to EPA Protocol-1. Certificates of analysis for calibration gases are included in the report.

Figure 5-1. Continuous Emissions Monitoring System

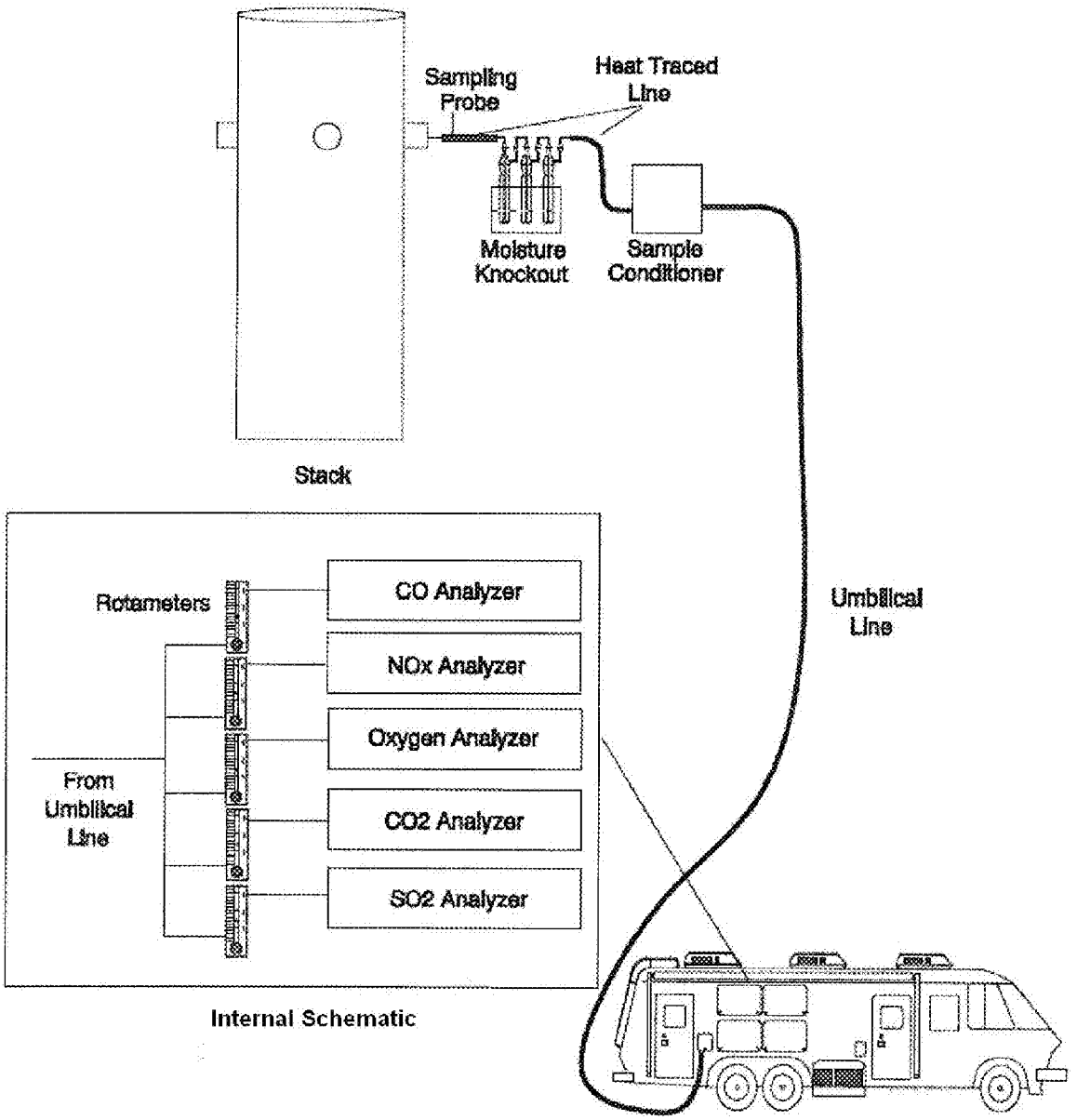


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TABLE 5-1. ALMEGA CEMS – GENERAL EQUIPMENT SPECIFICATIONS

ANALYZERS					
Specification	**O2**	**CO2**	**NOx**	**CO**	**SO2**
Manufacturer	Teledyne	Servomex	T-API	Thermo Electron	Western Research
Model	326RA	1400B	200AH	48C	921
Analytical Principle	E-Chemical Cell	NDIR	Chemiluminescent	NDIR-GCC	NDUV
Ranges	%: 0-5, -10, -25	%: 0-5, -10, -20	ppmv: 0-2.5, -10, -25, -50, -100, -250, -1,000	ppmv: 0-20, -50, -100, -200, -500, -1k, x10	ppmv: 0-10, -25, -50, -100, -200, -300
Accuracy, % of Full Scale	+/- 1%	+/- 1%	+/- 1%	+/- 1%	+ 0.5%
Repeatability, % of Full Scale	0.5%	0.5%	0.5%	0.5%	0.5%
Sensitivity, % of Full Scale	0.5%	0.5%	0.5%	0.5%	<2% of Range
Zero/Span Drift, % of Full Scale	+/- 1%, in 24 Hrs	+/- 1%, in 24 Hrs	+/- 1%, in 24 Hrs	+/- 1%, in 24 Hrs	-
Response Time	3 Seconds	<2 Seconds	1.7 Seconds	<2.0 Seconds	30 seconds
Linearity, % of Full Scale	< 1%	< 1%	< 1%	< 1%	< 1%
Output	1V DC, 5V DC	0.1V DC, 1V DC	1V DC, 10V DC	1V DC, 10V DC	0-1V DC

OTHER CEMS EQUIPMENT				
Specification	**Sample Conditioner**		**Stripchart Recorder**	
System used	Primary	Back-up	System used	Primary
Manufacturer	Almega	Universal	Manufacturer	Yokogawa
Model	(in-house)	Model 1090	Model	Model HR 2400
Principle	Refrigeration	Refrigeration	Pen Response	3 sec.
Max. Inlet Temperature	>700 F	500 F	Input Voltage	user-selectable
Max. Inlet Pressure	50 psi	50 psi	Chart Speed	user-selectable
Max. Flow Rate	10 SCFH	7.0 Lpm	Chart Width	10 inches
Max. Water Concentration	50%	50%	Output	user-selectable
Outlet Dew-Point Temperature	< 37 F	35 F +/- 2 F	No. of Channels	30 user-select. 30 calc'd
Dew-Point Stability		+/- 0.5 F	Colors	10 color, user-selectable

5.3 SCAQMD Method 5.1 - Total Particulate Matter

Measurements to determine total particulate matter were performed according to SCAQMD Method 5.1. In this method, a stack gas sample is isokinetically extracted from the stack through a stainless steel nozzle and probe and transported to an impinger train in an ice bath. Entrained particulate were collected in the impingers and on a back-up filter placed between the 3rd and 4th impingers. Figure 5-2 is a schematic of the sampling apparatus.

Prior to testing, a series of measurements were made to determine location and number of traverse points, gas velocity, MW, and moisture content. The results of these measurements were used to determine the appropriate nozzle size for isokinetic sampling. The sampling rate was adjusted to maintain isokinetic conditions based on pitot and TC measurements.

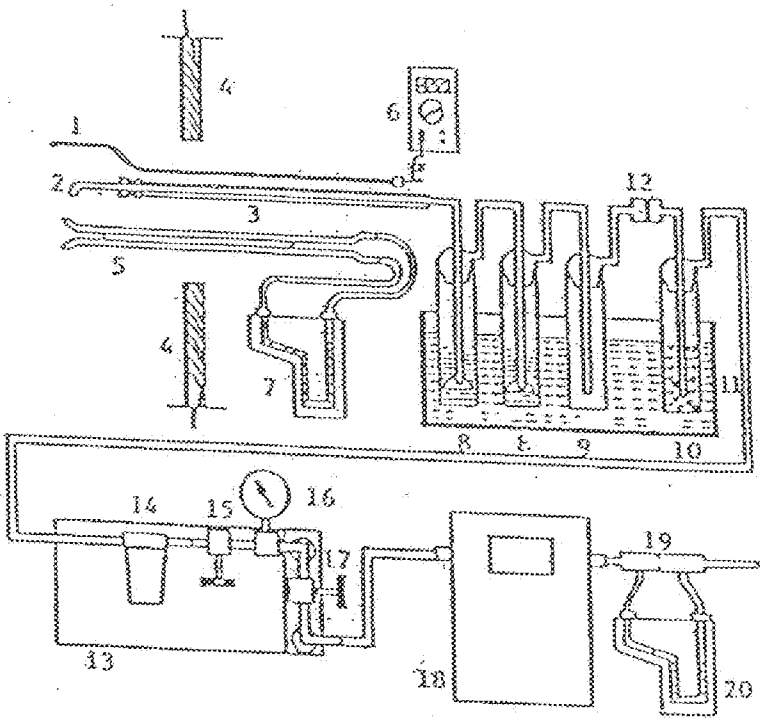
The sampling train was prepared by charging impingers # 1 and # 2 with 100 ml of D.I. water and impinger # 4 with approximately 200 g of silica gel. Impinger # 3 was left empty. Finally, the sampling train was the sealed, transported to the sampling location, and leak-checked. Sampling was performed at each traverse point. After completing the test, the Method 5.1 sample was taken to a secured area (ie. Mobile test van or Almega's laboratory) and recovered.

The recovered samples were entered into Almega's Sample Custody Program and delivered to the laboratory for analysis. At the laboratory, samples were analyzed as follows:

The filter was removed and placed in a desiccator until completely dry. Following drying, the filter was weighed to determine the fraction of sample acquired on the filter. The probe, nozzle, sampling lines, and impingers were washed with deionized water and methylene chloride, and the washing solutions were combined with the impinger solutions. The combined solution was extracted with methylene chloride. The aqueous fraction was heated to boil off water, and the organic fraction was allowed to evaporate at room temperature. Residues from both fractions were weighed and combined with the sample weight from the filter to determine the total particulate sample weight. Samples were stored at 4 °C until analyzed at Almega's in-house laboratory.

If necessary, the samples are further analyzed by wet-chemistry to determine acids and sulfates content. Field and laboratory data were used to calculate sample volume corrected to standard conditions, stack gas flow rate, and particulate emissions. Emissions were reported in gr/dscf and lb/hr.

Figure 5-2. Sampling Apparatus for Particulate Matter



1. Temperature Sensor
2. Nozzle
3. Glass Lined Stainless Steel Probe
4. S-type Pitot Tube
5. Stack Wall
6. Temperature Sensor Meter
7. Pitot Tube Inclined Manometer
8. Impinger with 100 ml H_2O
9. Empty Bubbler
10. Bubbler with Silica Gel
11. Ice Bath
12. Filter
13. Sealed Pump (Leak Free)
14. Filter for Pump
15. Metering Valve
16. Vacuum Gauge
17. By-pass Valve
18. Temperature Compensated Dry Gas Meter
19. Orifice
20. Orifice Inclined Manometer

5.4 SCAQMD Method 25.3 – VOC, as TGNMO (Low-level)

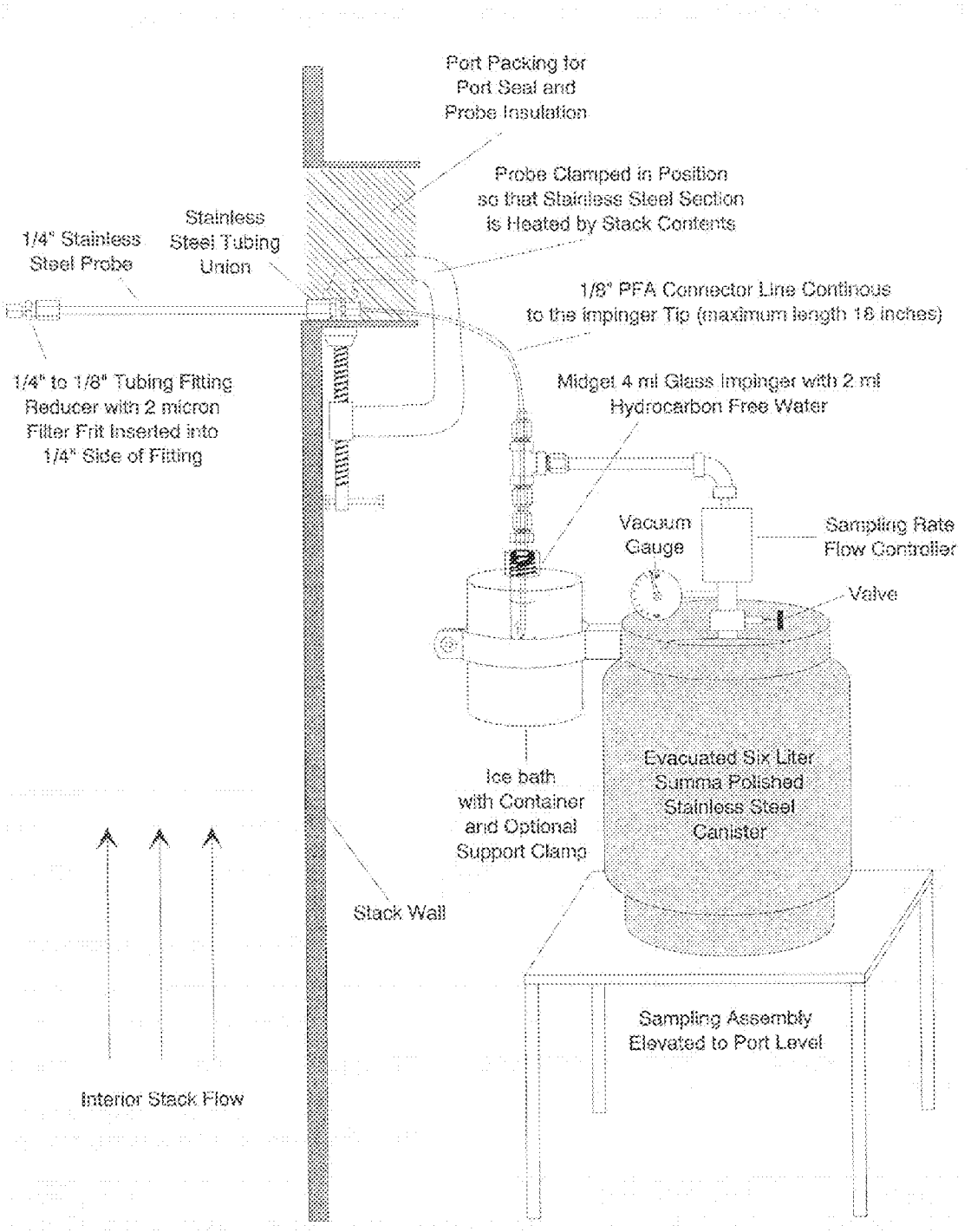
This method applies to the measurement of low-concentration (</= 50 ppmv) Volatile Organic Compounds (VOC) or total gaseous non-methane organics (TGNMO) as carbon in source emissions. In this method, gaseous samples are withdrawn from the gas stream at a constant rate through duplicate chilled condensate traps and collected in evacuated sample tanks. The sampling system is depicted in Figure 5-3. Each sampling train (there are two) consisted of an in-stack filter (optional), sample probe, water-chilled mini-impinger, a flow control system, and an evacuated sample tank. The flow controller incorporated a combination vacuum/pressure gauge, which was connected directly to the canister. The TGNMO was determined by combining the analytical results obtained from independent analyses of the condensate traps (condensible fraction) and the sample tanks (gaseous fraction).

Prior to testing, the sampling system was pre-cleaned and evacuated in preparation for sample collection. On-site, the sampling system was leak-checked and the impingers were placed in an ice-slurry (the impingers are chilled for at least 30 minutes prior to sampling). Then the sample probe was placed in the stack, facing downstream to prevent collection of particulate matter. Pretest data was recorded and the sample valve was opened. The flow controller was based on a critical orifice that was preset to flow at a rate of 80-cc/min +/- 15%. The sample probe was traversed when necessary. Periodically, sampling train readings (i.e. tank vacuum) were recorded on the field data sheet. Sampling was stopped when one hour had elapsed and/or and tank vacuum reached 5 inches as indicated by the vacuum gauge. Then, the sampling train was removed from the stack and a leak check was performed. Samples were logged in and delivered to the laboratory for analysis.

The analytical system consisted of two major sub-systems: a total organic carbon (TOC) analyzer capable of differentiating between total carbon (TC) and inorganic carbon (IC) and a non-methane organics (NMO) analyzer. The NMO analyzer was a gas chromatograph (GC) with back flush capability for NMO analysis and was equipped with an oxidation catalyst, reduction catalyst, and flame ionization detector (FID). The system for the recovery and conditioning of the organics captured in the condensate trap consisted of a heat source, oxidation catalyst, non-dispersive infrared (NDIR) CO_2 analyzer and an intermediate collection vessel (ICV.

NMO collected in the water impinger were analyzed in the TOC analyzer. The TOC analyzer determined both TC and IC. And the TOC was calculated as the difference between TC and IC.
The organic content of the sample fraction collected in the sampling tank was measured by injecting a gas sample into the GC to separate the NMO from carbon monoxide (CO), CO_2 and CH_4. The NMO were oxidized to CO_2, reduced to CH_4, and measured by the FID. In this manner, the variable response of the FID (associated with different type of organic compounds) was eliminated. The sampling apparatus and sample analysis services were provided by Almega, which is a SCAQMD-approved laboratory.

Figure 5-3. Sampling Apparatus for TGNMO per SCAQMD Method 25.3
(Figure shows one train – actual method was run in duplicate simultaneously)



6.0 QUALITY ASSURANCE AND QUALITY CONTROL

Almega applies stringent quality assurance and quality control (QA/QC) procedures to ensure the validity of measurements for all test methods. The following section discusses general and project-specific QA/QC measures.

6.1 General QA/QC

Almega's QA/QC procedures follow guidelines from the "Quality Assurance Handbook for Air Pollution Measurement Systems," Volume I through III. And, procedures for pretest preparation and calibration of sampling equipment are followed. Standardized written procedures, calculator programs, and computer spreadsheets are used for test planning, pre-survey, equipment checklist, preliminary calculations, testing, data analysis, and reporting. Pretest equipment preparation and maintenance include organization of the following equipment prior to testing:

- Mobile RM CEM test van: Check fluids, fuel, mechanical conditions, verify operation of CEM instruments, sample lines and sample conditioner prior to the date of the source test.

- Sampling Equipment: Check meter boxes, pitot tubes, manometers and thermocouples to ensure in good working conditions and in proper calibrations. Preclean sampling trains and seal all openings prior to use.

Calibrations are performed in accordance with Chapter III of the SCAQMD Source Test Manual (March 1989). Table 6-1 shows the test equipment calibration schedules. Table 6-2 shows the test equipment maintenance schedules.

6.2 Project-Specific QA/QC

This project includes specific QA/QC activities required to validate the test results. These QA/QC activities are based on the test methods discussed in Section 5 and generally acceptable test procedures. Reference Methods used for source testing are promulgated by the South Coast Air Quality Management District (SCAQMD), the California Air Resource Board (CARB), or the US Environmental Protection Agency (EPA). Any deviations from published Methods are approved in advance by the regulatory agency (i.e. SCAQMD), prior to implementation if possible. Project-specific QA/QC activities and results that may have impacted test results are discussed in Section 3.

TABLE 6-1. TEST EQUIPMENT CALIBRATION SCHEDULE

Equipment	Calibration Period	Standard or Method of Calibration
Thermocouples	6 Months and 2 Months	Mercury Thermometer, three point (ice, boiling water, hot oil)
Dry Gas Meters	6 Months and 2 Months	Critical orifice
Field Barometers	6 Months, Check prior to usage	Mercury Barometer
S-Type Pitot	6 Months Check prior to usage	EPA Method 2, Measure physical configuration. Reshape pitot tips or calibrate if configuration does not meet the limits.
Pressure gauges	6 Months 1 Month	Five-point calibration against manometer Three-point check
Temp. Meters	6 Months	Precision Potentiometer
CEM Systems	Bimonthly, or as needed	Specified by Manufacturer

TABLE 6-2. TEST EQUIPMENT MAINTENANCE

Equipment	Check For	Correction	Frequency
CEM Systems	Absence of malfunction, noise, drift, conversion efficiency for NOx anlzr.	As required by the manufacture, or depending on performance	Bimonthly
Pumps	Absence of leakage, flow, proper vacuum	Replace parts, inspect, clean	300 hours of usage
Flow Devices	Levelling, zeroing, obstruction, deformation	Clean, replace, or re-calibrate	300 hours of usage
Calibration Gases	Expiration date, tank pressure	Re-certify, order new gases	2 months and prior to field testing
Regulators	Malfunction, Gauge precision	Repair or replace	3 months and prior to field testing
Gas Divider	Malfunction, precision	Repair or replace	Monthly and before field testing
Condensers	Leakage, temperature	Repair or replace	Monthly and before field testing
Heated lines	Leakage, temperature, cleanliness	Repair, replace, clean	Monthly and before field testing

APPENDICES

APPENDIX A

GENERAL CALCULATIONS AND FORMULAE

GENERAL CALCULATIONS

Standard conditions: 29.92 in.Hg, 60 °F

Gas Moisture at standard conditions (scf): $V_{WTR} = K2*V_{COND}$
$K2 = 0.04707$ @ 68 °F, 0.0464 @ 60 °F

Sample volume at standard conditions (scf):
$Vmstd = K1*Vmacf*Ym*(Pbar+dH/13.6)/(Tm+460)$
$K1 = 17.64$ @ 68 °F, 17.38 @ 60 °F

Percent of water: $\%H_2O = 100*Vmstd/(Vmstd+Vwtr)$

Dry molecular weight: $M_d = (44*\%CO_2+32*\%O_2+28*(\%N_2+\%CO))/100$

Wet molecular weight: $M_w = M_d*(1-\%H_2O/100)+18*(\%H_2O/100)$

Stack gas pressure (In. Hg): $P_{stk} = P_{bar}+P_{stg}/13.6$

Average velocity head: Ave. $dP = \{SQRT(dP)\}^2$

Stack gas velocity (fps): $V = 85.49*C_p*SQRT(dP)*SQRT((T_S+460)/(P_{STK}*M_w))$

Percent of excess air: $\%EXCA = 100*(\%O_2-0.5\%CO)/(0.264(\%N_2-(\%O_2-0.5\%CO)))$

Stack gas flow (scfm): $Q_{STK} = 60(1-\%H_2O/100)*V*A*(528/(T_s+460))*P_{stk}/29.92$

Concentration at 3% O_2: $PPM\ @\ 3\%\ O_2 = PPM_{measured}*17.9/(20.9-\%O_2)$

Emissions lb/MMBtu:
$lb/MMBtu = PPM*10^{-6}*(MW\ lb/lb\text{-}mole)/SV\ Mole*F_d*20.9/(20.9-\%O_2)$

Emissions lb/hr:
$lb/hr = PPM*10^{-6}*((MW\ lb/lb\text{-}mole)/SV)*F_d*FF*(1050\ Btu/scf)*20.9/(20.9-\%O_2)$

CALCULATIONS FOR METHOD 100.1:

Corrected $PPM = (PPM_{measured}-C_o)*C_{ma}/(C_m-C_o)$

Where: C_o = Average of initial and final bias zeros
C_m = Average of initial and final bias calibrations
C_{ma} = Certified gas value used for the bias calibration.

CALCULATIONS FOR METHOD 100.1, continued

Calibration Error=	100*(Certified value-Anlzr response)/Anlzr range
Percent Bias=	100*(Direct Anlzr response-Bias response)/Anlzr range
System Zero/Span Drifts=	100*(Final-Initial)/Anlzr range
Linearity=	100*(Anlzr mid. gas response-Predictive value)/range

Where the Predictive Value for the mid gas is found by a straight line drawn between hi gas and zero gas calibration points which can be calculated from the straight line equation, Y=mx+b where m is the slope of the line and b is the Y-intercept. The calculation is done by a computer spreadsheet for Method 100.1.

DEFINITIONS

A:	Stack cross area, Square feet
Cp:	Pitot coefficient
@h:	Orifice Pressure, In. H2O
MW:	Molecular weight
Md:	Dry molecular weight of flue gas
Mw:	Wet molecular weight of flue gas
Pbar:	Barometric pressure, In. Hg
Psta:	Static Pressure, In. H2O
Pstk:	Stack pressure, In, Hg
P:	Stack differential pressure, In. H2O
Qstk:	Stack gas flow, scfm
Tm:	Meter temperature, F
Ts:	Stack gas temperature, F
Vcond:	Volume of water condensation, ml
Vm:	Meter volume, acf
Vmstd:	Sample gas at standard conditions, scf
Vwtr:	Water vapor volume, scf
Ym:	Meter correction factor
SV:	Specific molar volume, 379.5 dscf/Lb.mole at 60F, or 385.3 dscf/Lb.mole at 68F
FF:	Fuel Flow Rate (SCF/HR)
Fd:	Dry Fuel Factor, for natural gas Fd=8710 Dscf/MMBTU at 68F.

APPENDIX B

APPROVALS AND CERTIFICATIONS

Appendix B1

SCAQMD and CARB Testing Approvals

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

June 22, 2010

Mr. John W. Phillips
Almega Environmental
5251 McFadden Avenue
Huntington Beach, CA 92649

Subject: LAP Approval Notice
Reference # 93LA0827

Dear Mr. Phillips:

We completed our review of the renewal application you submitted for approval under the South Coast Air Quality Management District's Laboratory Approval Program (LAP). We are pleased to inform you that your firm is approved for the period beginning June 30, 2010 and ending June 30, 2011 for the following methods:

SCAQMD Methods 1-4
SCAQMD Methods 10.1
SCAQMD Method 25.1 (Analysis)
SCAQMD Method 25.1 (Sampling)
SCAQMD Method 25.3 (Analysis)
SCAQMD Method 5.1
SCAQMD Method 6.1
SCAQMD Method 7.1
SCAQMD Method 100.1
SCAQMD Rules1121/1146.2 Protocols
SCAQMD Rule 1420 (Ambient Sampling)
SCAQMD Rule 1420 (Source Sampling)
SCAQMD Rule 462 Test

Thank you for participating in the LAP program. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions.

You may direct any questions or information to LAP Coordinator, Ramiro Gonzalez. He may be reached by telephone at (909) 396-2228, by facsimile at (909) 396-2099 or via email: rgonzalez@aqmd.gov

Sincerely,

For: Rudy Eden, Senior Manager
Source Test Engineering

RE:RG:av
cc: Ramiro Gonzalez

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

June 9, 2010

John W. Phillips
Almega Environmental
5251 McFadden Avenue
Huntington Beach, CA 92649

Dear Mr. Phillips:

Subject: Laboratory Approval Program Approval
Re: Reference # 93LA0827

I am pleased to inform you that your firm is approved under the South Coast Air Quality Management District's Laboratory Approval Program (AQMD LAP) for the period beginning June 9, 2010 and ending June 30, 2011 for the following methods:

USEPA CTM-030
ASTM D6522-00

Thank you for participating in the AQMD LAP. Your cooperation helps us to achieve the goal of the AQMD LAP: to maintain high standards of quality in the sampling and analysis of source emissions.

You may direct any questions or information to AQMD LAP Coordinator Ramiro Gonzalez. He may be reached by telephone at (909)396-2228, by facsimile at (909)396-2099 or by email at rgonzalez@aqmd.gov .

Sincerely,

Rudy Eden, Sr. Manager
Laboratory Services and
Source Testing & Engineering

RWE:RG:av

cc: Ramiro Gonzalez

State of California

Air Resources Board

Approved Independent Contractor

Almega Environmental & Technical Services, Incorporated

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2010, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 8, 11, 13B, 17
100(CO, CO_2, NO_x, O_2, SO_2, THC), 410A; 434

for William V. Loscutoff, Chief
Monitoring and Laboratory Division

Appendix B2

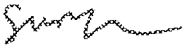
Certification of No Conflict-of-Interest

Certification of No Conflict-of-Interest

Almega Environmental & Technical Services
5251 McFadden Avenue
Huntington Beach, CA 92649

I certify that I am responsible for the testing operations of Almega and am authorized to sign this certificate on the Company's behalf.

Almega may conduct tests as an independent tester pursuant to SCAQMD Rule 304(k). I further certify that Almega has no conflict-of-interests, and is not related or owned in any way to the company being tested.

Company being tested:	BP West Coast Products, LLC
Facility ID:	131003
Device ID:	C2413
Signature:	
Name (printed or typed):	Surya Adhikari
Title:	Project Manager
Date:	November 15, 2010

APPENDIX C

REFERENCE METHOD CONTINUOUS EMISSIONS MONITORING SYSTEM

(RM CEMS)

Appendix C1

RM CEMS – Results and Calculations

Facility: BP West Coast Products, LLC.
Location: Carson, CA
Source: No. 1 TGU
Device ID: C2413

Run Information				Flue Gas Composition									Pollutant 1: CO (MW: 28 lb/lb-mole)		
Run No.	Test Date	Start Time	End Time	Moisture %	Flow Rate: dry scfm	dry scfh	wet scfm	wet scfh	O2 dry %	O2 wet %	CO2 dry %	CO2 wet %	dry ppm	dry ppm @3%O2	lbs/hr
1	10/18/10	11:04	12:19	9.81	26,424	1,585,440	29,041	1,742,433	5.04	4.59	4.67	4.25	124.6	140.7	14.58

* Based on Standard
Conditions of:
60 deg. F and
29.92 in. Hg

C-1-1

Facility:	BP West Coast Products, LLC.	Run No.:	1
Location:	Carson, CA	Test Date:	10/18/10
Source:	No. 1 TGU	Run Start Time:	11:04
Device ID:	C2413	Run End Time:	12:19

TEST DATA		Pollutant 1	Diluent 1	Diluent 2	
VARIABLE	DESCRIPTION	CO	O2	CO2	
A	ANALYTICAL RANGE	200	10	20	
	Unit of Measurement	ppmd	% dry	% dry	
	CALIBRATION GAS INFORMATION				
B	Zero Gas	0.00	0.00	0.00	
C'	Low Gas Concentration				
	Low Gas Cylinder S/N:				
C	Mid Gas Concentration	90.23	4.531	8.967	
	Mid Gas Cylinder S/N:	CC278176	CC184103	CC184103	
D	High Gas Concentration	181.9	8.74	18	
	High Gas Cylinder S/N:	CC305636	CC180176	CC180176	
	Primary Gas Cylinder S/N:				
E	UPSCALE CALIBRATION GAS USED	90.23	4.53	8.97	
	L=Low, M=Mid, H=High	M	M	M	
	INITIAL CALIBRATION ERROR TEST				
F	Zero Gas Response	0.36	0.00	0.00	
G'	Low Gas Response				
G	Mid Gas Response	90.69	4.53	8.97	
H	High Gas Reponse	181.74	8.78	17.85	
	INITIAL SYSTEM CALIBRATION CHECK				
I	Zero Gas Response	0.40	0.00	0.00	
J	Upscale Gas Response	90.03	4.53	8.94	
	FINAL SYSTEM CALIBRATION CHECK				
K	Zero Gas Response	0.00	0.00	0.06	
L	Upscale Gas Response	88.91	4.53	9.07	
	FINAL CALIBRATION ERROR CHECK				
M	Zero Gas Response	0.17	0.00	0.06	
N'	Low Gas Response				
N	Mid Gas Response	90.18	4.53	9.06	
O	High Gas Reponse	182.31	8.78	18.01	
P	AS MEASURED FLUE GAS CONCENTRATION	123.50	5.04	4.70	

CALCULATIONS					FORMULA
	AVERAGE SYSTEM CALIBRATION				
Q	Zero Response	0.20	0.00	0.03	(I+K)/2
R	Upscale Response	89.47	4.53	9.01	(J+L)/2
S	CORRECTED CONC.	124.63	5.04	4.67	E*(P-Q)/(R-Q)

QA/QC CALCULATIONS

CALIBRATION GAS SELECTION, % of Range				
Low Gas				C'*100/A
Mid Gas	45.1	45.3	44.8	C*100/A
High Gas	91.0	87.4	90.0	D*100/A
CALIBRATION ERROR, % of Range				
Initial Zero Gas Error	0.18	0.00	0.00	(F-B)*100/A
Initial Low Gas Error				(G'-C')*100/A
Initial Mid Gas Error	0.21	-0.01	0.02	(G-C)*100/A
Initial High Gas Error	-0.08	0.40	-0.75	(H-D)*100/A
Final Zero Gas Error	0.09	0.00	0.30	(M-B)*100/A
Final Low Gas Error				(N'-C')*100/A
Final Mid Gas Error	-0.02	-0.01	0.47	(N-C)*100/A
Final High Gas Error	0.20	0.40	0.05	(O-D)*100/A
LINEARITY, % of Range				
Initial	0.16	-0.22	0.39	{(G-F)-[(H-F)*C]/D}*100/A
Final	-0.17	-0.22	0.29	{(N-M)-[(O-M)*C]/D}*100/A
SAMPLING SYSTEM BIAS, % of Range				
Initial Zero Gas Bias	0.02	0.00	0.00	(I-F)*100/A
Initial Upscale Gas Bias	-0.31	0.00	-0.15	(J-G[or G', or H]*100/A
Final Zero Gas Bias	-0.09	0.00	0.00	(K-M)*100/A
Final Upscale Gas Bias	-0.64	0.00	0.05	(L-N[or N', or O]*100/A
CALIBRATION DRIFT, % of Range				
Zero	-0.20	0.00	0.30	(K-I)*100/A
Upscale	-0.56	0.00	0.65	(L-J)*100/A

