

# **SOURCE COMPLIANCE TEST REPORT**

**CITGO PETROLEUM CORPORATION**

*Petroleum Refinery Information Collection Request (ICR)*

*Component 4 Emission Test Program*

*Fluidized Catalytic Cracking Unit (FCCU)*

*B-Cat Wet Gas Scrubber (EQT039) [Source ID 3(II)17]*

**VOLUME I OF III**

**Prepared for:**

**CITGO Petroleum Corporation**

**Lake Charles Manufacturing Complex**

**Facility Contact:**

**Ms. Michele Walker**

**Office: (337) 708-8210**

**Prepared by:**

**Jason Pilgrim**

**Approved by:**

**Richard Ishikawa**



**4171 Essen Lane**

**Baton Rouge, LA 70809**

**Office: (225) 932-2745**

**Fax: (225) 213-1274**

**Test Date: May 17, 2011 through May 27, 2011**

**Shaw Project No. 142733**

## STATEMENT OF CERTIFICATION

**CITGO Petroleum Corporation  
Lake Charles Manufacturing Complex  
Sulphur, Calcasieu Parish, Louisiana**

**Petroleum Refinery Information Collection Request (ICR)  
Component 4 Emission Test Program  
Fluidized Catalytic Cracking Unit (FCCU)  
B-Cat (EQT039) Wet Gas Scrubber [Source ID (3(II)17]**

**Conducted: May 17, 2011 through May 27, 2011**

Shaw Environmental, Inc. (Shaw) is a commercial laboratory that operates in compliance with the *Louisiana Environmental Laboratory Accreditation Program* (LELAP), Certificate No. 04113. Shaw provides defensible air quality assessment data as a certified emission source testing firm. Agency Interest No. 122938 has been assigned to Shaw Environmental by the *Louisiana Department of Environmental Quality* (LDEQ) in accordance with *Louisiana Administrative Code of LAC 33.I. Chapter 45*.

I certify that I have examined and approve the contents of this document. Based on the information contained within, and procedures pursuant to EPA 40 CFR 60, Appendix A and/or B, other approved test methods, and test data obtained on-site by Shaw personnel, I believe the contents of this report to be true, accurate, and complete to the best of my knowledge.



Shaw Environmental, Inc. Representative

8/18/2011

Date

Facility Representative

Date

## Table of Contents

---

1.0	INTRODUCTION .....	1
1.1	Source Description .....	1
1.2	Applicable State and/or Federal Regulations .....	2
1.3	Test Results and Discussions .....	3
1.3.1	U.S. EPA Method 26A .....	4
1.3.2	U.S. EPA Other Test Method 29 .....	5
1.3.3	SW-846 Method 0011 .....	6
1.3.4	SW-846 Method 0010 .....	8
1.3.5	U.S. EPA Method 23 .....	13
1.3.6	SW-846 Method 0061 .....	17
1.3.7	ASTM D6784-02 (Hg) .....	18
1.3.8	U.S. EPA Method 5B/202 and ASTM D5907 .....	19
1.3.9	U.S. EPA Conditional Test Method 027 (CTM-027) .....	21
1.3.10	U.S. EPA Method 29 .....	22
1.3.11	U.S. EPA Method 18 (Methane and Ethane) .....	24
1.3.12	U.S. EPA Method 18 and Method 308 .....	25
1.3.13	U.S. EPA Methods 10, 7E, 6C, and 25A .....	28
1.4	Test Program Chronology .....	29
2.0	ICR COMPONENT 4 "EMISSION TESTING" MANUAL TEST METHODS .....	32
2.1	Sample Traverse Points .....	32
2.2	Velocity and Volumetric Flow Rate .....	32
2.3	Moisture Content .....	32
2.4	Speciated Volatile Organic Hazardous Air Pollutant (VOHAP) .....	33
2.4.2	Train 1 .....	33
2.4.3	Train 2 .....	34
2.4.4	Train 3 .....	34
2.5	Speciated Semi-volatile Organic Hazardous Air Pollutant (Semi-VOHAP) .....	34
2.6	Aldehydes .....	35
2.7	Methane and Ethane .....	35
2.8	Dioxins and Furans (D/F) and Polychlorinated Biphenyls (PCB) .....	35
2.9	Hydrogen Chloride (HCl), Chlorine (Cl <sub>2</sub> ), and Hydrogen Fluoride (HF) .....	36
2.10	Hydrogen Cyanide (HCN) .....	36
2.11	Mercury (Hg) .....	36
2.12	Hexavalent Chromium (Cr <sup>+6</sup> ) .....	37
2.13	Other Metals .....	37
2.14	PM/PM <sub>2.5</sub> (filterable and condensable) .....	38
2.15	Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) .....	38
2.16	Ammonia (NH <sub>3</sub> ) .....	38
3.0	INSTRUMENTAL ANALYZER REFERENCE METHODS, PROCEDURES, AND SPECIFICATIONS .....	40
3.1	Excess Oxygen (O <sub>2</sub> ) and Carbon Dioxide (CO <sub>2</sub> ) .....	40
3.2	Total Hydrocarbons (THC) .....	40
3.3	Carbon Monoxide (CO) .....	40

3.4	Nitrogen Oxides (NO <sub>x</sub> ) .....	40
3.5	Sulfur Dioxide (SO <sub>2</sub> ) .....	41
3.6	Procedures and Specifications .....	41
4.0	APPROVED STANDARD TEST METHOD DEVIATIONS .....	44

## List of Tables

Table 1	Comprehensive Summary of Results U.S. EPA Method 26A .....	4
Table 2	Comprehensive Summary of Results U.S. EPA Other Test Method 29.....	5
Table 3	Comprehensive Summary of Results SW-846 Method 0011 .....	6
Table 4	Comprehensive Summary of Results SW-846 Method 0010.....	8
Table 5	Comprehensive Summary of Results U.S. EPA Method 23.....	13
Table 6	Comprehensive Summary of Results SW-846 Method 0061 .....	17
Table 7	Comprehensive Summary of Results ASTM D6784-02 (Hg) .....	18
Table 8	Comprehensive Summary of Results U.S. EPA Method 5B/202 and ASTM D5907 .....	20
Table 9	Comprehensive Summary of Results U.S. EPA Conditional Test Method 027 (CTM-027).....	21
Table 10	Comprehensive Summary of Results U.S. EPA Method 29.....	22
Table 11	Comprehensive Summary of Results U.S. EPA Method 18 (Methane and Ethane) .....	24
Table 12	Comprehensive Summary of Results U.S. EPA Method 18 and Method 308.....	25
Table 13	Comprehensive Summary of Results U.S. EPA Methods 10, 7E, 6C, and 25A.....	28
Table 14	Chronology of Events .....	29
Table 15	Speciated VOHAPs .....	33
Table 16	Speciated Semi-VOHAPs .....	34
Table 17	Reference Method Instrument Specifications .....	42

## List of Figures

Figure 1	Process Flow Diagram .....	2
Figure 2	Mobile Test Trailer Sampling Configuration.....	43



## List of Appendices

---

A	Raw Field Data:
A1	Preliminary Data
A2	U.S. EPA Method 26A
A3	U.S. EPA Other Test Method 29
A4	SW-846 Method 0011
A5	U.S. EPA Method 23 and Method 0010
A6	SW-846 Method 0061
A7	ASTM D6784-02 (Hg)
A8	U.S. EPA Method 5B/202 and ASTM D5907
A9	U.S. EPA Conditional Test Method 027 (CTM-027)
A10	U.S. EPA Method 29
A11	U.S. EPA Method 18 (Methane and Ethane)
A12	U.S. EPA Method 18 and Method 308
B	Reference Method Instrument Data
C	Laboratory Reports
C1	Enthalpy: Analytical Report 0411-77
C2	Enthalpy: Analytical Report 0511-67
Volume II	
C3	Enthalpy: Analytical Report 0511-68
Volume III	
C4	DAT Reports
D	Calculations:
D1	U.S. EPA Method 26A
D2	U.S. EPA Other Test Method 29
D3	SW-846 Method 0011
D4	U.S. EPA Method 23 and Method 0010
D5	SW-846 Method 0061
D6	ASTM D6784-02 (Hg)
D7	U.S. EPA Method 5B/202 and ASTM D5907
D8	U.S. EPA Conditional Test Method 027 (CTM-027)
D9	U.S. EPA Method 29
D10	U.S. EPA Method 18 (Methane and Ethane)
D11	U.S. EPA Method 18 and Method 308
E	Process Data
F	Test Equipment Calibrations
G	Calibration Gas Certifications
H	Agency Correspondence
I	Shaw Personnel Resumes
J	Project Participants

## 1.0 INTRODUCTION

---

Shaw Environmental & Infrastructure, Inc. (Shaw) was retained by CITGO Petroleum Corporation (CITGO), Lake Charles Manufacturing Complex in Sulphur, Calcasieu Parish, Louisiana to conduct Component 4 Testing of the Petroleum Refinery Information Collection Request (ICR). The objective of the test program is to sample and report emission parameters on behalf of CITGO as required by the Environmental Protection Agency's (EPA) information gathering authority under Section 114 of the Clean Air Act. The test program was coordinated through Ms. Michele Walker of CITGO and conducted on May 17 through May 27, 2011 by Messrs. Richard Ishikawa, Blake Fogleman, Jason Pilgrim, Kelly Campbell, Jett Rink, Henry Walton, William Huggins, and Shane Vincent of Shaw.

### 1.1 Source Description

CITGO Lake Charles Manufacturing Complex is the fifth largest refining facility in the United States with a crude oil refining capacity of 440,000 barrels-per-day (bpd). The facility is particularly suited to process heavy sour crude oils into high-octane, unleaded gasoline, jet fuel, and ultra-low sulfur diesel, as well as a variety of petrochemicals used to manufacture a range of everyday products.

The Fluidized Catalytic Cracking Units (FCCUs) consist of the A, B, and C Units which convert heavy distillate gas oils and heavier cuts into higher grade lighter fractions. The FCC Unit consists of three (3) major sections: a) Reactor, b) Fractionation, and c) Regenerator Flue Gas Handling. A description of each section is presented as follows:

#### (a) Reactor

The feed is preheated through a heat exchange network and B-6 preheat furnaces and contacted with a stream of hot circulating catalyst, which completely vaporizes the feed. The mixture is separated into the catalyst and cracked hydrocarbons by the use of cyclones and steam. The vapor stream is quenched to minimize over-cracking.

#### (b) Fractionation

The reactor effluent is fed into the base of the fractionator. With heat removal at various stages, the vapors are condensed and fractionated into product streams.

#### (c) Regenerator- Flue Gas Handling

The cracking reaction deposits coke on the catalyst. The deposits reduce the active surface area of the catalyst. Thus, it is necessary to regenerate the catalyst to restore its activity.

Vapors leaving the regenerator, consisting of flue gas, air and steam flow through cyclone separators and out of the vessel. The rising stream of gas will contain a small amount of entrained catalyst. As the gas flows through the cyclones, the major portion of the catalyst is removed from the gases. The Wet Gas Scrubber reduces emissions of sulfur oxides, sulfuric acid, and particulate matter before venting the flue gas to the atmosphere. The process flow diagram, including the control equipment is presented below as Figure 1.