C-2

Appendix C2

RM CEMS – Stripchart

BPCAR-00000044

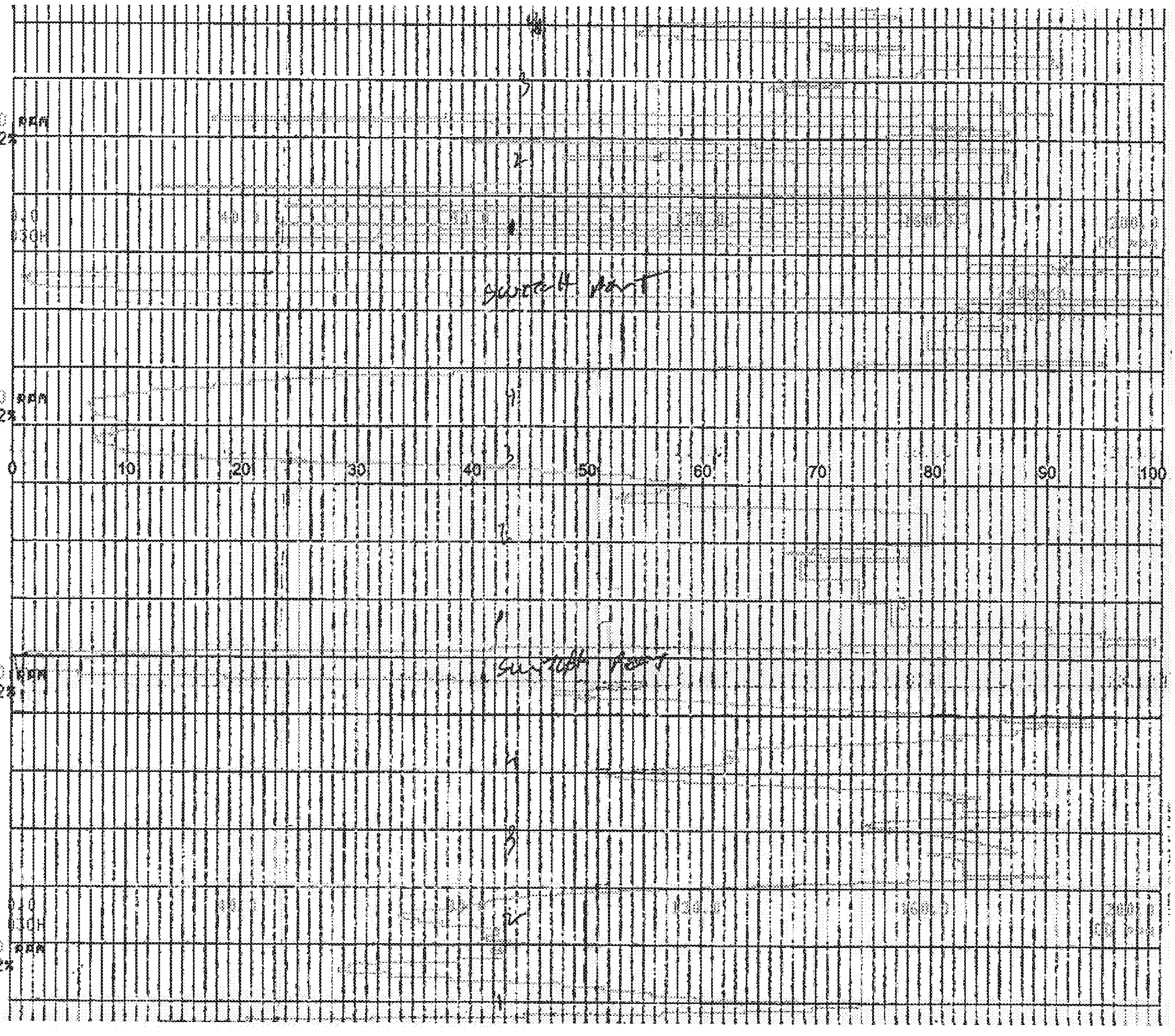
Oct.10 11:37
INTVL 1
03
01
Oct.10 11:22
INTVL 1
03
01
Oct.10 11:07
INTVL 1
INTVL 1

03 80.3C0 RAM
01 5.1202%
Oct.18 12:07
INTVL 1

03 51.8C0 RAM
01 4.9202%
Oct.18 11:52
INTVL 1

03 163.0C0 RAM
01 5.2202%
Oct.18 11:37
INTVL 1

03 128.6C0 RAM
01 5.2202%
Oct.18 11:22
INTVL 1



BPCAR-00000047

Appendix C3

RM CEMS – One-Minute DAS Data

Reference Method Reduced DAS Data

Facility	BP West Coast Products, LLC.
Location	Carson, CA
Unit	No. 1 TGU
Date/Time	10/18/2010 10:36
Job Number	9036

Date	Time	O2%	CO2%	CO ppm	
10/18/2010	10:37:01	0	0	0.46	Pre-Internal Calibration
10/18/2010	10:38:01	0	0	0.36	Local Cal Zero
10/18/2010	10:39:01	4.18	10.02	96.76	
10/18/2010	10:40:01	8.83	17.62	185.26	
10/18/2010	10:41:01	8.78	17.79	178.29	
10/18/2010	10:42:01	8.78	17.83	180.75	
10/18/2010	10:43:01	8.78	17.85	181.74	High
10/18/2010	10:44:01	7.33	11.43	192.05	
10/18/2010	10:45:01	4.5	8.73	81.75	
10/18/2010	10:46:01	4.53	8.84	79.02	
10/18/2010	10:47:01	4.53	8.96	91.99	
10/18/2010	10:48:01	4.53	8.96	101.27	
10/18/2010	10:49:01	4.53	8.97	92.9	
10/18/2010	10:50:01	4.53	8.97	90.65	Mid
10/18/2010	10:51:01	3.9	6.58	82.83	
10/18/2010	10:52:01	0.01	0	3.29	System Calibration
10/18/2010	10:53:01	0	0	0.4	System Bias Zero
10/18/2010	10:54:01	0.82	3.19	0.4	
10/18/2010	10:55:01	4.5	8.93	0.4	
10/18/2010	10:56:01	4.53	8.94	0.4	Bias Mid O2/CO2
10/18/2010	10:57:01	4.01	6.62	1.47	
10/18/2010	10:58:01	0.02	0	78.6	
10/18/2010	10:59:01	0	0	90.96	
10/18/2010	11:00:01	0	0	90.03	Bias Mid CO
10/18/2010	11:01:01	1.61	2.58	87.3	
10/18/2010	11:02:01	5.19	4.78	93.27	
10/18/2010	11:03:01	5.19	4.78	120.92	Port A
10/18/2010	11:04:01	5.19	4.78	145.39	1
10/18/2010	11:05:01	5.14	4.78	128.59	
10/18/2010	11:06:01	5.16	4.78	149.71	
10/18/2010	11:07:01	5.12	4.78	174.43	
10/18/2010	11:08:01	5.07	4.78	134.12	2
10/18/2010	11:09:01	5.16	4.77	112.41	
10/18/2010	11:10:01	5.12	4.77	147.94	
10/18/2010	11:11:01	5.19	4.77	162.19	
10/18/2010	11:12:01	5.14	4.77	162.02	3
10/18/2010	11:13:01	5.08	4.77	124.23	
10/18/2010	11:14:01	5.22	4.77	131.45	
10/18/2010	11:15:01	4.73	4.29	149.21	
10/18/2010	11:16:01	5	4.62	118.87	4
10/18/2010	11:17:01	5.02	4.79	77.09	
10/18/2010	11:18:01	5.02	4.79	51.04	
10/18/2010	11:19:01	5.04	4.8	50.42	
10/18/2010	11:20:01	5.28	4.2	43.39	
10/18/2010	11:21:01	313.32	0.41	10.6	Switch Port
10/18/2010	11:22:01	79.89	4.63	37.31	

Cz-1

Reference Method Reduced DAS Data

Facility	BP West Coast Products, LLC.
Location	Carson, CA
Unit	No. 1 TGU
Date/Time	10/18/2010 10:36
Job Number	9036

Date	Time	O2%	CO2%	CO ppm	
10/18/2010	11:23:01	5.2	4.73	130.27	Port B
10/18/2010	11:24:01	5.13	4.75	99.2	1
10/18/2010	11:25:01	5.05	4.77	65.04	
10/18/2010	11:26:01	5.1	4.77	86.3	
10/18/2010	11:27:01	5.05	4.77	83.05	
10/18/2010	11:28:01	5.02	4.78	72.87	2
10/18/2010	11:29:01	5.11	4.76	95.38	
10/18/2010	11:30:01	5.02	4.59	152.38	
10/18/2010	11:31:01	4.8	4.42	155.17	
10/18/2010	11:32:01	5.18	4.74	169.17	3
10/18/2010	11:33:01	5.08	4.66	153.57	
10/18/2010	11:34:01	4.83	4.43	158.38	
10/18/2010	11:35:01	5.08	4.77	140.52	
10/18/2010	11:36:01	5.16	4.77	114.79	4
10/18/2010	11:37:01	5.17	4.77	130.9	
10/18/2010	11:38:01	4.61	4.21	150.69	
10/18/2010	11:39:01	5.06	4.69	158.96	
10/18/2010	11:40:01	4.92	4.41	104.41	
10/18/2010	11:41:01	281.69	0.25	44.19	Switch Port
10/18/2010	11:42:01	239.43	2.3	18.14	
10/18/2010	11:43:01	5.13	4.55	173.89	Port C
10/18/2010	11:44:01	4.99	4.58	154.47	1
10/18/2010	11:45:01	4.93	4.51	143.59	
10/18/2010	11:46:01	5.21	4.75	146.5	
10/18/2010	11:47:01	4.95	4.6	136.53	
10/18/2010	11:48:01	5.13	4.78	148.46	2
10/18/2010	11:49:01	5.2	4.78	160.1	
10/18/2010	11:50:01	5.12	4.78	149.05	
10/18/2010	11:51:01	5.12	4.78	111.52	
10/18/2010	11:52:01	4.94	4.64	99.25	3
10/18/2010	11:53:01	4.68	4.66	32.05	
10/18/2010	11:54:01	4.95	4.91	17.27	
10/18/2010	11:55:01	4.91	4.91	17.91	
10/18/2010	11:56:01	4.95	4.91	17.41	4
10/18/2010	11:57:01	5.13	4.85	48.32	
10/18/2010	11:58:01	5.16	4.68	148.29	
10/18/2010	11:59:01	5.17	4.65	161.83	
10/18/2010	12:00:01	4.97	4.37	155.36	
10/18/2010	12:01:01	58.42	3.22	166.79	Switch Port
10/18/2010	12:02:01	323.82	0.15	47.59	
10/18/2010	12:03:01	143.64	3.46	92.84	Port D
10/18/2010	12:04:01	5.29	4.71	167.31	1
10/18/2010	12:05:01	5.21	4.74	94.59	
10/18/2010	12:06:01	5.22	4.74	128.15	
10/18/2010	12:07:01	4.72	4.37	113.93	
10/18/2010	12:08:01	5.16	4.77	132.3	2

C3-2

Reference Method Reduced DAS Data

Facility	BP West Coast Products, LLC.
Location	Carson, CA
Unit	No. 1 TGU
Date/Time	10/18/2010 10:36
Job Number	9036

Date	Time	O2%	CO2%	CO ppm	
10/18/2010	12:09:01	5.14	4.77	144.53	
10/18/2010	12:10:01	5.15	4.77	133.58	
10/18/2010	12:11:01	4.96	4.61	112.4	
10/18/2010	12:12:01	5.03	4.71	162.19	3
10/18/2010	12:13:01	4.86	4.65	133.01	
10/18/2010	12:14:01	5.03	4.73	163.27	
10/18/2010	12:15:01	4.46	4.26	140.69	
10/18/2010	12:16:01	5	4.83	115.31	4
10/18/2010	12:17:01	4.95	4.67	139.59	
10/18/2010	12:18:01	4.87	4.58	158.29	
10/18/2010	12:19:01	5.2	4.79	166.7	
10/18/2010	12:20:01	4.58	3.5	147.5	
10/18/2010	12:21:01	0.06	0.07	17.44	System Calibration
10/18/2010	12:22:01	0	0.07	0.06	
10/18/2010	12:23:01	0	0.06	0	System Bias Zero
10/18/2010	12:24:01	0.33	1.87	0.07	
10/18/2010	12:25:01	4.35	8.61	0.06	
10/18/2010	12:26:01	4.48	8.84	0.09	
10/18/2010	12:27:01	4.53	9.07	0.1	Bias Mid O2/CO2
10/18/2010	12:28:01	3.51	5.7	8.21	
10/18/2010	12:29:01	0	0.06	85.07	
10/18/2010	12:30:01	0	0.06	88.91	Bias Mid CO
10/18/2010	12:31:01	0	0.06	60.91	
10/18/2010	12:32:01	0	0.06	0.49	Post-Internal Calibration
10/18/2010	12:33:01	0	0.06	0.17	Local Cal Zero
10/18/2010	12:34:01	4.45	11.53	71.33	
10/18/2010	12:35:01	8.87	18.07	166.88	
10/18/2010	12:36:01	8.79	18.02	173.71	
10/18/2010	12:37:01	8.78	18.01	182.31	High
10/18/2010	12:38:01	7.3	13.27	164.85	
10/18/2010	12:39:01	4.51	9.06	114.34	
10/18/2010	12:40:01	4.53	9.06	91.66	
10/18/2010	12:41:01	4.53	9.06	90.18	Mid
10/18/2010	12:42:01	1.98	2.92	56.25	
10/18/2010	12:43:01	0	0.06	0.32	
10/18/2010	12:44:01	0	0.06	0.17	
10/18/2010	12:45:01	0	0.06	0.17	
10/18/2010	12:46:01	0	0.06	-0.11	

APPENDIX D

SCAQMD METHOD 5.1 – PARTICULATE MATTER

Appendix D1

PARTICULATE MATTER – Results and Calculations

PARTICULATE TEST SUMMARY

No. 1 TGU

Run Number	1	
Run Date	10/18/10	
Run Start Time	11:01	
Run Stop Time	12:21	
Test Train Parameters		**AVERAGE**
Volume of Dry Gas Sample, SCF*	46.330	46.330
Flue Gas Parameters		
CO2, Percent By Volume, Dry	4.67	4.67
O2, Percent By Volume, Dry	5.04	5.04
Temperature, Degrees F	1319.3	1319.3
Moisture , %	9.01	9.01
Air Flow Rate, Wet ACFM	99,292	99,292
Air Flow Rate, Dry SCFM*	26,424	26,424
Total Particulate		
Total catch, mg	21.47	21.47
Concentration, Gr/DSCF	0.00715	0.00715
Concentration @ 12% CO2	0.01838	0.01838
Emission Rate, lb/hr	1.620	1.620

* 60 Degrees F and 29.92 Inches of Mercury

Concentration and Mass Emission Tables

SCAQMD RULE 404(a)

	Flow Rate (dscfm)	Concentration Measured (gr/dscf)	Concentration Allowable (gr/dscf)
Table	24,720	XX	0.0563
Measured	26,424	0.00715	**0.0550**
Table	28,250	XX	0.0537

Concentration at 12% CO2

SCAQMD RULE 409

Concentration at 12% CO2 = Concentration (Std) x 12 / CO2 Measured

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: SCAQMD M5.1

Client Name	BP West Coast Products, LLC.	Operator		BH
Plant Name	BP West Coast Products, LLC.	Project #		9036
Sampling Location	No. 1 TGU	Standard Temperature, °F		60

USE IN AVERAGE OF RUN SET? 1 or 0 =>		1			SET AVERAGE
Run Number		1			
Run Date		10/18/10			
Run Start Time	hh:mm	11:01			
Run Stop Time	hh:mm	12:21			
Meter Calibration Factor	Y	0.9989			
Pitot Tube Coefficient	C_p	0.84			
Actual Nozzle Diameter	in	0.520			
Sample Volume	ft^3	47.566			47.566
Total Sampling Time	min	72			72
Average Meter Temperature	°F	76.5			76.5
Average Stack Temperature	°F	1319.3			1319.3
Barometric Pressure	in Hg	30.01			30.0
Stack/Duct Static Pressure	in H_2O	-0.91			-0.91
Absolute Stack/Duct Pressure	in Hg	29.9			29.9
Average Delta H	in H_2O	1.40			1.40
Absolute Meter Pressure	in Hg	30.1			30.1
Avg Differential Pressure (Delta P)	in H_2O	0.069			0.069
Total Water Volume Collected	mL	99.0			99.0
Volume of Water vapor @ STP	SCF	4.589			4.589
Volume Metered @ STP	DSCF	46.330			46.330
Calculated Stack Moisture	% H_20	9.01			9.0
Saturated Stack Moisture	% H_20	100.0			100.0
Reported Stack Moisture Content	% H_20	9.0			9.01
Carbon Dioxide Percentage	% CO_2	4.67			4.7
Oxygen Percentage	% O_2	5.04			5.04
Nitrogen Percentage	% N_2	90.3			90.3
Dry Mole Fraction	decimal	0.910			0.910
Dry Gas Molecular Weight	lb/lb-mole	28.95			28.95
Wet Stack Gas Molecular Weight	lb/lb-mole	27.96			27.96
Flue Gas Density	lb/ft^3	0.0726			0.0726
Calculated Fuel Factor	F_o	3.40			3.40
Percent Excess Air	% EA	26.8			26.8
Stack Cross-Sectional Area	in^2	8659.0			8659.0
Stack Cross-Sectional Area	ft^2	60.13			60.13
Percent of Isokinetic Rate	% ISO	99.3			99.3
Air Flow Rate Results					
Average Stack Gas Velocity	ft/sec	27.52			27.52
Actual Stack Flow/Minute	ACFM	99,292			99,292
Dry Standard Stack Flow/Minute	DSCFM	26,424			26,424

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD SCAQMD M5.1

Client Name	BP West Coast Products, LLC	Run #	1		
Plant Name	BP West Coast Products, LLC	Project #	9036	Run Start	11:01
Plant City, State	Carson, CA	Personnel	BH	Run End	12:21
Test Location	No. 1 TGU	Tester Signature	Signature on File		
Date of Test	10/18/10	Checked By	SA		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tares		Actuals
ΔH @ 0.75 SCFM	1.775	Pbar	30.01	Meter Console #	A-2			CO_2
Meter Calibration Factor	0.9989	Pstatic	-0.91	Ideal Nozzle Diameter	0.452			4.67
Pitot Tube Coefficient	0.840	Abs P	29.9	Nozzle #	0.520			O_2
Estimated Dry Gas Meter Temp	68	Tstd, °F	60	Actual Nozzle Diameter	0.520			5.04
Estimated Stack Temp or M2 Avg.	300	Pstd	29.92	Probe Lgth/ID #	4			CO
Estimated Delta P or M2 Avg.	0.070	Estimates		Liner Material		XAD ID & Tares		
Estimated Moisture Content	9.5	CO_2	5.0	Filter Box #	NA			N_2
Estimated Dry Molecular Weight	29.00	O_2	5.0	Cold Box ID #	NA			90.3
Estimated Velocity, ft/sec	18.1	CO		Umbilical ID #	NA			H_2O
K Factor (delta H/delta P)	49.01	N_2	90.0	TC ID #s	4			99.0

Equipment & Leak Check Data, OK? Y or N					Leak Checks	1	2	3	4	5	6	Status
Tambient			PRE	POST	DGM Initial	645.427						645.427
Thermocouples					Vacuum	21						21
Pitots					Leak Rate	0.000						OK
Tedlar Bag					DGM final	645.751						645.751

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft^3	in H_2O	in H_2O	in H_2O	in Hg	°F	°F	°F	°F	°F	°F
E 0	11:01	0.0	621.993	0.040	1.96	0.78	2.00	70	69	1327	NA	57	NA
E - 1		3.0	623.570	0.030	1.47	0.59	1.50	71	70	1322		57	
E - 2		6.0	624.750	0.080	2.45	0.99	2.00	72	70	1321		57	
E - 3		9.0	626.490	0.070	3.43	1.38	2.50	73	71	1318		57	
E - 4		12.0	628.390	0.090	4.41	1.78	2.50	74	72	1319		57	
E - 5		15.0	630.630	0.090	4.41	1.79	2.50	76	72	1317		57	
E - 6		18.0	632.920	0.100	4.90	1.99	3.00	76	73	1315		57	
E - 7		21.0	635.250	0.080	3.92	1.60	2.50	77	75	1313		57	
E - 8		24.0	637.330	0.090	4.41	1.80	2.50	77	76	1314		57	
E - 9		27.0	639.570	0.070	3.43	1.40	2.50	78	76	1312		57	
E - 10		30.0	641.860	0.060	2.94	1.20	2.00	79	77	1312		56	
E - 11		33.0	643.550	0.060	2.94	1.21	2.00	79	77	1310		56	
E 12		36.0	645.427	0.050	2.45	0.99	2.00	72	69	1311		56	
S - 1		39.0	647.380	0.070	3.43	1.40	2.50	76	72	1309		56	
S - 2		42.0	649.410	0.060	2.94	1.20	2.00	77	74	1310		56	
S - 3		45.0	651.250	0.070	3.43	1.40	2.50	78	75	1312		56	
S - 4		48.0	653.210	0.090	4.41	1.80	2.50	79	77	1317		56	
S - 5		51.0	655.490	0.100	4.90	2.00	3.00	81	79	1324		56	
S - 6		54.0	657.920	0.080	3.92	1.60	3.50	82	80	1330		56	
S - 7		57.0	660.060	0.090	4.41	1.79	2.50	83	80	1336		56	
S - 8		60.0	662.280	0.070	3.43	1.39	2.50	83	81	1340		56	
S - 9		63.0	664.300	0.070	3.43	1.40	2.50	84	82	1332		55	
S - 10		66.0	666.350	0.060	2.94	1.21	2.00	84	82	1326		55	
S - 11		69.0	668.160	0.050	2.45	1.01	2.00	83	81	1318		55	
S 12	12:21	72.0	669.883										
						MAX =>	3.00						
Average Values		72.0	47.566	0.069	3.451	1.404		76.5		1319.3			

	Water 1	Water 2	Empty	SG
Initial	581.2	583.5	614.5	850.9
Final	655.3	594.5	616.4	862.9
H2O gain	**74.1**	**11.0**	**1.9**	**12.0**
Total H2O	**99.0**			

Cumul. Percent ISO	Point Percent ISO	Square Root DP	Local Stack Velocity	Cumulative Meter Volume	Point Meter Volume
%	%	(in H_2O)$^{1/2}$	ft/sec	scf	scf
105.9	105.9	0.200	21.0	1.578	1.578
99.0	91.2	0.173	18.1	2.755	1.178
100.9	104.1	0.224	23.4	4.493	1.737
99.4	95.9	0.265	27.7	6.388	1.895
99.5	99.7	0.300	31.4	8.621	2.232
100.0	101.7	0.300	31.4	10.902	2.280
99.6	98.0	0.316	33.1	13.220	2.316
99.4	97.4	0.283	29.6	15.281	2.060
99.3	98.9	0.300	31.4	17.500	2.218
99.8	104.3	0.265	27.6	19.566	2.065
100.0	101.7	0.245	25.6	21.429	1.863
100.0	100.9	0.245	25.6	23.278	1.850
101.1	116.6	0.224	23.4	25.230	1.951
101.2	101.8	0.265	27.6	27.247	2.017
101.1	99.4	0.245	25.6	29.069	1.822
100.9	97.9	0.265	27.6	31.007	1.938
100.9	100.4	0.300	31.4	33.260	2.251
100.9	101.4	0.316	33.2	35.655	2.391
100.8	99.7	0.283	29.7	37.756	2.100
100.7	97.7	0.300	31.6	39.935	2.177
100.7	100.7	0.265	27.9	41.913	1.977
100.7	101.8	0.265	27.8	43.916	2.003
100.5	96.9	0.245	25.7	45.681	1.768
100.5	100.8	0.224	23.4	47.363	1.685
100.5	100.8	Final Values		47.363	1.685
		0.263	27.5		

EXAMPLE CALCULATIONS, RUN 1

ABSOLUTE PRESSURE, INCHES OF MERCURY

Ps = Pbar + Pg/13.6
= 30.01 + -0.91/13.6
= 29.94

VOLUME OF WATER VAPOR, STANDARD CUBIC FEET

Vwstd = 0.002667 * [(Tstd + 460) / Pstd] * Vlc
= 0.002667 * [(60 + 460) / 29.92 * 99.0
= 4.589

SAMPLED VOLUME OF SOURCE GAS, DRY STANDARD CUBIC FEET

Vmstd = [(Tstd + 460)/Pstd] * Y * Vm * (Pbar + Delta-H/13.6) / (460 + tm)
= [(60 + 460)/ 29.92] * 0.9989 * 47.566 * (30.01 + 1.404/13.6) / (460 + 77)
= 46.330

MOISTURE CONTENT, PERCENT BY VOLUME

%H2O = Vwstd / (Vwstd + Vmstd)
= 4.589 / (4.589 + 46.330)
= 9.01

DRY MOLE FRACTION, LB-MOLE/LB-MOLE

Mfd = 1 - %H2O/100
= 1 - 9.01/100
= 0.910

DRY MOLECULAR WEIGHT, LB/LB-MOLE

Md = 44*(%CO2/100) + 32*(%O2/100) + 28*([100-(%CO2+%O2)]/100)
= 44*(4.7/100) + 32*(5.0/100) + 28*([100-(4.7+5.0)]/100)
= 28.95

WET MOLECULAR WEIGHT, LB/LB-MOLE

Ms = Md*Mfd + 18.0*%H2O/100
= 28.95*0.910 + 18.0*9.01/100
= 27.96

FUEL FACTOR

Fo = (20.9 - %O2) / %CO2
= (20.9 - 5.0) / 4.7
= 3.396

ISOKINETIC SAMPLING RATE, PERCENT

%I = Pstd/(Tstd + 460) * (100/60) * Vmstd*(ts + 460)/[Ps*vs*Mfd*Theta*(PI*Dia*Dia/576)]
= 29.92/(60 + 460) * (100/60) * 46.330*(1319 + 460)/[29.94*27.52*0.910*72.00*(PI*0.520*0.520/576)]
= 99.3

VELOCITY, FEET PER SECOND

vs = 85.49 * Cp * SQRT[Delta-p*(460+ts)/Ps/Ms]
= 85.49 * 0.84 * SQRT[0.0691*(460+1319)/29.94/27.96]
= 27.52

VOLUMETRIC FLOW RATE, ACTUAL CUBIC FEET PER MINUTE

Qaw = (60/144) * vs * A
= (60/144) * 27.52 * 8659
= 99292

VOLUMETRIC FLOW RATE, DRY STANDARD CUBIC FEET PER MINUTE

Qsd = (60/144) * Mfd * vs * A * (Tstd + 460)/(ts + 460) * (Ps/Pstd)
= (60/144) * 0.910 * 27.52 * 8659 * (60 + 460)/(1319 + 460) * (29.94/29.92)
= 26424

EXAMPLE CALCULATIONS, RUN 1

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT

gr/DSCF = (Catch/Conversion) * 7,000 / 453.592 / Vmstd

= (21.47/1000) * 7,000 / 453.592 / 46.330

= 0.00715

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT @ 12% CO2

Gr@12%CO2 = gr/DSCF * 12 / %CO2

= 0.00715 * 12 / 4.7

= 0.01838

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT @ 7% O2

Gr@7%O2 = gr/DSCF * (20.9-7) / (20.9-%O2)

= 0.00715 * (20.9-7) / (20.9-5.04)

= 0.00627

TOTAL PARTICULATE EMISSION RATE, POUNDS PER HOUR

lb/hr = 60 * (Catch/Conversion) * Qsd / 453.592 / Vmstd

= 60 * (21.47/1000) * 26424 / 453.592 / 46.330

= 1.620

Appendix D2

PARTICULATE MATTER – Field Data

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: Produces 1.0
PLANT NAME: S
CITY, STATE:
SAMPLING LOCATION:
TYPE OF TESTING: ace

NO. OF PORTS AVAILABLE: 8
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 4 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 116.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 11.00 inches
DEPTH OF STACK OR DUCT, D: 105.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

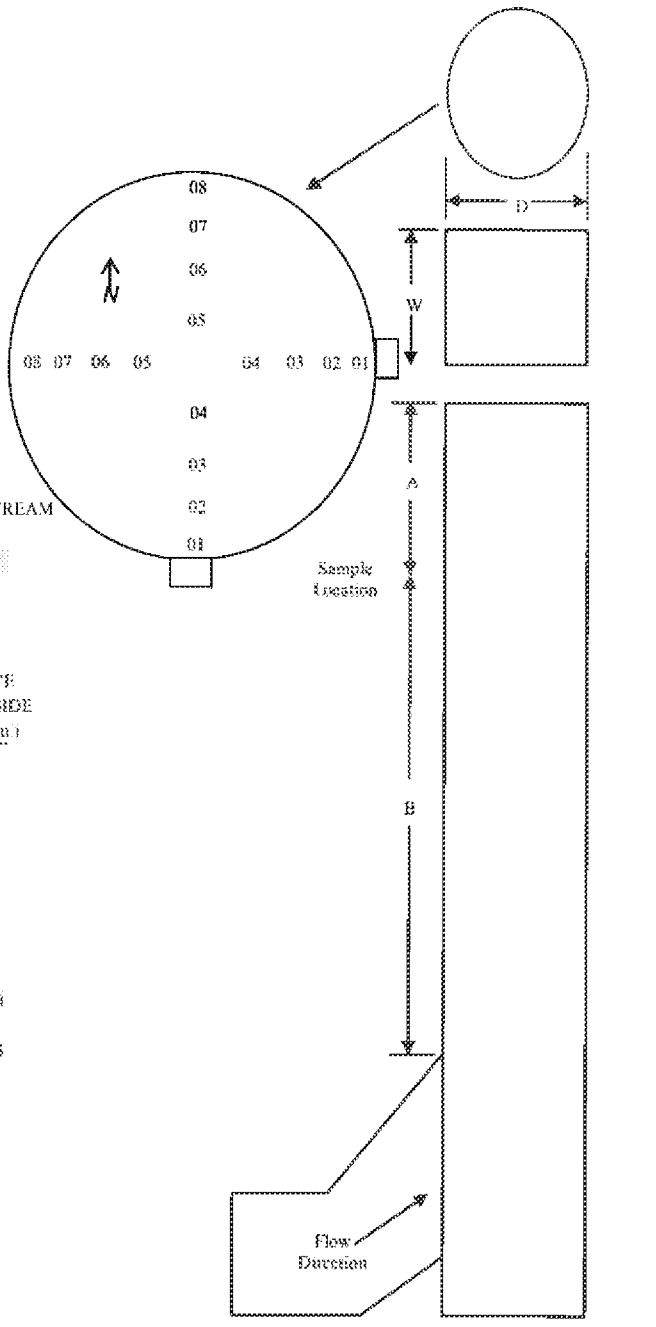
EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH) /(DEPTH+WIDTH) = 105.00 inches

STACK/DUCT AREA = 60.13 sq feet 8659.0 sq.inches

DISTANCE FROM PORT TO FLOW DISTURBANCES	UPSTREAM B	DOWNSTREAM A
# OF INCHES	780.00	180.00
# OF DIAMETERS	7.43	1.71

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	3.1	2.23	13 1/4
2	6.7	7.04	18
3	11.8	12.39	23 3/8
4	17.7	18.59	29 5/8
5	25.0	26.25	37 1/4
6	35.6	37.38	48 3/8
7	64.4	67.62	78 5/8
8	75.0	78.75	89 3/4
9	82.3	86.42	97 3/8
10	88.2	92.61	103 5/8
11	93.3	97.97	109
12	97.9	102.80	113 3/4



DRAWING NOT TO SCALE

D1 - 1

Almega Environmental

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Run #	1	Pitot ID:	4	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date	10/12/10	Pitot Coeff.:	.84	1	581.2	685.3	104.1	Initial	✓		
Client	BP	Meter Box #:	A-2	2	523.5	534.5	11.0	Final	✓		
Unit	TGU 1	Meter @ Dh:	1.775	3	614.5	616.4	1.9				
Operator	BA	Meter Y:	.9987	4	252.1	264.1	12.0	Meter Box Leak Check			
Stack Dia	10.5"	TC #:	4	5					Rate	"HG	
Amb. Press	30.01	Start Time:	1101	Nozzle Dia	H2O Gain =	99.0		Initial	.000	23"	
Static Press	-.91	Stop Time:	1321	.52	Filter	9437		Final	.000	22"	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp (F)	Sqt delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac ("HG)	YE Cooler Temp. (F)	Cyclone Flow ("H2O)
					621.993								
1	3	.04	1327	.78	623.57	70	69	N/A	N/A	57	2"	37	5
2	6	.03	1322	.59	624.35	71	70			57	1.5"	37	6
3	9	.05	1321	.99	626.49	72	70			57	2"	37	3
4	12	.07	1318	1.38	628.39	73	71			57	2.5"	37	2
5	15	.09	1319	1.78	630.63	74	72			57	2.5"	37	5
6	18	.09	1317	1.79	632.92	75	72			57	2.5"	37	1
7	21	.10	1315	1.99	635.25	76	73			57	3"	37	4
8	24	.08	1313	1.60	637.33	77	75			57	2.5"	36	0
9	27	.09	1314	1.80	639.57	77	76			57	2.5"	36	3
10	30	.07	1312	1.40	641.66	78	76			57	2.5"	36	7
11	33	.06	1312	1.20	643.555	79	77			56	2"	36	2
12	36	.06	1310	1.21	645.427	79	77			56	2"	36	4
1	39	.05	1311	.99	647.38	72	69			56	2"	36	1
2	42	.07	1309	1.40	649.41	76	72			56	2.5"	36	6
3	45	.06	1310	1.20	651.25	77	74			56	2"	36	5
4	48	.07	1312	1.40	653.21	78	75			56	2.5"	35	6
5	51	.09	1317	1.80	655.49	79	77			56	2.5"	35	2
6	54	.10	1324	2.00	657.92	81	79			56	3"	35	4
7	57	.08	1330	1.60	660.06	82	80			56	2.5"	35	3
8	60	.09	1336	1.79	662.28	83	80			56	2.5"	35	5
9	63	.09	1340	1.39	664.30	83	81			56	2.5"	35	2
10	66	.04	1332	1.40	666.35	84	82			55	2.5"	35	2
11	69	.06	1326	1.21	668.16	84	82			55	2"	35	0
12	72	.05	1315	1.01	669.883	83	81	✓	✓	55	2"	35	2

E

S

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp.	72
Estimated Stack Temp.	1324
Estimated Delta P.	.07
Estimated Moisture Content	9.5
Estimated O2.	5
Estimated CO2	5

Equipment Evaluation, OK? @ or N

Ambient Temp	66
YE Check	✓
Pitot Check	✓
Tedlar Bag	N/A

Dry Gas Meter Leak Checks

	1	2	3	4	5	6
DGM Initial	645.928					
Vacuum	2"					
Leak Rate	.000					
DGM Final	645.928					

D2-2

Almega

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Run # :	FB	Pitot ID :		Impinger #	Initial	Final	Net		Pitot Leak Check	
Date :	10/18/10	Pitot Coeff. :		1	528.7			Initial :		
Client :	BP	Meter Box # :	A-2	2	582.4			Final :		
Unit :	TGU 1	Meter @ Dh :	1.775	3	614.5					
Operator :	BU	Meter Y :	.9984	4	852.9				Meter Box Leak Check	
Stack Dia :	105	TC # :		5					Rate	"HG
Amb. Press :	30.01	Start Time :		Nozzle Dia	H2O Gain =			Initial :	.000	21
Static Press :		Stop Time :		.52	Filter : 9432			Final :		

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
					621.317								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation , OK? Y or N

Ambient Temp:	
TC Check:	
Pitot Check:	
Tedlar Bag:	

Dry Gas Meter Leak Checks

	1	2	3	4	5	6
DGM Initial:						
Vacuum:						
Leak Rate:						
DGM Final:						

Da-3

Appendix D3

PARTICULATE MATTER – Laboratory Data

Almega
ENVIRONMENTAL

LABORATORY REPORT

SCAQMD M5.1

Lab Report No.	A 173	Project No.:	c9036
Client Name:	BP	Date Sampled:	18-Oct-10
Unit Tested:	TGU #1	Analyst:	DW

Client ID	Run #1	Field Blank
Container No 1 (Filter)	1	1
Client ID No.:	R1 - Filter	FB - Filter
Lab ID No.:	A 173 - R1 - C1	A 173 - FB - C1
Filter ID #	9437	9432
Filter wt., total , mg (m_{FT})	18.45	0.00
Filter Acid, mg	7.90	NA
Filter SO4, mg	18.34	NA
Filter wt, net ,mg (m_{FN})	18.45	0.00
Container No 2 (Impinger) -Water org	2	2
Client ID No.:	R1 - Sample	FB - Sample
Lab ID No.:	A 173 - R1 - C2 org	A 173 - FB - C2 org
Volume ml (V_{MW})	100	100
Impinger Catch, total, mg (m_{BHT})	0.05	0.00
Methylen Chloride Blank, mg (W_M)	0.03	0.03
Impinger Catch, net, mg (m_{BHX}) ($m_{BHX}=m_{BHT}-W_M$)	0.02	0.00
Container No 2 (Impinger) -Water sr	2	2
Client ID No.:	R1 - Sample	FB - Sample
Lab ID No.:	A 173 - R1 - C2 sr	A 173 - FB - C2 sr
Volume, L (V_{WW})	585	360
Impinger Catch, total, mg (m_{BHT})	3.35	0.45
Water Blank, mg (W_W)	0.35	0.22
Impinger Catch, net, mg (mB_{HN}) ($m_{BHN}=m_{BHT}-W_W$)	3.00	0.23
Total Particulate mass, net, mg (m_T)	**21.85**	**0.45**
Blank correction weight of PM, mg (m_{TB})	**21.47**	**0.23**

$m_T = m_{FN} + m_{FHN} + m_{BHN}$

Checked by: GA

Lot # A173

Almega
ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO: ______

ATTN:

REPORT TO: PO # ______

ALMEGA Environmental & Technical Services
5251 McFadden Ave.
Huntington Beach, CA 92649
(714) 889-4000 Fax (714) 889-7030
lab@almegaenvironmental.com
Contact:

Turnaround Time
Standard: ____ Other: ____
Rush:
Depends on # of Samples
5 - 10 days ____
3 - 7 days ____

Job # 7036 | Unit # TGU #1 | Client: BP | Location: CARSON, CA

Sampler (Signature): [signature]

Project Manager: T. TRAN

Unit Information:

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	ANALYSIS REQUESTED: Method 5.1	25.3				Return or Dispose / REMARKS
10/18/10	1035	FB- SAMPLE	A173-FB-C2	✓			1	✓					
↓	1035	FB- FILTER	-C1			✓	1	✓					FILTER # 9432
	1101	R1- SAMPLE	-R1-C2	✓			1	✓					
	1101	R1 - FILTER	-C1			✓	1	✓					FILTER # 9437
	1113	TNK A	A173-011A		✓		1		✓				TNK # 8-025
	1113	TNK B	011B		✓		1		✓				TNK # 91187
	1113	TRP 69	012A	✓			1		✓				TNK A
	1113	TRP 70	012B	✓			1		✓				TNK B

Relinquished by: [signature] Date: 10/18/10 Time 1415	Received by: A. Alexandroff Date: 10/18/10 Time: 1415	Relinquished by: Date: Time:	Received by: Date: Time

D3-2

Almega
ENVIRONMENTAL

Standard Receipt
Sample LOG in Checklist

Project No: 9036 BP #1704

Lab ID: 4173

Method: 25.3, 5.1

Sampling Date: 10/18/10

Location: _____ Int: _____

Date & Time Rc'd: 10/18/10 14:15

Location: _____ Int: _____

Arrived By: (circle) FedEx UPS Drop Off (Int) ✓ Other _____

Condition of Package(s): (comment): OK

Package Type: Box (Cooler) Other: _____

Number of Sample Container(s): 2+4

Correct Containers (per Method): (Y) N

Preservation: (circle) (ICE) DryICE ICEPacks None

Sample Conditions:

Sample Temp (C): ~4C (2513)

Ambient Temp (C): 22

Sample Temp (C): _____

Filter Condition: _____

PH: _____

Components Sealed: Y N

Sample Recovery Completed On: (date & time) _____

Recovered In: (circle) (Field) Lab Other _____

Silica Gel Condition: _____

Tedlar Bags -
Condensation: Y N

Comments:

Container(s) Requested: Glass ____ Plastic ____

Additional Comments:

D2-4

SULFURIC ACID & SULFUR OXIDES - LABORATORY DATA SHEET

Client: BP
Site Location:
Analyst: GA
Project #: c9036
Unit Tested: TGU #1
Date Analyzed: 9-Nov-10
Checked by: GA

Sample No.	Sample: Total, V (mL)	Sample: Aliquot, A (mL)	Sample: Factor, F = V/A	Sample Titration: T1 (mL)	Sample Titration: T2 (mL)	Sample Titration: Avg, V (mL)	Acid, as $H_2SO_4*2H_2O$ mg	Sulfate, as $H_2SO_4*2H_2O$ mg
ANALYSIS FOR ACID								
A 173 - R1 - C1	40	5	8	0.145	0.150	0.15	7.90	
ANALYSIS FOR SULFATE								
A 173 - R1 - C1	40	10	4	6.90	6.90	6.90		18.34

No.	Sodium Hydroxide Titration: KHP (mg)	Volume, Vs (mL)	Normality, Ns	Barium Chloride Titration: Aliquot, VI (10 mL)	Volume, VT (mL)	Normality, NB
Blank				-	0.00	
1				4	8.20	0.00988
2				4	8.15	0.00994
Avg.			0.0999			0.00991

Detection Limit	
Sulfate,as $H_2SO_4*2H_2O$, mg	0.04
Acid,as $H_2SO_4*2H_2O$, mg	0.33

Sulfuric Acid Concentration 0.0201N
PolarChem Lot S03468 Exp January 2011
Sodium Hydroxide Solution 0.0999 N
PolarChem Lot U39346 Exp October 2012

CALCULATIONS:

$$N_B = (V_I \times N_{H2SO4})/(V_T - V_{TB})$$

Sulfate
as SO_4, mg=$(V_S-V_B) \times N_S \times 134.11/2 \times F$

Acid
as SO_4, mg=$(V_S-V_B) \times N_S \times 134.11/2 \times F$

SUMMARY
SCAQMD #5.1

Laboratory: Almega
Project: BP
Unit Tested: TGU #1
Lab. ID No.: A 173

Project No.: 08038
Filter, Beaker Wt. Log Page(s): #21, #834

Sample Number	Lab ID	Tare Wt. (avg. g)	Final Wt. (avg. g)	Net Change (mg)	Volume ml	Blank mg	Comments
R1 - Filter	A 173 - R1 - C1	0.3515	0.3699	18.45	-		**Run #1**
R1 - **Sample**	A 173 - R1 - C2 org	**29.2547**	**29.2548**	0.05	**100**	0.03	Run #1
R1 - Sample	A 173 - R1 - C2 sr	28.9688	28.9721	3.35	585	0.35	Run #1
FB - Filter	A 173 - FB - C1	0.3481	**0.3480**	-0.10	-		Field **Blank**
FB - **Sample**	A 173 - FB - C2 org	**28.8464**	**28.8463**	-0.10	100	**0.03**	Field **Blank**
FB - Sample	A 173 - FB - C2 sr	29.0333	29.0337	0.45	360	0.22	Field Blank
Reagent **Blank**		27.8972	27.8975	0.30	**500**		**DI Water**
Reagent **Blank**		48.7496	48.7498	0.15	**500**		Methylene Chloride

CALCULATIONS

$C_A = m_A/(V_A * \rho_A)$

Where:

C_A - Blank Concentration

m_A - Mass of residue of after evaporation, mg

V_A - Volume of blank, ml

ρ_A - Density , g/ml

$W_A = C_A * V_{WA} * \rho_A$

Where:

W_A - Weight of residue , mg

V_{WA} - Volume of liquid use, ml

Reagent Blank

Methylene Chloride

Density of methylene chloride ρM, g/ml = 1.3550
Methylene Chloride blank volume V_M, ml = 500
Methylene Chloride blank concentration C_M, mg/g = 0.0002

MeCl Lot No. 47362 OmniSolv

DI Water

Density of Water ρW, g/ml = 0.998
Water blank volume VW, ml = 500
Water blank concentration C_W, mg/g = 0.0008

DI Water System - Pure Water Co.

Checked by:

Beakers Weight Record

Laboratory: Almega
Project: BP
Project No.: c9036
Unit Tested: TGU #1
Lab. ID No.: A 173

x Pretest

(page__of__)
Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 2-Jun-10
Beaker Weight Log Page(s): #834

Sample Number	Lab ID	Beaker ID	Beaker Weights (g)							D Wt. (mg)	Volume ml	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average			
R1 - Sample	A 173 - R1 - C2 org	7301	9/23/10 18:00	DW	29.2543	10/21/10 17:00	DW	29.2549	29.2547	0.40	100	Run #1
R1 - Sample	A 173 - R1 - C2 gr	7972	9/23/10 18:00	DW	28.9688	10/21/10 17:00	DW	28.9687	28.9688	0.10	585	Run #1
FB - Sample	A 173 - FB - C2 org	7978	9/23/10 18:00	DW	28.8462	10/21/10 17:00	DW	28.8465	28.8464	0.30	180	Field Blank
FB - Sample	A 173 - FB - C2 gr	6713	9/23/10 18:00	DW	29.0334	10/21/10 17:00	DW	29.0333	29.0333	0.30	360	Field Blank
Reagent Blank		7341	3/25/10 9:30	DW	27.8971	3/26/10 10:30	DW	27.8973	27.8973	0.20	500	DI Water
Reagent Blank		2731	6/9/08 14:00	DW	48.7493	6/11/08 15:00	DW	48.7497	48.7496	0.30	300	Methylene Chloride

Checked by:

38 - 7

Beakers Weight Record

x Post-test (page__of__)

Laboratory: Almega
Project: BP
Project No.: n5038
Unit Tested: TGU #3
Lab. ID No.: A 173

Balance ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 2-Jun-10
Beaker Weight Log Page(s): 4834

Sample Number	Lab ID	Beaker ID	Beaker Weights (g)							D Wt. (mg)	Volume ml	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average			
R1 - Sample	A 173 - R1 - C2 org	7301	10/25/10 14:00	DW	29.2547	10/28/10 10:00	DW	29.2548	29.2548	-0.10	100	Run #1
R1 - Sample	A 173 - R1 - C2 sr	7972	10/25/10 14:00	DW	28.9723	10/28/10 10:00	DW	28.9719	28.9721	0.40	585	Run #1
FB - Sample	A 173 - FB - C2 org	7978	10/25/10 14:00	DW	28.8464	10/28/10 10:00	DW	28.8461	28.8463	0.30	100	Field Blank
FB - Sample	A 173 - FB - C2 sr	6713	10/25/10 14:00	DW	29.0336	10/28/10 10:00	DW	29.0338	29.0337	-0.20	360	Field Blank
Reagent Blank		7341	6/1/10 11:00	DW	27.8974	6/3/10 13:00	DW	27.8976	27.8975	-0.20	500	DI Water
Reagent Blank		2751	6/16/08 15:00	DW	48.7500	6/17/08 11:00	DW	48.7495	48.7498	0.50	500	Methylene Chloride

Checked by:

D 3 - 8

Filter Weight Record

x Pretest (page__of__)

Laboratory: Almega
Project: BP
Project No.: c9036
Unit Tested: TGU #1
Lab. ID No.: A 173

Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 2-Jun-10
Filter Weight Log Page(s): #21

Client Sample No.	Lab ID	Filter ID	Filter Weights (g)							D Wt. (mg)	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average		
R1 - Filter	A 173 - R1 - C1	9437	9/8/10 15:30	DW	0.3514	10/15/10 10:00	DW	0.3515	0.3515	-0.10	Run #1
FB - Filter	A 173 - FB - C1	9432	9/8/10 15:30	DW	0.3481	10/15/10 10:00	DW	0.3481	0.3481	0.00	Field Blank

Checked By:

Filter Weight Record

x Post-test (page__of__)

Laboratory: Almega
Project: BP
Project No.: c9036
Unit Tested: TGU #1
Lab. ID No.: A 173

Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 2-Jun-10
Filter Weight Log Page(s): #21

Client Sample No.	Lab ID	Filter ID	Filter Weights (g)							D Wt. (mg)	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average		
R1 - Filter	A 173 - R1 - C1	9437	10/25/10 14:00	DW	0.3700	10/27/10 11:00	DW	0.3698	0.3699	0.20	Run #1
FB - Filter	A 173 - FB - C1	9432	10/25/10 14:00	DW	0.3479	10/28/10 10:00	DW	0.3481	0.3480	-0.20	Field Blank

Checked By:

APPENDIX E

SCAQMD METHOD 25.3 – VOC AS TGNMO (LOW-LEVEL)

Appendix E1

VOC AS TGNMO (LOW-LEVEL) – Results and Calculations

TGNMO SOURCE TEST RESULTS

Facility: BP West Coast Products, LLC.
City: Carson, CA
Source: No. 1 TGU
Test Date: 10/18/10

Parameter	units	Run 1		
		1A	1B	AVG
Sampling Method		25.3	25.3	**25.3**
Standard Temperature	deg. F	60	60	**60**
Stack Gas Parameters				
Barometric Pressure	in. Hg	30.01	30.01	**30.01**
Temperature	deg.F	1319	1319	**1319**
O2 Content	%,dry	4.80	4.80	**4.80**
CO2 content	%,dry	5.10	5.20	**5.15**
Moisture Content	%	9.01	9.01	**9.01**
Flow Rate, dry	DSCFM	26,424	26,424	**26,424**
TGNMO, as Methane *				
CONCENTRATION				
measured as Methane (1)	ppmv	2.41	3.21	**2.81**
measured as Methane **	ppmv	2.18	3.01	**2.60**
EMISSION RATE				
measured as Hexane	lb/hr	0.144	0.193	**0.168**
measured as Hexane**	lb/hr	0.131	0.180	**0.156**

* corrected based on carbon number: Methane = 1

(1) One half of the reporting limit is reported for the calculated test results specified in AB2588 guidelines.

** Fractions of the reported values are below reporting limit.

Stack flow rate was measured during isokinetic sampling per SCAQMD Method 5.1.

Test Data Reduction and Calculations for Method 25.3

Facility:	BP West Coast Products, LLC.	Operator:	BH
City:	Carson, CA	Entered by:	SA
Source:	No. 1 TGU	Checked by:	SA
Location:	Stack		

DATA ENTRY		Symbol	units	Test No. 1A	Test No. 1B
Run Data:	Test Date	**	m/d/y	10/18/10	10/18/10
	Start Time	**	hh:mm	11:13	11:13
	End Time	**	hh:mm	12:13	12:13
Standard Temperature		**	deg. F	60	60
Standard Pressure		**	in. Hg	29.92	29.92
Molar Volume of Air at Standard Conditions		Vmol	dscM	23.68	23.68
Calculation Factor K1 for Standard Corrections		X1	deg./in. Hg	17.38	17.38
Barometric Pressure		Ps	in. Hg	30.01	30.01
Stack Temperature		Ts	deg.F	1319.3	1319.3
Stack Gas Moisture Content		H2O	%	9.01	9.01
Stack Gas Flow Rate		Qstd	DSCFM	26,424	26,424
Mol. Wt.:	TGNMO, as Hexane *	MWi	g/g-mole	14.36	14.36
	METHANE	MW1	g/g-mole	16	16

LABORATORY DATA		Symbol	units	1A	1B
Canister (tank):	VACUUM, Initial	P1	mm Hg	-763	-763
	VACUUM, Final	P2	mm Hg	-143	-169
	VOLUME of Gas Sample	Vtank	Liters	4.791	4.590
Concentration:	OXYGEN	O2	%,dry	4.80	4.80
	CARBON DIOXIDE	CO2	%,dry	5.1	5.2
	TGNMO, as Methane	Ci,t	ppmv	< 1.37	< 1.43
Condensate:	VOLUME of Condensate Sample	Vtank	ml	2.00	2.00
	TGNMO, as Methane	Ci,c	ppmv	1.53	2.24

TEST RESULTS		Symbol	units	1A	1B
TGNMO, as Methane *					
CONCENTRATION, measured as Methane (1)		Ci	ppmv	2.22	2.96
	corrected for bias factor of 1.086	Ci'	ppmv	2.41	3.21
	TGNMO, as Methane *	Ci,x	ppmv	2.41	3.21
MASS RATE:	TGNMO, as Hexane *				
	lb/hr = [TGNMO]xMWxDSCFMx60/(379.5e6)	Mi	lb/hr	0.144	0.193
	kg/hr = Mi/1000*453.6	Mi,m	kg/hr	0.065	0.087

NOTE: * corrected based on carbon number. Methane = 1

(1) One half of the reporting limit is reported for the calculated test results specified in AB2588 guidelines.

Test Data Reduction and Calculations for Method 25.3

Facility:	BP West Coast Products, LLC.	Operator:	BH
City:	Carson, CA	Entered by:	SA
Source:	No. 1 TGU	Checked by:	SA
Location:	Stack		

DATA ENTRY		Symbol	units	Test No. 1A	Test No. 1B
Run Data:	Test Date	**	m/d/y	10/18/10	10/18/10
	Start Time	**	hh:mm	11:13	11:13
	End Time	**	hh:mm	12:13	12:13
Standard Temperature		**	deg. F	60	60
Standard Pressure		**	in. Hg	29.92	29.92
Molar Volume of Air at Standard Conditions		Vmol	dscM	23.68	23.68
Calculation Factor K1 for Standard Corrections		X1	deg./in. Hg	17.38	17.38
Barometric Pressure		Ps	in. Hg	30.01	30.01
Stack Temperature		Ts	deg.F	1319.3	1319.3
Stack Gas Moisture Content		H2O	%	9.01	9.01
Stack Gas Flow Rate		Qstd	DSCFM	26424	26,424
Mol. Wt.:	TGNMO, as Hexane *	MWi	g/g-mole	14.36	14.36
	METHANE	MW1	g/g-mole	16	16

LABORATORY DATA		Symbol	units	1A	1B
Canister (tank):	VACUUM, Initial	P1	mm Hg	-763	-763
	VACUUM, Final	P2	mm Hg	-143	-169
	VOLUME of Gas Sample	Vtank	Liters	4.791	4.59
Concentration:	OXYGEN	O2	%,dry	4.80	4.80
	CARBON DIOXIDE	CO2	%,dry	5.10	5.20
	TGNMO, as Methane	Ci, t	ppmv	** 0.48	** 0.53
Condensate:	VOLUME of Condensate Sample	Vtank	ml	2.00	2.00
	TGNMO, as Methane	Ci, c	ppmv	1.53	2.24

TEST RESULTS		Symbol	units	1A	1B
TGNMO, as Methane *					
CONCENTRATION, measured as Methane		Ci	ppmv	2.01	2.77
	corrected for bias factor of 1.086	Ci'	ppmv	2.18	3.01
	TGNMO, as Methane *	**Ci,x**	**ppmv**	**2.18**	**3.01**
MASS RATE:	TGNMO, as Hexane *				
	lb/hr = [TGNMO]xMWxDSCFMx60/(379.5e6)	Mi	lb/hr	0.1310	0.180
	kg/hr = Mi/1000*453.6	Mi,m	kg/hr	0.059	0.082

NOTE: * corrected based on carbon number: Methane = 1

** Reported values are below the reporting limit.

Appendix E2

VOC AS TGNMO (LOW LEVEL) – Field Data

Almega
ENVIRONMENTAL

VOC FIELD DATA SHEET - SCAQMD METHOD 25.3

Date: 10/18/10 Test No.: 1
Client: BP Barometric Pressure (in. Hg): 30.01
Unit: Tank 1 Pretest Leak Check:
Operator Name: BH A: ✓ B: ✓
Fuel: Post-test Leak check:
Location: Carson, CA A: ✓ B: ✓

Time 24 Hours	SAMPLE A Flow ml/min.	SAMPLE A Vacuum inch Hg	SAMPLE B Flow ml/min.	SAMPLE B Vacuum inch Hg
10:13		Tank #S-025 Trap #69 Control ID: 33		Tank #9187 Trap #20 Control ID: 35
0	Orifice	27.5	Orifice	27.5
10		24.0		23.5
20		20.5		20.0
30		16.5		16.5
40		13.5		13.0
50		9.5		9.0
60		6.0		5.5

E2-1

Appendix E3

VOC AS TGNMO (LOW-LEVEL) – Laboratory Data

Almega
ENVIRONMENTAL

LABORATORY REPORT

Non-Methane Non-Ethane Organic compound Emissions by SCAQMD Method 25.3 (TCA/FID)

Client: BP
Project No.: c9036
Unit Tested: TGU#1
Sampling Date: 18-Oct-10
Analyzed Date: 22-Oct-10
Lab No.: A 173

Client Sample ID	Lab ID	Almega Sample ID		Total* NMNEO ppm	NMNEO ppm condensable	NMNEO ppm noncondensable	CH_4 ppm	C_2H_6 ppm	CO_2 % v/v by TCD	O_2 % v/v by TCD
		Tank	Trap							
TGU#1										
TNK A	A 173 - 011 A	S025	69	**2.01**	1.53	< 2.0	ND	ND	4.8	5.1
TNK B	A 173 - 011 B	91187	70	**2.77**	2.24	< 2.0	ND	ND	4.8	5.2
Detection Limit					1	2	2	2	0.3	0.3

* NOTE - the BIAS FACTOR (of 1.050) is NOT applied in these results

ND: Not Detected

	Run A	Run B
Detection Limit NMNEO noncondensable	1.37	1.43

Water Blank, ppmC 0.010

TGNMNEO concentration values are reported in ppm (v/v) as Methane (carbon=1)

The sample cylinder is analyzed for NMNEO, CO, CH_4, CO_2 and C_2H_6. It is then directed to a separation column where all heavy organics (C_3+) separate from the light organics (CO, CO_2, CH_4 and C_2H_6). The light organics are then passed through a reduction catalyst to convert CO and CO_2 to CH_4, and are then directed to a FID for detection and quantification. The heavy organics are backflushed off the holding column, passed through an oxidation catalyst, which convert all organics to CO_2, then through a reduction catalyst to convert CO_2 to CH_4 and then to a FID for detection and quantification.

Reviewed by: GA

Almega Environmental & Technical Services
5251 McFadden Ave. Huntington Beach CA. 92649
Phone 714 889-4800 Fax 714-889-7930
www.almegaenvironmental.com

E3-1

CALCULATIONS

Client:	BP		Lab No.: A 173	
Project No.:	c9036			
Unit Tested:	TGU#1			
Sampling Date:	18-Oct-10			
Date tested:	22-Oct-10			
Parameter	Symbol	Units	Run #1 A	Run #1 B
Sample ID			TNK A	TNK B
Lab ID			A 173 - 011 A	A 173 - 011 B
Sample Tank				
Tank No			8025	91187
Sample Tank Volume	V_T	L	6.000	6.000
Barometric Pressure	P_b	mm Hg	763	763
Pre-test Pressure	P_{TI}	mm Hg (abs)	0	0
Pre-test Temperature	t_{TI}	°C	22	22
Abs. Pre-test Temperature	T_{TI}	°K	295	295
Post-test Pressure	P_{TS}	mm Hg (abs)	620	594
Post-test Temperature	t_{TS}	°C	22	22
Abs. Post-test Temperature	T_{TS}	°K	295	295
Final Pressure	P_{TF}	mm Hg (abs)	918	916
Abs.Final Temperature	T_{TF}	°K	293	293
Dilution Factor	DF_T		1.49	1.55
Concentration Methane	C_{CH4}	ppm	ND	ND
Concentration Carbon Monoxide	C_{CO}	ppm	153.12	124.14
NMNEO (noncond)	C_{SA}	ppm	0.32	0.34
Sample Volume	V_S	L	4.791	4.590
Methane in Tank(C_{CH4}*DF_T)	C_{CH4T}	ppm	ND	ND
Carbon Monoxide in Tank(C_{CO}*DF_T)	C_{COT}	ppm	228.26	192.78
NMNEO (noncond)	C_{SAT}	ppm	0.48	0.53
Condensate Recovery - Trap				
Sample ID			TRP 69	TRP 70
Trap No			69	70
Lab No.:			A 173 - 012 A	A 173 - 012 B
Sample Impinger Volume	V_{IMP}	ml	2.0	2.0
Sample Volume	V_S	L	4.791	4.590
TC Concentration	C_{TC}	mg/L	19.71	17.48
IC Concentration	C_{IC}	mg/L	17.85	14.87
TOC Concentration	C_{TOC}	mg/L	1.857	2.610
NMNEO, Condensable	C_T	ppm	1.53	2.34
TNMNEOC (C_{SB}+C_T)	C	ppmC	2.01	2.22

Calculations

$V_S = k_1 * V_T * (P_{TS}/T_{TS} - P_{TI}/T_{TI})$

$k_1 = (273+15.56)/760 = 0.3799$

$C_{SAT} = DF * C_{SA}$

$C_{CH4T} = DF * C_{CH4}$

$DF = (P_{TF}/T_{TF})/(P_{TS}/T_{TS} - P_{TI}/T_{TI})$

$C_T = (C_{TOC} * V_{IMP} * V_{ID})/(V_S * A_C)$

$V_{ID} = 23.6902$ L/mole

QA/QC SUMMARY
(Repeat Analysis)

Client Project No.: e9036
Sampling Date: 18-Oct-10
Lab No.: A 173
Analyzed Date: 22-Oct-10

Run #1 A

Analyte	Sample ID	Area Count #1	Area Count #2	Area % diff (±20%)	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO	A 173 - 011 A	3747335	3774011	-0.71	153	154	153	-0.71
CH4	A 173 - 011 A	ND	ND	ND	ND	ND	ND	ND
CO2 *	A 173 - 011 A	194256	194960	-0.36	3.2	3.2	3.2	-0.36
O2*	A 173 - 011 A	733963	736003	-0.28	3.4	3.5	3.4	-0.28
C2H6	A 173 - 011 A	ND	ND	ND	ND	ND	ND	ND
NMNEO	A 173 - 011 A	7876	7838	0.48	0.32	0.32	0.32	0.48

Analyte	Sample ID	Conc # 1	Conc # 2	Conc # 3	Mean Conc ppm	COV 10%	
Trap Analysis							
TC	A 173 - 012 A	10.01	9.505	10.05	19.71	3.15	DF=2
IC	A 173 - 012 A	9.242	8.643	8.895	17.88	3.22	

Run #1 B

Analyte	Sample ID	Area Count #1	Area Count #2	Area % diff (±20%)	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO	A 173 - 011 B	3048539	3049612	-0.04	124	124	124	-0.04
CH4	A 173 - 011 B	ND	ND	ND	ND	ND	ND	ND
CO2 *	A 173 - 011 B	185959	185816	0.08	3.1	3.1	3.1	0.08
O2 *	A 173 - 011 B	721258	711762	1.32	3.4	3.3	3.4	1.33
C2H6	A 173 - 011 B	ND	ND	ND	ND	ND	ND	ND
NMNEO	A 173 - 011 B	9328	7399	20.68	0.38	0.30	0.34	23.06

Analyte	Sample ID	Conc # 1	Conc # 2	Conc # 3	Mean Conc ppm	COV 10%	
Trap Analysis							
TC	A 173 - 012 B	8.74	8.817	8.66	17.48	0.91	DF=2
IC	A 173 - 012 B	7.610	7.464	7.228	14.87	2.46	

Water blank

TC	0.000
IC	-0.010
TOC	0.010

* - by GC/TCD

$Conc_{CO}$ in tank = $MeanConc_{CO}$ * DF
$Conc_{CO2}$ in tank = $MeanConc_{CO2}$ * DF
$Conc_{O2}$ in tank = $MeanConc_{O2}$ * DF
$Conc_{C2H6}$ in tank = $MeanConc_{C2H6}$ * DF

SAMPLE INVENTORY REPORT

Method 25.3 Sampling Train

Project No.: c9036
Client: BP

Lab No.: A 173
Sampling Date: 18-Oct-10

Laboratory ID	Client ID	Component ID	
Run #1 A			
A 173 - 011 A	TNK A	Tank #	S025
A 173 - 012 A	TRP 69	Impinger	69
Run #1 B			
A 173 - 011 B	TNK B	Tank #	91187
A 173 - 012 B	TRP 70	Impinger	70

Ref # A173

Almega
ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN:

REPORT TO: PO #

ALMEGA Environmental & Technical Services
5251 McFadden Ave.
Huntington Beach, CA 92649
(714) 889-4000 Fax (714) 889-7030
lab@almegaenvironmental.com
Contact:

Turnaround Time
Standard: Other:
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days

Job # 9036 Unit # TGU #1 Client: BP Location: CARSON, CA
Sampler (Signature) [signature]
Project Manager: T. TRAN
Unit Information:

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	ANALYSIS REQUESTED: Method 5.1	15.3			Return or Dispose / REMARKS
10/18/10	1035	FB - SAMPLE	A173-FB-C2	✓			1	✓				
↓	1035	FB - FILTER	-C1			✓	1	✓				FILTER # 9432
	1101	RI - SAMPLE	-RI-C2	✓			1	✓				
	1101	RI - FILTER	-C1			✓	1	✓				FILTER # 9437
	1113	TNK A	A173-011A		✓		1		✓			TNK # S-025
	1113	TNK B	011B		✓		1		✓			TNK # 91187
	1113	TRP 69	012A	✓			1		✓			TNK A
	1113	TRP 70	012B	✓			1		✓			TNK B

Relinquished by: [signature] Date: 10/18/10 Time 1415
Received by: [signature] Alexandroff Date: 10/18/10 Time: 14:15
Relinquished by: Date: Time:
Received by: Date: Time

E3-5

Almega
ENVIRONMENTAL

Standard Receipt
Sample LOG in Checklist

Project No: 9036 BP #1704

Lab ID: 4173

Method: 25.3, 5.1

Sampling Date: 10/18/10

Location: _____ Int: _____

Date & Time Rec'd: 10/18/10 14:15

Location: _____ Int: _____

Arrived By: (circle) FedEx UPS Drop Off (Int) ✓ Other _____

Condition of Package(s): (comment): OK

Package Type: Box (Cooler) Other: _____

Number of Sample Container(s): 2 + 4

Correct Containers (per Method): (Y) N

Preservation: (circle) (ICE) DryICE ICEPacks None

Sample Conditions:

Sample Temp (C): ~ 4°C (253)

Ambient Temp (C): 22

Sample Temp (C): _____

Filter Condition: _____

PH: _____

Components Sealed: Y N

Sample Recovery Completed On: (date & time) _____

Recovered In: (circle) (Field) Lab Other _____

Silica Gel Condition: _____

Tedlar Bags -
Condensation: Y N

Comments:

Container(s) Requested: Glass ____ Plastic ____

Additional Comments:

Eq-6

APPENDIX F

QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Appendix F1

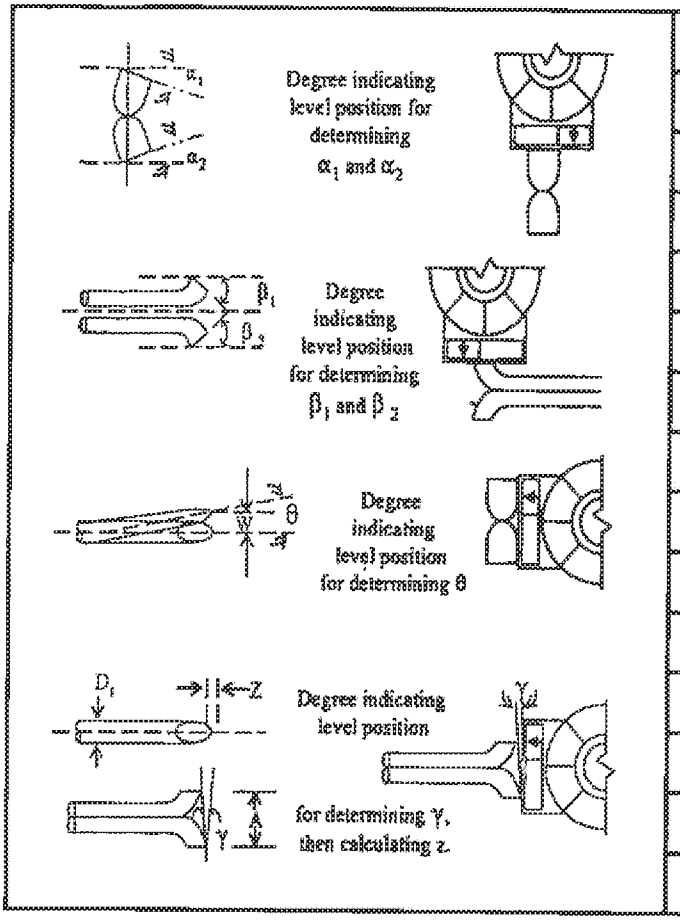
Test Equipment Calibration Data

TYPE S PITOT TUBE INSPECTION SHEET

CAL DATE: 8/2/2010

NEXT DUE DATE: Jan-11

PITOT ID: PT-4



Parameter	Values	Allowable Range
Level and Perpendicular?	Yes OR No	Yes
Obstruction?	Yes OR No	No
Damaged?	Yes OR No	No
α1	1	$-10° \leq \alpha 1 \leq +10°$
α2	4	$-10° \leq \alpha 2 \leq +10°$
β1	2	$-5° \leq \beta 1 \leq +5°$
β2	0	$-5° \leq \beta 2 \leq +5°$
γ	1	NA
θ	0	NA
Z = A (tan γ)	0.014	≤ 0.125 in.
W = A (tan θ)	0.000	≤ 0.031 in.
Dt	0.373	$0.188 \leq Dt \leq 0.375$
A	0.787	NA
A/2/(Dt)	1.05	$1.05 \leq PA/Dt \leq 1.5$

Certification:

I certify that this pitot tube meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor Cp of 0.84.

Certified By: _____ Date: 8/2/2010

F-1

ALMEGA ENVIRONMENTAL AND TECHNICAL SERVICES
5251 MCFADDEN AVENUE
HUNTINGTON BEACH, CA 92649

STACK TEMPERATURE SENSOR CALIBRATION

TEMPERATURE SENSOR I.D:	4	REF. IN HG. GLASS THERMOMETER ID:	20-500
READ OUT I.D:	RO-1	ICE BATH: YES	
PITOT TUBE I.D:	4	BOILING WATER:	YES
PITOT TUBE LENGTH:	110"	HOT OIL:	YES
DATE:	5/24/2010	CALIBRATED BY:	JZ

ICE BATH

REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{O}F)	FIELD METER TEMPERATURE (^{O}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{O}F)	% DIFFERENCE (%)
35.0	35.0	0.0	0.0
35.0	35.0	0.0	0.0
35.0	35.2	0.2	0.6

BOILING WATER

REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{O}F)	FIELD METER TEMPERATURE (^{O}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{O}F)	% DIFFERENCE (%)
212.0	213.0	1.0	0.5
212.0	213.0	1.0	0.5
212.0	214.0	2.0	0.9

HOT OIL

REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{O}F)	FIELD METER TEMPERATURE (^{O}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{O}F)	% DIFFERENCE (%)
358.0	355.0	3.0	0.8
358.0	356.5	1.5	0.4
358.0	356.0	2.0	0.6

NOTE:
MAXIMUM TOLERANCE BETWEEN ANY TWO MEASUREMENT IS 1.5%.
TAKE READING EVERY ONE MINUTE.