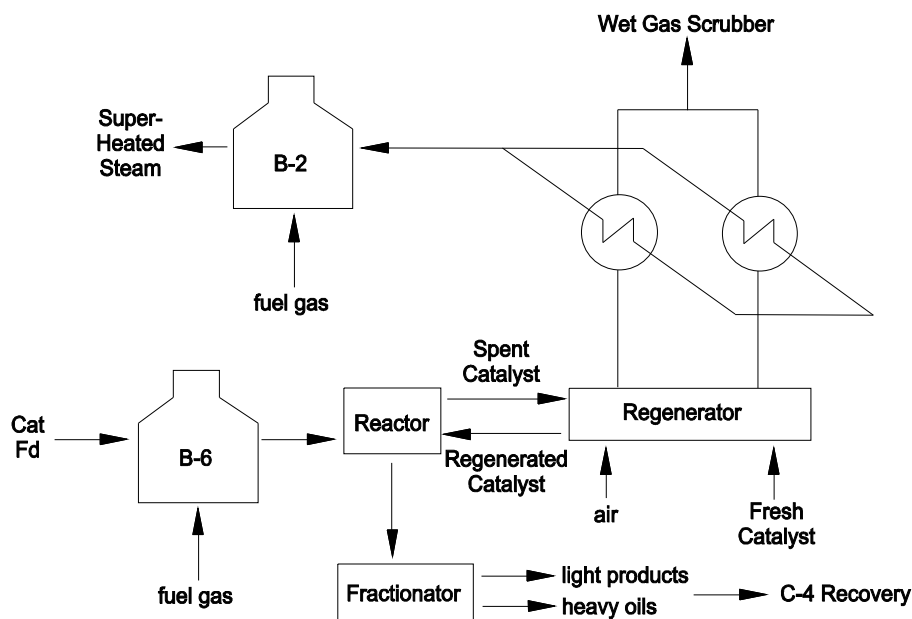


Figure 1 Process Flow Diagram

## 1.2 Applicable State and/or Federal Regulations

EPA's Office of Air and Radiation (OAR) is conducting an information collection request (ICR) to assist the EPA Administrator, as required by sections 111(b), 112(d), and 112(f)(6) of the Clean Air Act (CAA), as amended, to reevaluate emission standards for petroleum refineries. The ICR has four components: a questionnaire to be completed by all petroleum refineries, an emissions inventory to be developed by all petroleum refineries, distillation feed sampling and analysis to be conducted by all petroleum refineries, and emissions testing to be completed in accordance with an EPA-approved protocol for 88 selected emissions sources. The deadline for submissions of the required information for the applicable component is August 31, 2011 for Component 4 (Emission Testing).

Pursuant to the EPA ICR, CITGO will be required to conduct emissions testing at one of the FCCUs. At this time, CITGO has decided to test FCCU B (Cat B) at the exhaust of the wet gas scrubber (WGS).

### 1.3 *Test Results and Discussions*

Shaw used the test procedures outlined in Part VIII “Test Procedures, Methods, and Reporting Requirements for the Information Collection Request for Petroleum Refineries” to satisfy requirements of Component 4.

Test methods and/or procedures used to conduct this test program for the corresponding measurement parameters are presented in Sections 2.0. Sampling, analyses, and corresponding calculations were performed in accordance with published test methods, except when indicated. Approved modifications to the test methods were implemented to facilitate testing and used in cases where the modifications were not expected to affect the data quality.

In the Part VIII: Test Procedures, Methods, and Reporting Requirements for the Information Collection Request for Petroleum Refineries, Table 1.3: Target Volatile Analytes is listed. Shaw reported all target compounds listed except for triethylamine. Triethylamine was not listed due to the emission testing FAQ section of the Petroleum Refineries Information Collection Request website as follows:

Test-001

Q: What changes can I make from the ICR for sampling and analysis of the volatile organic compounds on Table 1.3 of Component 4?

A: EPA has determined that the following changes are acceptable. This list is not meant to be exhaustive. You may request other alternatives (e.g. NCASI CI/WP-98.01, ISS-FPA105.01, etc.) following the process outlined in Component 4. For such requests, please submit as much detail in the request as possible including information on the associated QA/QC, spiking procedures and recovery standards.

- Because Method 18 sampling and analysis techniques are not suitable for measuring trimethylamine and there are no readily available validated method alternatives, we have removed trimethylamine from the target analyte list on Table 1.3.

All the documentation of this can be found in the corresponding appendix. The results are presented in Table 12 Comprehensive Summary of Results U.S. EPA Method 18 and Method 308.

### 1.3.1 U.S. EPA Method 26A

Shaw conducted three one hundred twenty eight minute tests during normal operating conditions. Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Chlorine (Cl<sub>2</sub>) were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 1.

Table 1 Comprehensive Summary of Results U.S. EPA Method 26A

Test No.	1	2	3	Average
Date	05/18/11	05/18/11	05/19/11	n/a
Start Time	12:50	19:18	9:46	n/a
End Time	18:15	21:35	12:10	n/a
Test Duration, min	128	128	128	128

#### Unit Operating Parameters

Oxygen Content	vol%	0.75	0.76	0.63	0.71
Carbon Dioxide Content	vol%	17.80	17.50	18.08	17.79
Moisture Content	vol%	20.25	20.35	19.93	20.18
Wet Molecular Weight	lb/lb-mol	28.27	28.22	28.34	28.28
Velocity	ft/sec	40.92	41.29	39.25	40.49
Volumetric Flow Rate	dscfm	86,182	86,677	83,106	85,322

#### Sampling Parameters

Isokinetic Sampling Rate	%	97.57	97.16	94.94	96.56
Sample Volume	dscf	87.860	88.000	82.440	86.100
	dscm	2.488	2.492	2.334	2.438

#### Laboratory Results <sup>1</sup>

Hydrogen Chloride (HCl)	µg	2,023	1,388	1,093	1,501
Hydrogen Fluoride (HF)	µg	[<232] BDL	[<187] BDL	[<172] BDL	[<197] BDL
Chloride <sup>2</sup>	µg	10,889	9,693	9,135	9,906

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Pollutants**

Hydrogen Chloride (HCl)	mg/dscm	0.8131	0.5570	0.4682	0.6128
	lb/hr	0.263	0.181	0.146	0.196
Hydrogen Fluoride (HF)	mg/dscm	[<0.0933] BDL	[<0.0750] BDL	[<0.0737] BDL	[<0.0807] BDL
	lb/hr	[<0.030] BDL	[<0.024] BDL	[<0.023] BDL	[<0.026] BDL
Chlorine (Cl <sub>2</sub> ) <sup>2</sup>	mg/dscm	0.1239	0.1101	0.1108	0.1150
	lb/hr	1.413	1.263	1.218	1.298

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

<sup>2</sup> Chlorine (Cl<sub>2</sub>) and Chloride are equal in mass

BDL (below detection level) - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

### 1.3.2 U.S. EPA Other Test Method 29

Shaw conducted three one hundred twenty eight minute tests during normal operating conditions. Hydrogen Cyanide (HCN) was measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 2.

**Table 2 Comprehensive Summary of Results U.S. EPA Other Test Method 29**

Test No.	1	2	3	Average
Date	05/18/11	05/18/11	05/19/11	n/a
Start Time	12:50	19:18	9:46	n/a
End Time	18:15	21:35	12:10	n/a
Test Duration, min	128	128	128	128

**Unit Operating Parameters**

Oxygen Content	vol%	0.75	0.76	0.63	0.71
Carbon Dioxide Content	vol%	17.80	17.50	18.08	17.79
Moisture Content	vol%	21.75	21.68	21.81	21.75
Wet Molecular Weight	lb/lb-mol	28.08	28.05	28.10	28.08
Velocity	ft/sec	38.77	41.59	40.73	40.36
Volumetric Flow Rate	dscfm	79,793	85,545	83,747	83,028

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

**Sampling Parameters**

Isokinetic Sampling Rate	%	99.63	96.08	89.05	94.92
Sample Volume	dscf	28.118	29.072	26.379	27.856
	dscm	0.796	0.823	0.747	0.789

**Laboratory Results <sup>1</sup>**

Hydrogen Cyanide (HCN)	µg	42,721	119,064	81,553	81,113
------------------------	----	--------	---------	--------	--------

**Pollutants**

Hydrogen Cyanide (HCN)	µg/dscm	53,655	144,630	109,178	102,488
	lb/hr	16.04	46.35	34.25	32.21

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

**1.3.3 SW-846 Method 0011**

Shaw conducted three sixty four minute tests during normal operating conditions. Formaldehyde, Acetaldehyde, and Propionaldehyde were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 3.

Table 3 Comprehensive Summary of Results SW-846 Method 0011

Test No.	1	2	3	Average
Date	05/20/11	05/20/11	05/20/11	n/a
Start Time	11:40	13:50	15:40	n/a
End Time	12:54	14:57	16:48	n/a
Test Duration, min	64	64	64	64

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Unit Operating Parameters**

Oxygen Content	vol%	0.64	0.69	0.50	0.61
Carbon Dioxide Content	vol%	17.41	17.32	17.42	17.38
Moisture Content	vol%	20.23	20.11	20.15	20.16
Wet Molecular Weight	lb/lb-mol	28.22	28.23	28.23	28.23
Velocity	ft/sec	40.48	40.34	39.50	40.11
Volumetric Flow Rate	dscfm	85,402	85,252	83,347	84,667

**Sampling Parameters**

Isokinetic Sampling Rate	%	96.77	97.07	98.27	97.37
Sample Volume	dscf	45.725	45.787	45.315	45.609
	dscm	1.295	1.297	1.283	1.292

**Laboratory Results <sup>1</sup>**

Formaldehyde	µg	31.7	23.0	17.4	24.0
Acetaldehyde	µg	[<0.634] BDL	[<0.615] BDL	6.460	2.570 DLL
Propionaldehyde	µg	[<2.20] BDL	[<2.13] BDL	[<1.48] BDL	[<1.94] BDL

**Pollutants**

Formaldehyde	µg/dscm	24.483	17.739	13.560	18.5940
	lb/hr	7.83E-03	5.67E-03	4.23E-03	5.91E-03
Acetaldehyde	µg/dscm	[<0.490] BDL	[<0.474] BDL	5.034	1.999 DLL
	lb/hr	[<1.57E-04] BDL	[<1.51E-04] BDL	1.57E-03	6.27E-04 DLL
Propionaldehyde	µg/dscm	[<1.699] BDL	[<1.643] BDL	[<1.153] BDL	[<1.498] BDL
	lb/hr	[<5.44E-04] BDL	[<5.25E-04] BDL	[<3.60E-04] BDL	[<4.76E-04] BDL

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DLL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)



### 1.3.4 SW-846 Method 0010

Shaw conducted three two hundred forty minute tests during normal operating conditions. Speciated Semi-volatile Organic HAP's were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 4.

**Table 4 Comprehensive Summary of Results SW-846 Method 0010**

Test No.	1	2	3	Average
Date	05/23/11	05/23/11	05/24/11	n/a
Start Time	10:25	16:28	8:35	n/a
End Time	14:31	20:35	12:39	n/a
Test Duration, min	240	240	240	240

#### Unit Operating Parameters

Oxygen Content	vol%	0.63	0.79	0.50	0.64
Carbon Dioxide Content	vol%	18.17	18.06	18.05	18.09
Moisture Content	vol%	19.90	19.97	19.82	19.90
Wet Molecular Weight	lb/lb-mol	28.36	28.34	28.35	28.35
Velocity	ft/sec	39.11	38.33	40.03	39.16
Volumetric Flow Rate	dscfm	83,073	81,248	85,023	83,115

#### Sampling Parameters

Isokinetic Sampling Rate	%	97.86	99.14	97.63	98.21
Sample Volume	dscf	147.905	132.522	151.010	143.812
	dscm	4.188	3.753	4.276	4.072

#### Laboratory Results <sup>1</sup>

Acenaphthene	µg	[<1.38] BDL	[<1.38] BDL	[<1.38] BDL	[<1.38] BDL
Acenaphthylene	µg	[<0.44] BDL	[<0.44] BDL	[<0.44] BDL	[<0.44] BDL
Aniline	µg	[<6.64] BDL	[<6.64] BDL	[<6.64] BDL	[<6.64] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

Anthracene	µg	[<0.44] BDL	[<0.44] BDL	[<0.44] BDL	[<0.44] BDL
Benzidine	µg	[<0.68] BDL	[<0.68] BDL	[<0.68] BDL	[<0.68] BDL
Benzo[a]anthracene	µg	[<1.97] BDL	[<1.97] BDL	[<1.97] BDL	[<1.97] BDL
Benzo[b]fluoranthrene	µg	[<0.36] BDL	[<0.36] BDL	[<0.36] BDL	[<0.36] BDL
Benzo[k]fluoranthrene	µg	[<0.54] BDL	[<0.54] BDL	[<0.54] BDL	[<0.54] BDL
Benzo[g,h,i]perylene	µg	[<1.31] BDL	[<1.31] BDL	[<1.31] BDL	[<1.31] BDL
Benzo[a]pyrene	µg	[<1.22] BDL	[<1.22] BDL	[<1.22] BDL	[<1.22] BDL
Benzo[e]pyrene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Biphenyl	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Cresol (mixed isomers)	µg	221.60	236.40	244.00	234.00
Chrysene	µg	[<1.39] BDL	[<1.39] BDL	[<1.39] BDL	[<1.39] BDL
Dibenz[a,h]anthracene	µg	[<1.19] BDL	[<1.19] BDL	[<1.19] BDL	[<1.19] BDL
Dibenzofuran	µg	[<1.01] BDL	[<1.01] BDL	[<1.01] BDL	[<1.01] BDL
3,3'-Dimethoxybenzidine	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Dimethylaminobenzene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
7,12-Dimethylbenz(a)anthracene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
3,3'-Dimethylbenzidine	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
α,α-Dimethylphenylethylamine	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
2,4-Dimethylphenol	µg	[<0.29] BDL	26.65 DLL	4.74 DLL	10.56 DLL
Fluoranthene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Fluorene	µg	[<0.52] BDL	[<0.52] BDL	[<0.52] BDL	[<0.52] BDL
Indeno(1,2,3-cd)pyrene	µg	[<1.26] BDL	[<1.26] BDL	[<1.26] BDL	[<1.26] BDL
Isophorone	µg	[<0.29] BDL	[<0.29] BDL	[<0.29] BDL	[<0.29] BDL
3-Methylcholanthrene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
2-Methylnaphthalene	µg	[<0.66] BDL	[<0.66] BDL	[<0.66] BDL	[<0.66] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

Naphthalene	µg	[<1.74] BDL	[<1.74] BDL	[<1.74] BDL	[<1.74] BDL
Perylene	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Phenanthrene	µg	[<1.58] BDL	[<1.58] BDL	[<1.58] BDL	[<1.58] BDL
Phenol	µg	169.80	152.10	193.09 DLL	171.66 DLL
1,4-Phenylenediamine	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL
Pyrene	µg	[<0.48] BDL	[<0.48] BDL	[<0.48] BDL	[<0.48] BDL
o-Toluidine	µg	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL	[<0.40] BDL

## Pollutants

Acenaphthene	µg/dscm	[<0.3295] BDL	[<0.3677] BDL	[<0.3227] BDL	[<0.3400] BDL
	lb/hr	[<1.03E-04] BDL	[<1.12E-04] BDL	[<1.03E-04] BDL	[<1.06E-04] BDL
Acenaphthylene	µg/dscm	[<0.1051] BDL	[<0.1173] BDL	[<0.1029] BDL	[<0.1084] BDL
	lb/hr	[<3.27E-05] BDL	[<3.57E-05] BDL	[<3.28E-05] BDL	[<3.37E-05] BDL
Aniline	µg/dscm	[<1.5854] BDL	[<1.7694] BDL	[<1.5528] BDL	[<1.6359] BDL
	lb/hr	[<4.93E-04] BDL	[<5.39E-04] BDL	[<4.95E-04] BDL	[<5.09E-04] BDL
Anthracene	µg/dscm	[<0.1051] BDL	[<0.1173] BDL	[<0.1029] BDL	[<0.1084] BDL
	lb/hr	[<3.27E-05] BDL	[<3.57E-05] BDL	[<3.28E-05] BDL	[<3.37E-05] BDL
Benzidine	µg/dscm	[<0.1624] BDL	[<0.1812] BDL	[<0.1590] BDL	[<0.1675] BDL
	lb/hr	[<5.05E-05] BDL	[<5.52E-05] BDL	[<5.07E-05] BDL	[<5.21E-05] BDL
Benzo[a]anthracene	µg/dscm	[<0.4704] BDL	[<0.5250] BDL	[<0.4607] BDL	[<0.4853] BDL
	lb/hr	[<1.46E-04] BDL	[<1.60E-04] BDL	[<1.47E-04] BDL	[<1.51E-04] BDL
Benzo[b]fluoranthrene	µg/dscm	[<0.0860] BDL	[<0.0959] BDL	[<0.0842] BDL	[<0.0887] BDL
	lb/hr	[<2.68E-05] BDL	[<2.92E-05] BDL	[<2.68E-05] BDL	[<2.76E-05] BDL
Benzo[k]fluoranthrene	µg/dscm	[<0.1289] BDL	[<0.1439] BDL	[<0.1263] BDL	[<0.1330] BDL
	lb/hr	[<4.01E-05] BDL	[<4.38E-05] BDL	[<4.02E-05] BDL	[<4.14E-05] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

Benzo[g,h,i]perylene	µg/dscm	[<0.3128] BDL	[<0.3491] BDL	[<0.3064] BDL	[<0.3227] BDL
	lb/hr	[<9.73E-05] BDL	[<1.06E-04] BDL	[<9.76E-05] BDL	[<1.00E-04] BDL
Benzo[a]pyrene	µg/dscm	[<0.2913] BDL	[<0.3251] BDL	[<0.2853] BDL	[<0.3006] BDL
	lb/hr	[<9.07E-05] BDL	[<9.90E-05] BDL	[<9.09E-05] BDL	[<9.35E-05] BDL
Benzo[e]pyrene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Biphenyl	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Cresol (mixed isomers)	µg/dscm	52.9102	62.9959	57.0607	57.6556
	lb/hr	1.65E-02	1.92E-02	1.82E-02	1.79E-02
Chrysene	µg/dscm	[<0.3319] BDL	[<0.3704] BDL	[<0.3251] BDL	[<0.3424] BDL
	lb/hr	[<1.03E-04] BDL	[<1.13E-04] BDL	[<1.04E-04] BDL	[<1.07E-04] BDL
Dibenz[a,h]anthracene	µg/dscm	[<0.2841] BDL	[<0.3171] BDL	[<0.2783] BDL	[<0.2932] BDL
	lb/hr	[<8.84E-05] BDL	[<9.65E-05] BDL	[<8.86E-05] BDL	[<9.12E-05] BDL
Dibenzofuran	µg/dscm	[<0.2412] BDL	[<0.2691] BDL	[<0.2362] BDL	[<0.2488] BDL
	lb/hr	[<7.51E-05] BDL	[<8.19E-05] BDL	[<7.52E-05] BDL	[<7.74E-05] BDL
3,3'-Dimethoxybenzidine	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Dimethylaminobenzene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
7,12-Dimethylbenz(a)anthracene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
3,3'-Dimethylbenzidine	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
α,α-Dimethylphenylethylamine	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

2,4-Dimethylphenol	µg/dscm	[<0.0692] BDL	7.1017 DLL	1.1085 DLL	2.7598 DLL
	lb/hr	[<2.15E-05] BDL	2.16E-03 DLL	3.53E-04 DLL	8.45E-04 DLL
Fluoranthene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Fluorene	µg/dscm	[<0.1242] BDL	[<0.1386] BDL	[<0.1216] BDL	[<0.1281] BDL
	lb/hr	[<3.86E-05] BDL	[<4.22E-05] BDL	[<3.87E-05] BDL	[<3.99E-05] BDL
Indeno(1,2,3-cd)pyrene	µg/dscm	[<0.3008] BDL	[<0.3358] BDL	[<0.2947] BDL	[<0.3104] BDL
	lb/hr	[<9.36E-05] BDL	[<1.02E-04] BDL	[<9.39E-05] BDL	[<9.66E-05] BDL
Isophorone	µg/dscm	[<0.0692] BDL	[<0.0773] BDL	[<0.0678] BDL	[<0.0714] BDL
	lb/hr	[<2.15E-05] BDL	[<2.35E-05] BDL	[<2.16E-05] BDL	[<2.22E-05] BDL
3-Methylcholanthrene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
2-Methylnaphthalene	µg/dscm	[<0.1576] BDL	[<0.1759] BDL	[<0.1543] BDL	[<0.1626] BDL
	lb/hr	[<4.90E-05] BDL	[<5.35E-05] BDL	[<4.92E-05] BDL	[<5.06E-05] BDL
Naphthalene	µg/dscm	[<0.4155] BDL	[<0.4637] BDL	[<0.4069] BDL	[<0.4287] BDL
	lb/hr	[<1.29E-04] BDL	[<1.41E-04] BDL	[<1.30E-04] BDL	[<1.33E-04] BDL
Perylene	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Phenanthrene	µg/dscm	[<0.3772] BDL	[<0.4210] BDL	[<0.3695] BDL	[<0.3893] BDL
	lb/hr	[<1.17E-04] BDL	[<1.28E-04] BDL	[<1.18E-04] BDL	[<1.21E-04] BDL
Phenol	µg/dscm	40.5422	40.5316	45.1551 DLL	42.0763 DLL
	lb/hr	1.26E-02	1.23E-02	1.44E-02 DLL	1.31E-02 DLL
1,4-Phenylenediamine	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL
Pyrene	µg/dscm	[<0.1146] BDL	[<0.1279] BDL	[<0.1123] BDL	[<0.1183] BDL
	lb/hr	[<3.57E-05] BDL	[<3.89E-05] BDL	[<3.58E-05] BDL	[<3.68E-05] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

o-Toluidine	µg/dscm	[<0.0955] BDL	[<0.1066] BDL	[<0.0935] BDL	[<0.0985] BDL
	lb/hr	[<2.97E-05] BDL	[<3.24E-05] BDL	[<2.98E-05] BDL	[<3.07E-05] BDL

\* Dibenzo(a,e)pyrene cannot be determined per DAT (Data Analysis Technologies, Inc)

<sup>1</sup> Laboratory Results provided by Data Analysis Technologies, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DLL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

### 1.3.5 U.S. EPA Method 23

Shaw conducted three two hundred forty minute tests during normal operating conditions. Dioxins, Furans, and PCB congeners were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 5.