F-2

ALMEGA ENVIRONMENTAL AND TECHNICAL SERVICES
5251 MCFADDEN AVENUE
HUNTINGTON BEACH, CA 92649

STACK TEMPERATURE SENSOR CALIBRATION

TEMPERATURE SENSOR I.D:	4	REF. IN HG. GLASS THERMOMETER ID:	20-500
READ OUT I.D:	RO-1	ICE BATH: YES	
PITOT TUBE I.D:	4	BOILING WATER:	YES
PITOT TUBE LENGTH:	110"	HOT OIL:	YES
DATE:	10/8/2010	CALIBRATED BY:	KA

ICE BATH			
REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
32.0	31.8	0.2	0.6

BOILING WATER			
REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
214.0	213.5	0.5	0.2

HOT OIL			
REF. IN HG. GLASS THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
356.0	352.5	3.5	1.0

NOTE:
MAXIMUM TOLERANCE BETWEEN ANY TWO MEASUREMENT IS 1.5%.
TAKE READING EVERY ONE MINUTE.

Field Dry Gas Meter Calibration*

Calibration Date: 8/23/2010

Orifice Series: 33-73

Serial Number: AE_1AE_2

Orifice Cal. Date(m/d/y): 4/14/2009

Calibrated by: Khemal Adhikari

(signature):

DRY GAS METER CALIBRATION FACTOR Y	ORIFICE CALIBRATION FACTOR dH@
Yds = 0.9989	dH@ = 1.775

DRY GAS METER READINGS								QUALITY CONTROL CHECKS				DGM ID: A-2
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading						Serial #:
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	($Y_{ds\ max}$ - $Y_{ds\ min}$) < 0.010 **	0.98 < (Y_{ds}/Y_{dn}) < 1.02	Average Coeff. $Y_{ds,i}$	$dH@_{i,corr}$ < (dH@ ± 0.15)	Calibration Interval:
71.0	73.0	71.0	72.0	538.097	543.920	0.120	0.120					Semi-Annual: x
73.0	74.0	72.0	74.0	543.920	549.735	0.120	0.120	0.0032	0.988	0.987	1.646	Bi-monthly:
74.0	76.0	74.0	75.0	549.735	555.565	0.120	0.120	PASS	PASS	PASS	PASS	Other:
76.0	77.0	76.0	76.0	557.752	563.797	0.770	0.770					
77.0	77.0	76.0	76.0	563.797	569.843	0.770	0.770	0.0056	0.993	0.992	1.783	Standard Temperature (deg.F)
77.0	78.0	78.0	77.0	569.843	575.823	0.770	0.770	PASS	PASS	PASS	PASS	Tstd = 60
76.0	80.0	77.0	77.0	577.652	583.084	1.800	1.800					Barometric Pressure (in.Hg)
80.0	81.0	77.0	77.0	583.084	588.545	1.900	1.800	0.0053	1.008	1.007	1.807	Initial: 29.8
81.0	81.0	77.0	77.0	588.545	593.960	1.900	1.800	PASS	PASS	PASS	PASS	Final: 29.9
82.0	84.0	78.0	78.0	597.186	603.583	3.700	3.700					Pstd: 29.90
84.0	86.0	78.0	78.0	603.583	610.012	3.700	3.700	0.0045	1.011	1.010	1.884	
86.0	87.0	78.0	79.0	610.012	616.418	3.700	3.700	PASS	PASS	PASS	PASS	

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
					Corrected					Corrected		Coefficient	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Flowrate Q'rm (SCFM)	Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Flowrate Q'fm (SCFM)	Volume (SCF)	$Y_{ds,i}$ (0.95 < $Y_{ds,i}$ < 1.05)	Orifice $dH@_i$ (in.H2O)
33	28	0.1549	23.0	75.0	0.200	5.608	0.120	71.75	5.823	0.203	5.896	0.9847	1.848
33	28	0.1549	23.0	76.0	0.200	5.603	0.120	73.25	5.815	0.203	5.672	0.9879	1.848
33	28	0.1549	23.0	77.0	0.200	5.598	0.120	74.75	5.830	0.203	5.670	0.9872	1.845
52	12	0.3769	20.5	77.0	0.486	5.837	0.770	76.25	6.045	0.469	5.872	0.9940	1.783
52	12	0.3769	20.5	77.0	0.486	5.837	0.770	76.50	6.046	0.469	5.871	0.9943	1.783
52	12	0.3769	20.5	78.0	0.486	5.832	0.770	77.00	6.080	0.492	5.898	0.9888	1.784
63	7	0.5890	18.0	78.0	0.759	5.316	1.800	78.00	5.432	0.753	5.374	1.0080	1.809
63	7	0.5890	18.0	78.0	0.759	5.316	1.800	78.75	5.461	0.758	5.396	1.0040	1.807
63	7	0.5890	18.0	78.0	0.759	5.316	1.800	79.00	5.435	0.753	5.366	1.0093	1.806
73	6	0.8109	15.5	78.0	1.046	6.274	3.700	80.50	6.397	1.035	6.210	1.0103	1.867
73	6	0.8109	15.5	78.0	1.046	6.274	3.700	81.50	6.429	1.038	6.229	1.0071	1.863
73	6	0.8109	15.5	79.0	1.045	6.268	3.700	82.50	6.406	1.033	6.198	1.0116	1.863

* Critical Orifice used.

Pg - 4

Field Dry Gas Meter Calibration*

Calibration Date: 10/1/2010

Orifice Series: 31-73

Serial Number: AE_1/AE_2

Orifice Cal. Date(m/d/y): 4/14/2009

Calibrated by: KA

(signature): [signature]

SEMI TO BI CHECK		DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
(+2% of Y)	(-2% of Y)	Y	dH@
1.0189	0.9789	Yds = 0.9859	dH@ = 1.841
PASS			

DRY GAS METER READINGS								QUALITY CONTROL CHECKS			
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading					
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	$(Y_{fm,max} - Y_{fm,min}) <$ 0.010 **	0.98 < (Y_{ds}/Y_{fm}) 1.02	Average Coeff. $Y_{fm,i}$	$dH@_{i,avg} <$ (dH@ ± 0.15)
72.0	72.0	72.0	72.0	830.930	837.097	0.770	0.770				
72.0	73.0	72.0	72.0	837.097	843.246	0.770	0.770	0.0058	0.988	0.974	1.780
73.0	73.0	72.0	73.0	843.246	849.385	0.770	0.770	PASS	PASS	PASS	PASS
74.0	74.0	73.0	73.0	851.895	857.374	2.000	2.000				
74.0	75.0	73.0	74.0	857.374	862.824	2.000	2.000	0.0062	1.012	0.998	1.902
75.0	76.0	74.0	74.0	862.824	868.312	2.000	2.000	PASS	PASS	PASS	PASS

DGM ID:	A-2
Serial #:	
Semi A Yfm:	0.9989
Calibration Interval:	
Bi-monthly:	x
Standard Temperature (deg.F)	
Tstd =	60
Barometric Pressure (in.Hg)	
Pstd:	29.90

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
					Corrected					Corrected			
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Flowrate Q'm (SCFM)	Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Flowrate Q'm (SCFM)	Volume (SCF)	Coefficient $Y_{fm,i}$ (0.95 < $Y_{fm,i}$ < 1.05)	Orifice dH@ (in.H2O)
52	12	0.3769	21.0	72.0	0.489	5.866	0.770	72.00	6.167	0.503	6.039	0.9712	1.781
52	12	0.3769	21.0	72.0	0.489	5.866	0.770	72.25	6.149	0.502	6.018	0.9745	1.780
52	12	0.3769	21.0	72.0	0.489	5.866	0.770	72.75	6.139	0.500	6.003	0.9770	1.778
63	7	0.5890	18.0	73.0	0.763	5.341	2.000	73.50	5.479	0.767	5.366	0.9954	1.904
63	7	0.5890	18.0	73.0	0.763	5.341	2.000	74.00	5.460	0.762	5.333	1.0016	1.902
63	7	0.5890	18.0	73.0	0.763	5.341	2.000	74.75	5.488	0.766	5.362	0.9960	1.899

* Critical Orifice used.

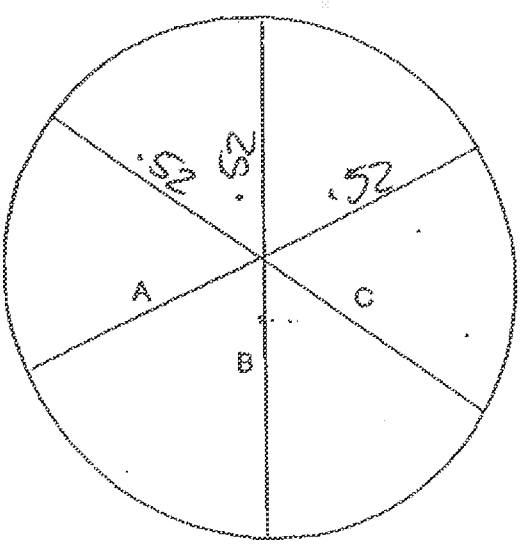
A-5

NOZZLE CALIBRATION FORM

NOZZLE ID #: .52
MICROMETER ID: CALIPER
CALIBRATOR: Brian Harrison
SIGNATURE: [signature]

CLIENT: BP
DATE: 10/18/12

Measured Diameter A:	.52 inch
Measured Diameter B:	.52 inch
Measured Diameter C:	.52 inch
Average Diameter:	.52 inch



Nozzle inside diameter

Appendix F2

CEMS Calibration Gas Certificates

AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

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

Cylinder S/N: CC180176

Customer: ALMEGA ENVIRONMENTAL
Location: HUNTINGTON BEACH, CA

P.O. Number:

Shipping Order Number: 28206454
Transfer Number:
Lot Number: SFS120169
Valve: CGA 580
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 30-Apr-2008

Expiration Date: 30-Apr-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Oxygen	8.5-9 %	8.74 ± 0.12 %
Carbon Dioxide	18 %	18.0 ± 0.3 %

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
10.00 ± 0.07 %	Oxygen	Nitrogen	CC88322	SFS78759	23-Jul-2009	SC	GMIS
20.011 ± 0.020 %	Carbon Dioxide	Nitrogen	D349039	PRM	25-Jan-2011	3220784-03	PRM

Analytical Data

Component:	Oxygen		FIRST TRIAD ANALYSIS 30-Apr-2008			
Analyzer Information			Trial 1	Trial 2	Trial 3	Units
Analyzer Type	Series II Gas Chromatograph	Zero	0.0000	0.0000	0.0000	%
Manufacturer	Hewlett Packard	Reference	9.8784	9.9319	9.9184	%
Model Number	5890A	Candidate	8.6805	8.6644	8.6580	%
Serial Number	3336A54820	Result	8.767	8.724	8.729	%
MPR Last Calibrated	11-Apr-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle	FID & TCD			Mean Analytical Result	8.740	%

Component:	Carbon Dioxide		FIRST TRIAD ANALYSIS 30-Apr-2008			
Analyzer Information			Trial 1	Trial 2	Trial 3	Units
Analyzer Type	Series II Gas Chromatograph	Zero	0.0000	0.0000	0.0000	%
Manufacturer	Hewlett Packard	Reference	19.883	19.702	19.706	%
Model Number	5890A	Candidate	17.786	17.778	17.753	%
Serial Number	3336A54820	Result	18.03	18.05	18.03	%
MPR Last Calibrated	11-Apr-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle	FID & TCD			Mean Analytical Result	18.04	%

Analyst: Aidan Reed

Approved by: Date Reg

AIR LIQUIDE AMERICA, L.P. 8832 Dice Road, Santa Fe Springs, CA 90670-2516
Phone: (562) 946-1383 • Fax: (562) 893-1156

F2-1

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-8891
Fax: (323) 567-3566
www.airgas.com

Part Number:	E03NI86E15A62Q5	Reference Number:	48-124215901-6
Cylinder Number:	CC184103	Cylinder Volume:	150 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Apr 21, 2010	Valve Outlet:	580

Expiration Date: Apr 21, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	4.500 %	4.531 %	G1	+/- 1% NIST Traceable
CARBON DIOXIDE	9.000 %	8.967 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	82658	SG9160228	7.015% OXYGEN/	Jun 01, 2013
NTRM	970910	SG9198971	10.818% CARBON DIOXIDE/NITROGEN	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS % CO2	NDIR	Apr 09, 2010
Siemens %O2	PARAMAGNETIC	Apr 09, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

F2-2

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2135
(323) 357-6891
Fax (323) 567-3586
www.airgas.com

Part Number:	E02NI99E15A0110	Reference Number:	48-124198740-6
Cylinder Number:	CC305636	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 08, 2009	Valve Outlet:	350

Expiration Date: Dec 08, 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	180.0 PPM	181.9 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080503	CC255363	250.0PPM CARBON MONOXIDE/NITROGEN	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 CO	FTIR	Nov 14, 2009

Triad Data Available Upon Request

Notes:

QA Approval

Ex-3

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3888
www.airgas.com

Part Number:	E02NI99E15AC672	Reference Number:	48-124207894-5
Cylinder Number:	CC278176	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 16, 2010	Valve Outlet:	350

Expiration Date: Feb 16, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	90.00 PPM	90.23 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	090605	CC280825	88.88PPM CARBON MONOXIDE/NITROGEN	Feb 01, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 CO	FTIR	Jan 16, 2010

Triad Data Available Upon Request

Notes:

QA Approval

Ex-4

APPENDIX G

FACILITY PROCESS DATA

FACILITY DAS DATA

DATE/TIME	PPM 1INCIN STK NOX 68AI995A	PPM 1INCIN STK O2 68AI995B	PPM 1INCIN STK SO2 68AI995C	FACTOR 1INCIN STK K FACTOR 68FY223K	BIAS 1INCIN NOX STK EMIS BIAS 68FY223E	LB/HR 1INCIN NOX STK EMIS-LB/H 68FY223C	BIAS 1INCIN SO2 STK EMIS BIAS 68FY223F	LB/HR 1INCIN SO2 STK EMIS-LB/H 68FY223D	DEG F 1INCIN STACK TEMP 68TI721	M#SCFH 1INCIN STKFLO-DSCFH 68FY233B
10/18/2010 11:01	20.37	5.25	35.42	0.70	1.07	3.92	1.00	8.88	1295.02	1.51
10/18/2010 11:02	20.26	5.33	35.21	0.70	1.07	3.85	1.00	8.78	1293.98	1.50
10/18/2010 11:03	20.46	5.28	35.00	0.70	1.07	3.94	1.00	8.80	1293.98	1.51
10/18/2010 11:04	20.46	5.28	35.00	0.70	1.07	3.94	1.00	8.80	1293.98	1.51
10/18/2010 11:05	20.51	5.22	35.10	0.70	1.07	3.92	1.00	8.75	1295.02	1.50
10/18/2010 11:06	20.13	5.30	35.42	0.70	1.07	3.91	1.00	8.96	1295.02	1.52
10/18/2010 11:07	20.35	5.32	35.52	0.70	1.07	4.00	1.00	9.11	1295.02	1.54
10/18/2010 11:08	20.34	5.32	35.21	0.70	1.07	3.98	1.00	8.98	1293.98	1.54
10/18/2010 11:09	20.34	5.32	35.21	0.70	1.07	3.98	1.00	8.98	1293.98	1.54
10/18/2010 11:10	20.21	5.32	35.52	0.70	1.07	3.96	1.00	9.11	1292.93	1.54
10/18/2010 11:11	20.21	5.32	35.52	0.70	1.07	3.96	1.00	9.11	1292.93	1.54
10/18/2010 11:12	20.31	5.29	35.00	0.70	1.07	4.00	1.00	8.99	1292.93	1.55
10/18/2010 11:13	20.15	5.32	35.42	0.70	1.07	4.01	1.00	9.20	1293.98	1.56
10/18/2010 11:14	20.10	5.29	35.52	0.70	1.07	3.93	1.00	9.07	1292.93	1.54
10/18/2010 11:15	20.10	5.29	35.52	0.70	1.07	3.93	1.00	9.07	1292.93	1.54
10/18/2010 11:16	20.31	5.33	35.42	0.70	1.07	4.03	1.00	9.20	1292.93	1.56
10/18/2010 11:17	20.20	5.23	35.52	0.70	1.07	4.00	1.00	9.19	1293.98	1.56
10/18/2010 11:18	20.20	5.23	35.52	0.70	1.07	4.00	1.00	9.19	1293.98	1.56
10/18/2010 11:19	19.92	5.35	36.11	0.70	1.07	3.97	1.00	9.38	1292.93	1.56
10/18/2010 11:20	19.88	5.41	36.01	0.70	1.07	3.96	1.00	9.33	1291.88	1.56
10/18/2010 11:21	20.37	5.19	36.39	0.70	1.07	3.97	1.00	9.27	1299.88	1.53
10/18/2010 11:22	20.37	5.19	36.39	0.70	1.07	3.97	1.00	9.27	1299.88	1.53
10/18/2010 11:23	20.36	5.22	36.21	0.70	1.07	3.96	1.00	9.18	1301.96	1.53
10/18/2010 11:24	20.34	5.17	36.38	0.70	1.07	3.98	1.00	9.31	1304.04	1.54
10/18/2010 11:25	19.86	5.22	36.70	0.70	1.07	3.93	1.00	9.47	1305.09	1.55
10/18/2010 11:26	19.56	5.31	36.49	0.70	1.07	3.81	1.00	9.30	1303.00	1.53
10/18/2010 11:27	19.60	5.31	36.49	0.70	1.07	3.81	1.00	9.30	1303.00	1.53
10/18/2010 11:28	19.77	5.36	36.80	0.70	1.07	3.86	1.00	9.41	1303.00	1.54
10/18/2010 11:29	19.80	5.23	36.70	0.70	1.07	3.85	1.00	9.32	1303.00	1.53
10/18/2010 11:30	19.80	5.23	36.70	0.70	1.07	3.85	1.00	9.32	1303.00	1.53
10/18/2010 11:31	19.87	5.25	36.60	0.70	1.07	3.87	1.00	9.30	1303.00	1.53
10/18/2010 11:32	19.94	5.23	36.60	0.70	1.07	3.84	1.00	9.20	1303.00	1.51
10/18/2010 11:33	19.52	5.23	36.49	0.70	1.07	3.78	1.00	9.21	1303.00	1.52
10/18/2010 11:34	19.22	5.39	37.01	0.70	1.07	3.74	1.00	9.40	1298.84	1.53
10/18/2010 11:35	19.22	5.39	37.01	0.70	1.07	3.74	1.00	9.40	1298.84	1.53
10/18/2010 11:36	19.31	5.33	36.49	0.70	1.07	3.70	1.00	9.13	1298.14	1.50
10/18/2010 11:37	19.39	5.34	36.49	0.70	1.07	3.78	1.00	9.25	1298.14	1.52
10/18/2010 11:38	19.78	5.35	37.29	0.70	1.07	3.81	1.00	9.40	1297.19	1.51
10/18/2010 11:39	19.78	5.35	37.29	0.70	1.07	3.81	1.00	9.40	1297.19	1.51
10/18/2010 11:40	19.60	5.30	37.60	0.70	1.07	3.78	1.00	9.45	1297.19	1.51
10/18/2010 11:41	19.55	5.33	37.39	0.70	1.07	3.81	1.00	9.50	1297.19	1.53
10/18/2010 11:42	19.53	5.40	37.60	0.70	1.07	3.74	1.00	9.43	1296.06	1.51
10/18/2010 11:43	19.53	5.40	37.60	0.70	1.07	3.74	1.00	9.43	1296.06	1.51

Exp - 4

FACILITY DAS DATA

DATE/TIME	PPM 1INCIN STK NOX 68AI996A	PPM 1INCIN STK O2 68AI996B	PPM 1INCIN STK SO2 68AI996C	FACTOR 1INCIN STK K FACTOR 68FY223K	BIAS 1INCIN NOX STK EMIS BIAS 68FY223E	LB/HR 1INCIN NOX STK EMIS-LB/H 68FY223C	BIAS 1INCIN SO2 STK EMIS BIAS 68FY223F	LB/HR 1INCIN SO2 STK EMIS-LB/H 68FY223D	DEG F 1INCIN STACK TEMP 68TI721	MMSCFH 1INCIN STKFLO-DSCFH 68FY223B
10/18/2010 11:44	19.75	5.31	37.81	0.70	1.07	3.82	1.00	9.56	1297.10	1.52
10/18/2010 11:45	19.31	5.33	38.51	0.70	1.07	3.73	1.00	9.71	1296.06	1.52
10/18/2010 11:46	19.13	5.42	38.88	0.70	1.07	3.67	1.00	9.75	1293.98	1.51
10/18/2010 11:47	19.13	5.42	38.88	0.70	1.07	3.67	1.00	9.75	1293.98	1.51
10/18/2010 11:48	19.36	5.41	38.89	0.70	1.07	3.74	1.00	9.79	1292.93	1.51
10/18/2010 11:49	19.45	5.34	39.10	0.70	1.07	3.77	1.00	9.90	1291.89	1.52
10/18/2010 11:50	19.45	5.42	38.20	0.70	1.07	3.68	1.00	9.68	1290.16	1.49
10/18/2010 11:51	19.45	5.42	38.20	0.70	1.07	3.68	1.00	9.68	1290.16	1.49
10/18/2010 11:52	19.44	5.34	40.10	0.70	1.07	3.73	1.00	10.02	1290.16	1.50
10/18/2010 11:53	19.54	5.37	40.42	0.70	1.07	3.74	1.00	10.10	1290.16	1.50
10/18/2010 11:54	19.75	5.32	40.58	0.70	1.07	3.79	1.00	10.17	1291.89	1.51
10/18/2010 11:55	19.89	5.29	41.11	0.70	1.07	3.85	1.00	10.38	1293.93	1.52
10/18/2010 11:56	20.56	5.39	41.32	0.70	1.07	4.03	1.00	10.57	1296.14	1.54
10/18/2010 11:57	20.03	5.14	40.58	0.70	1.07	3.85	1.00	10.19	1305.09	1.51
10/18/2010 11:58	20.04	5.19	39.89	0.70	1.07	3.81	1.00	10.15	1309.95	1.53
10/18/2010 11:59	19.82	5.10	40.52	0.70	1.07	3.79	1.00	10.20	1315.15	1.52
10/18/2010 12:00	16.83	5.18	39.30	0.70	1.07	3.60	1.00	9.81	1316.89	1.50
10/18/2010 12:01	16.27	5.32	38.81	0.70	1.07	3.45	1.00	9.61	1315.15	1.50
10/18/2010 12:02	17.99	5.46	39.20	0.70	1.07	3.41	1.00	9.70	1309.95	1.49
10/18/2010 12:03	17.82	5.46	38.89	0.70	1.07	3.38	1.00	9.69	1303.60	1.49
10/18/2010 12:04	18.26	5.54	40.21	0.70	1.07	3.50	1.00	10.05	1297.10	1.50
10/18/2010 12:05	18.59	5.44	39.79	0.70	1.07	3.54	1.00	9.88	1293.98	1.49
10/18/2010 12:06	18.59	5.44	39.79	0.70	1.07	3.54	1.00	9.88	1293.98	1.49
10/18/2010 12:07	18.77	5.42	39.69	0.70	1.07	3.60	1.00	9.94	1290.85	1.51
10/18/2010 12:08	18.72	5.40	39.30	0.70	1.07	3.61	1.00	9.90	1288.07	1.52
10/18/2010 12:09	19.13	5.38	38.71	0.70	1.07	3.63	1.00	9.59	1287.03	1.49
10/18/2010 12:10	19.13	5.38	38.71	0.70	1.07	3.63	1.00	9.59	1287.03	1.49
10/18/2010 12:11	19.17	5.38	38.99	0.70	1.07	3.71	1.00	9.85	1287.03	1.52
10/18/2010 12:12	19.35	5.38	38.51	0.70	1.07	3.77	1.00	9.76	1287.03	1.53
10/18/2010 12:13	19.33	5.35	38.61	0.70	1.07	3.71	1.00	9.67	1287.03	1.51
10/18/2010 12:14	19.33	5.31	38.40	0.70	1.07	3.71	1.00	9.61	1288.07	1.51
10/18/2010 12:15	19.24	5.32	38.30	0.70	1.07	3.67	1.00	9.52	1289.11	1.50
10/18/2010 12:16	19.24	5.32	38.30	0.70	1.07	3.67	1.00	9.52	1289.11	1.50
10/18/2010 12:17	19.01	5.26	38.09	0.70	1.07	3.72	1.00	9.43	1290.16	1.49
10/18/2010 12:18	19.04	5.24	38.40	0.70	1.07	3.81	1.00	9.71	1291.89	1.52
10/18/2010 12:19	18.89	5.22	38.51	0.70	1.07	3.80	1.00	9.66	1293.98	1.50
10/18/2010 12:20	18.89	5.22	38.51	0.70	1.07	3.80	1.00	9.66	1293.98	1.50
10/18/2010 12:21	19.57	5.20	38.19	0.70	1.07	3.85	1.00	9.32	1295.02	1.47
AVERAGE	19.04	5.31	37.61	0.70	1.07	3.89	1.00	9.49	1296.28	1.52

Cy - 2

APPENDIX H

SCAQMD PERMIT TO OPERATE

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
Process 13 : SULFUR RECOVERY					
OXIDIZER, THERMAL, NO. 1 WASTE GAS, REFINERY GAS OR NATURAL GAS, 39.5 MMBTU/HR A/N: 457433	C2413	D790 D893 C896 S912 C2406 S2415	NOX: MAJOR SOURCE**; SOX: MAJOR SOURCE**	CO: 2000 PPMV (5) [RULE 407,4-2-1982] ; NOX: 0.06 LBS/MMBTU NATURAL GAS (4) [RULE 2005,4-20-2001;RULE 2005,5-6-2005] PM: (9) [RULE 404,2-7-1986] ; PM: 0.1 GRAINS/SCF (5) [RULE 409,8-7-1981] ; SOX: 21.1 LBS/HR (2)	A72.1, A99.6, B61.4, C8.2, D82.2, D90.4, D328.1, H23.1, I296.1, K40.1
STACK, HEIGHT: 200 FT; DIAMETER: 6 FT A/N: 457433	S2415	C2413			
FUGITIVE EMISSIONS, MISCELLANEOUS A/N: 457433	D2678			HAP: (10) [40CFR 63 Subpart CC, #5A,5-23-2003]	H23.3
System 7 : CLAUS TAIL GAS TREATING UNIT NO. 1					S18.1
REGENERATOR, RPV 4120, COMMON TO TGU NO. 1 & 2, HEIGHT: 56 FT 6 IN; DIAMETER: 7 FT A/N:	D898				
ACCUMULATOR, RPV 4122, REGENERATOR OVERHEAD, COMMON TO TGU NO. 1 & 2, HEIGHT: 5 FT 6 IN; DIAMETER: 3 FT A/N:	D900				
TANK, SURGE, RPV 4123, LEAN MDEA, COMMON TO TGU NO. 1 & 2, HEIGHT: 17 FT; DIAMETER: 10 FT A/N:	D901				

* (1)(1A)(1B) Denotes RECLAIM emission factor (2)(2A)(2B) Denotes RECLAIM emission rate
(3) Denotes RECLAIM concentration limit (4) Denotes BACT emission limit
(5)(5A)(5B) Denotes command and control emission limit (6) Denotes air toxic control rule limit
(7) Denotes NSR applicability limit (8)(8A)(8B) Denotes 40 CFR limit(e.g. NSPS, NESHAPS,etc.)
(9) See App B for Emission Limits (10) See Section J for NESHAP/MACT requirements

** Refer to Section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

H-L

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

A63.30 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
ROG	Less than or equal to 36 LBS PER DAY
CO	Less than or equal to 21 LBS PER DAY
PM	Less than or equal to 106 LBS PER DAY

[RULE 1303(b)(2)-Offset, 5-10-1996]

[Devices subject to this condition : D63]

A72.1 The operator shall maintain this equipment to achieve a minimum destruction efficiency of 98 percent for H2S during the normal operation of the equipment it vents.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : C2413]

A99.1 The 8 PPM NOX emission limit(s) shall not apply when this equipment is operating during startup and shutdown modes.

[RULE 2005, 5-6-2005]

[Devices subject to this condition : D1226, D1233, D1236, D1239]

A99.2 The 2.5 PPM CO emission limit(s) shall not apply when the associated gas turbine is operating at less than 85 percent of the rated capacity. This condition refers to CO emission limit.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D1226, D1233, D1236, D1239]

H-2

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

A99.3 The 2.5 PPM CO emission limit(s) shall not apply when the equipment is operating at startup and shutdown modes.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D1226, D1233, D1236, D1239]

A99.4 The 20 ppm NH3 emission limit(s) shall not apply when this equipment is operating at startup and shutdown modes.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : C1242, C1248, C1252, C1256]

A99.6 The 21.1 Lbs/hr SOX emission limit(s) shall not apply when burning only natural gas.

[RULE 2011, 5-6-2005]

[Devices subject to this condition : C2413]

A103.1 The operator shall keep materials in petroleum coke handling and storage systems sufficiently moist to prevent fugitive dust emissions.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D121, D122, D148]

A195.1 The 20 PPMV NOX emission limit(s) is averaged over 365 day rolling average at 0 percent O2, dry basis.

For the purposes of this condition, this limit is a long term limit which applies at all times.

[CONSENT DECREE CIVIL NO. 2:96 CV 095 RL (Fourth Amendment), 10-7-2005]

[Devices subject to this condition : D164]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

B61.2 The operator shall only use butane containing the following specified compounds:

Compound	ppm by volume
Total Sulfur less than	50

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D1226, D1227, D1233, D1234, D1236, D1237, D1239, D1240]

B61.3 The operator shall only use natural gas containing the following specified compounds:

Compound	ppm by volume
Total Sulfur less than	5

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D1226, D1227, D1233, D1234, D1236, D1237, D1239, D1240]

B61.4 The operator shall not use fuel gas, except uncombined natural gas which is not regulated by the condition, containing the following specified compounds:

Compound	ppm by volume
H2S greater than	160

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition : D27, D29, D31, D33, D67, D69, D151, D153, D155, D250, D252, D416, D417, D418, D419, D421, D423, D425, D532, D535, D538, D539, D541, D570, D625, D626, D627, D628, D629, C910, D1226, D1227, D1233, D1234, D1236, D1237, D1239, D1240, D1262, C1326, D1439, D1465, C2413, D2837]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

C6.2 The operator shall use this equipment in such a manner that the hydrocarbon concentration being monitored, as indicated below, does not exceed 30 percent of the Lower Explosive Limit.

The operator shall use an explosimeter to measure the Lower Explosive Limit (LEL) in the vapor space above the floating roof, twice a year at a 4 to 8 month interval.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 1178, 4-7-2006]

[Devices subject to this condition : D1153, D1154, D1155, D1156, D1158, D1161, D1166, D1167, D1168, D1169, D1170, D1171, D1172, D1173, D1174, D1176, D1179, D1180, D1181, D1182, D1183, D1184, D1188, D1190, D1194, D1195, D2850]

C8.1 The operator shall use this equipment in such a manner that the percent excess air being monitored, as indicated below, is not less than 1 percent.

This condition shall only apply during normal operation. This limit is not applicable during startup, shutdown, or process upset.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition : D1465]

C8.2 The operator shall use this equipment in such a manner that the temperature being monitored, as indicated below, is not less than 1200 Deg F.

To comply with this condition, the operator shall install and maintain a(n) temperature reading device to accurately indicate the temperature in the firebox or in the ductwork immediatly downstream from the firebox.

The operator shall also install and maintain a device to continuously record the parameter being measured.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition : C910, C2413]

H-5

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

D82.2 The operator shall install and maintain a CEMS to measure the following parameters:

NOX concentration in ppmv

SOX concentration in ppmv

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS will convert the actual NOX concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

The CEMS will convert the actual SOX concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

The CEMS shall be installed and certified no later than 12 months after the initial start up according to the requirements of Rule 2011 for SOx major sources and Rule 2012 for NOx major sources

[RULE 2011, 5-6-2005; RULE 2012, 5-6-2005]

[Devices subject to this condition : C910, C2413]

D82.4 The operator shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv

Oxygen concentration in percent volume

[40CFR 63 Subpart UUU, 4-20-2006]

[Devices subject to this condition : D164]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

D90.3 The operator shall periodically analyze the fuel gas for total sulfur content in the refinery gases and butane used in the cogeneration facility according to the following specifications:

The operator shall analyze once every week.

[RULE 2005, 5-6-2005; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition : D860, D866, D1226, D1227, D1233, D1234, D1236, D1237, D1239, D1240]

D90.4 The operator shall continuously monitor the H2S concentration in the fuel gases before being burned in this device according to the following specifications:

The operator shall use Gas Chromatograph meeting the requirements of 40CFR60 Subpart J to monitor the parameter.

The operator shall also install and maintain a device to continuously record the parameter being monitored.

The operator may monitor the H2S concentration at a single location for fuel combustion devices, if monitoring at this location accurately represents the concentration of H2S in the fuel gas being burned in this device.

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition : D27, D29, D31, D33, D67, D69, D151, D153, D155, D250, D252, D313, D416, D417, D418, D419, D421, D423, D425, D532, D535, D538, D539, D541, D570, D625, D626, D627, D628, D629, C910, D1226, D1227, D1233, D1234, D1236, D1237, D1239, D1240, D1262, D1439, C2413, D2837]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

D328.1 The operator shall determine compliance with the CO emission limit(s) either: (a) conducting a source test at least once every five years using AQMD Method 100.1 or 10.1; or (b) conducting a test at least annually using a portable analyzer and AQMD-approved test method. The test shall be conducted when the equipment is operating under normal conditions to demonstrate compliance with the CO emission limit(s). The operator shall comply with all general testing, reporting, and recordkeeping requirements in Sections E and K of this permit.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition : D27, D29, D31, D33, D63, D67, D151, D153, D155, D250, D313, D416, D417, D418, D419, D421, D423, D425, D532, D535, D538, D539, D541, D570, D625, D626, D627, D628, D629, C910, D1262, D1433, D1439, D1465, C2413]

D330.1 The operator shall have a person that has been trained in accordance with Rule 461conduct a semi-annual inspection of the gasoline transfer and dispensing equipment. The first inspection shall be in accordance with Rule 461, Attachment B, the second inspection shall be in accordance with Rule 461, Attachment C, and the subsequent inspections shall alternate protocols. The operator shall keep records of the inspection and the repairs in accordance to Rule 461 and Section K of this Permit.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 461, 3-7-2008]

[Devices subject to this condition : D1276]

D332.1 The operator shall determine compliance with the CO emission limit(s) by conducting a test at least once every five years using a portable analyzer and AQMD-approved test method or, if not available, a non-AQMD approved test method. The test shall be conducted when the equipment is operating under normal conditions to demonstrate compliance with the CO emission limit(s). The operator shall comply with all general testing, reporting, and recordkeeping requirements in Sections E and K of this permit.