Table 5 Comprehensive Summary of Results U.S. EPA Method 23

Test No.	1	2	3	Average
Date	05/23/11	05/23/11	05/24/11	n/a
Start Time	10:25	16:28	8:35	n/a
End Time	14:31	20:35	12:39	n/a
Test Duration, min	240	240	240	240

#### Unit Operating Parameters

Oxygen Content	vol%	0.63	0.79	0.50	0.64
Carbon Dioxide Content	vol%	18.17	18.06	18.05	18.09
Moisture Content	vol%	19.90	19.97	19.82	19.90
Wet Molecular Weight	lb/lb-mol	28.36	28.34	28.35	28.35
Velocity	ft/sec	39.11	38.33	40.03	39.16
Volumetric Flow Rate	dscfm	83,073	81,248	85,023	83,115

#### Sampling Parameters

Isokinetic Sampling Rate	%	97.86	99.14	97.63	98.21
--------------------------	---	-------	-------	-------	-------

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Sample Volume	dscf	147.905	132.522	151.010	143.812
	dscm	4.188	3.753	4.276	4.072

**Laboratory Results <sup>1</sup>**

3,3',4,4-TetraCB (PCB 77)	pg	49.76	222.61	[<5.51] BDL	92.63 DLL
3,4,4',5-TetraCB (PCB 81)	pg	56.59	155.17	[<6.09] BDL	72.62 DLL
2,3,3',4,4'-PentaCB (PCB 105)	pg	982.08	2,289.93	142.04	1,138.02
2,3,4,4',5-PentaCB (PCB 114)	pg	80.55	228.54	[<5.18] BDL	104.76 DLL
2,3',4,4',5-PentaCB (PCB 118)	pg	2,867.35	8,136.04	393.95	3,799.11
2',3,4,4',5-PentaCB (PCB 123)	pg	2,784.94	7,657.04	362.73	3,601.57
3,3',4,4',5-PentaCB (PCB 126)	pg	[<4.50] BDL	[<4.54] BDL	[<4.40] BDL	[<4.48] BDL
2,3,3',4,4',5-HexaCB (PCB 156)	pg	179.17	198.56	40.05	139.26
2,3,3',4,4',5'-HexaCB (PCB 157)	pg	[<3.71] BDL	[<6.29] BDL	[<3.72] BDL	[<4.57] BDL
2,3',4,4',5,5'-HexaCB (PCB 167)	pg	328.47	628.92	72.33	343.24
3,3',4,4',5,5'-HexaCB (PCB 169)	pg	[<4.05] BDL	[<6.86] BDL	[<4.24] BDL	[<5.05] BDL
2,3,3',4,4',5,5'-HeptaCB (PCB 189)	pg	[<3.37] BDL	[<6.23] BDL	[<3.46] BDL	[<4.35] BDL
2,3,7,8-TCDF	pg	[<2.96] BDL	13.94 ADL	[<3.76] BDL	6.89 DLL
1,2,3,7,8-PeCDF	pg	[<5.14] BDL	[<9.61] BDL	[<7.75] BDL	[<7.50] BDL
2,3,4,7,8-PeCDF	pg	[<5.26] BDL	[<9.84] BDL	[<7.93] BDL	[<7.68] BDL
1,2,3,4,7,8-HxCDF	pg	[<7.77] BDL	[<11.37] BDL	[<7.79] BDL	[<8.98] BDL
1,2,3,6,7,8-HxCDF	pg	[<7.20] BDL	[<10.53] BDL	[<7.21] BDL	[<8.31] BDL
2,3,4,6,7,8-HxCDF	pg	[<7.82] BDL	[<11.44] BDL	[<7.83] BDL	[<9.03] BDL
1,2,3,7,8,9-HxCDF	pg	[<9.26] BDL	[<13.54] BDL	[<9.27] BDL	[<10.69] BDL
1,2,3,4,6,7,8-HpCDF	pg	[<6.89] BDL	[<10.04] BDL	[<7.38] BDL	[<8.10] BDL
1,2,3,4,7,8,9-HpCDF	pg	[<9.09] BDL	[<13.24] BDL	22.35 ADL	14.89 DLL
OCDF	pg	30.00	[<18.19] BDL	39.58 ADL	29.26 DLL
2,3,7,8-TCDD	pg	[<3.74] BDL	[<6.35] BDL	[<4.73] BDL	[<4.94] BDL
1,2,3,7,8-PeCDD	pg	[<5.85] BDL	[<10.23] BDL	[<8.26] BDL	[<8.11] BDL
1,2,3,4,7,8--HxCDD	pg	[<10.09] BDL	[<13.94] BDL	[<12.61] BDL	[<12.21] BDL

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

1,2,3,6,7,8-HxCDD	pg	[<9.53] BDL	[<13.16] BDL	[<11.91] BDL	[<11.53] BDL
1,2,3,7,8,9-HxCDD	pg	[<9.83] BDL	[<13.58] BDL	[<12.29] BDL	[<11.90] BDL
1,2,3,4,6,7,8-HpCDD	pg	[<8.10] BDL	[<10.85] BDL	[<8.80] BDL	[<9.25] BDL
OCDD	pg	373.71	118.12	80.70	190.84

**Pollutants**

3,3',4,4'-TetraCB (PCB 77)	pg/dscm	11.8809	59.3211	[<1.29] BDL	24.16 DLL
	lb/hr	3.70E-09	1.81E-08	[<4.10E-10] BDL	7.39E-09 DLL
3,4,4',5-TetraCB (PCB 81)	pg/dscm	13.5117	41.3497	[<1.42] BDL	18.76 DLL
	lb/hr	4.21E-09	1.26E-08	[<4.54E-10] BDL	5.75E-09 DLL
2,3,3',4,4'-PentaCB (PCB 105)	pg/dscm	234.4859	610.2208	33.2168	292.6412
	lb/hr	7.30E-08	1.86E-07	1.06E-08	8.98E-08
2,3,4,4',5-PentaCB (PCB 114)	pg/dscm	19.2325	60.9014	[<1.21] BDL	27.12 DLL
	lb/hr	5.99E-09	1.85E-08	[<3.86E-10] BDL	8.30E-09 DLL
2,3',4,4',5-PentaCB (PCB 118)	pg/dscm	684.6216	2168.0927	92.1273	981.6139
	lb/hr	2.13E-07	6.60E-07	2.93E-08	3.01E-07
2',3,4,4',5-PentaCB (PCB 123)	pg/dscm	664.9450	2040.4488	84.8263	930.0734
	lb/hr	2.07E-07	6.21E-07	2.70E-08	2.85E-07
3,3',4,4',5-PentaCB (PCB 126)	pg/dscm	[<1.07] BDL	[<1.21] BDL	[<1.03] BDL	[<1.10] BDL
	lb/hr	[<3.34E-10] BDL	[<3.68E-10] BDL	[<3.28E-10] BDL	[<3.43E-10] BDL
2,3,3',4,4',5-HexaCB (PCB 156)	pg/dscm	42.7795	52.9123	9.3659	35.0192
	lb/hr	1.33E-08	1.61E-08	2.98E-09	1.08E-08
2,3,3',4,4',5'- HexaCB (PCB 157)	pg/dscm	[<0.89] BDL	[<1.68] BDL	[<0.87] BDL	[<1.14] BDL
	lb/hr	[<2.76E-10] BDL	[<5.10E-10] BDL	[<2.77E-10] BDL	[<3.54E-10] BDL
2,3',4,4',5,5'- HexaCB (PCB 167)	pg/dscm	78.4270	167.5947	16.9147	87.6455
	lb/hr	2.44E-08	5.10E-08	5.39E-09	2.69E-08
3,3',4,4',5,5'- HexaCB (PCB 169)	pg/dscm	[<0.97] BDL	[<1.83] BDL	[<0.99] BDL	[<1.26] BDL
	lb/hr	[<3.01E-10] BDL	[<5.56E-10] BDL	[<3.16E-10] BDL	[<3.91E-10] BDL
2,3,3',4,4',5,5'- HeptaCB (PCB 189)	pg/dscm	[<0.80] BDL	[<1.66] BDL	[<0.81] BDL	[<1.09] BDL
	lb/hr	[<2.50E-10] BDL	[<5.05E-10] BDL	[<2.58E-10] BDL	[<3.38E-10] BDL



## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

2,3,7,8-TCDF	pg/dscm	[<0.71] BDL	3.71 ADL	[<0.88] BDL	1.77 DLL
	lb/hr	[<2.20E-10] BDL	1.13E-09 ADL	[<2.80E-10] BDL	5.44E-10 DLL
1,2,3,7,8-PeCDF	pg/dscm	[<1.23] BDL	[<2.56] BDL	[<1.81] BDL	[<1.87] BDL
	lb/hr	[<3.82E-10] BDL	[<7.79E-10] BDL	[<5.77E-10] BDL	[<5.80E-10] BDL
2,3,4,7,8-PeCDF	pg/dscm	[<1.26] BDL	[<2.62] BDL	[<1.85] BDL	[<1.91] BDL
	lb/hr	[<3.91E-10] BDL	[<7.98E-10] BDL	[<5.91E-10] BDL	[<5.93E-10] BDL
1,2,3,4,7,8-HxCDF	pg/dscm	[<1.86] BDL	[<3.03] BDL	[<1.82] BDL	[<2.24] BDL
	lb/hr	[<5.77E-10] BDL	[<9.22E-10] BDL	[<5.80E-10] BDL	[<6.93E-10] BDL
1,2,3,6,7,8-HxCDF	pg/dscm	[<1.72] BDL	[<2.81] BDL	[<1.69] BDL	[<2.07] BDL
	lb/hr	[<5.35E-10] BDL	[<8.54E-10] BDL	[<5.37E-10] BDL	[<6.42E-10] BDL
2,3,4,6,7,8-HxCDF	pg/dscm	[<1.87] BDL	[<3.05] BDL	[<1.83] BDL	[<2.25] BDL
	lb/hr	[<5.81E-10] BDL	[<9.28E-10] BDL	[<5.83E-10] BDL	[<6.97E-10] BDL
1,2,3,7,8,9-HxCDF	pg/dscm	[<2.21] BDL	[<3.61] BDL	[<2.17] BDL	[<2.66] BDL
	lb/hr	[<6.88E-10] BDL	[<1.10E-09] BDL	[<6.91E-10] BDL	[<8.26E-10] BDL
1,2,3,4,6,7,8-HpCDF	pg/dscm	[<1.65] BDL	[<2.68] BDL	[<1.73] BDL	[<2.02] BDL
	lb/hr	[<5.12E-10] BDL	[<8.14E-10] BDL	[<5.50E-10] BDL	[<6.25E-10] BDL
1,2,3,4,7,8,9-HpCDF	pg/dscm	[<2.17] BDL	[<3.53] BDL	5.23 ADL	3.64 DLL
	lb/hr	[<6.75E-10] BDL	[<1.07E-09] BDL	1.66E-09 ADL	1.14E-09 DLL
OCDF	pg/dscm	7.1629	[<4.85] BDL	9.26 ADL	7.09 DLL
	lb/hr	2.23E-09	[<1.48E-09] BDL	2.95E-09 ADL	2.22E-09 DLL
2,3,7,8-TCDD	pg/dscm	[<0.89] BDL	[<1.69] BDL	[<1.11] BDL	[<1.23] BDL
	lb/hr	[<2.78E-10] BDL	[<5.15E-10] BDL	[<3.52E-10] BDL	[<3.82E-10] BDL
1,2,3,7,8-PeCDD	pg/dscm	[<1.40] BDL	[<2.73] BDL	[<1.93] BDL	[<2.02] BDL
	lb/hr	[<4.35E-10] BDL	[<8.30E-10] BDL	[<6.15E-10] BDL	[<6.27E-10] BDL
1,2,3,4,7,8--HxCDD	pg/dscm	[<2.41] BDL	[<3.71] BDL	[<2.95] BDL	[<3.02] BDL
	lb/hr	[<7.50E-10] BDL	[<1.13E-09] BDL	[<9.39E-10] BDL	[<9.40E-10] BDL
1,2,3,6,7,8-HxCDD	pg/dscm	[<2.28] BDL	[<3.51] BDL	[<2.79] BDL	[<2.86] BDL
	lb/hr	[<7.08E-10] BDL	[<1.07E-09] BDL	[<8.87E-10] BDL	[<8.88E-10] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

1,2,3,7,8,9-HxCDD	pg/dscm	[<2.35] BDL	[<3.62] BDL	[<2.87] BDL	[<2.95] BDL
	lb/hr	[<7.30E-10] BDL	[<1.10E-09] BDL	[<9.15E-10] BDL	[<9.16E-10] BDL
1,2,3,4,6,7,8-HpCDD	pg/dscm	[<1.93] BDL	[<2.89] BDL	[<2.06] BDL	[<2.29] BDL
	lb/hr	[<6.02E-10] BDL	[<8.80E-10] BDL	[<6.56E-10] BDL	[<7.12E-10] BDL
OCDD	pg/dscm	89.2287	31.4766	18.8721	46.5258
	lb/hr	2.78E-08	9.58E-09	6.01E-09	1.45E-08

<sup>1</sup>Laboratory Results provided by Data Analysis Technologies, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DLL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

**ADL (above detection level)** - all analytical values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

### 1.3.6 SW-846 Method 0061

Shaw conducted three one hundred seventy six minute tests during normal operating conditions. Hexavalent Chromium was measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 6.

Table 6 Comprehensive Summary of Results SW-846 Method 0061

Test No.	1	2	3	Average
Date	05/25/11	05/25/11	05/26/11	n/a
Start Time	11:10	16:06	8:48	n/a
End Time	14:19	19:15	11:58	n/a
Test Duration, min	176	176	176	176

#### Unit Operating Parameters

Oxygen Content	vol%	0.58	0.67	0.67	0.64
Carbon Dioxide Content	vol%	17.92	18.07	17.98	17.99
Moisture Content	vol%	19.76	19.94	19.62	19.77
Wet Molecular Weight	lb/lb·mol	28.34	28.34	28.37	28.35
Velocity	ft/sec	39.52	37.99	37.10	38.20

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Volumetric Flow Rate	dscfm	83,937	80,341	79,041	81,106
----------------------	-------	--------	--------	--------	--------

**Sampling Parameters**

Isokinetic Sampling Rate	%	94.01	99.57	91.95	95.18
Sample Volume	dscf	120.067	121.717	112.939	118.241
	dscm	3.400	3.447	3.198	3.348

**Laboratory Results <sup>1</sup>**

Hexavalent Chromium	µg	[<2.12] BDL	[<2.51] BDL	[<2.11] BDL	[<2.25] BDL
---------------------	----	-------------	-------------	-------------	-------------

**Pollutants**

Hexavalent Chromium	µg/dscm	[<0.6235] BDL	[<0.7282] BDL	[<0.6598] BDL	[<0.6705] BDL
	lb/hr	[<1.96E-04] BDL	[<2.19E-04] BDL	[<1.95E-04] BDL	[<2.04E-04] BDL

<sup>1</sup> Laboratory Results provided by Data Analysis Technologies, Inc.

BDL (below detection level) - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**1.3.7 ASTM D6784-02 (Hg)**

Shaw conducted three one hundred seventy six minute tests during normal operating conditions. Organic Mercury and Elemental Mercury were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 7.

**Table 7 Comprehensive Summary of Results ASTM D6784-02 (Hg)**

Test No.	1	2	3	Average
Date	05/25/11	05/25/11	05/26/11	n/a
Start Time	11:10	16:06	8:45	n/a
End Time	14:19	19:15	11:58	n/a
Test Duration, min	176	176	176	176

**Unit Operating Parameters**

Oxygen Content	vol%	0.58	0.67	0.67	0.64
----------------	------	------	------	------	------

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Carbon Dioxide Content	vol%	17.92	18.07	17.98	17.99
Moisture Content	vol%	22.28	21.83	21.78	21.96
Wet Molecular Weight	lb/lb·mol	28.02	28.10	28.09	28.07
Velocity	ft/sec	38.06	36.23	38.95	37.75
Volumetric Flow Rate	dscfm	77,722	74,420	80,248	77,463

**Sampling Parameters**

Isokinetic Sampling Rate	%	94.95	94.90	94.28	94.71
Sample Volume	dscf	111.488	106.704	114.307	110.833
	dscm	3.157	3.022	3.237	3.138

**Laboratory Results <sup>1</sup>**

Organic Mercury	µg	[<0.015] BDL	[<0.012] BDL	0.023	0.017 DLL
Elemental Mercury	µg	0.411	0.413 DLL	0.427	0.417 DLL

**Pollutants**

Organic Mercury	µg/dscm	[<4.75E-03] BDL	[<3.97E-03] BDL	7.11E-03	5.28E-03 DLL
	lb/hr	[<1.38E-06] BDL	[<1.11E-06] BDL	2.14E-06	1.54E-06 DLL
Elemental Mercury	µg/dscm	0.130	0.137 DLL	0.132	0.133 DLL
	lb/hr	3.79E-05	3.81E-05 DLL	3.96E-05	3.86E-05 DLL

<sup>1</sup> Laboratory Results provided by Data Analysis Technologies, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DLL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

**1.3.8 U.S. EPA Method 5B/202 and ASTM D5907**

Shaw conducted one hundred twenty minute test and two one hundred twenty eight minute tests during normal operating conditions. Particulate Matter (PM), Particulate Matter (PM) with condensables, Particulate Matter (PM) Non-sulfate, and Particulate Catch Weight were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 8.

**Table 8 Comprehensive Summary of Results U.S. EPA Method 5B/202 and ASTM D5907**

Test No.	1	2	3	Average
Date	05/26/11	05/27/11	05/27/11	n/a
Start Time	16:15	10:42	14:58	n/a
End Time	18:49	13:06	17:16	n/a
Test Duration, min	120	128	128	125.33

#### Unit Operating Parameters

Oxygen Content	vol%	0.50	0.66	0.62	0.59
Carbon Dioxide Content	vol%	18.45	18.19	18.01	18.22
Moisture Content	vol%	19.79	19.69	20.07	19.85
Wet Molecular Weight	lb/lb-mol	28.41	28.39	28.32	28.37
Velocity	ft/sec	39.29	38.94	38.35	38.86
Volumetric Flow Rate	dscfm	83,318	82,935	81,025	82,426

#### Sampling Parameters

Isokinetic Sampling Rate	%	91.53	91.53	90.16	91.07
Sample Volume	dscf	79.111	83.999	80.840	81.317
	dscm	2.240	2.379	2.289	2.303

#### Laboratory Results <sup>1</sup>

Particulate Matter (PM)	mg	28.1	34.5	32.3	31.6
Condensable Particulate Matter (CPM)	mg	23.1	16.0	19.0	19.4
Particulate Matter (PM) Non-sulfate	mg	18.9	26.4	24.8	23.4
Particulate Catch Weight	mg	10,551.4	10,391.4	10,860.4	10,601.1
Sample Final Volume	L	0.500	0.470	0.490	0.487

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Pollutants**

Particulate Matter (PM)	gr/dscf	0.0055	0.0063	0.0062	0.0060
	lb/hr	3.91	4.50	4.28	4.23
Condensable Particulate Matter (CPM)	gr/dscf	0.0045	0.0029	0.0036	0.0037
	lb/hr	3.22	2.09	2.52	2.61
Particulate Matter (PM) Non-sulfate	gr/dscf	0.0037	0.0049	0.0047	0.0044
	lb/hr	2.63	3.45	3.29	3.12
Particulate Catch Weight <sup>2</sup>	mg/L	21,103	22,109	22,164	21,792

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

<sup>2</sup> Particulate Catch Weight is per method ASTM D5907 and is represented as mg solids per liter of scrubber recirculation liquid

**1.3.9 U.S. EPA Conditional Test Method 027 (CTM-027)**

Shaw conducted one hundred twenty minute test and two one hundred twenty eight minute tests during normal operating conditions. Ammonia (NH<sub>3</sub>) was measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 9.

**Table 9 Comprehensive Summary of Results U.S. EPA Conditional Test Method 027 (CTM-027)**

Test No.	1	2	3	Average
Date	05/26/11	05/27/11	05/27/11	n/a
Start Time	16:18	10:42	14:58	n/a
End Time	18:50	13:06	17:16	n/a
Test Duration, min	120	128	128	125.33

**Unit Operating Parameters**

Oxygen Content	vol%	0.50	0.66	0.62	0.59
Carbon Dioxide Content	vol%	18.45	18.19	18.01	18.22
Moisture Content	vol%	20.57	22.18	21.99	21.58
Wet Molecular Weight	lb/lb·mol	28.30	28.07	28.07	28.15
Velocity	ft/sec	33.53	37.81	37.65	36.33

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Volumetric Flow Rate	dscfm	70,220	77,463	77,222	74,968
----------------------	-------	--------	--------	--------	--------

**Sampling Parameters**

Isokinetic Sampling Rate	%	96.75	98.60	97.34	97.56
Sample Volume	dscf	68.991	82.734	81.428	77.718

**Laboratory Results <sup>1</sup>**

Ammonia (NH <sub>3</sub> )	µg	4,088	5,577	5,390	5,018
----------------------------	----	-------	-------	-------	-------

**Pollutants**

Ammonia (NH <sub>3</sub> )	ppmvd	2.95	3.36	3.30	3.2043
	lb/hr	0.550	0.691	0.676	0.639

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

**1.3.10 U.S. EPA Method 29**

Shaw conducted three one hundred seventy six minute tests during normal operating conditions. Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Manganese (Mn), Nickel (Ni), and Selenium (Se) were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 10.