[RULE 1146.1, 5-13-1994; RULE 1146.1, 9-5-2008; **RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]**

[Devices subject to this condition : D69, D252, D705]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

E336.13 The operator shall vent the vent gases from this equipment as follows:

All vent gases under normal operating conditions shall be directed to Thermal Oxidizer No.1 and/or Thermal Oxidizer No.2 of System 6 of Process 13.

This equipment shall not be operated unless either the Thermal Oxidizer No.1 and/or Thermal Oxidizer No.2 of System 6 of Process 13 are in full use and have a valid permit to receive vent gases from this equipment.

[RULE 1176, 9-13-1996]

[Devices subject to this condition : D830, D832]

H. Applicable Rules

H23.1 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
H2S	40CFR60, SUBPART	J

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition : D27, D29, D31, D33, D67, D69, D151, D153, D155, D250, D252, D313, D416, D417, D418, D419, D421, D423, D425, D532, D535, D538, D539, D541, D570, D625, D626, D627, D628, D629, C910, D1227, D1233, D1234, D1236, D1237, D1239, D1240, D1262, C1326, D1439, D1465, C2413, D2837]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

H.1 The operator shall comply with all the requirements of the conditions and compliance schedule as specified in the variance dated July 15, 2009, Case no. 5357-36, in accordance with the Findings and Decisions of the Hearing Board or as subsequently modified by the Hearing Board. The operator shall submit progress reports at least semi-annually, or more frequently if specified in the Findings and Decisions. The progress reports shall contain dates for achieving activities, milestones or compliance required in the schedule of compliance and dates when such activities, milestones or compliance were achieved; and an explanation of why any dates in the schedule of compliance were not, or will not be met, and any preventative or corrective measures adopted.

The variance (or Order for Abatement) referenced in this condition does not affect federal or citizen enforceability of the underlying SIP approved rules for which the applicant is receiving the variance (or Order for Abatement).

[RULE 3004(a)(10)(C), 12-12-1997]

[Devices subject to this condition : C1302, C1305, C1308, C1326]

I296.1 This equipment shall not be operated unless the operator demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

[RULE 2005, 5-6-2005]

[Devices subject to this condition : D730, C2413]

I296.2 This equipment shall not be operated unless the operator demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

To comply with this condition, the operator shall, prior to each compliance year hold a minimum of NOx RTCs of 2,633 lbs and a minimum of SOx RTCs of 35 lbs.

In accordance with Rule 2005(f), unused RTCs may be sold only during the reconciliation period for the fourth quarter of the applicable compliance year inclusive of the 1st compliance year.

[RULE 2005, 5-6-2005]

[Devices subject to this condition : D2776]

FACILITY PERMIT TO OPERATE
BP WEST COAST PROD.LLC BP CARSON REF.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

procedure Method TP-201.6. Results shall be submitted to the AQMD, Engineering and Compliance, within thirty (30) days of the test.

The AQMD shall be notified by e-mail at r461testing@aqmd.gov or by facsimile at telephone number (909) 396-3606 at least twenty-four hours prior to testing. Such notification shall include the name of the owner or operator; the name of the contractors; the location of the facility; and the scheduled start and completion dates of the liquid removal rate test.

The testing frequency for the above mentioned tests shall be conducted in accordance with the most recent AQMD Rule 461 amendment or CARB Executive Order requirements, whichever is more stringent.

[RULE 461, 3-7-2008]

[Devices subject to this condition : D1277]

K. Record Keeping/Reporting

K40.1 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Emission data shall be expressed in terms of mass rate (lbs/hr). In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

[RULE 2011, 5-6-2005; RULE 2012, 5-6-2005]

[Devices subject to this condition : C2413]

APPENDIX I

SCAQMD CHECKLIST FOR SOURCE TEST REPORTS, FORM STR.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING FORM STR
CHECK LIST FOR SOURCE TEST REPORTS

Please check off all the following items to verify that the information is provided in the source test report, and then send the checklist along with the source test report.

[X] Brief description of the equipment tested.

[X] Brief process description, including maximum and normal operating temperatures, pressures, through-put, etc.

[X] Operating conditions under which test was performed.

[X] Process schematic diagram showing the ports and sampling locations, including the dimensions of the ducts/stacks at the sampling locations, along with upstream and downstream locations, and distances of flow disturbances, (e.g. elbows, tees, fans, dampers) from the sampling locations (upstream and downstream).

[X] Field and laboratory data forms, strip charts and analyses.

[X] Brief description of sampling and analytical methods for each gaseous and particulate constituent measured.

[X] Calculations for volumetric flow rates and emission rates.

[X] Description of calibration and quality assurance procedures.

[X] Determination that the testing laboratory qualifies as an "independent testing laboratory" under Rule 304 (no conflict of interest).

ATTACHMENTS

Attachment 1

Laboratory Report and Data Package for TGNMO per SCAQMD

Method 25.3

Almega
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LABORATORY REPORT

Non-Methane Non-Ethane Organic compound Emissions by SCAQMD Method 25.3 (TCA/FID)

Client: BP
Project No.: e9036
Unit Tested: TGU#1
Sampling Date: 18-Oct-10
Analyzed Date: 22-Oct-10
Lab No.: A 173

Client Sample ID	Lab ID	Almega Sample ID		Total* NMNEO	NMNEO	NMNEO	CH_4	C_2H_6	CO_2	O_2
		Tank	Trap	ppm	ppm condensable	ppm noncondensable	ppm	ppm	% v/v by TCD	% v/v by TCD
TGU#1										
INK A	A 173 - 011 A	5025	69	**2.01**	1.53	< 2.0	ND	ND	4.8	5.1
INK B	A 173 - 011 B	91187	70	**2.77**	2.24	< 2.0	ND	ND	4.8	5.2
Detection Limit					1	2	2	2	0.3	0.3

* NOTE - the BIAS FACTOR ref 1 0901 is NOT applied in these results

ND Not Detected

	Run A	Run B
Detection Limit NMNEO noncondensable	1.37	1.43

Water Blank , ppmC 0.838

TGNMNEO concentration values are reported in ppm (v/v) as Methane (carbon = 1).

The sample cylinder is analyzed for NMNEO, CO, CH_4, CO_2 and C_2H_6. It is then directed to a separation column where all heavy organics (C_3^+) separate from the light organics (CO, CO_2, CH_4 and C_2H_6). The light organics are then passed through a reduction catalyst to convert CO and CO_2 to CH_4, and are then directed to a FID for detection and quantification. The heavy organics are backflushed off the holding column, passed through an oxidation catalyst, which convert all organics to CO_2, then through a reduction catalyst to convert CO_2 to CH_4 and then to a FID for detection and quantification.

Reviewed by: CA

CALCULATIONS

Client:	BP		Lab No.: A 173	
Project No.:	e9036			
Unit Tested:	TGU#1			
Sampling Date:	18-Oct-10			
Date tested:	22-Oct-10			
Parameter	Symbol	Units	Run #1 A	Run #1 B
Sample ID			TNK A	TNK B
Lab ID			A 173 - 011 A	A 173 - 011 B
Sample Tank				
Tank No			5025	91187
Sample Tank Volume	V_T	L	6.000	6.000
Barometric Pressure	P_b	mm Hg	763	763
Pre-test Pressure	P_{Ti}	mm Hg (abs)	0	0
Pre-test Temperature	t_{Ti}	°C	22	22
Abs. Pre-test Temperature	T_{Ti}	°K	295	295
Post-test Pressure	P_{Ts}	mm Hg (abs)	620	594
Post-test Temperature	t_{Ts}	°C	22	22
Abs. Post-test Temperature	T_{Ts}	°K	295	295
Final Pressure	P_{TF}	mm Hg (abs)	918	916
Abs.Final Temperature	T_{TF}	°K	293	293
Dilution Factor	DF_T		1.49	1.55
Concentration Methane	C_{CH4}	ppm	ND	ND
Concentration Carbon Monoxide	C_{CO}	ppm	153.12	124.14
NMNEO (noncond)	C_{SA}	ppm	0.32	0.34
Sample Volume	Vs	L	4.791	4.590
Methane in Tank(C_{CH4}*DF_T)	C_{CH4T}	ppm	ND	ND
Carbon Monoxide in Tank(C_{CO}*DF_T)	C_{COT}	ppm	228.26	192.78
NMNEO (noncond)	C_{SAT}	ppm	0.48	0.53
Condensate Recovery - Trap				
Sample ID			TRP 69	TRP 70
Trap No			69	70
Lab No.:			A 173 - 012 A	A 173 - 012 B
Sample Impinger Volume	V_{IMP}	ml	2.0	2.0
Sample Volume	V_s	L	4.791	4.590
TC Concentration	C_{TC}	mg/L	19.71	17.48
IC Concentration	C_{IC}	mg/L	17.85	14.87
TOC Concentration	C_{TOC}	mg/L	1.857	2.610
NMNEO, Condensable	C_T	ppm	1.53	2.24
TNMNEOC (C_{SA}+C_T)	C	ppmC	2.01	2.77

Calculations

$V_s = k_i * V_T * (P_{TF}/T_{TF} - P_{Ti}/T_{Ti})$

$k_i = (273+15.56)/760 = 0.3799$

$C_{SAT} = DF * C_{SA}$

$C_{CH4T} = DF * C_{CH4}$

$DF = (P_{TF}/T_{TF})/(P_{Ts}/T_{Ts} - P_{Ti}/T_{Ti})$

$C_T = (C_{TOC} * V_{IMP} * V_m)/(V_s * A_C)$

$V_m = 23.6902$ L/mole

QA/QC SUMMARY
(Repeat Analysis)

Client Project No.: c9036
Sampling Date: 18-Oct-10
Run #1 A

Lab No.: A 173
Analyzed Date: 22-Oct-10

Analyte	Sample ID	Area Count #1	Area Count #2	Area % diff (±20%)	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO	A 173 - 011 A	3747335	3774011	-0.71	153	154	153	-0.71
CH4	A 173 - 011 A	ND	ND	ND	ND	ND	ND	ND
CO2 *	A 173 - 011 A	194256	194960	-0.36	3.2	3.2	3.2	-0.36
O2*	A 173 - 011 A	733963	736003	-0.28	3.4	3.5	3.4	-0.28
C2H6	A 173 - 011 A	ND	ND	ND	ND	ND	ND	ND
NMNEO	A 173 - 011 A	7876	7838	0.48	0.32	0.32	0.32	0.48

Analyte	Sample ID	Conc # 1	Conc # 2	Conc # 3	Mean Conc ppm	COV 10%	
Trap Analysis							
TC	A 173 - 012 A	10.01	9.505	10.05	19.71	3.15	DF=2
IC	A 173 - 012 A	9.242	8.643	8.895	17.85	3.22	

Run #1 B

Analyte	Sample ID	Area Count #1	Area Count #2	Area % diff (±20%)	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO	A 173 - 011 B	3048539	3049612	-0.04	124	124	124	-0.04
CH4	A 173 - 011 B	ND	ND	ND	ND	ND	ND	ND
CO2 *	A 173 - 011 B	185959	185816	0.08	3.1	3.1	3.1	0.08
O2 *	A 173 - 011 B	721258	711762	1.32	3.4	3.3	3.4	1.33
C2H6	A 173 - 011 B	ND	ND	ND	ND	ND	ND	ND
NMNEO	A 173 - 011 B	9328	7399	20.68	0.38	0.30	0.34	23.06

Analyte	Sample ID	Conc # 1	Conc # 2	Conc # 3	Mean Conc ppm	COV 10%	
Trap Analysis							
TC	A 173 - 012 B	8.74	8.817	8.66	17.48	0.91	DF=2
IC	A 173 - 012 B	7.610	7.464	7.228	14.87	2.46	

Water blank

TC	0.000
IC	-0.010
TOC	0.010

* - by GC/TCD

$Conc_{CO}$ in tank = $MeanConc_{CO}$ * DF
$Conc_{CO2}$ in tank = $MeanConc_{CO2}$ * DF
$Conc_{O2}$ in tank = $MeanConc_{O2}$ * DF
$Conc_{CH4}$ in tank = $MeanConc_{CH4}$ * DF

SAMPLE INVENTORY REPORT

Method 25.3 Sampling Train

Project No.: c9036
Client: BP

Lab No.: A 173
Sampling Date: 18-Oct-10

Laboratory ID	Client ID	Component ID	
Run #1 A			
A 173 - 011 A	TNK A	Tank #	S025
A 173 - 012 A	TRP 69	Impinger	69
Run #1 B			
A 173 - 011 B	TNK B	Tank #	91187
A 173 - 012 B	TRP 70	Impinger	70

Lot # A173

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN:

REPORT TO:

PO # _____

ALMEGA Environmental & Technical Services
5251 McFadden Ave,
Huntington Beach, CA 92649
(714) 889-4000 Fax (714) 889-7030
lab@almegaenvironmental.com
Contact:

Turnaround Time
Standard: Other:
Rush:
Depends on # of Samples
5 - 10 days _____
3 - 7 days _____

Job # 7036 | Unit # TEU #1 | Client: BP | Location: Carson, CA

Sampler: (Signature)

Project Manager: T. TRAN

Unit Information:

ANALYSIS REQUESTED

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	Method #.51	45.3				Return or Dispose / REMARKS
10/18/10	1035	FB - SAMPLE	A173 - FB - C2	✓			1	✓					
	1035	FB - FILTER	- C1			✓	1	✓					FILTER # 9432
	1101	R1 - SAMPLE	- R1 - C2	✓			1	✓					
	1101	R1 - FILTER	- C1			✓	1	✓					FILTER # 9437
	1113	TNK A	A173 - 011A		✓		1		✓				TNK # S-025
	1113	TNK B	011B		✓		1		✓				TNK # 91187
	1113	TRP 69	012A	✓			1		✓				TNK A
	1113	TRP 70	012B	✓			1		✓				TNK B

Relinquished by: _____ Date: 10/18/10 Time: 1415

Received by: Alexandra Date: 10/18/10 Time: 14:15

Relinquished by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time _____

5

Almega
ENVIRONMENTAL

Standard Receipt
Sample LOG in Checklist

Project No: 9036 BP #1704

Lab ID: 4173

Method: 25.3, 5.1

Sampling Date: 10/18/10 Location: Int:

Date & Time Rc'd: 10/18/10 14:15 Location: Int:

Arrived By: (circle) FedEx UPS Drop Off (init) ✓ Other

Condition of Package(s): (comment): OK Package Type: Box (Cooler) Other:

Number of Sample Container(s): 2+4 Correct Containers (per Method): (Y) N

Preservation: (circle) (ICE) DryICE ICEPacks None

Sample Conditions:

Sample Temp (C): ~ 4°C (25.3) Ambient Temp (C): 92

Sample Temp (C): Filter Condition:

PH: Components Sealed: Y N

Sample Recovery Completed On: (date & time)

Recovered In: (circle) (Field) Lab Other Silica Gel Condition:

Tedlar Bags -
Condensation: Y N

Comments:

Container(s) Requested: Glass Plastic

Additional Comments:

CHROMATOGRAM

TEST SAMPLES

Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 17:27:22, a 173 - 011 a.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 16:36:55, a 173 - 011 b~2.tmp
Sample ID : A 173 - 011 A

Injection Date: 10/20/2010 17:27 Calculation Date: 10/20/2010 18:10

Operator : Galina Detector Type: 0800 (10 Volts)
Workstation: Bus Address : 88
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d5b-21e1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	156.6837	2.313	0.000	3747335	BB	5.2	
2	Methane		3.740					M
3	Carbon Dioxi	8505.5479	3.993	-0.107	213480416	BB	19.7	C
4	Ethane		8.326					M
5	NMOC	0.3259	12.567	0.134	7876	BB	13.2	
	Totals:	8662.5315		0.027	217236627			

Status Codes:
M = Missing peak
C = Out of calibration range

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 2 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -133 microVolts LSB: 1 microVolts

Noise (used): 181 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Calib. out of range; No Recovery Action Specified

Original Notes:

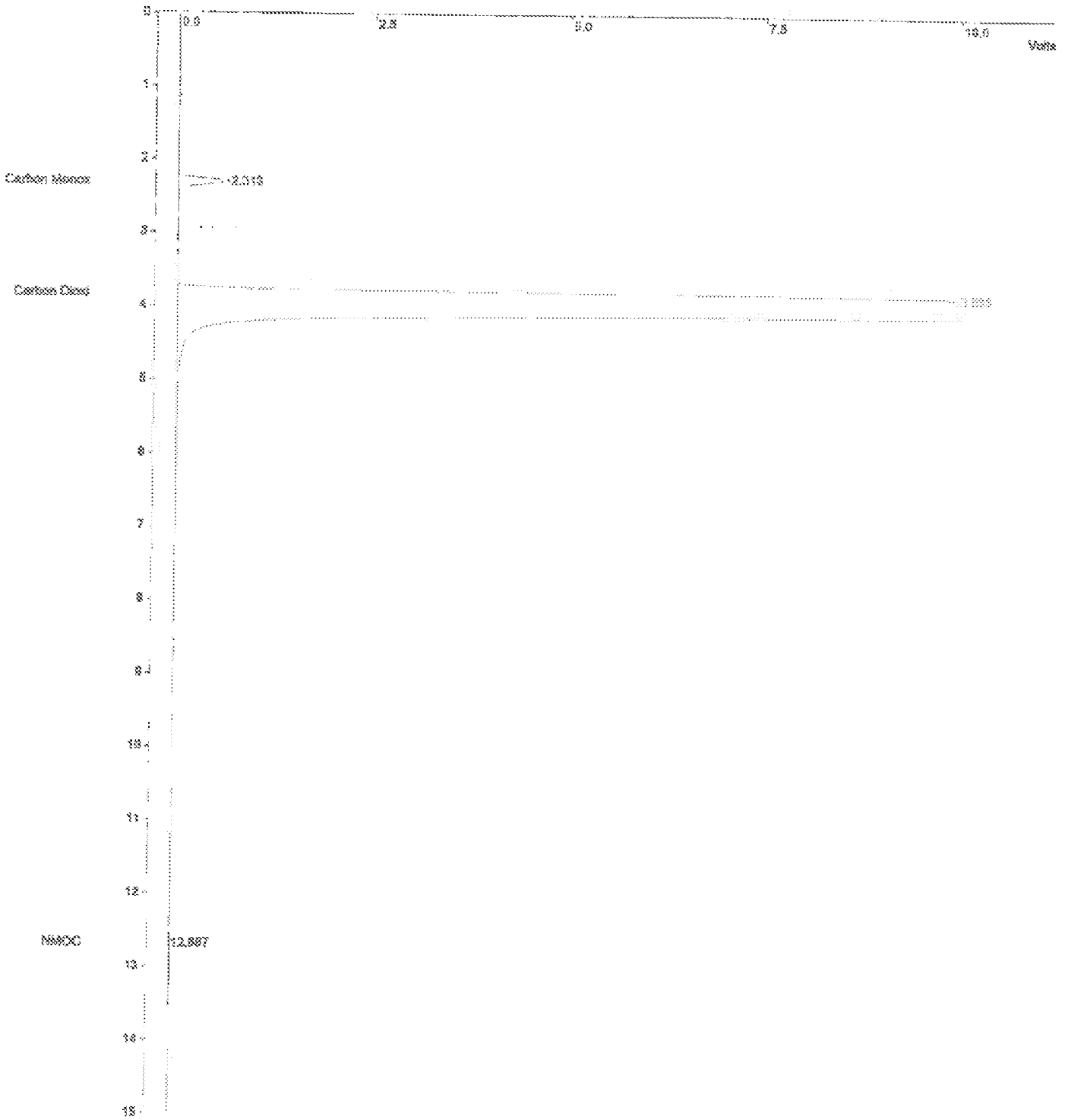
c 9036 BP

Appended Notes:

c 9036 BP

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct_10\10-20-2010, 17;27;22, a 173 - 011 a.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b-2.tmp
Sample ID    : A 173 - 011 A

Injection Date: 10/20/2010 17:27     Calculation Date: 10/20/2010 18:10

Operator    : Galina                 Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 88
Instrument : Varian Star #1          Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10       Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3589-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 4728          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 17;55;10, a 173 - 011 a dup.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b~2.tmp
Sample ID : A 173 - 011 A dup

Injection Date: 10/20/2010 17:55 Calculation Date: 10/20/2010 18:19

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	157.7689	2.327	0.014	3774011	BB	5.2	
2	Methane		2.740					M
3	Carbon Dioxi	8537.5400	3.833	-0.107	214283376	BB	19.7	C
4	Ethane		8.326					M
5	NMOC	0.3283	13.913	0.360	7838	BB	9.5	
	Totals:	8695.6372		0.267	218068325			

Status Codes:
M - Missing peak
C - Out of calibration range

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 2 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -304 microVolts LSB: 1 microVolts

Noise (used): 459 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Calib. out of range; No Recovery Action Specified

Original Notes:

c 9036 BP

Appended Notes:

c 9036 BP

****

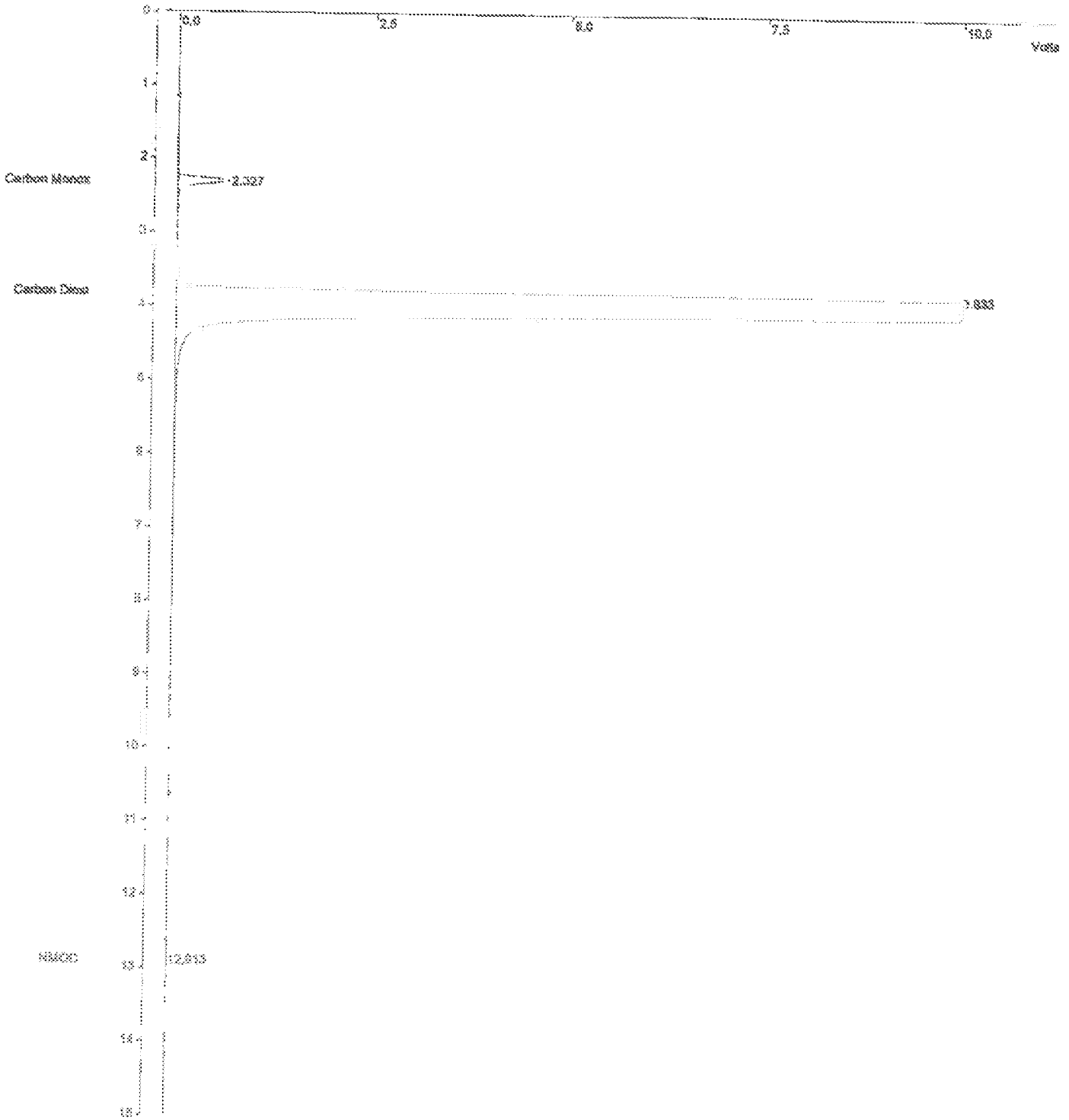
Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 17;55;10, a 173 - 011 a dup.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b-2.tmp
Sample ID : A 173 - 011 A dup

Injection Date: 10/20/2010 17:55 Calculation Date: 10/20/2010 18:19

Operator : Galina Detector Type: 0800 (10 Volts)
Workstation: Bus Address : 88
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3589-d6b-21e1 **

Chart Speed = 1.33 cm/min Attenuation = 4729 Zero Offset = 2%
Start Time = 0.000 min End Time = 15.013 min Min / Tick = 1.00



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 16;36;55, a 173 - 011 b.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b~2.tmp
Sample ID : A 173 - 011 B

Injection Date: 10/20/2010 16:36 Calculation Date: 10/20/2010 16:55

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	127.4412	2.313	0.000	3048539	BB	5.1	
2	Methane		2.740					M
3	Carbon Dioxi	8373.8906	3.853	-0.107	210175952	BB	19.4	C
4	Ethane		8.326					M
5	NMOC	0.3808	12.913	0.380	9328	BB	-1.7	
	Totals:	8501.7226		0.253	213233813			

Status Codes:
M - Missing peak
C - Out of calibration range

Total Unidentified Counts : 0 counts

Detected Peaks: 6 Rejected Peaks: 3 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -139 microVolts LSB: 1 microVolts

Noise (used): 188 microVolts - monitored before this run

Screen: 1 Injection Number: 1 Sampling Time: 0.00 min

Calib. out of range; No Recovery Action Specified

Original Notes:

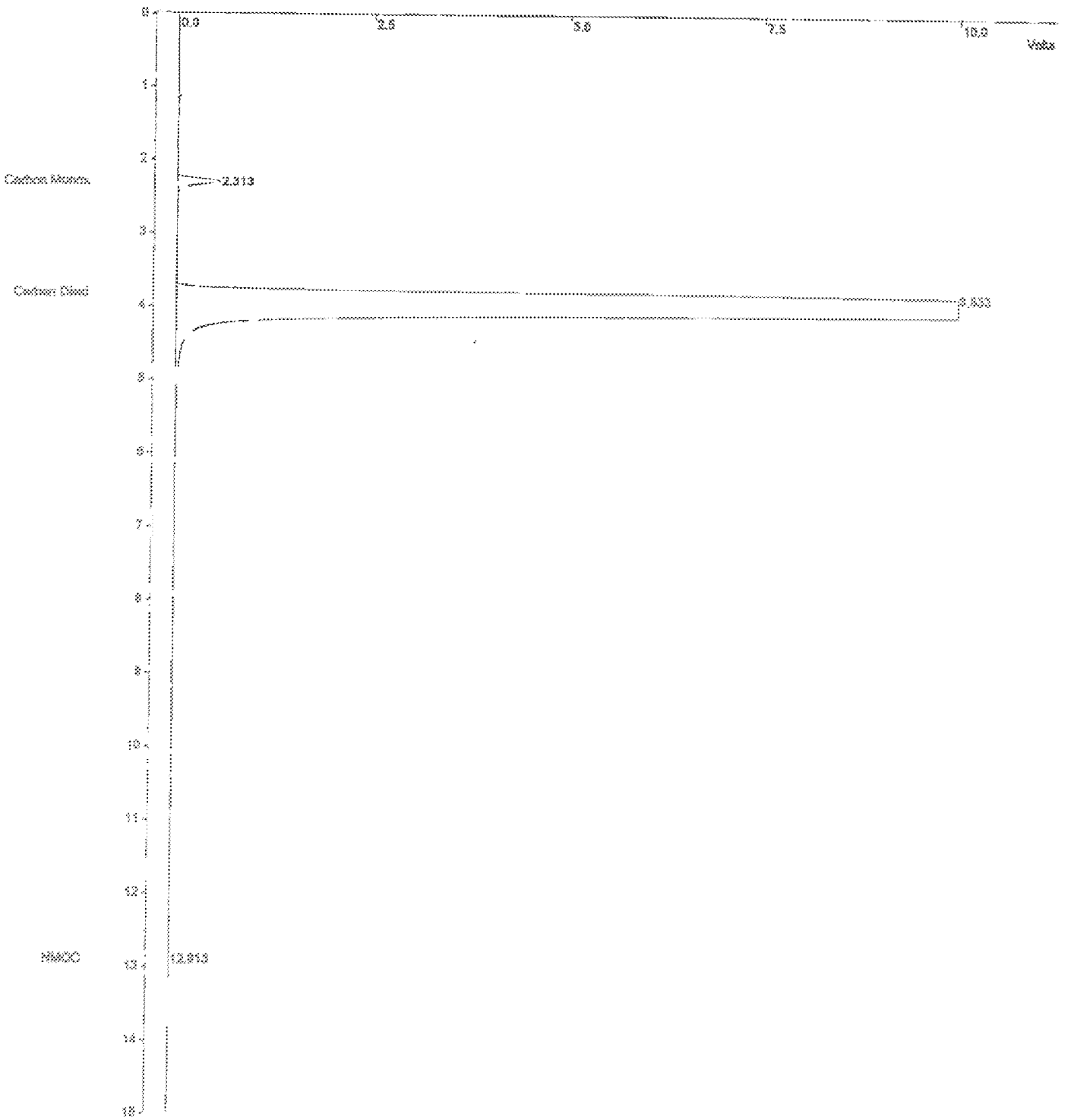
c 9036 BP

Appended Notes:

c 9036 BP

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct 10\10-20-2010, 16;36:55, a 173 - 011 b.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b-2.tmp
Sample ID    : A 173 - 011 B

Injection Date: 10/20/2010 16:36     Calculation Date: 10/20/2010 16:55

Operator     : Galina                Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 88
Instrument   : Varian Star #1        Sample Rate  : 1.25 Hz
Channel      : 2 = Foreflush 10      Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 4728          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 17;02;35, a 173 - 011 b dup.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;58, a 173 - 011 b~2.tmp
Sample ID : A 173 - 011 B dup

Injection Date: 10/20/2010 17:02 Calculation Date: 10/20/2010 17:19

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	127.4661	2.300	-0.013	3049612	BB	5.2	
2	Methane		2.740					M
3	Carbon Dioxi	8388.4223	3.820	-0.120	210540688	BB	19.4	C
4	Ethane		8.326					M
5	NMOC	0.3100	12.887	0.334	7398	BB	14.6	
	Totals:	8516.2190		0.201	213587698			

Status Codes:
M - Missing peak
C - Out of calibration range

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 2 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -347 microVolts LSB: 1 microVolts

Noise (used): 195 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Calib. out of range; No Recovery Action Specified

Original Notes:

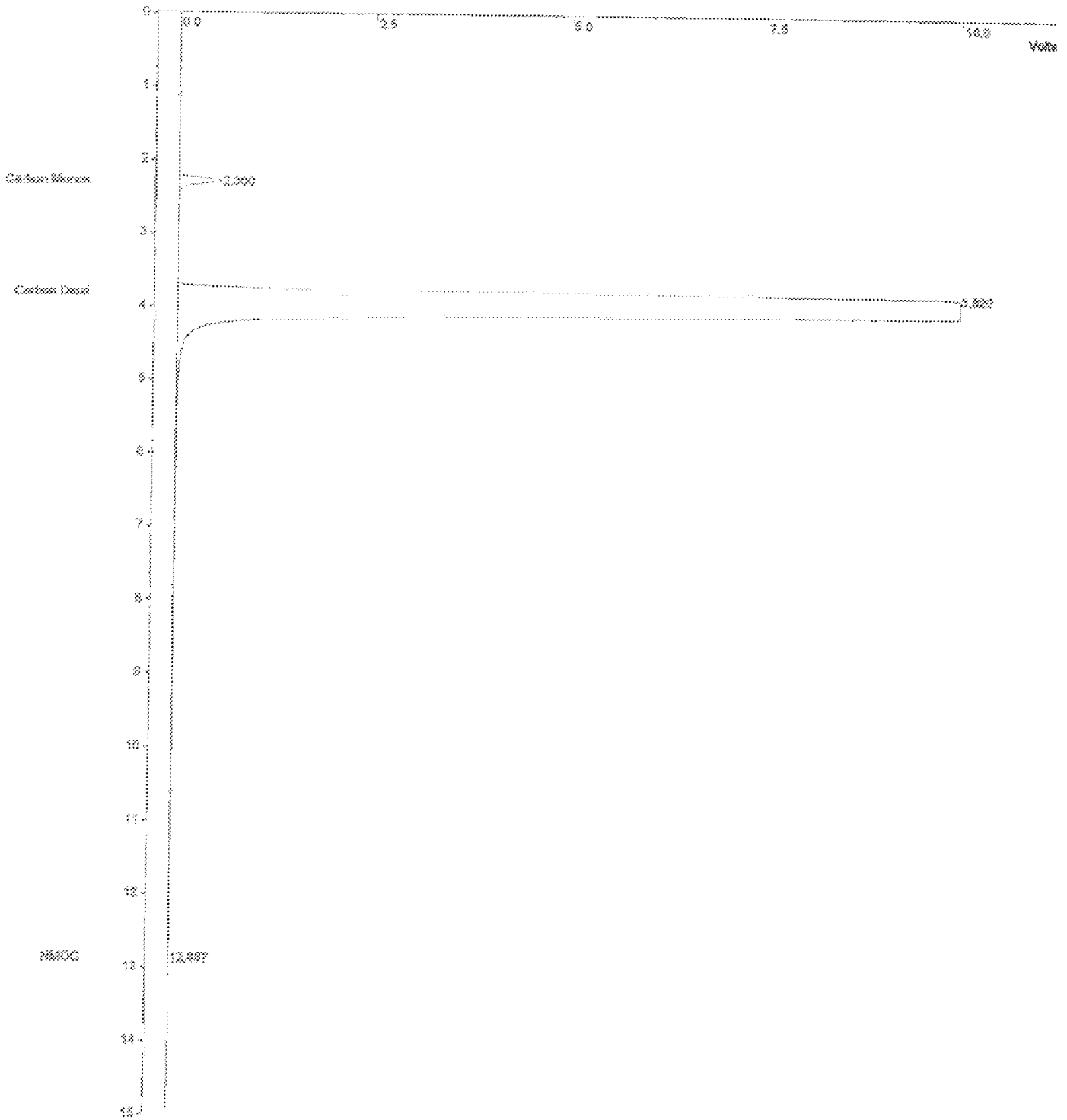
c 9036 BP

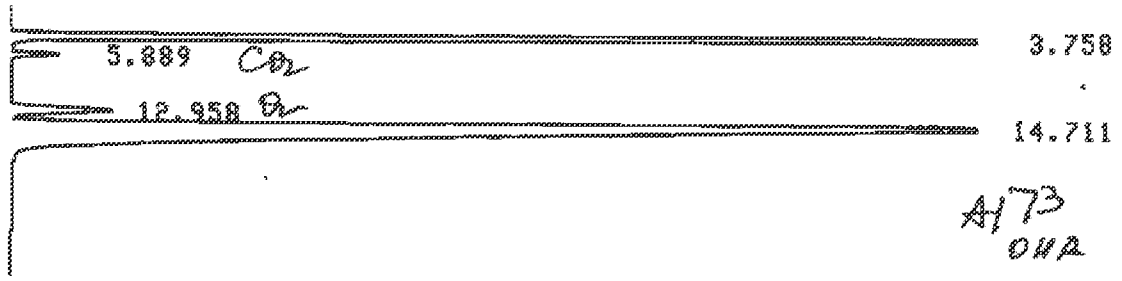
Appended Notes:

c 9036 BP

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct_10\10-20-2010, 17;02;35, a 173 - 011 b dup.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 16;36;55, a 173 - 011 b-2.tmp
Sample ID    : A 173 - 011 B dup