**Table 10 Comprehensive Summary of Results U.S. EPA Method 29**

Test No.	1	2	3	Average
Date	05/26/11	05/27/11	05/27/11	n/a
Start Time	16:15	10:42	14:58	n/a
End Time	19:30	13:48	18:00	n/a
Test Duration, min	176	176	176	176

**Unit Operating Parameters**

Oxygen Content	vol%	0.50	0.66	0.62	0.59
Carbon Dioxide Content	vol%	18.45	18.19	18.01	18.22

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Moisture Content	vol%	19.68	20.32	20.13	20.04
Wet Molecular Weight	lb/lb-mol	28.42	28.31	28.31	28.35
Velocity	ft/sec	37.13	38.14	38.12	37.80
Volumetric Flow Rate	dscfm	78,852	80,422	80,464	79,913

**Sampling Parameters**

Isokinetic Sampling Rate	%	94.01	94.78	90.64	93.14
Sample Volume	dscf	111.991	115.159	110.192	112.447
	dscm	3.171	3.261	3.120	3.184

**Laboratory Results <sup>1</sup>**

Antimony (Sb)	µg	[<3.650] BDL	[<3.640] BDL	[<3.640] BDL	[<3.643] BDL
Arsenic (As)	µg	[<5.790] BDL	[<5.780] BDL	[<5.780] BDL	[<5.783] BDL
Beryllium (Be)	µg	0.058 DLL	0.048 DLL	[<0.035] BDL	0.042 DLL
Cadmium (Cd)	µg	[<0.181] BDL	0.798 DLL	0.730	0.570 DLL
Chromium (Cr)	µg	13.040 DLL	9.910 DLL	12.360	11.770 DLL
Cobalt (Co)	µg	[<1.800] BDL	[<1.790] BDL	[<1.790] BDL	[<1.793] BDL
Lead (Pb)	µg	8.520 DLL	5.130 DLL	6.360 DLL	6.670 DLL
Manganese (Mn)	µg	10.420	6.560	7.600	8.193
Nickel (Ni)	µg	25.710	18.260	25.560	23.177
Selenium (Se)	µg	10.740 DLL	10.240	9.440	10.140 DLL

**Pollutants**

Antimony (Sb)	mg/dscm	[<1.15E-03] BDL	[<1.12E-03] BDL	[<1.17E-03] BDL	[<1.14E-03] BDL
	lb/hr	[<3.40E-04] BDL	[<3.36E-04] BDL	[<3.52E-04] BDL	[<3.43E-04] BDL
Arsenic (As)	mg/dscm	[<1.83E-03] BDL	[<1.77E-03] BDL	[<1.85E-03] BDL	[<1.82E-03] BDL
	lb/hr	[<5.39E-04] BDL	[<5.34E-04] BDL	[<5.58E-04] BDL	[<5.44E-04] BDL
Beryllium (Be)	mg/dscm	5.18E-07 DLL	4.17E-07 DLL	[<3.18E-07] BDL	3.71E-07 DLL
	lb/hr	5.40E-06 DLL	4.43E-06 DLL	[<3.38E-06] BDL	3.91E-06 DLL
Cadmium (Cd)	mg/dscm	[<5.71E-05] BDL	2.45E-04 DLL	2.34E-04	1.79E-04 DLL



## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

	lb/hr	[<1.69E-05] BDL	7.37E-05 DLL	7.05E-05	5.37E-05 DLL
Chromium (Cr)	mg/dscm	4.11E-03 DLL	3.04E-03 DLL	3.96E-03	3.70E-03 DLL
	lb/hr	1.21E-03 DLL	9.16E-04 DLL	1.19E-03	1.11E-03 DLL
Cobalt (Co)	mg/dscm	[<5.68E-04] BDL	[<5.49E-04] BDL	[<5.74E-04] BDL	[<5.63E-04] BDL
	lb/hr	[<1.68E-04] BDL	[<1.65E-04] BDL	[<1.73E-04] BDL	[<1.69E-04] BDL
Lead (Pb)	mg/dscm	2.69E-03 DLL	1.57E-03 DLL	2.04E-03 DLL	2.10E-03 DLL
	lb/hr	7.94E-04 DLL	4.74E-04 DLL	6.14E-04 DLL	6.27E-04 DLL
Manganese (Mn)	mg/dscm	3.29E-03	2.01E-03	2.44E-03	2.58E-03
	lb/hr	9.71E-04	6.06E-04	7.34E-04	7.70E-04
Nickel (Ni)	mg/dscm	8.11E-03	5.60E-03	8.19E-03	7.30E-03
	lb/hr	2.39E-03	1.69E-03	2.47E-03	2.18E-03
Selenium (Se)	mg/dscm	3.39E-03 DLL	3.14E-03	3.03E-03	3.18E-03 DLL
	lb/hr	1.00E-03 DLL	9.46E-04	9.12E-04	9.53E-04 DLL

<sup>1</sup> Laboratory Results provided by Data Analysis Technologies, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DLL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

### 1.3.11 U.S. EPA Method 18 (Methane and Ethane)

Shaw conducted three one hundred twenty eight minute tests during normal operating conditions. Methane and Ethane were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 11.

Table 11 Comprehensive Summary of Results U.S. EPA Method 18 (Methane and Ethane)

Test No.	1	2	3	Average
Date	05/18/11	05/18/11	05/19/11	n/a
Start Time	12:50	19:18	9:46	n/a
End Time	18:15	21:35	12:10	n/a
Test Duration, min	128	128	128	128

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Unit Operating Parameters**

Oxygen Content	vol%	0.75	0.76	0.63	0.71
Carbon Dioxide Content	vol%	17.80	17.50	18.08	17.79
Moisture Content	vol%	20.25	20.35	19.93	20.18
Wet Molecular Weight	lb/lb·mol	28.27	28.22	28.34	28.28
Velocity	ft/sec	40.92	41.29	39.25	40.49
Volumetric Flow Rate	dscfm	86,182	86,677	83,106	85,322

**Sampling Parameters**

Sample Volume	dscf	87.860	88.000	82.440	86.100
	dscm	2.488	2.492	2.334	2.438

**Pollutants**

Methane	ppmvd	0.27	4.10	6.63	3.67
	lb/hr	0.06	0.89	1.38	0.77
Ethane	ppmvd	0.93	3.33	5.20	3.16
	lb/hr	0.38	1.35	2.02	1.25

Reference Method 26A Sampling and Unit Operating Parameters were used for calculations

**1.3.12 U.S. EPA Method 18 and Method 308**

Shaw conducted three sixty minute tests during normal operating conditions. Speciated Volatile Organic HAP's were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 12.

**Table 12 Comprehensive Summary of Results U.S. EPA Method 18 and Method 308**

Test No.	1	2	3	Average
Date	05/20/11	05/20/11	05/20/11	n/a
Start Time	11:40	13:50	15:40	n/a
End Time	12:40	14:50	16:40	n/a
Test Duration, min	60	60	60	60

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Unit Operating Parameters**

Oxygen Content	vol%	0.64	0.69	0.50	0.61
Carbon Dioxide Content	vol%	17.41	17.32	17.42	17.38
Moisture Content	vol%	20.23	20.11	20.15	20.16
Wet Molecular Weight	lb/lb-mol	28.22	28.23	28.23	28.23
Velocity	ft/sec	40.48	40.34	39.50	40.11
Volumetric Flow Rate	dscfm	85,402	85,252	83,347	84,667

**Sampling Parameters**

Sample Volume (RM 18)	L	60.272	59.426	59.192	59.630
	dscf	2.128	2.099	2.090	2.106
	dscm	0.060	0.059	0.059	0.060
Sample Volume (RM 308)	L	57.645	57.327	57.681	57.551
	dscf	2.036	2.024	2.037	2.032
	dscm	0.058	0.057	0.058	0.058

**Pollutants**

Acetone	µg/dscm	1771.167 DLL	1769.302 DLL	[<1070.055] BDL	1536.841 DLL
	lb/hr	0.567 DLL	0.565 DLL	[<0.334] BDL	0.489 DLL
Acetonitrile	µg/dscm	[<2705.328] BDL	[<2705.328] BDL	[<2705.328] BDL	[<2705.328] BDL
	lb/hr	[<0.612] BDL	[<0.611] BDL	[<0.597] BDL	[<0.606] BDL
Acrolein	µg/dscm	[<816.793] BDL	[<818.448] BDL	[<818.915] BDL	[<818.052] BDL
	lb/hr	[<0.261] BDL	[<0.261] BDL	[<0.256] BDL	[<0.259] BDL
Acrylonitrile	µg/dscm	[<881.647] BDL	[<881.647] BDL	[<881.647] BDL	[<881.647] BDL
	lb/hr	[<0.258] BDL	[<0.257] BDL	[<0.251] BDL	[<0.255] BDL
Benzene	µg/dscm	[<729.060] BDL	[<730.808] BDL	[<731.300] BDL	[<730.389] BDL
	lb/hr	[<0.233] BDL	[<0.233] BDL	[<0.228] BDL	[<0.232] BDL
1,3-Butadiene	µg/dscm	[<836.293] BDL	[<838.501] BDL	[<839.123] BDL	[<837.973] BDL
	lb/hr	[<0.268] BDL	[<0.268] BDL	[<0.262] BDL	[<0.266] BDL
Carbon disulfide	µg/dscm	422.265 DLL	409.038 DLL	375.578 DLL	402.294 DLL
	lb/hr	0.135 DLL	0.131 DLL	0.117 DLL	0.128 DLL
Chlorobenzene	µg/dscm	[<22.730] BDL	[<23.054] BDL	[<23.145] BDL	[<22.976] BDL

## CITGO Petroleum Corporation

## Petroleum Refinery Information Collection Request (ICR)

	lb/hr	[<0.007] BDL	[<0.007] BDL	[<0.007] BDL	[<0.007] BDL
Cumene (isopropylbenzene)	µg/dscm	[<17.089] BDL	[<17.332] BDL	[<17.401] BDL	[<17.274] BDL
	lb/hr	[<0.005] BDL	[<0.006] BDL	[<0.005] BDL	[<0.005] BDL
1,2-Dibromoethane	µg/dscm	[<996.864] BDL	[<1001.186] BDL	[<1002.404] BDL	[<1000.151] BDL
	lb/hr	[<0.319] BDL	[<0.320] BDL	[<0.313] BDL	[<0.317] BDL
Ethylbenzene	µg/dscm	[<17.255] BDL	[<17.501] BDL	[<17.570] BDL	[<17.442] BDL
	lb/hr	[<0.006] BDL	[<0.006] BDL	[<0.005] BDL	[<0.006] BDL
Hexane	µg/dscm	[<676.958] BDL	[<678.274] BDL	[<678.645] BDL	[<677.959] BDL
	lb/hr	[<0.217] BDL	[<0.217] BDL	[<0.212] BDL	[<0.215] BDL
Methanol	µg/dscm	[<59.676] BDL	5407.574	33.807	1833.685 DLL
	lb/hr	[<0.019] BDL	1.727	0.011	0.586 DLL
Methyl isobutyl ketone	µg/dscm	[<16.757] BDL	[<16.996] BDL	[<17.063] BDL	[<16.939] BDL
	lb/hr	[<0.005] BDL	[<0.005] BDL	[<0.005] BDL	[<0.005] BDL
Methyl t-butyl ether	µg/dscm	[<16.293] BDL	[<16.525] BDL	[<16.590] BDL	[<16.469] BDL
	lb/hr	[<0.005] BDL	[<0.005] BDL	[<0.005] BDL	[<0.005] BDL
Methylene chloride	µg/dscm	[<2555.401] BDL	3362.408 DLL	[<2558.792] BDL	2825.534 DLL
	lb/hr	[<0.818] BDL	1.074 DLL	[<0.799] BDL	0.897 DLL
Nitrobenzene	µg/dscm	23.228	23.390	21.625	22.748
	lb/hr	0.007	0.007	0.007	0.007
2-Nitropropane	µg/dscm	[<23.560] BDL	[<23.895] BDL	28.213	25.223 DLL
	lb/hr	[<0.008] BDL	[<0.008] BDL	0.009	0.008 DLL
Pentane	µg/dscm	[<672.645] BDL	[<673.899] BDL	[<674.252] BDL	[<673.598] BDL
	lb/hr	[<0.215] BDL	[<0.215] BDL	[<0.211] BDL	[<0.214] BDL
Styrene	µg/dscm	[<19.246] BDL	[<19.520] BDL	[<19.597] BDL	[<19.454] BDL
	lb/hr	[<0.006] BDL	[<0.006] BDL	[<0.006] BDL	[<0.006] BDL
Tetrachloroethene	µg/dscm	[<884.311] BDL	[<887.547] BDL	[<888.458] BDL	[<886.772] BDL
	lb/hr	[<0.283] BDL	[<0.283] BDL	[<0.277] BDL	[<0.281] BDL
Toluene	µg/dscm	735.341 DLL	[<702.723] BDL	[<703.209] BDL	713.758 DLL
	lb/hr	0.235 DLL	[<0.224] BDL	[<0.220] BDL	0.226 DLL
Trichloroethene	µg/dscm	[<1094.627] BDL	[<1097.556] BDL	[<1098.381] BDL	[<1096.855] BDL