Injection Date: 10/20/2010 17:02     Calculation Date: 10/20/2010 17:19

Operator    : Galina                 Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 88
Instrument  : Varian Star #1         Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10       Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 4728          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



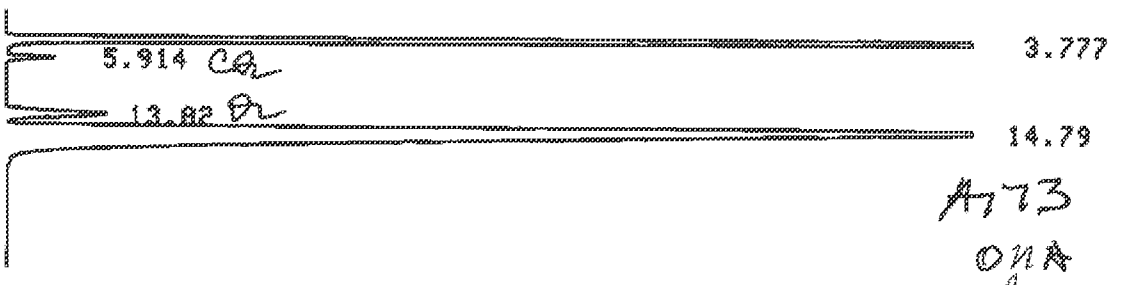


A173
ONA

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 15

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.758	8044843			35.2466	
2	5.889	194256			0.8512	
3	12.958	733963			3.216	
4	14.711	13849945	V		60.6863	
	TOTAL	22822286			100	

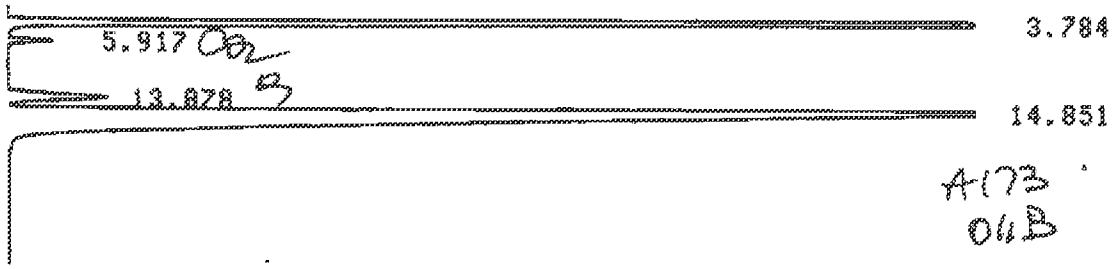


A173
ONA
dup

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 16

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.777	8051918			34.9569	
2	5.914	194960			0.8464	
3	13.02	736083			3.1953	
4	14.79	14050928	V		61.0013	
	TOTAL	23033888			100	

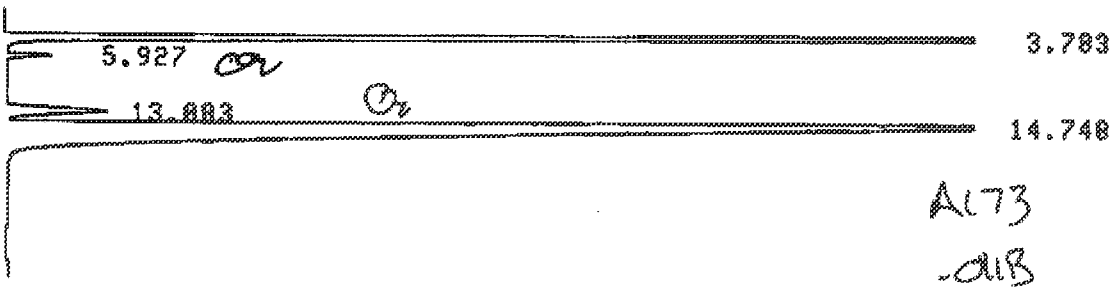


A173
01B

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 8 METHOD 41
REPORT NO 17

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.784	8882982			35.8486	
2	5.917	185959			0.8062	
3	13.878	721258			3.1268	
4	14.851	14077148	V		61.0265	
	TOTAL	23867264			100	



A173
.01B
dp

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 9 METHOD 41
REPORT NO 18

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.783	8185814			35.4839	
2	5.927	1858816			8.8117	
3	13.883	711762			3.1891	
4	14.748	13898489	V		68.6753	
	TOTAL	22893888			100	

QAQC

Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 07;50;18, lab air.run
Method File : C:\star\nmoc.mth
Sample ID : Lab Air

Injection Date: 10/20/2010 07:50 Calculation Date: 10/20/2010 08:05

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 - Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	1.8727	2.300	-0.013	44797	BB	9.1	
2	Methane	2.0906	2.753	0.013	50762	BB	5.7	
3	Carbon Dioxi	550.1555	3.953	0.013	13808331	BB	9.1	
4	Ethane		8.326					M
5	NMOC		12.553					M
	Totals:	554.1188		0.013	13903890			

Status Codes:
M - Missing peak

Total Unidentified Counts : 0 counts

Detected Peaks: 11 Rejected Peaks: 8 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: 52 microVolts LSB: 1 microVolts

Noise (used): 109 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

****

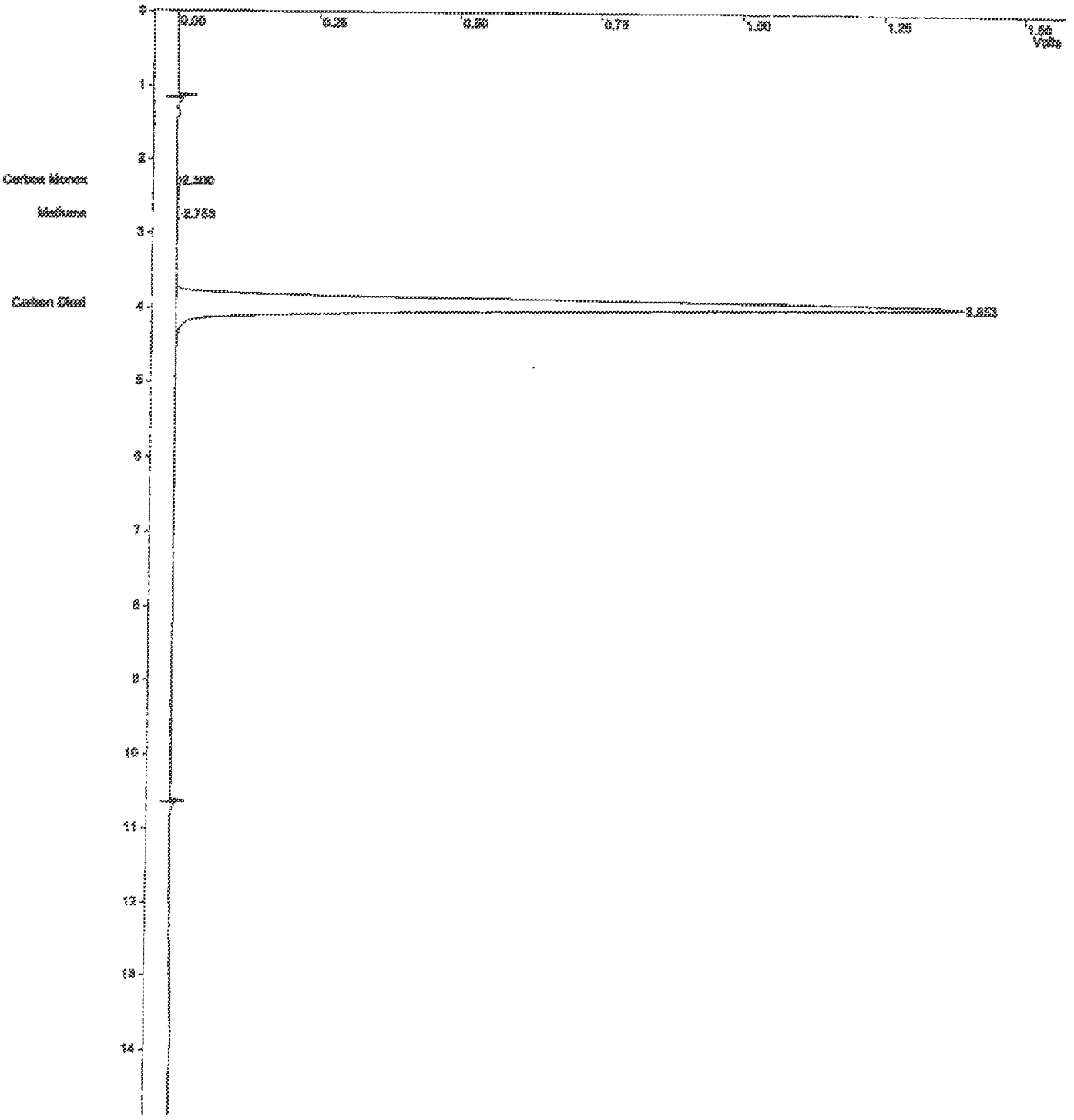
Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 07;50;18, lab air.run
Method File : C:\star\nmoc.mth
Sample ID : Lab Air

Injection Date: 10/20/2010 07:50 Calculation Date: 10/20/2010 08:05

Operator : Galina Detector Type: 0800 (10 Volts)
Workstation: Bus Address : 88
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Chart Speed = 1.33 cm/min Attenuation = 660 Zero Offset = 2%
Start Time = 0.000 min End Time = 15.013 min Min / Tick = 1.00



: SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 08;54;36, n2 blank 91182.run
Method File : C:\star\nmoc.mth
Sample ID : N2 Blank 91182

Injection Date: 10/20/2010 08:54 Calculation Date: 10/20/2010 09:09

Operator : Galina Detector Type: 0800 (10 Volts)
Workstation: Bus Address : 88
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	0.4004	2.353	0.040	9578	BB	6.5	
2	Methane		2.740					M
3	Carbon Dioxi	1.0902	4.020	0.080	27362	BB	10.6	
4	Ethane		8.326					M
5	NMOC		12.553					M
	Totals:	1.4906		0.120	36940			

Status Codes:
M - Missing peak

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 3 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: 14 microVolts LSB: 1 microVolts

Noise (used): 236 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

****

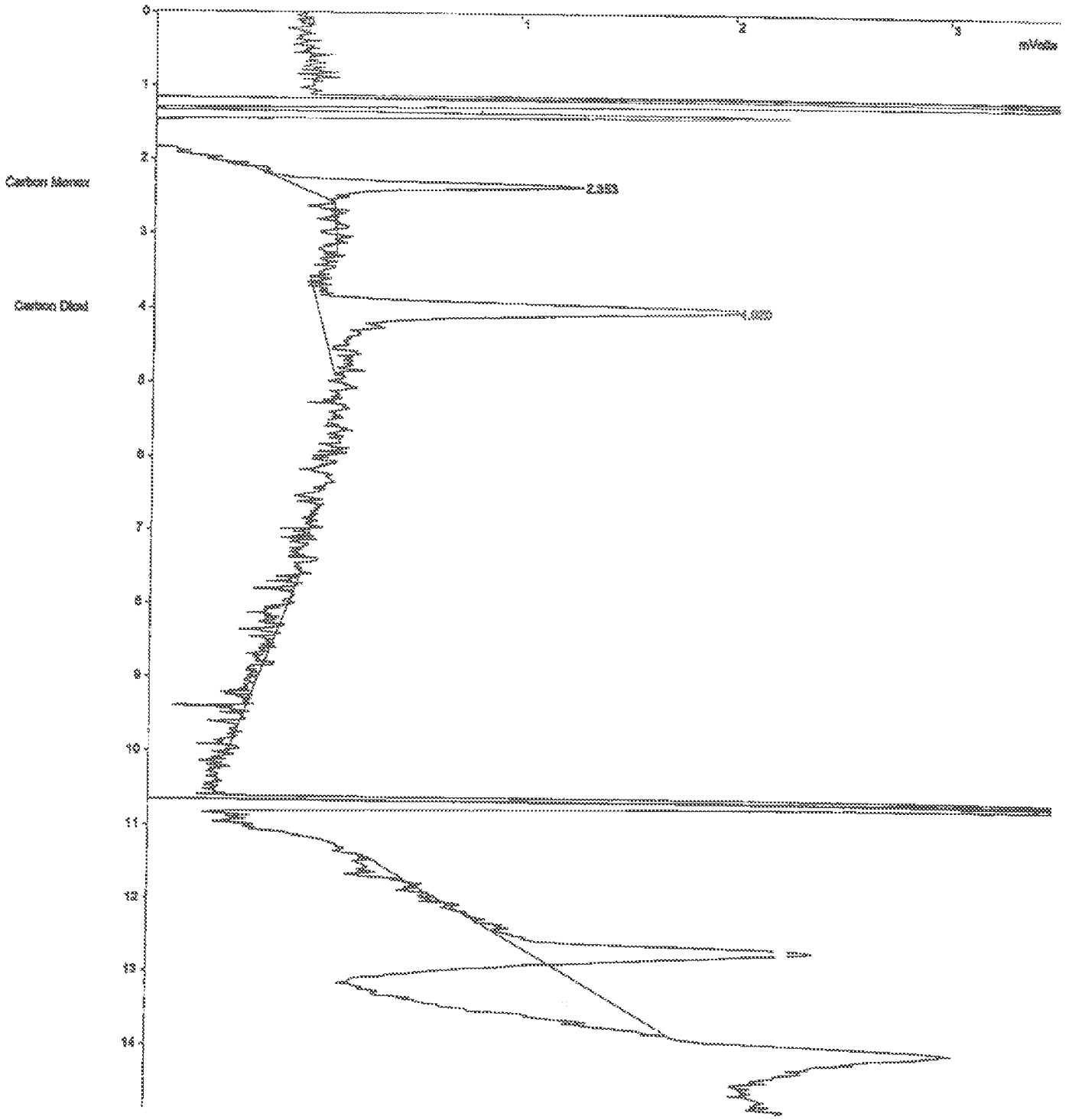
Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 08;54;36, n2 blank 91182.run
Method File : C:\star\nmoc.mth
Sample ID : N2 Blank 91182

Injection Date: 10/20/2010 08:54 Calculation Date: 10/20/2010 09:09

Operator : Galina Detector Type: 0800 (10 Volts)
Workstation: Bus Address : 08
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed = 1.33 cm/min Attenuation = 1 Zero Offset = 20%
Start Time = 0.000 min End Time = 15.013 min Min / Tick = 1.00



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 09;39;30, 5ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 07;50;18, lab air-2.tmp
Sample ID : 5ppm mix

Injection Date: 10/20/2010 09:39 Calculation Date: 10/20/2010 10:18

Operator : Galina Detector Type: 0800 (10 volts)
Workstation: Bus Address : 88
Instrument : Varian Star #1 Sample Rate : 1.25 Hz
Channel : 2 = Foreflush 10 Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00289-3588-d8b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	5.1066	2.353	0.040	122155	BB	5.4	
2	Methane	5.0827	2.780	0.040	123413	BB	5.9	
3	Carbon Dioxi	5.8381	3.980	0.040	146531	BB	9.4	
4	Ethane	5.1280	8.333	0.067	128079	BB	23.2	
5	NMOC	5.3773	12.220	-0.333	128360	BB	18.8	
	Totals:	26.5327		-0.146	648538			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: 161 microVolts LSB: 1 microVolts

Noise (used): 246 microVolts - monitored before this run

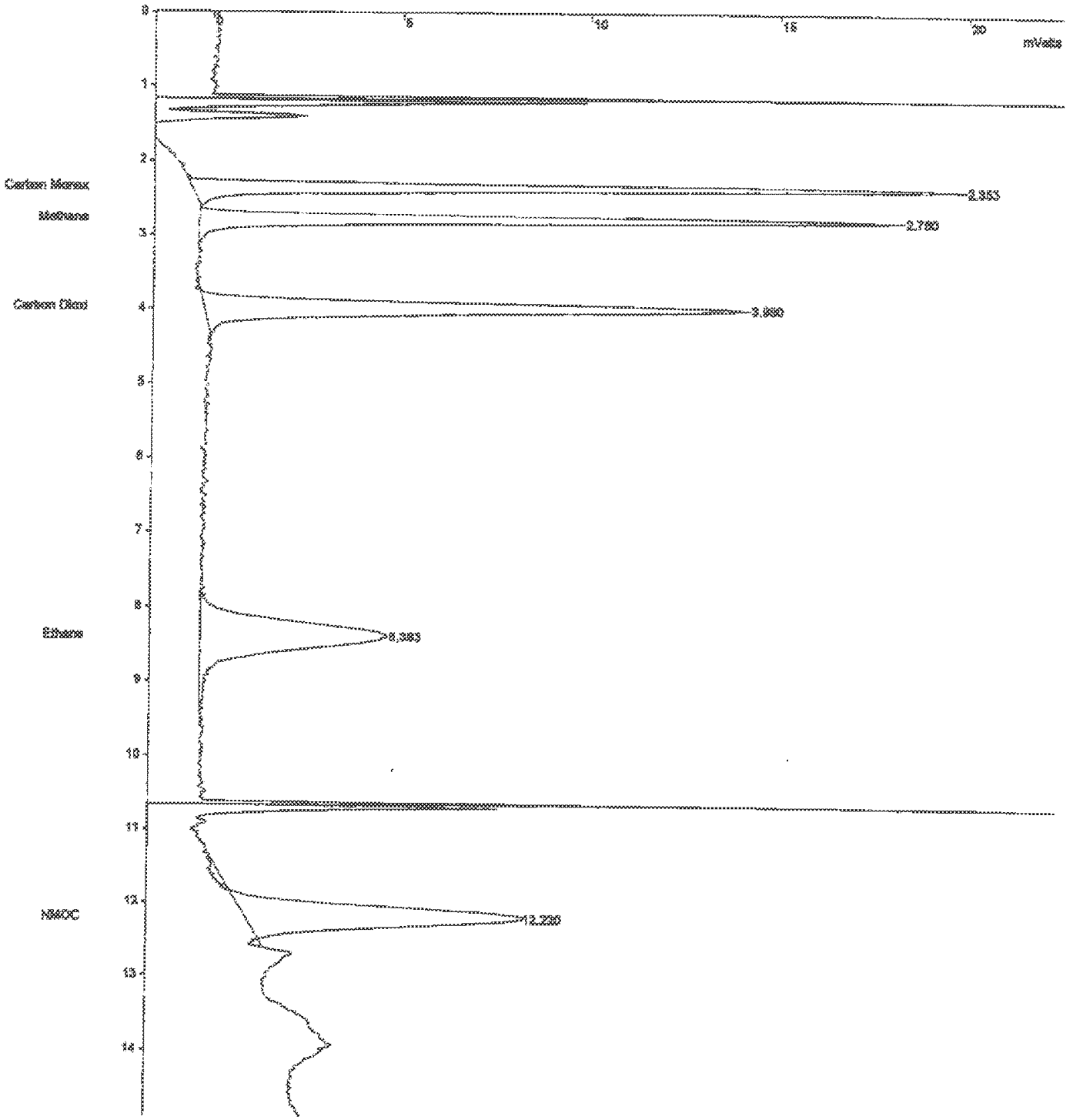
Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct_10\10-20-2010, 09;39;30, 5ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 07;50;18, lab air-2.tmp
Sample ID    : 5ppm mix

Injection Date: 10/20/2010 09:39     Calculation Date: 10/20/2010 10:18

Operator    : Galina                 Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 08
Instrument : Varian Star #1          Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10       Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 9              Zero Offset = 6%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 10;07;26, 5ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 07;50;18, lab air-2.tmp
Sample ID : 5ppm mix

Injection Date: 10/20/2010 10:07 Calculation Date: 10/20/2010 10:58

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	5.0959	2.313	0.000	121900	BB	5.3	
2	Methane	4.9396	2.753	0.013	118940	BB	5.8	
3	Carbon Dioxi	5.1982	3.967	0.027	130469	BB	9.3	
4	Ethane	5.0013	8.420	0.094	124913	BB	23.4	
5	NMOC	4.9993	12.100	-0.373	119336	BB	19.1	
	Totals:	25.2343		-0.239	616558			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: 8 microVolts LSB: 1 microVolts

Noise (used): 120 microVolts - monitored before this run

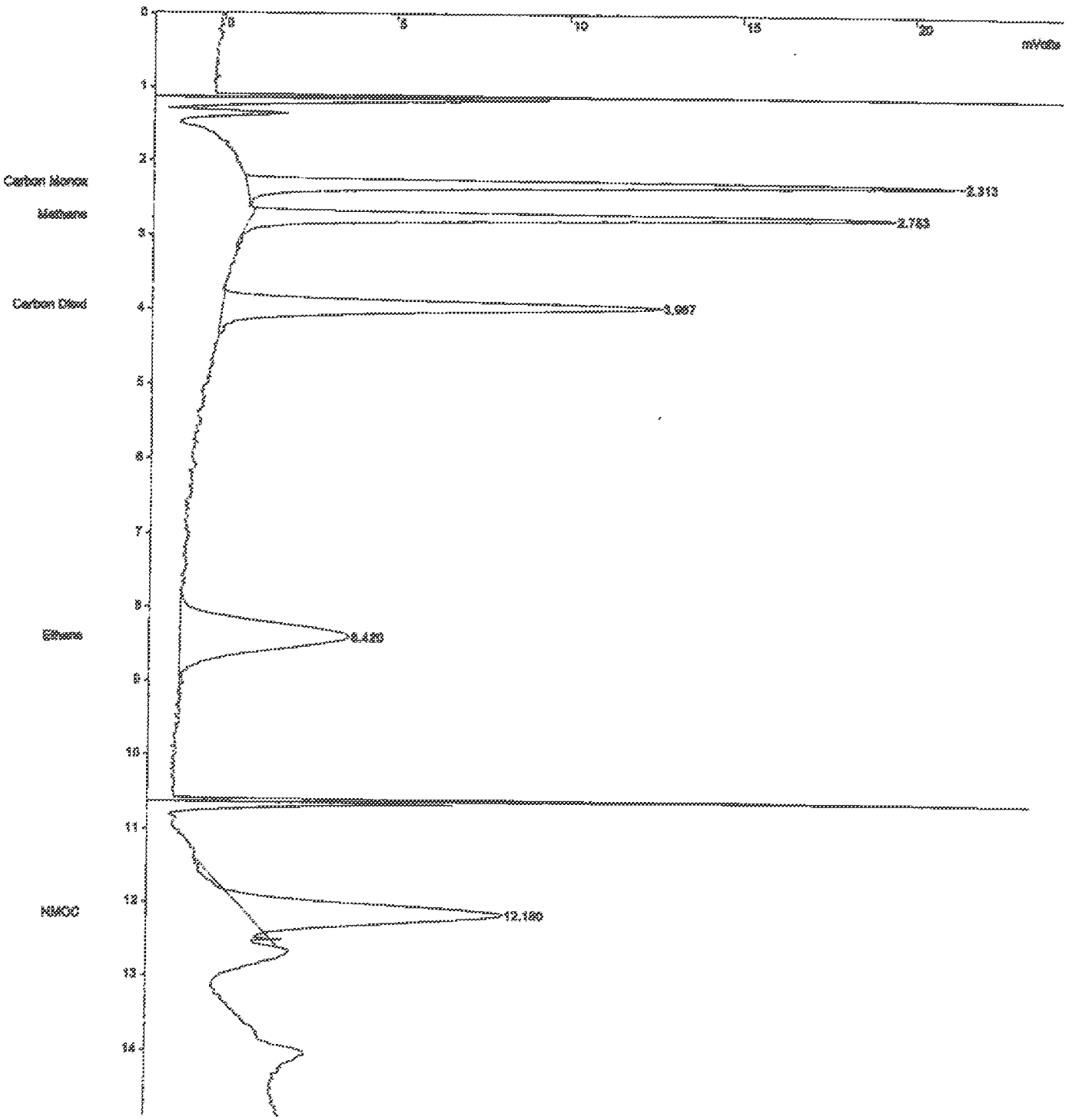
Stream: 1 Injection Number: 2 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct_10\10-20-2010, 10;07;26, 5ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 07;50;18, lab air~2.tmp
Sample ID    : 5ppm mix

Injection Date: 10/20/2010 10:07     Calculation Date: 10/20/2010 10:58

Operator    : Galina                 Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 08
Instrument : Varian Star #1          Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10       Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 10            Zero Offset = 8%
Start Time  =    0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 10;34;40, n2 blank s045.run
Method File : C:\star\nmoc.mth
Sample ID : N2 Blank S045

Injection Date: 10/20/2010 10:34 Calculation Date: 10/20/2010 10:49

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	0.3580	2.327	0.014	8563	BB	6.5	
2	Methane	0.0629	2.967	0.227	1526	BB	2.0	
3	Carbon Dioxi	0.5163	4.007	0.067	12959	BB	10.0	
4		0.0000	5.099	0.000	2833	BB	0.0	
5	Ethane		8.326					M
6	NMOC	0.8292	12.660	0.107	19793	BB	17.1	
	Totals:	1.7664		0.415	45674			

Status Codes:
M - Missing peak

Total Unidentified Counts : 2833 counts

Detected Peaks: 6 Rejected Peaks: 1 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: 55 microVolts LSB: 1 microVolts

Noise (used): 158 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

****

Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 10;34;40, n2 blank s045.run
Method File : C:\star\nmoc.mth
Sample ID : N2 Blank S045

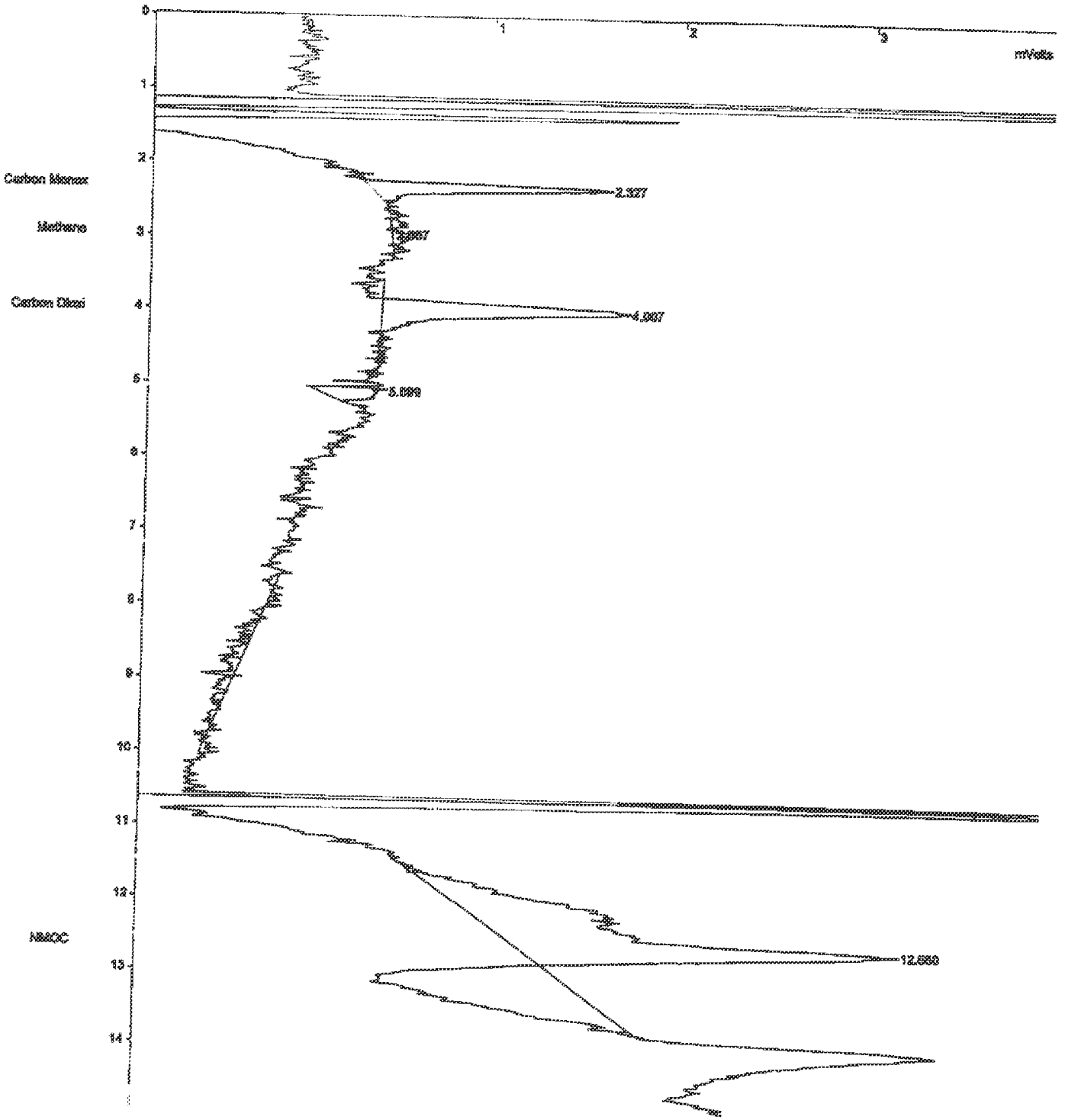
Injection Date: 10/20/2010 10:34 Calculation Date: 10/20/2010 10:49

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed = 1.33 cm/min Attenuation = 1 Zero Offset = 31%
Start Time = 0.000 min End Time = 15.013 min Min / Tick = 1.00



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 18;29;55, 5 ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 18;29;55, 5 ppm mix~2.tmp
Sample ID : 5 ppm mix

Injection Date: 10/20/2010 18:29 Calculation Date: 10/20/2010 18:51

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.23 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3388-d6b-21e1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	5.0949	2.340	0.027	121877	BB	5.5	
2	Methane	5.0993	2.780	0.040	123817	BB	6.0	
3	Carbon Dioxi	10.1846	3.993	0.053	238623	BB	9.3	
4	Ethane	5.0598	8.380	0.054	126374	BB	23.3	
5	NMOC	7.6764	12.207	-0.346	183242	BB	19.9	
	Totals:	33.1180		-0.172	810933			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -83 microVolts LSB: 1 microVolts

Noise (used): 443 microVolts - monitored before this run

Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 18;29;55, 5 ppm m+x.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 18;29;55, 5 ppm mix~2.tmp
Sample ID : 5 ppm mix

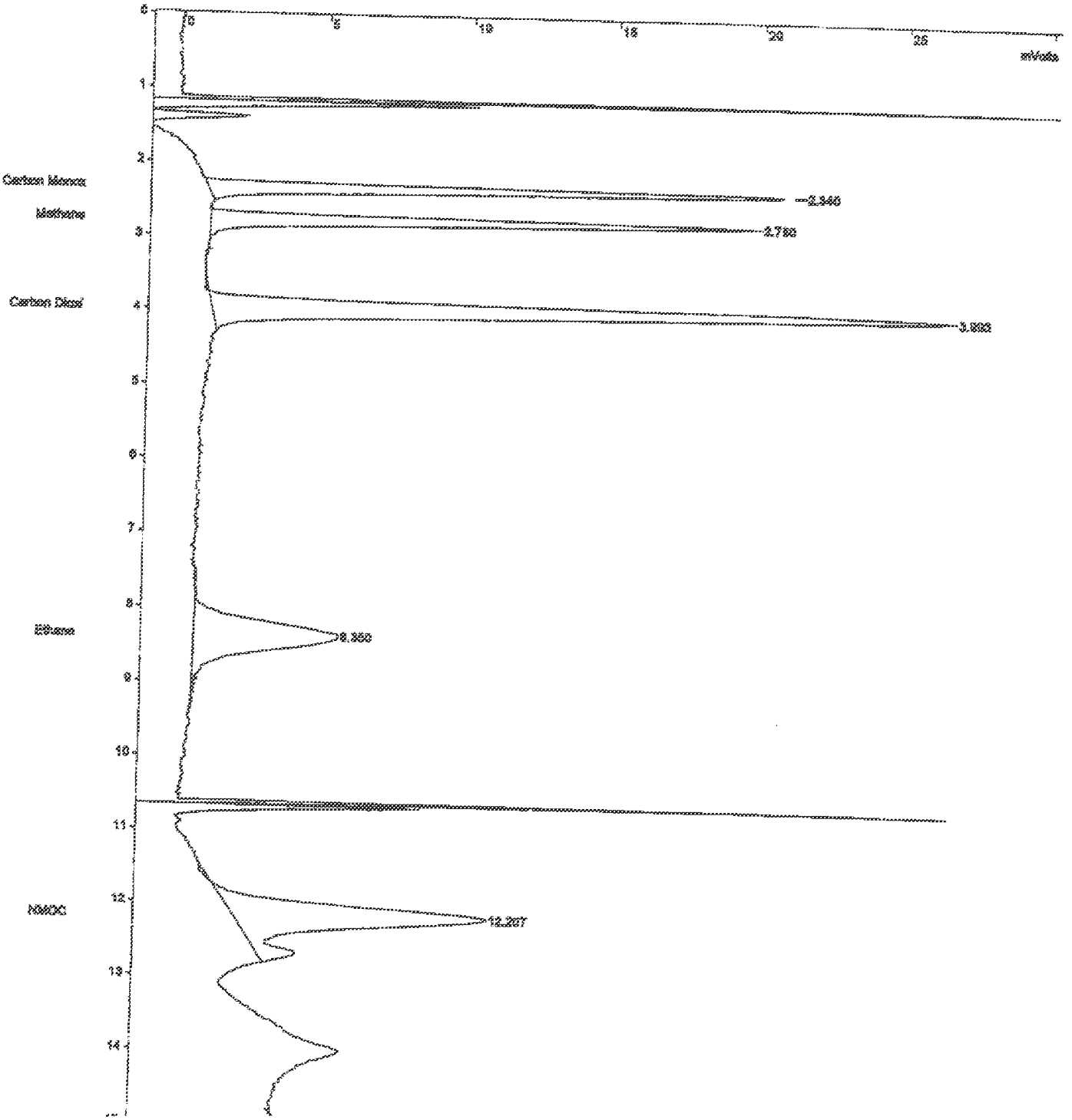
Injection Date: 10/20/2010 18:29 Calculation Date: 10/20/2010 18:51