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

	lb/hr	[<0.350] BDL	[<0.351] BDL	[<0.343] BDL	[<0.348] BDL
2,2,4 Trimethylpentane (Isooctane)	µg/dscm	[<13.771] BDL	[<13.967] BDL	[<14.022] BDL	[<13.920] BDL
	lb/hr	[<0.004] BDL	[<0.004] BDL	[<0.004] BDL	[<0.004] BDL
Xylenes (mixed isomers)	µg/dscm	[<35.008] BDL	[<35.506] BDL	[<35.647] BDL	[<35.387] BDL
	lb/hr	[<0.011] BDL	[<0.011] BDL	[<0.011] BDL	[<0.011] BDL

<sup>1</sup> Laboratory Results provided by Enthalpy Analytical, Inc.

**BDL (below detection level)** - all analytical values used to calculate and report an in-stack emissions value are less than the laboratory's reported detection level(s)

**DL (detection level limited)** - at least one but not all values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

### 1.3.13 U.S. EPA Methods 10, 7E, 6C, and 25A

Shaw conducted three one hundred twenty eight minute tests during normal operating conditions. Carbon Monoxide (CO), Nitrogen Oxides (NO<sub>x</sub>), Sulfur Dioxide (SO<sub>2</sub>), and Total Hydrocarbons (THC) were measured and the three tests were averaged.

Documentation supporting the results of this test program is presented in the appendices. A comprehensive summary of the test results and process operating conditions is presented on Table 13.

**Table 13 Comprehensive Summary of Results U.S. EPA Methods 10, 7E, 6C, and 25A**

Test No.	1	2	3	Average
Date	05/18/11	05/18/11	05/19/11	n/a
Start Time	12:50	19:18	9:46	n/a
End Time	18:15	21:35	12:10	n/a
Test Duration, min	128	128	128	128

### Unit Operating Parameters

Oxygen Content	vol%	0.75	0.76	0.63	0.71
Carbon Dioxide Content	vol%	17.80	17.50	18.08	17.79
Moisture Content	vol%	20.25	20.35	19.93	20.18
Wet Molecular Weight	lb/lb-mol	28.27	28.22	28.34	28.28
Velocity	ft/sec	40.92	41.29	39.25	40.49
Volumetric Flow Rate	dscfm	86,182	86,677	83,106	85,322

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**
**Sampling Parameters**

Sample Volume	dscf	87.860	88.000	82.440	86.100
	dscm	2.488	2.492	2.334	2.438

**Pollutants**

Carbon Monoxide (CO)	ppmvd	52.60	46.90	71.30	56.93
	lb/hr	19.78	17.74	25.86	21.13
Nitrogen Oxides (NO <sub>x</sub> )	ppmvd	15.30	18.23	15.84	16.46
	lb/hr	9.45	11.33	9.44	10.07
Sulfur Dioxide (SO <sub>2</sub> )	ppmvd	-0.11	0.02	0.05	-0.01
	lb/hr	-0.09	0.02	0.04	-0.01
Total Hydrocarbons (THC)	ppmvd	4.02	5.60	6.77	5.46
	lb/hr	2.38	3.34	3.87	3.19

Reference Method 26A Sampling and Unit Operating Parameters were used for calculations

## 1.4 Test Program Chronology

The B-Cat WGS ICR test program was conducted on May 17 through 27, 2011. A comprehensive chronology of events outlining the test period is presented below on Table 14.

**Table 14 Chronology of Events**

Date	Time	Activity
05/16/11	08:30	Arrived at plant.
05/16/11	09:30	Standby on power.
05/16/11	10:20	Received Power / Standby on Crane
05/16/11	14:00	Crane Arrived / Begin Setup
05/16/11	19:30	Departed plant.
05/17/11	07:30	Arrived at plant.
05/17/11	08:45	Begin Calibration.
05/17/11	13:15	Begin RM 4 Testing.
05/17/11	20:50	Finish RM 4 Testing.
05/17/11	21:00	Departed plant.
05/18/11	07:15	Arrive at plant.
05/18/11	07:45	Setup / Begin Calibrations.
05/18/11	12:50	Begin RM 26A and OTM 29 Run 1 testing.

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Date	Time	Activity
05/18/11	12:54	Pause testing (Power Issues).
05/18/11	13:45	Continue Testing.
05/18/11	15:00	Pause testing (Broken probe liner).
05/18/11	17:11	Continue Testing.
05/18/11	18:15	Finish RM 26A and OTM 29 Run 1 Testing.
05/18/11	19:18	Begin RM 26A and OTM 29 Run 2 Testing.
05/18/11	21:35	Finish RM 26A and OTM 29 Run 2 Testing.
05/18/11	22:15	Departed plant.
05/19/11	07:00	Arrived at plant
05/19/11	09:46	Begin RM 26A and OTM 29 Run 3 Testing.
05/19/11	12:10	Finish RM 26A and OTM 29 Run 3 Testing.
05/19/11	12:15	Setup for Methods MTD 0011, 18, and 308.
05/19/11	17:00	Departed plant.
05/20/11	07:00	Arrive at plant.
05/20/11	07:15	Setup.
05/20/11	11:40	Begin MTD 0011, RM 18, and EPA Method 308 Run 1 testing.
05/20/11	12:54	Finish MTD 0011, RM 18, and EPA Method 308 Run 1 testing.
05/20/11	13:50	Begin MTD 0011, RM 18, and EPA Method 308 Run 2 testing.
05/20/11	14:57	Finish MTD 0011, RM 18, and EPA Method 308 Run 2 testing.
05/20/11	15:40	Begin MTD 0011, RM 18, and EPA Method 308 Run 3 testing.
05/20/11	16:48	Finish MTD 0011, RM 18, and EPA Method 308 Run 3 testing.
05/20/11	18:30	Departed plant.
05/23/11	07:30	Arrive at plant.
05/23/11	08:00	Setup.
05/23/11	10:25	Begin Method 23/0010 Run 1 testing.
05/23/11	14:31	Finish Method 23/0010 Run 1 testing.
05/23/11	16:28	Begin Method 23/0010 Run 2 testing.
05/23/11	20:35	Finish Method 23/0010 Run 2 testing.
05/23/11	21:00	Departed plant.
05/24/11	07:00	Arrive at plant.
05/24/11	08:35	Begin Method 23/0010 Run 3 testing.
05/24/11	12:39	Finish Method 23/0010 Run 3 testing.

**CITGO Petroleum Corporation**
**Petroleum Refinery Information Collection Request (ICR)**

Date	Time	Activity
05/24/11	13:15	Departed plant.
05/25/11	07:15	Arrive at plant.
05/25/11	07:30	Setup.
05/25/11	11:10	Begin Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 1 testing.
05/25/11	14:19	Finish Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 1 testing.
05/25/11	16:06	Begin Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 2 testing.
05/25/11	19:15	Finish Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 2 testing.
05/25/11	20:30	Departed plant.
05/26/11	07:00	Arrive at plant.
05/26/11	08:45	Begin Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 3 testing.
05/26/11	11:58	Finish Methods SW-846 0061 and ASTM D6784-02 (Hg) Run 3 testing.
05/26/11	16:15	Begin Methods 5B/202, CTM-027, and RM 29 Run 1 testing.
05/26/11	19:30	Finish Methods 5B/202, CTM-027, and RM 29 Run 1 testing.
05/26/11	20:30	Departed plant.
05/27/11	07:00	Arrive at plant.
05/27/11	07:15	Setup
05/27/11	10:42	Begin Methods 5B/202, CTM-027, and RM 29 Run 2 testing.
05/27/11	13:48	Finish Methods 5B/202, CTM-027, and RM 29 Run 2 testing.
05/27/11	14:58	Begin Methods 5B/202, CTM-027, and RM 29 Run 3 testing.
05/27/11	18:00	Finish Methods 5B/202, CTM-027, and RM 29 Run 3 testing / Demobilization
05/27/11	19:30	Departed plant.



## 2.0 ICR COMPONENT 4 "EMISSION TESTING" MANUAL TEST METHODS

---

The WGS stack exhausts to atmosphere approximately 200 feet above grade. The sampling plane is located 87 feet upstream of the exhaust and 52 feet downstream of the gas inlet. The internal diameter of the stack is 96 inches. Four four-inch sample ports are positioned at 90 degrees at the sampling plane with 8-inch port extensions. The effluent had high velocity and moisture content. The test methods and procedures to be used during this test program are presented in Sections 2.1 through 2.16.

### 2.1 Sample Traverse Points

Shaw used 40 CFR 60, Appendix A, Reference Method 1 (RM 1) *Determination of Sample and Velocity Traverses for Stationary Sources* to determine traverse points for representative sampling of the effluent. The number of sample points is dependent upon upstream and downstream flow disturbance distances from the port location and the internal diameter of the stack. This method was conducted during all tests.

### 2.2 Velocity and Volumetric Flow Rate

Shaw used 40 CFR 60, Appendix A, Reference Method 2 (RM 2) *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube)* to determine the stack gas velocity and volumetric flow rate. A Type-S pitot tube, with an assigned coefficient of 0.84, and an inclined manometer will be used to measure the differential pressure ( $\Delta P$ ) of the stack gas. The "A"-side of the pitot tube measures the stack gas impact pressure and the "B"-side of the pitot tube measures the static pressure. Unit of measure is in inches of water ( $\text{H}_2\text{O}$ ). Differential pressure, molecular weight, physical properties of the stack gas, and the stack ID are used to calculate the stack gas velocity and volumetric flow rate. This method was conducted during all tests.

### 2.3 Moisture Content

Shaw used 40 CFR 60, Appendix A, Reference Method 4 (RM 4) *Determination of Moisture in Stack Gases* to determine the moisture content of the stack gas. A gas sample is extracted at either a constant rate or isokinetically from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically. This method was conducted during all tests.

## 2.4 Speciated Volatile Organic Hazardous Air Pollutant (VOHAP)

Shaw used 40 CFR 60, Appendix A, Reference Method 18 (RM 18) *Measurement of Gaseous Organic Compound Emissions by Gas Chromatography* and EPA Method 308 *Procedure for Determination of Methanol Emission from Stationary Sources* to determine the speciated volatile organic hazardous air pollutant (VOHAP) concentrations of the stack gas. Shaw conducted three one-hour test runs. The target speciated VOHAPs (Part VIII, Table 1.3 from the ICR guidance document) are presented on Table 15.