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed = 1.33 cm/min Attenuation = 12 Zero Offset = 3%
Start Time = 0.000 min End Time = 15.013 min Min / Tick = 1.00



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\oct_10\10-20-2010, 18;57;54, 5 ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~10-20-2010, 18;29;55, 5 ppm mix 2.tmp
Sample ID : 5 ppm mix

Injection Date: 10/20/2010 18:57 Calculation Date: 10/20/2010 19:14

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Analysis
Peak Measurement: Peak Area
Calculation Type: External Standard

Peak No.	Peak Name	Result (ppmC)	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	5.1368	2.340	0.027	122877	BB	5.5	
2	Methane	5.1501	2.780	0.040	125050	BB	6.0	
3	Carbon Dioxi	6.1126	4.007	0.067	153419	BB	9.4	
4	Ethane	5.0396	8.473	0.147	125871	BB	23.5	
5	NMOC	8.0362	12.193	-0.360	192307	BB	18.7	
	Totals:	29.4953		-0.079	719524			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: 1 Divisor: 1 Unidentified Peak Factor: 0

Baseline Offset: -384 microVolts LSB: 1 microVolts

Noise (used): 131 microVolts - monitored before this run

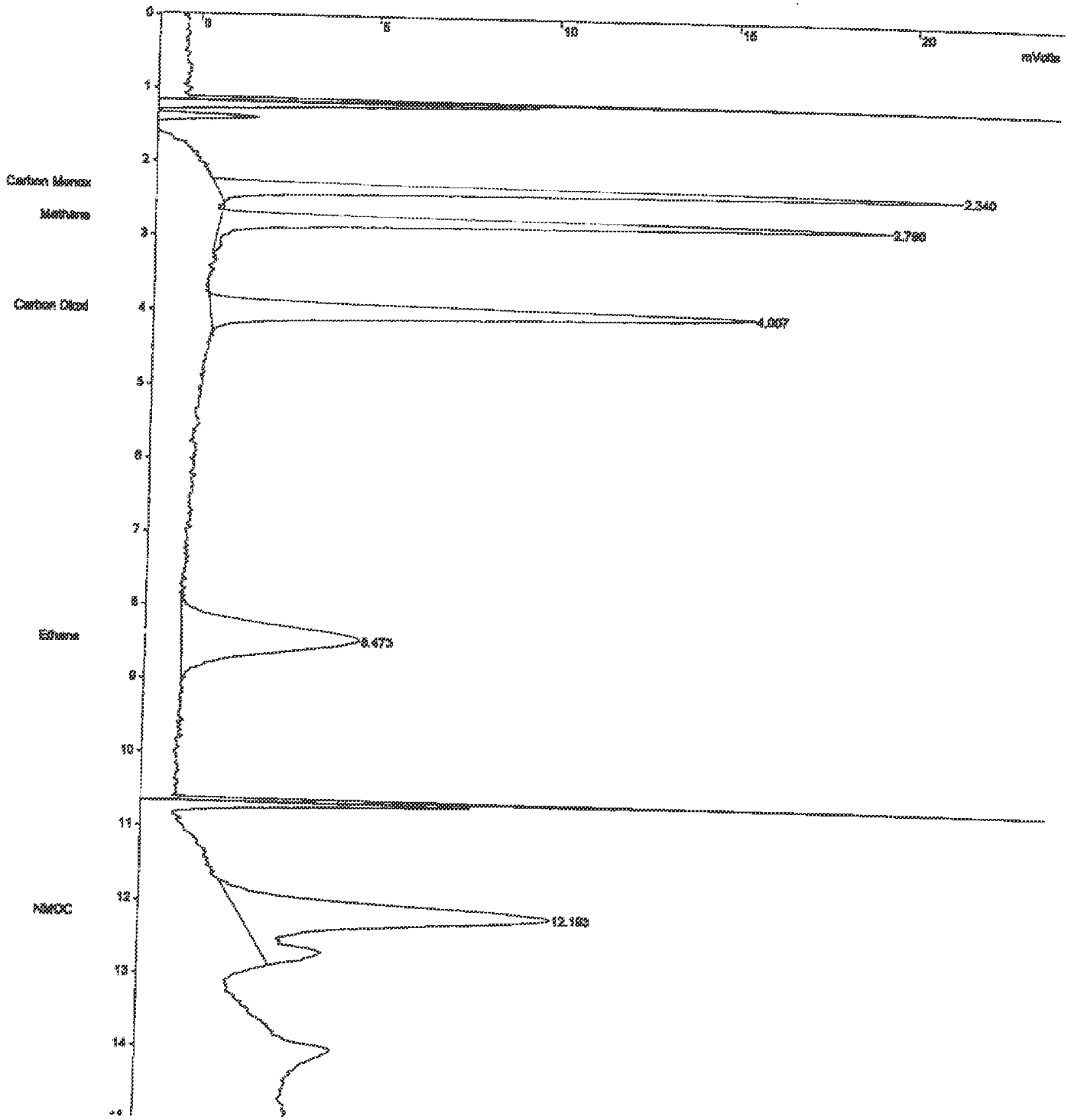
Stream: 1 Injection Number: 2 Sampling Time: 0.00 min

Original Notes:

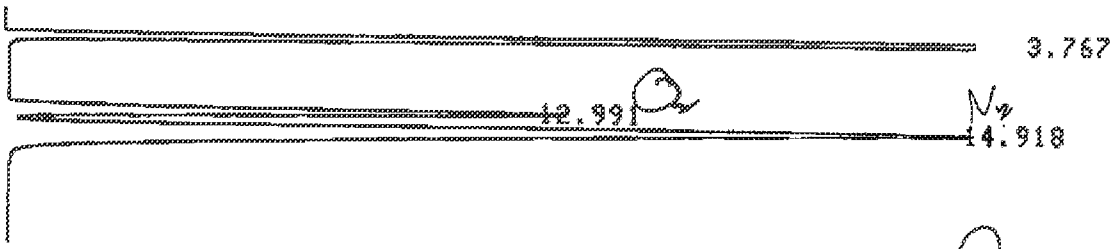
Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\oct_10\10-20-2010, 18;57;54, 5 ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~10-20-2010, 18;29;55, 5 ppm mix~2.tmp
Sample ID    : 5 ppm mix

Injection Date: 10/20/2010 18:57     Calculation Date: 10/20/2010 19:14

Operator    : Galina                 Detector Type: 0800 (10 Volts)
Workstation:                         Bus Address  : 88
Instrument : Varian Star #1          Sample Rate  : 1.25 Hz
Channel    : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 10          Zero Offset = 4%
Start Time  =    0.000   min    End Time    = 15.013  min   Min / Tick  = 1.00
```



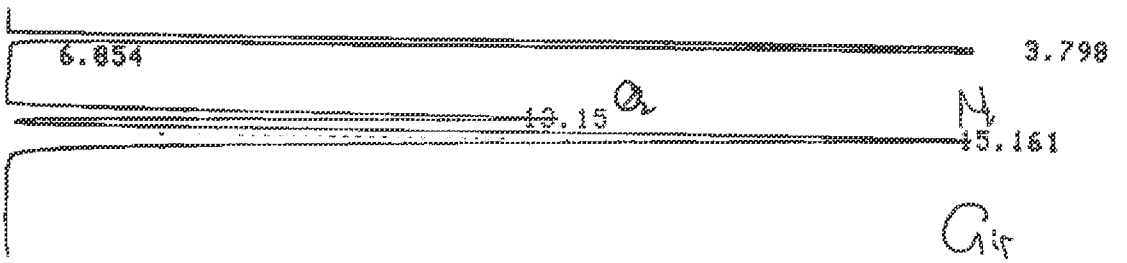
19/19



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 495

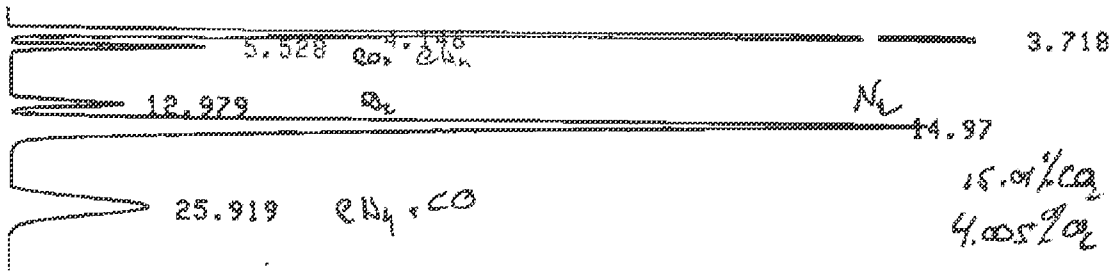
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.767	8718487			35.6994	
2	12.991	4084325			16.7395	
3	14.918	11604591	V		47.5611	
	TOTAL	24399322			100	



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 496

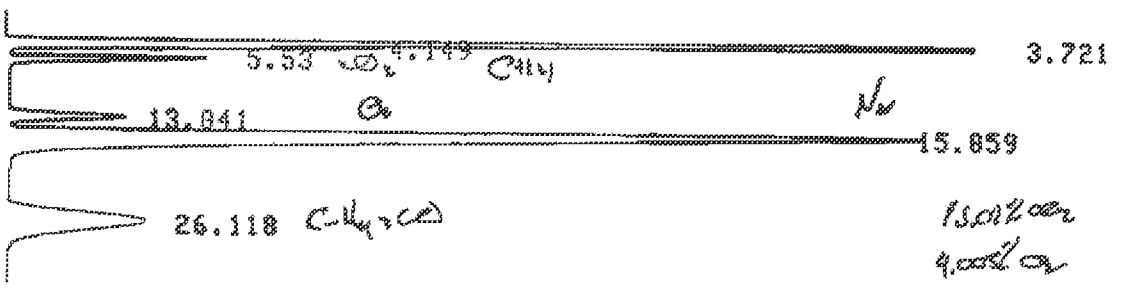
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.798	8776532			35.5895	
2	6.854	6767			0.0274	
3	13.15	4135438			16.7318	
4	15.161	11797268	V		47.7313	
	TOTAL	24715994			100	



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 1

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.718	6749387			29.1357	
2	4.146	1009740	V		4.3589	
3	5.528	896913	V		3.8718	
4	12.979	841338			3.6319	
5	14.97	10763496	V		46.4643	
6	25.919	2904386			12.5374	
	TOTAL	23165896			100	



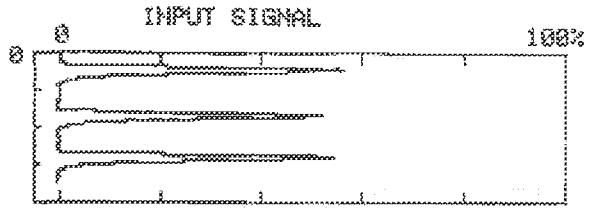
CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 2

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.721	6884484			29.096	
2	4.149	986872	V		4.2199	
3	5.53	905030	V		3.8699	
4	13.041	866198			3.7038	
5	15.859	10907318	V		46.6397	
6	26.118	2916458			12.4787	
	TOTAL	23386342			100	

TOC ANALYSIS

on the TRAPS

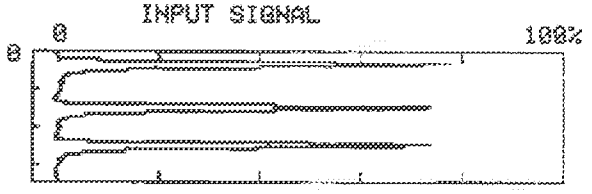


TIME [min]

SAMPLE# 15 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	22961	10.01			
2	21775	9.505			
3	23057	10.05			
MN	22597	9.857			
SD	714	0.305			
CV	3.15 %				
COR CONC DIL		9.857 [x 1.0]			
COR CONC INJ		9.857 [x 1.0]			

DATE 18(OCT)-20-2010 17:32



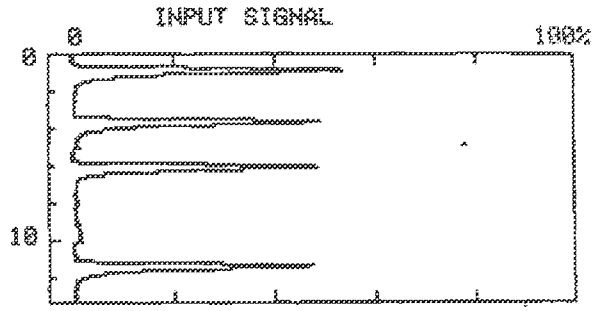
TIME [min]

SAMPLE# 15 IC
[x 1, 53µl, C# 8, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	28760	9.242			
2	26971	8.643			
3	27724	8.895			
MN	27818	8.927			
SD	898	0.301			
CV	3.22 %				
COR CONC DIL		8.927 [x 1.0]			
COR CONC INJ		8.927 [x 1.0]			

SAMPLE# 15 TOC(TC-IC) 0.930 ppm

DATE 18(OCT)-20-2010 17:40

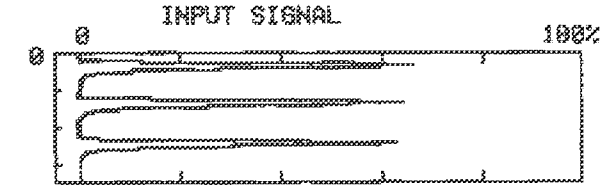


TIME [min]

SAMPLE# 16 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	22004	9.637			
2	19983	8.739			
3	20165	8.817T			
+ 4	19801	8.661			
MN	19983	8.739			
SD	182	0.077			
CV	0.91 %				
COR CONC DIL		8.739 [x 1.0]			
COR CONC INJ		8.739 [x 1.0]			

DATE 18(OCT)-20-2010 17:56



TIME [min]

SAMPLE# 16 IC
[x 1, 53µl, C# 8, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	23809	7.610			
2	23453	7.464			
3	22746	7.228			
MN	23362	7.434			
SD	576	0.193			
CV	2.46 %				
COR CONC DIL		7.434 [x 1.0]			
COR CONC INJ		7.434 [x 1.0]			

SAMPLE# 16 TOC(TC-IC) 1.305 ppm

DATE 18(OCT)-20-2010 18:04

Almega Environmental Technical Services

SCAQMD Method 25.3
TOC Analysis on the Trap

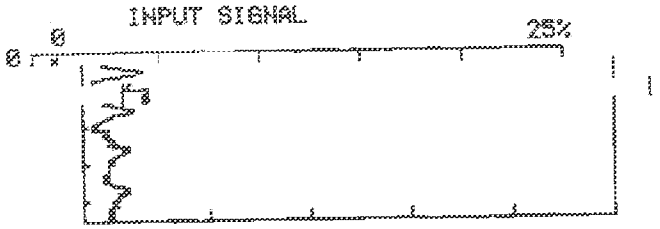
Calibration Curve No.: TC IC

Page: # 186

	No	Sample ID	Date	Sample Volume, ml		Dilution Factor	Concentration, ppmC			
				Initial	Final		TC	IC	TOC	
	1	Blnk	10/20	—	—	1	-.000	-.01	.01	
	2	Tcstd		—	—	1	12.89	0019	12.87	101
	3	Ics std		—	—	1	15.11	11.52	—	102
	4	LCS		—	—	1	14.54	.211	14.32	99
	5	Blnk		—	—	1	-.090	-.14	.047	
57	6	A171 -012A		2	4	2	13.69	12.93	.760	
56	7	-012B		2	4	2	11.31	9.666	1.644	
72	8	A172 -022A		2	4	2	9.127	1.611	7.516	
71	9	-022B		2	4	2	9.212	1.333	7.879	
74	10	-042A		2	4	2	5.014	.822	4.192	
73	11	-042B		2	4	2	6.452	.843	5.609	
87	12	A174 2B		2	4	2	0.501	.264	.237	
85	13	0224		2	4	2	6.923	6.209	.714	
86	14	0228		2	4	2	7.275	6.111	1.164	
69	15	A173 -012A		2	4	2	9.857	8.927	.930	
70	16	012B		2	4	2	8.739	7.389	1.350	
	17	LCs		—	—	1	15.42	.364	15.06	98
	18									
	19									
	20									
	21									

Comments

Checked by:



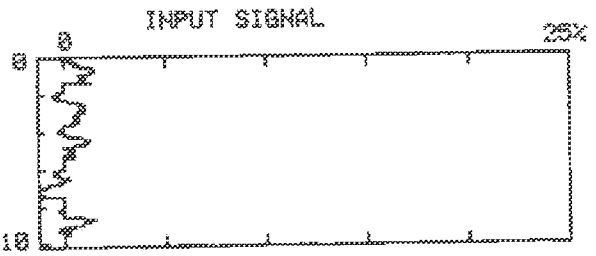
TIME [min]

SAMPLE# 1 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	941	0.033			
2	944	-0.01			
3-	329	-0.25			
+ 4	813	-0.02			
MN	866	-0.08			
SD	66	0.031			
CV	7.7%				

COR CONC DIL -0.00 [x 1.0]
COR CONC INJ -0.00 [x 1.0]

DATE 18(OCT)-20-2010 09:25



TIME [min]

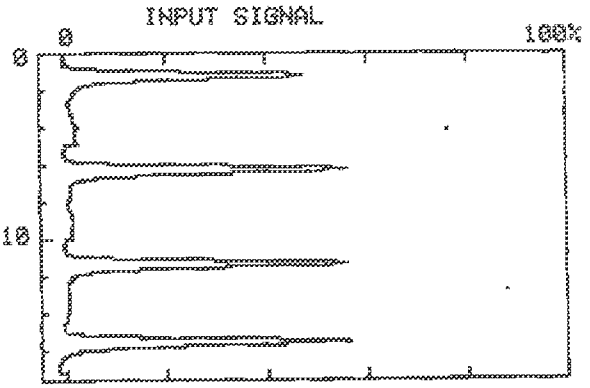
SAMPLE# 1 IC
[x 1, 53µl, C# 8, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1-	484	-0.04			
2	611	-0.00			
3	588	-0.01			
+ 4-	364	-0.00			
+ 5	576	-0.01			
MN	591	-0.01			
SD	17	0.005			
CV	3.0%				

COR CONC DIL -0.01 [x 1.0]
COR CONC INJ -0.01 [x 1.0]

SAMPLE# 1 TOC(TC-IC) 0.010 ppm

DATE 18(OCT)-20-2010 09:52



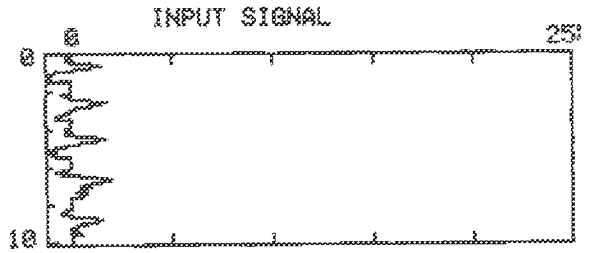
TIME [min]

SAMPLE# 2 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1-	25737	11.20T			
2	30146	13.08T			
3	29483	12.80			
+ 4	29456	12.79			
MN	29695	12.89			
SD	398	0.167			
CV	1.3%				

COR CONC DIL 12.89 [x 1.0]
COR CONC INJ 12.89 [x 1.0]

DATE 18(OCT)-20-2010 10:16



TIME [min]

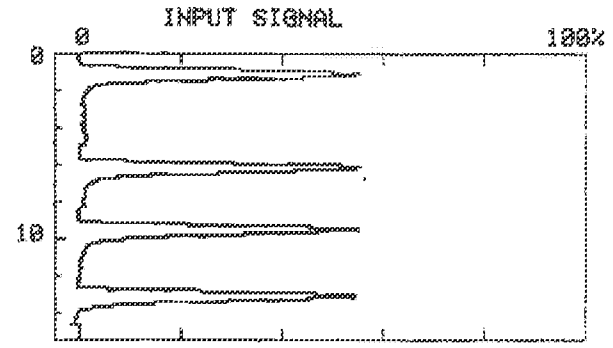
SAMPLE# 2 IC
[x 1, 53µl, C# 8, #WASH 2, SP 0min

#	AREA	ppm	C#	µl	RG
1-	596	-0.01			
2	729	0.020			
3	731	0.029			
+ 4-	900	0.003			
+ 5	635	-0.00			
MN	698	0.019			
SD	54	0.017			
CV	7.8%				

COR CONC DIL 0.019 [x 1.0]
COR CONC INJ 0.019 [x 1.0]

SAMPLE# 2 TOC(TC-IC) 12.87 ppm

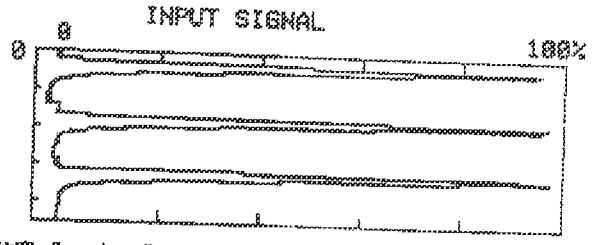
DATE 18(OCT)-20-2010 10:31



TIME [min]
SAMPLE# 3 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	34975	15.15	T		
2	35382	15.32			
3	35382	15.29			
+ 4	33953	14.71			
MN	34879	15.11			
SD	801	0.343			
CV	2.29 %				
COR CONC DIL		15.11 [x 1.0]			
COR CONC INJ		15.11 [x 1.0]			

DATE 10(OCT)-20-2010 10:51

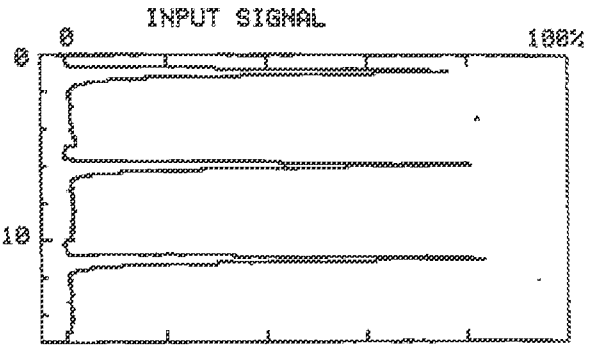


TIME [min]
SAMPLE# 3 IC
[x 1, 53µl, C# 0, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	40990	13.34			
2	41876	13.63			
3	41784	13.60			
MN	41550	13.52			
SD	487	0.163			
CV	1.17 %				
COR CONC DIL		13.52 [x 1.0]			
COR CONC INJ		13.52 [x 1.0]			

SAMPLE# 3 TOC(TC-IC) 1.590 ppm

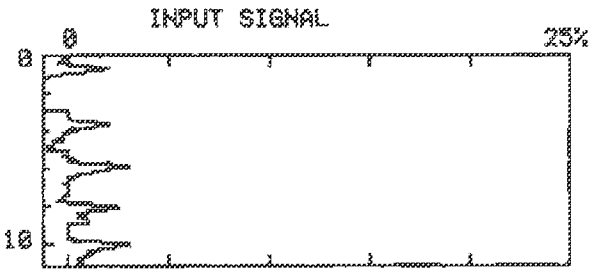
DATE 10(OCT)-20-2010 11:04



TIME [min]
SAMPLE# 4 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	32750	14.19	T		
2	34414	14.91	T		
3	33581	14.52			
MN	33582	14.54			
SD	833	0.356			
CV	2.48 %				
COR CONC DIL		14.54 [x 1.0]			
COR CONC INJ		14.54 [x 1.0]			

DATE 10(OCT)-20-2010 11:22



TIME [min]
SAMPLE# 4 IC
[x 1, 53µl, C# 0, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	1312	0.214			
2	1025	0.122			
3	1305	0.211			
+ 4	977	0.107			
+ 5	1299	0.209			
MN	1305	0.211			
SD	6	0.002			
CV	0.49 %				
COR CONC DIL		0.211 [x 1.0]			
COR CONC INJ		0.211 [x 1.0]			

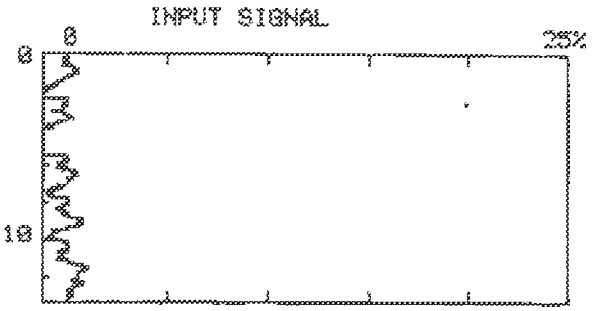
SAMPLE# 4 TOC(TC-IC) 14.32 ppm

DATE 10(OCT)-20-2010 11:36

TOC-5000 DATA REPORT
DATE 10(OCT)-20-2010 18:36

SPL#	TC,ppm	RMK	IC,ppm	RMK	TOC,ppm
1	-0.00	7****	-0.01	8****	0.010
2	12.89	7****	0.019	8****	12.87
3	15.11	7****	13.52	8****	1.590
4	14.54	7****	0.211	8****	14.32
5	-0.07	7****	-0.14	8****	0.070
6	13.69	7****	12.93	6*H**	0.760
7	11.31	7****	9.666	8****	1.644
8	9.127	7****	1.611	8****	7.516
9	9.212	7****	1.333	8****	7.879
10	5.014	7****	0.822	8****	4.192
11	6.452	7****	0.843	8****	5.609
12	0.501	7****	0.264	8****	0.237
13	6.923	7****	6.209	8****	0.714
14	7.275	7****	6.111	8****	1.164
15	9.857	7****	8.927	8****	0.930
16	8.739	7****	7.434	8****	1.305
17	15.42	7****	0.364	8****	15.05

ANALYST :
SAMPLE :

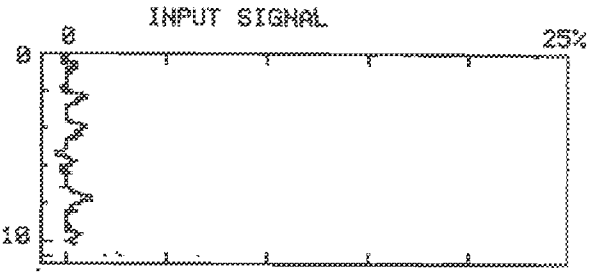


TIME [min]

SAMPLE# 5 TC
[x 1, 42μl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	μl	RG
1	838	-0.0.			
2-	535	-0.16			
3	561	-0.14			
+ 4	769	-0.04			
+ 5-	1105	0.111			
MN	720	-0.07			
SD	141	0.067			
CV	19.5 %				
COR CONC DIL	-0.07 [x 1.0]				
COR CONC INJ	-0.07 [x 1.0]				

DATE 10(OCT)-20-2010 13:32



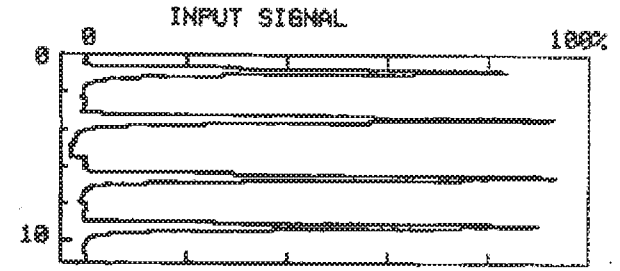
TIME [min]

SAMPLE# 5 IC
[x 1, 53μl, C# 8, #WASH 2, SP 0min]

#	AREA	ppm	C#	μl	RG
1-	119	-0.16			
2	182	-0.14			
3	237	-0.12			
+ 4-	359	-0.08			
+ 5-	605	-0.01			
+ 6	170	-0.14			
MN	196	-0.14			
SD	35	0.011			
CV	18.1 %				
COR CONC DIL	-0.14 [x 1.0]				
COR CONC INJ	-0.14 [x 1.0]				

SAMPLE# 5 TOC(TC-IC) 0.070 ppm

DATE 10(OCT)-20-2010 13:46

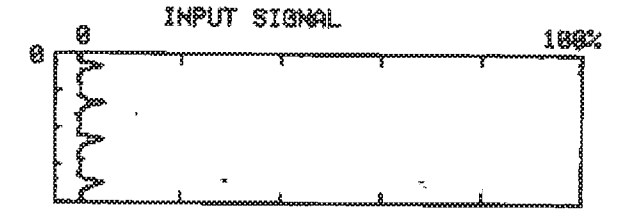


TIME [min]

SAMPLE# 17 TC
[x 1, 42µl, C# 7, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	32574	14.12			
2	36858	15.61			
3	35997	15.58			
+ 4	34769	15.06			
MN	35605	15.42			
SD	724	0.310			
CV	2.03 %				
COR CONC DIL	15.42 [x 1.0]				
COR CONC INJ	15.42 [x 1.0]				

DATE 18(OCT)-20-2010 18:21



TIME [min]

SAMPLE# 17 IC
[x 1, 53µl, C# 8, #WASH 2, SP 0min]

#	AREA	ppm	C#	µl	RG
1	1568	0.295			
2	1728	0.346			
3	1853	0.385			
+ 4	1778	0.361			
MN	1706	0.364			
SD	62	0.028			
CV	3.52 %				
COR CONC DIL	0.364 [x 1.0]				
COR CONC INJ	0.364 [x 1.0]				

SAMPLE# 17 TOC(TC-IC) 15.05 ppm

DATE 18(OCT)-20-2010 18:33

TANK PREPARATION

TANK PREPARATIONS

Client: BP
Project No.: c9036
Unit Tested: TGU#1
Sampling Date: 18-Oct-10
Date pressurized: 18-Oct-10

Lab No.: A 173

Tank ID	Sample ID	Pre-test pressure mm Hg		Post-test pressure mm Hg	Final Pressure	Comments
		1	2			
S025	A 173 - 011 A	-760	-760	-140 *	158	Run #1 A
91187	A 173 - 011 B	-760	-760	-166 *	156	Run #1 B

* - Post -test Pressure is less then 200 mm Hg.

CALIBRATIONS

28-Sep-10
Current

	100 ppm mix					1000 ppm mix					2000 ppm mix						
	cons	area 1	area 2	RF 1	RF 2	conc	area 1	area 2	RF 1	RF 2	conc	area 1	area 2	RF 1	RF 2	Ave	RSD
Carbon Monoxide	99.6	2495959	2489550	3.99E-05	4.00E-05	1007	24980054	25233440	4.03E-05	3.99E-05	1994	45244458	49219680	4.39E-05	4.03E-05	4.07E-05	1.6
Methane	102.4	2547858	2542584	4.02E-05	4.03E-05	1017	25844622	25994354	3.94E-05	3.91E-05	2022	46688044	50823792	4.33E-05	3.98E-05	4.03E-05	0.6
Carbon Dioxide	109.3	2671168	2656993	4.10E-05	4.12E-05	1004	26581484	26518942	3.78E-05	3.79E-05	2006	47892276	53193728	4.19E-05	3.84E-05	3.97E-05	1.0
Ethane	102.9	2661568	2646777	3.87E-05	3.89E-05	1014	26703788	26659332	3.80E-05	3.80E-05	2024	48093788	52402704	4.21E-05	3.86E-05	3.90E-05	2.6
YGNMO	101.2	2514029	2527613	4.03E-05	4.00E-05	1012	25587582	25464480	3.96E-05	3.97E-05	2008	45699692	49676536	4.39E-05	4.04E-05	4.07E-05	1.4
	Average	2598656	2593492	4.00E-05	4.01E-05	Average	25939506	25975110	3.90E-05	3.89E-05	Average	46723651	50863276	4.30E-05	3.95E-05		
			Average	4.01E-05				Average	3.90E-05				Average	4.13E-05			
	RSD%				0.1					3.8					7.9		

Average **4.01E-05**

RSD %

RSD_{CO} =	2.641	r_{CO} =	0.99810
RSD_{CH4} =	2.785	r_{CH4} =	0.99792
RSD_{CO2} =	3.563	r_{CO2} =	0.99785
RSD_{C2H6} =	0.412	r_{C2H6} =	0.99786
RSD_{NMOC} =	2.629	r_{NMOC} =	0.99790

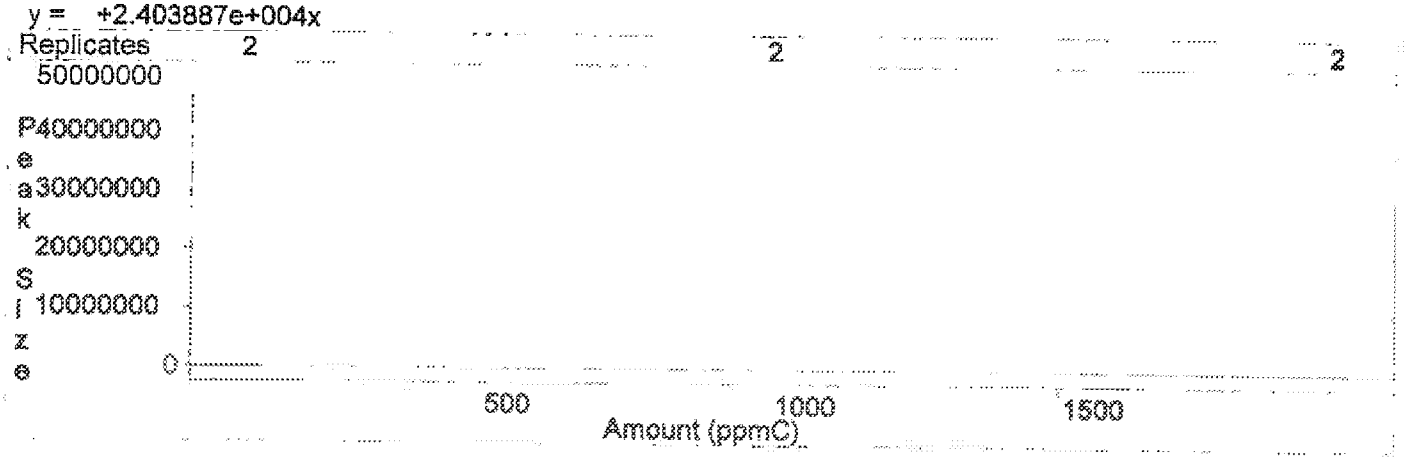
45

Print Date: 28 Sep 2010 12:11:03
Calibration Curves Report - Page 1
File: c:\star\nmoc.mth
Detector: 800 Interface Box, Address: 88, Channel ID: 2

Carbon Monoxide

External Standard Analysis
Curve Type: Linear
Origin: Force
y = +2.403887e+004x

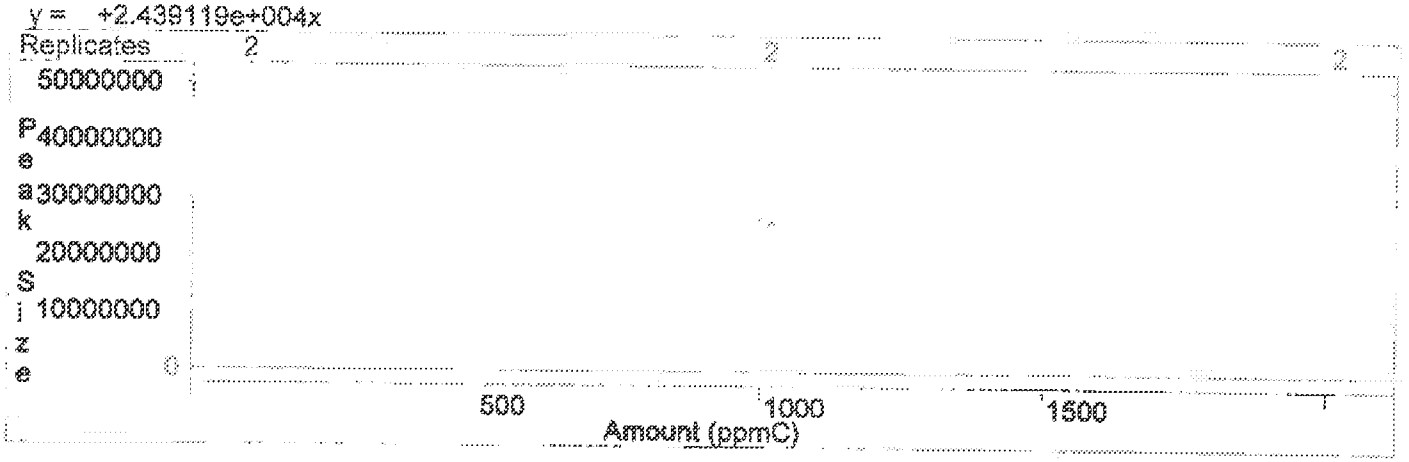
Resp. Fact. RSD: 2.641%
Coeff. Det.(r^2): 0.996209



Methane

External Standard Analysis
Curve Type: Linear
Origin: Force
y = +2.439119e+004x

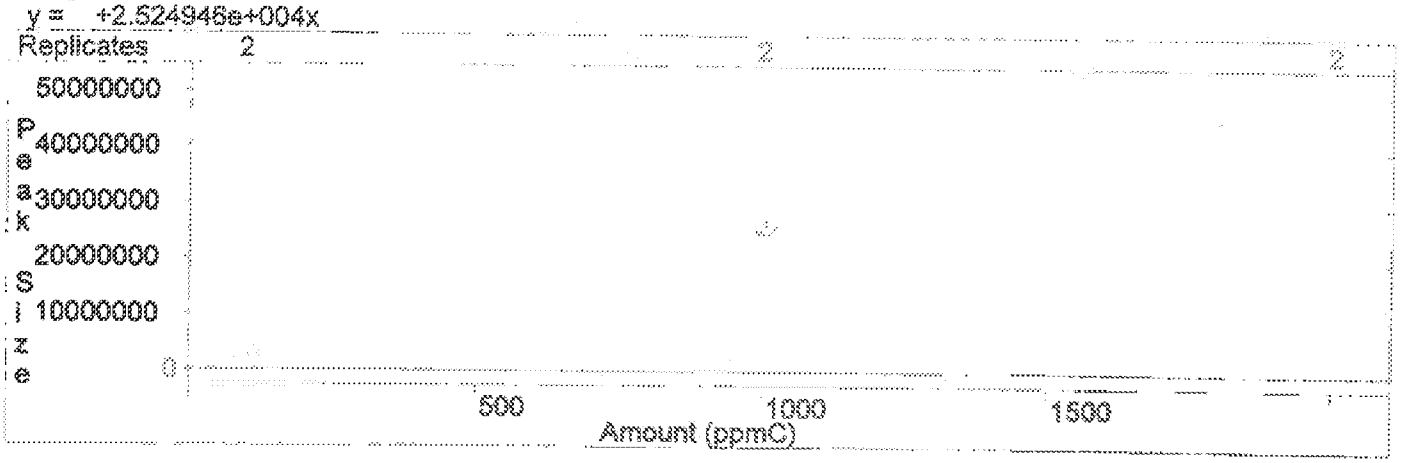
Resp. Fact. RSD: 2.785%
Coeff. Det.(r^2): 0.995849



Carbon Dioxide

External Standard Analysis
Curve Type: Linear
Origin: Force
y = +2.524946e+004x

Resp. Fact. RSD: 3.563%
Coeff. Det.(r^2): 0.995712

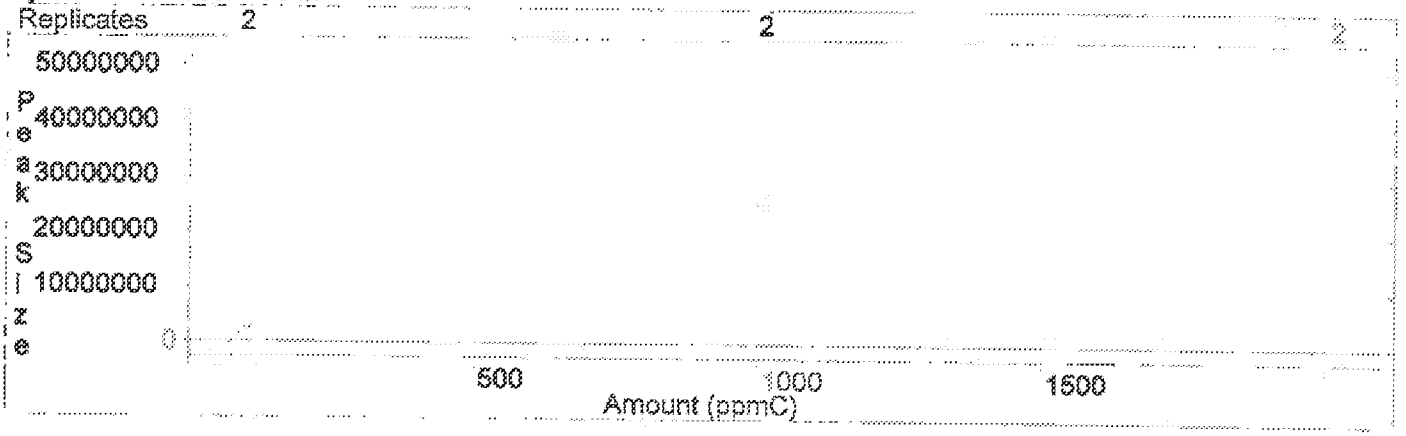


Print Date: 28 Sep 2010 12:11:03
Calibration Curves Report - Page 2
File: c:\star\nmoc.mth
Detector: 800 Interface Box, Address: 88, Channel ID: 2

Ethane

External Standard Analysis
Curve Type: Linear
Origin: Force
y = +2.512665e+004x

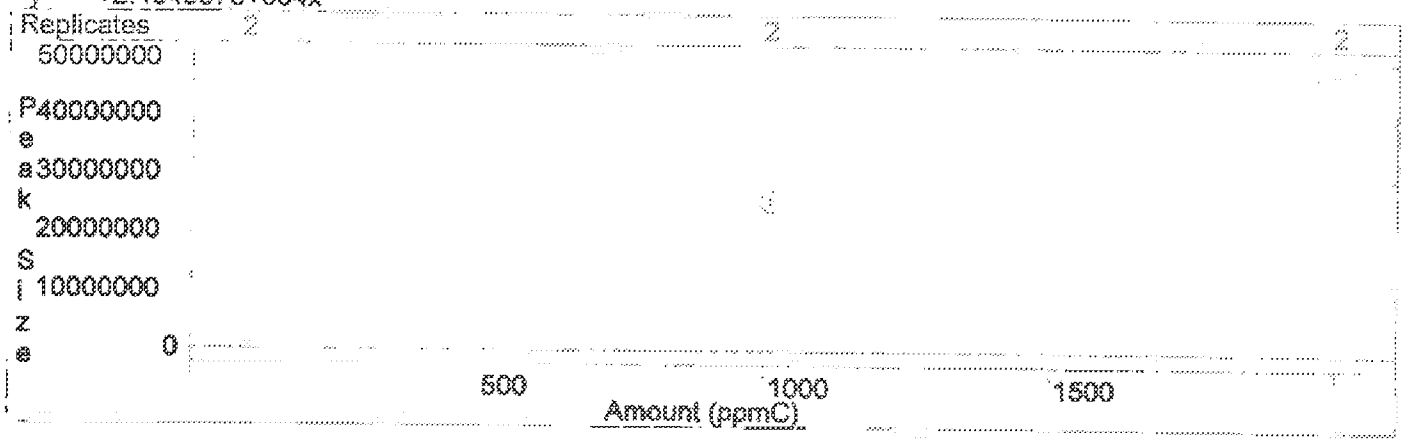
Resp. Fact. RSD: 3.188%
Coeff. Det.(r^2): 0.995719



NMOC

External Standard Analysis
Curve Type: Linear
Origin: Force
y = +2.404997e+004x

Resp. Fact. RSD: 3.425%
Coeff. Det.(r^2): 0.995809



Print Date: Tue Sep 28 12:11:57 2010 Page 1 of 1

Title : SCAQMD Methods 35.x
Run File : c:\star\data\2010\sept_10\9-28-2010, 09;38;00, 100ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID : 100ppm mix

Injection Date: 9/28/2010 09:38 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 3

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.340	0.027	2495959	BB	5.1	
2	Methane	3.767	0.014	2547858	BB	5.8	
3	Carbon Dioxi	3.980	0.014	2671168	BB	9.2	
4	Ethane	8.393	0.000	2661568	BB	23.4	
5	NMOC	12.567	0.014	2514023	BB	18.8	
	Totals:		0.069	12890582			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: -148 microVolts LSB: 1 microVolts

Noise (used): 198 microVolts ~ monitored before this run

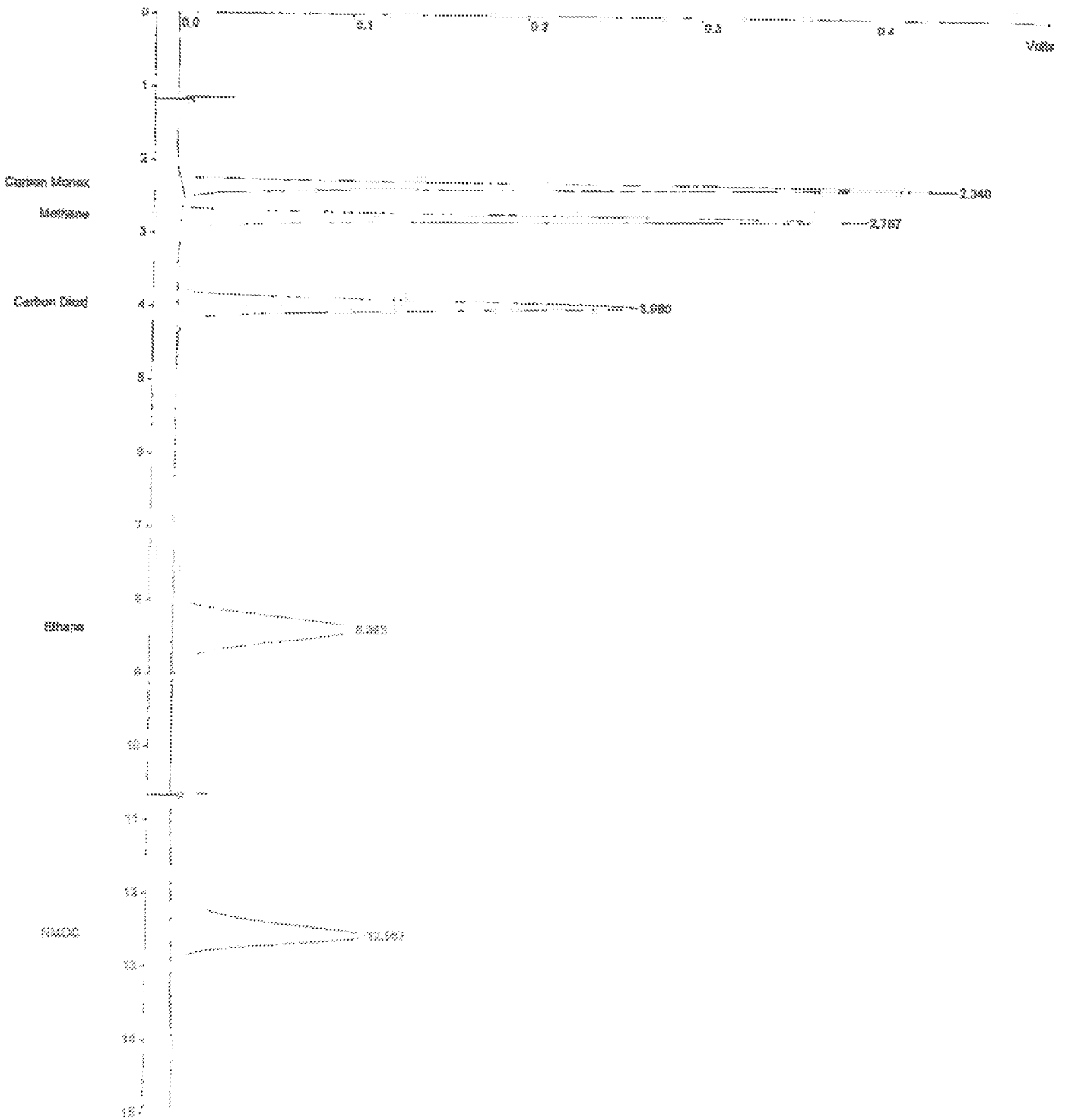
Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 09;38;00, 100ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 100ppm mix

Injection Date: 9/28/2010 09:38     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 88
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 212          Zero Offset = 2%
Start Time  =    0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\sept_10\9-28-2010, 10;02;53, 100ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~amoc.tmp
Sample ID : 100ppm mix

Injection Date: 9/28/2010 10:02 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 - Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d8b-21a1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 3

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.340	0.000	2489550	BB	5.1	
2	Methane	2.780	0.014	2542584	BB	5.8	
3	Carbon Dioxi	3.380	0.000	2656993	BB	9.2	
4	Ethane	8.420	0.027	2646777	BB	23.5	
5	NMOC	12.580	0.016	2527813	BB	18.9	
	Totals:		0.058	12863517			

Total Unidentified Counts : 0 counts

Detected Peaks: 5 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: -186 microVolts LSB: 1 microVolts

Noise (used): 401 microVolts - monitored before this run

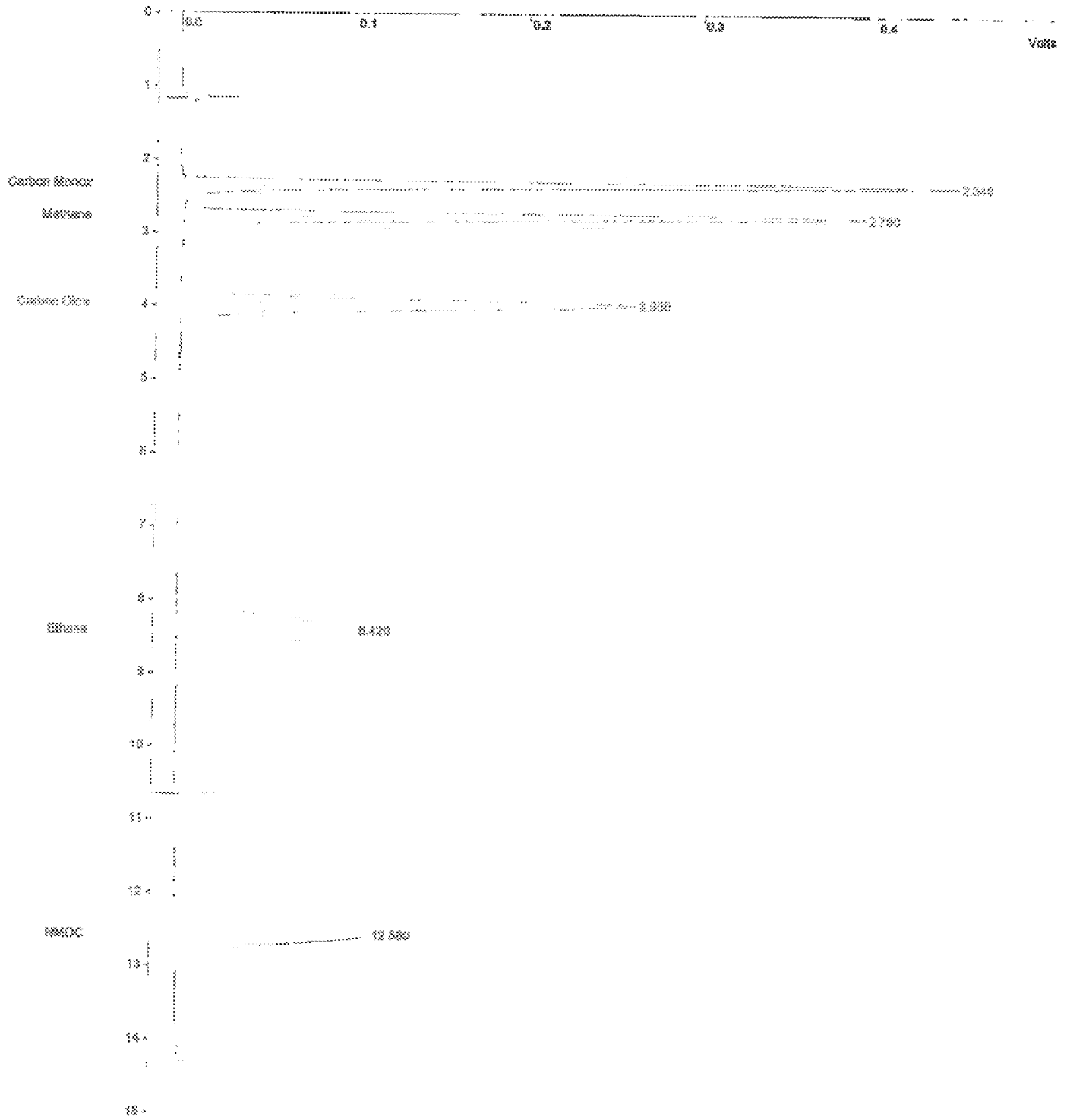
Stream: 1 Injection Number: 2 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 10;02;52, 100ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 100ppm mix

Injection Date: 9/28/2010 10:02     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 66
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel    : 2 = Foreflush 10         Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 212          Zero Offset = 2%
Start Time  =    0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\sepc_10\9-28-2010, 10;31;41, 1000ppm mix.run
Method File : c:\docume~1\user\local3~1\temp\~nmoc.tmp
Sample ID : 1000ppm mix

Injection Date: 9/28/2010 10:31 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 - Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 2

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.353	0.013	24980054	BB	5.0	
2	Methane	2.780	0.000	25844622	BB	5.7	
3	Carbon Dioxi	3.993	0.013	26581484	BB	9.1	
4		6.437	0.000	53260	BB	15.4	
5	Ethane	8.433	0.013	26703788	BB	23.5	
6	NMOC	12.580	0.000	25587582	BB	19.0	
	Totals:		0.039	129750790			

Total Unidentified Counts : 53260 counts

Detected Peaks: 6 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: 19 microVolts LSB: 1 microVolts

Noise (used): 184 microVolts - monitored before this run

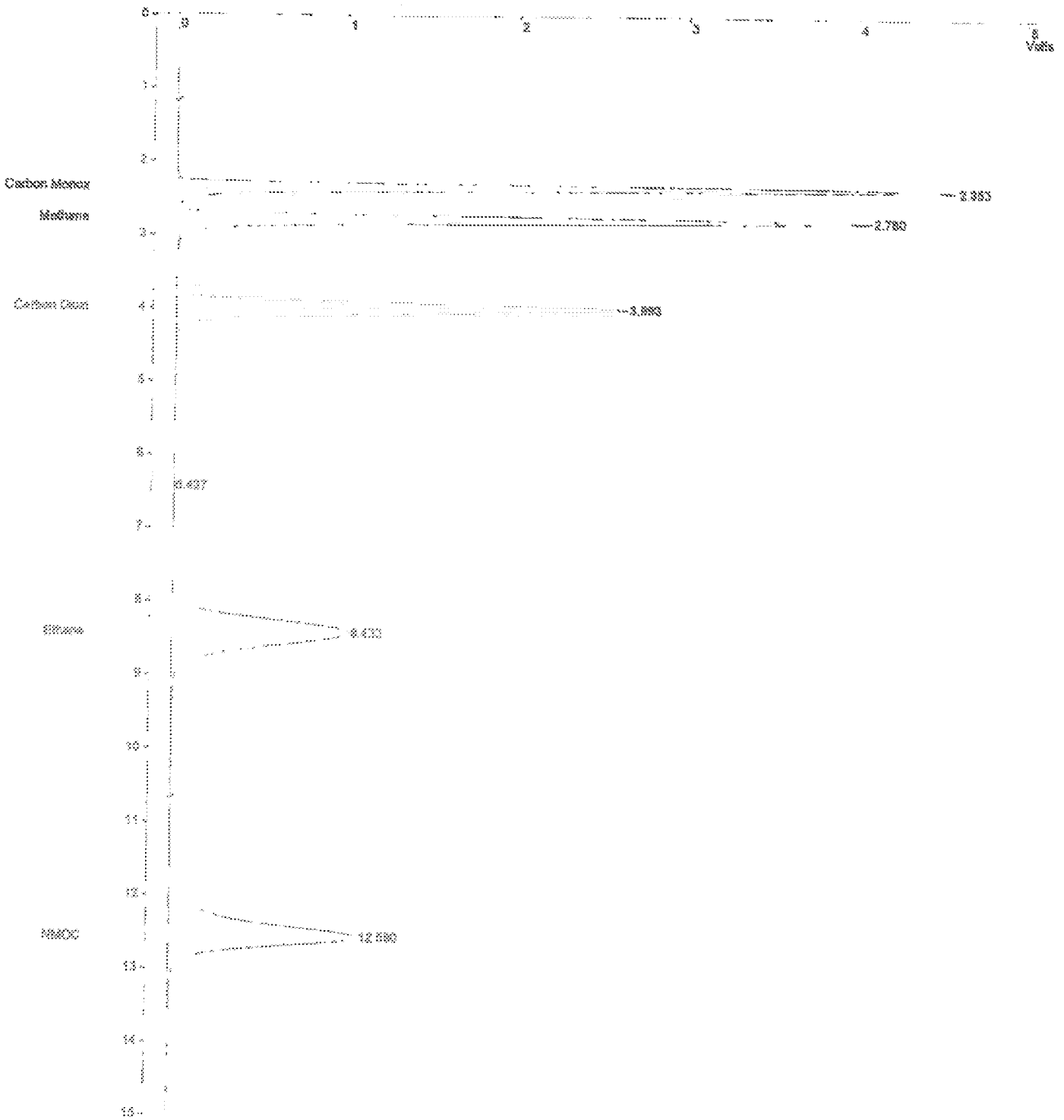
Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 10;31;41, 1000ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 1000ppm mix

Injection Date: 9/28/2010 10:31     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 88
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 2170          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



53

Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\sept_10\9-28-2010, 10;58;48, 1000ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID : 1000ppm mix

Injection Date: 9/28/2010 10:58 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00293-3588-d6b-21e1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 2

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.313	-0.013	25233440	BB	5.1	
2	Methane	2.753	0.000	25999358	BB	5.8	
3	Carbon Dioxi	3.967	0.001	26518942	BB	9.2	
4		6.417	0.000	55944	BB	16.6	
5	Ethane	8.407	-0.013	26659332	BB	23.6	
6	NMOC	12.553	-0.013	25464480	BB	19.2	
	Totals:		-0.038	129931498			

Total Unidentified Counts : 55944 counts

Detected Peaks: 6 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: -318 microVolts LSB: 1 microVolts

Noise (used): 281 microVolts - monitored before this run

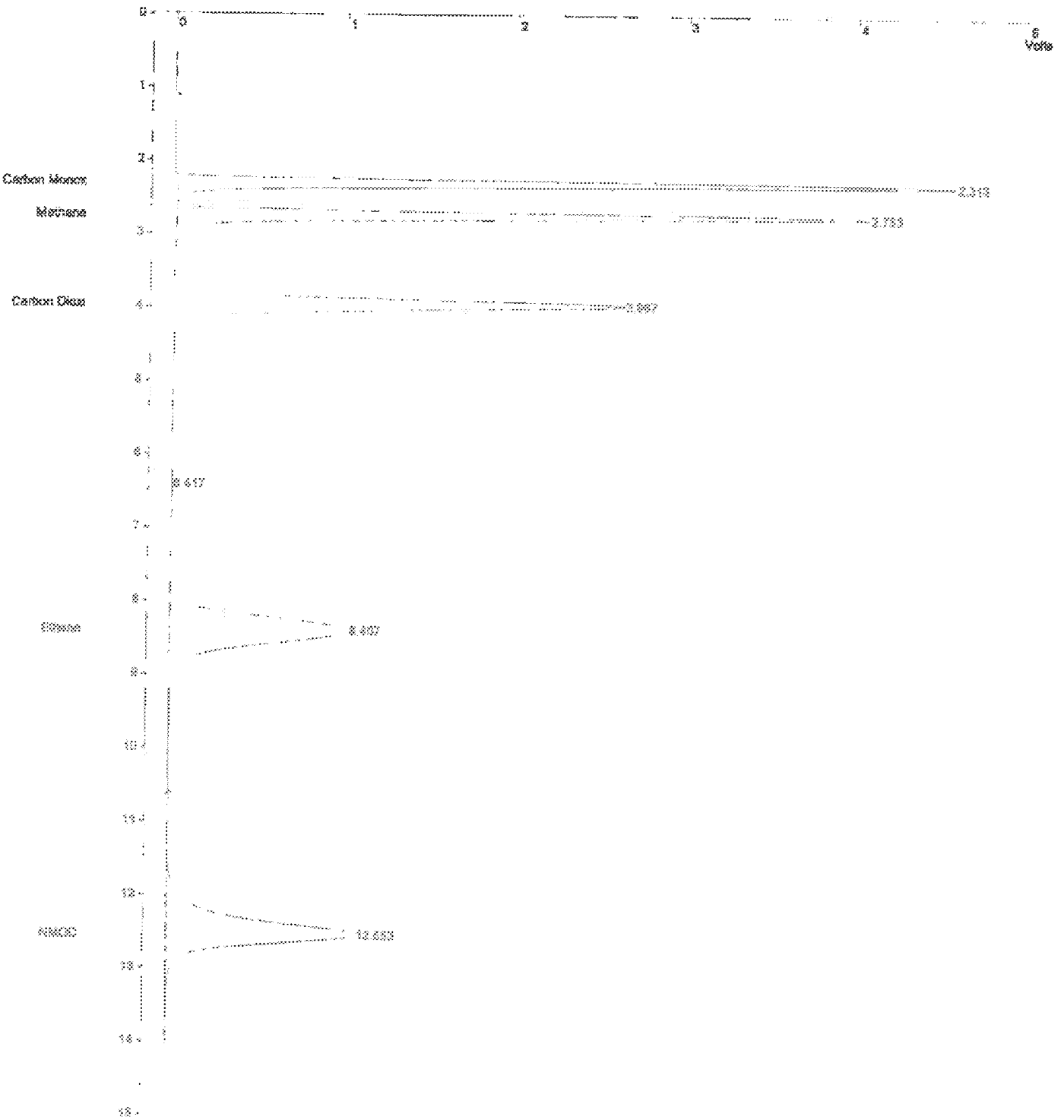
Stream: 1 Injection Number: 2 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 10;58;48, 1000ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 1000ppm mix

Injection Date: 9/28/2010 10:58     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 88
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 2167          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\sept_10\9-28-2010, 11;23;08, 2000 ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID : 2000 ppm mix

Injection Date: 9/28/2010 11:23 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 - Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 1

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.313	0.000	45244456	BB	5.1	
2	Methane	2.753	0.000	46688044	BB	5.7	
3	Carbon Dioxi	3.967	0.001	47882276	BB	9.2	
4		6.413	0.000	98412	BB	16.2	
5	Ethane	8.393	-0.013	48093788	BB	23.5	
6	NMOC	12.553	0.000	45699692	BB	19.3	
	Totals:		-0.012	233716668			

Total Unidentified Counts : 98412 counts

Detected Peaks: 6 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: 10 microVolts LSB: 1 microVolts

Noise (used): 244 microVolts - monitored before this run

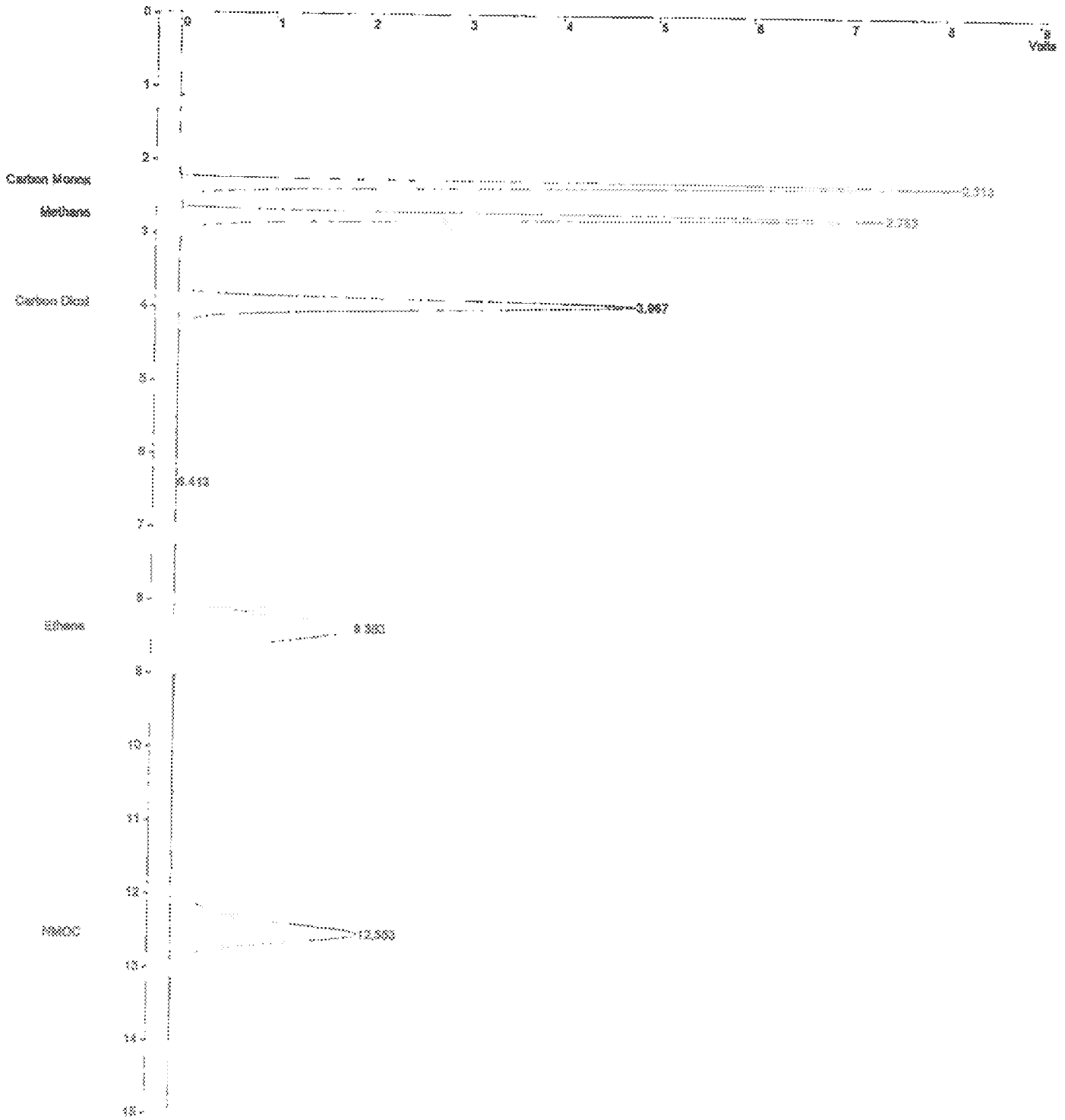
Stream: 1 Injection Number: 1 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 11;23;08, 2000 ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 2000 ppm mix

Injection Date: 9/28/2010 11:23     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 88
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 3865          Zero Offset = 2%
Start Time  =   0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```



Title : SCAQMD Methods 25.x
Run File : c:\star\data\2010\sept_10\9-28-2010, 11;51;21, 2000 ppm mix.run
Method File : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID : 2000 ppm mix

Injection Date: 9/28/2010 11:51 Calculation Date: 9/28/2010 12:10

Operator : Galina
Workstation:
Instrument : Varian Star #1
Channel : 2 = Foreflush 10

Detector Type: 0800 (10 Volts)
Bus Address : 88
Sample Rate : 1.25 Hz
Run Time : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21a1 **

Run Mode : Calibration
Peak Measurement: Peak Area
Calculation Type: External Standard
Level : 1

Peak No.	Peak Name	Ret. Time (min)	Time Offset (min)	Area (counts)	Sep. Code	Width 1/2 (sec)	Status Codes
1	Carbon Monox	2.327	-0.025	49219600	BB	5.1	
2	Methane	2.753	-0.027	50823792	BB	5.8	
3	Carbon Dioxi	3.967	-0.026	52183728	BB	9.2	
4		6.429	0.000	108723	BB	16.2	
5	Ethane	8.420	-0.013	52402704	BB	23.6	
6	NMOC	12.567	-0.013	49676556	BB	13.4	
	Totals:		-0.105	254425103			

Total Unidentified Counts : 108723 counts

Detected Peaks: 6 Rejected Peaks: 0 Identified Peaks: 5

Multiplier: N/A Divisor: N/A Unidentified Peak Factor: 0

Baseline Offset: -195 microVolts LSB: 1 microVolts

Noise (used): 212 microVolts - monitored before this run

Stream: 1 Injection Number: 2 Sampling Time: 0.00 min

Original Notes:

Appended Notes:

****

```
Title        : SCAQMD Methods 25.x
Run File     : c:\star\data\2010\sept_10\9-28-2010, 11;51;21, 2000 ppm mix.run
Method File  : c:\docume~1\user\locals~1\temp\~nmoc.tmp
Sample ID    : 2000 ppm mix

Injection Date: 9/28/2010 11:51     Calculation Date: 9/28/2010 12:10

Operator    : Galina                  Detector Type: 0800 (10 Volts)
Workstation:                          Bus Address  : 88
Instrument : Varian Star #1           Sample Rate  : 1.25 Hz
Channel     : 2 = Foreflush 10        Run Time     : 15.013 min

** Star Chromatography Workstation Version 6.00 ** 00299-3588-d6b-21e1 **

Chart Speed =    1.33 cm/min   Attenuation = 4205          Zero Offset = 2%
Start Time  =    0.000   min     End Time    = 15.013  min   Min / Tick  = 1.00
```