Table 15 Speciated VOHAPs

Compound	CAS Number	Compound	CAS Number
Acetone	67-64-1	Methyl isobutyl ketone	108-10-1
Acetonitrile	75-05-8	Methyl t-butyl ether	91-20-3
Acrolein	107-05-8	Methylene chloride	75-09-2
Acrylonitrile	107-13-1	Nitrobenzene	98-95-3
Benzene	71-43-2	2-Nitropropane	79-46-9
1,3-Butadiene	106-99-0	Pentane	109-66-0
Carbon disulfide	75-15-0	Styrene	100-42-5
Chlorobenzene	108-90-7	Tetrachloroethene	127-18-4
Cumene (isopropylbenzene)	98-82-8	Toluene	108-88-3
1,2-Dibromoethane	106-93-4	Trichloroethene	79-01-6
Ethylbenzene	100-41-4	Triethylamine	121-44-8
Hexane	110-54-3	2,2,4-Trimethylpentane	504-84-1
Methanol	67-56-1	Xylenes (mixed isomers)	1330-20-7

Due to the physical and chemical properties of compounds included in this table, Shaw concurrently sampled with three separate sampling trains. The sampling trains and a brief description of the sampling procedure are presented in Sections 2.4.2 through 2.4.4.

### 2.4.2 Train 1

For Train 1, Shaw used 40 CFR 60, Appendix A, Reference Method 18 (RM 18) “Bag Sampling Procedure” with a modification to include a dry, chilled knockout midget impinger before the bag sample for condensate collection. Shaw recovered the samples and sent them to a contract laboratory for analysis with a gas chromatograph equipped with a flame ionization detector (GC/FID). This test method and analysis was used to determine the concentrations of acetone, acetonitrile, acrolein, acrylonitrile, benzene, 1,3-butadiene, carbon disulfide, 1,2-dibromoethane, hexane, methylene chloride, pentane, tetrachloroethene, toluene, and trichloroethene in the effluent.

Important note: Per the method, an in-lab spike and recovery analysis was performed.

### 2.4.3 Train 2

For Train 2, Shaw used 40 CFR 60, Appendix A, Reference Method 18 (RM 8) “Adsorbent Tube Sampling Procedure” with a modification to include a distilled water-charged knockout midget impinger followed by two adsorbent tubes in series.; an XAD tube followed by a charcoal tube. This test method and analysis was used to determine the concentrations of chlorobenzene, cumene, ethylbenzene, methyl isobutyl ketone, methyl t-butyl ether, nitrobenzene, 2-nitropropane, styrene, 2,2,4-trimethyl pentane, and xylene isomers in the effluent. A minimum of 2 cubic feet of sample was collected during each run.

Important note: A co-located spiked train was collected with each sampling run.

### 2.4.4 Train 3

For Train 3, Shaw used EPA Method 308. This train uses two distilled water-charged knockout midget impingers followed by a silica gel tube. This test method and analysis was used to determine the concentrations of methanol in the effluent. A minimum of 2 cubic feet of sample was collected during each run.

## 2.5 Speciated Semi-volatile Organic Hazardous Air Pollutant (Semi-VOHAP)

Shaw used SW-846 Method 0010 *Modified Method 5 Sampling Train* and SW-846 Method 8270D *Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* to sample and analyze speciated semi-volatile organic hazardous air pollutant (Semi-VOHAP) concentrations of the stack gas. Shaw conducted three four-hour test runs collecting a minimum of 3.9 cubic meters per run. The samples were sent to a contract laboratory for Semi-VOHAP analysis by GC/MS. The target speciated VOHAPs (Part VIII, Table 1.4 from the ICR guidance document) are presented on Table 16.

Table 16 Speciated Semi-VOHAPs

Compound	CAS Number	Compound	CAS Number
Acenaphthene	83-32-9	Dimethylaminobenzene	60-11-7
Acenaphthylene	208-96-8	7,12-Dimethylbenz(a)anthracene	57-97-6
Aniline	62-53-3	3,3-Dimethylbenzidine	119-93-7
Anthracene	120-12-7	$\alpha,\alpha$ -Dimethylphenylethylamine	122-09-8
Benzidine	92-87-5	2,4-Dimethylphenol	105-67-9
Benzo[a]anthracene	56-55-3	Fluoranthene	206-44-0
Benzo[b]fluoranthrene	205-99-2	Fluorene	86-73-7
Benzo[k]fluoranthrene	207-08-9	Indeno(1,2,3-cd)pyrene	193-39-5

Compound	CAS Number	Compound	CAS Number
Benzo[g,h,i]perylene	191-24-2	Isophorone	78-59-1
Benzo[a]pyrene	50-32-8	3-Methylcholanthrene	56-49-5
Benzo[e]pyrene	192-97-2	2-Methylnaphthalene	91-57-6
Biphenyl	92-52-4	Naphthalene	91-20-3
Cresol (mixed isomers)	1319-77-3	Perylene	198-55-0
Chrysene	218-01-9	Phenanthrene	85-01-8
Dibenz[a,h]anthracene	53-70-3	Phenol	108-95-2
Dibenzofuran	132-64-9	1,4-Phenylenediamine	106-50-3
Dibenzo[a,e]pyrene	192-65-4	Pyrene	129-00-0
3,3-Dimethoxybenzidine	119-90-4	o-Toluidine	95-53-4

## 2.6 Aldehydes

Shaw used SW-846 Method 0011 *Sampling for Selected Aldehyde and Ketone Emissions from Stationary Sources* and SW-846 Method 8315A *Determination of Carbonyl Compounds by High Performance Liquid Chromatography (HPLC)* to determine the concentrations of formaldehyde (CAS no. 100-41-4), acetaldehyde (CAS no. 106-99-0), and propanal (CAS no. 123-38-6). The gas sample is passed through 2,4-dinitrophenylhydrazine (2,4-DNPH) and the aldehydes react with the DNPH to form a derivative which is extracted in the lab and analyzed by high performance liquid chromatography (HPLC). Shaw conducted three sixty four minute sampling runs and collected a minimum of 1.3 cubic meters (45.9 cubic feet) per run. The samples were recovered and sent to a contract laboratory for analysis.

## 2.7 Methane and Ethane

Shaw used 40 CFR 60, Appendix A, Reference Method 18 (RM 18) *Measurement of Gaseous Organic Compound Emissions By Gas Chromatography* to determine the methane and ethane concentrations of the effluent. Integrated gas samples were collected in Tedlar® bags. Immediately after sampling, the samples were analyzed for methane and ethane analysis with a gas chromatograph equipped with a flame ionization detector (GC/FID). The methane and ethane are reported in parts per million by volume (ppmv). Shaw conducted three one hundred twenty eight minute runs.

## 2.8 Dioxins and Furans (D/F) and Polychlorinated Biphenyls (PCB)

Shaw used 40 CFR 60, Appendix A, Reference Method 23 (RM 23) *Determination of Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans from Municipal Waste Combustors* to determine the polychlorinated dibenzo-p-dioxins (PCDD's) and polychlorinated dibenzofurans (PCDF's) concentrations in the vent gas. A sample is withdrawn isokinetically from the gas stream and collected in the sample probe, on a glass fiber filter, and on a packed

column of adsorbent material. The sample will be sent to a contract laboratory for analysis. At the lab, the PCDD's and PCDF's are extracted from the sample, separated by high resolution gas chromatography (HRGC), and measured by high resolution mass spectrometry (HRMS). Shaw conducted three four-hour runs collecting a minimum of 3 cubic meters (105.9 cubic feet) of sample.

## 2.9 *Hydrogen Chloride (HCl), Chlorine (Cl<sub>2</sub>), and Hydrogen Fluoride (HF)*

Shaw used 40 CFR 60, Appendix A, Reference Method 26A (RM 26A) *Determination of Hydrogen Halides and Halogen Emissions From Stationary Sources - Isokinetic Method* to determine HCl, Cl<sub>2</sub>, and HF vent gas concentrations. Gaseous and particulate pollutants are withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. Acidic and alkaline absorbing solutions collect the gaseous hydrogen halides and halogens, respectively. The hydrogen halides are solubilized in the acidic solution and form chloride (Cl<sup>-</sup>) and fluoride (F<sup>-</sup>) ions. The halogens have a very low solubility in the acidic solution and pass through to the alkaline solution where they are hydrolyzed to form a proton (H<sup>+</sup>), the halide ion, and the hypohalous acid (HClO). Sodium thiosulfate is added to the alkaline solution to assure reaction with the hypohalous acid to form a second halide ion such that 2 halide ions are formed for each molecule of halogen gas. The sample was shipped to a contract laboratory where the halide ions in the separate solutions were measured by ion chromatography (IC). Shaw conducted three one hundred twenty eight minute runs collecting a minimum of 2 cubic meters (70.6 cubic feet) of sample.

## 2.10 *Hydrogen Cyanide (HCN)*

Shaw used EPA Other Test Method 29 *Sampling and Analysis for Hydrogen Cyanide Emissions From Stationary Sources* to determine the HCN concentration of the vent gas. Gaseous and particulate pollutants are withdrawn from the emission source at an isokinetic sampling rate and are collected in impingers containing sodium hydroxide (NaOH) solution. Hydrogen cyanide present in the stack gas stream reacts with the NaOH to form a cyanide ion, which is retained in the alkaline solution. The sample was sent to a contract laboratory for analysis by liquid chromatography using an ion chromatograph equipped with an electrochemical detector. Shaw conducted three one hundred twenty eight minute runs collecting a minimum of 0.78 cubic meters of sample.

## 2.11 *Mercury (Hg)*

Shaw used ASTM D6784-02 *Standard Test Method for Elemental, Oxidized, Particle-Bound, and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro*

*Method*) to determine the Hg concentration of the vent gas. A sample is withdrawn from the flue gas stream isokinetically through a probe/filter system, maintained at 120°C or the flue gas temperature, whichever is greater, followed by a series of impingers in an ice bath. Particle-bound mercury is collected in the front half of the sampling train. Oxidized mercury is collected in impingers containing a chilled aqueous potassium chloride solution. Elemental mercury is collected in subsequent impingers (one impinger containing a chilled aqueous acidic solution of hydrogen peroxide and three impingers containing chilled aqueous acidic solutions of potassium permanganate). Samples were recovered, sent to a contract laboratory, digested, and then analyzed for mercury using cold-vapor atomic absorption (CVAAS) or fluorescence spectroscopy (CVAFS). Shaw conducted three one hundred seventy six minute runs collecting a minimum of 2.5 cubic meters (88.3 cubic feet) of sample.

## 2.12 Hexavalent Chromium ( $\text{Cr}^{+6}$ )

Shaw used SW-846 Method 0061 *Determination of Hexavalent Chromium Emissions from Stationary Sources* to determine the  $\text{Cr}^{+6}$  concentration of the stack gas. The  $\text{Cr}^{+6}$  emissions were collected isokinetically from the source. To eliminate the possibility of  $\text{Cr}^{+6}$  reduction between the nozzle and impinger, the emission samples were collected with a recirculatory train where the impinger reagent is continuously recirculated to the nozzle. Samples were recovered, sent to a contract laboratory, samples were analyzed for  $\text{Cr}^{+6}$  by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The IC/PCR separates the  $\text{Cr}^{+6}$  as chromate ( $\text{CrO}_4^{2-}$ ) from other diphenylcarbazide reactions that occur in the post-column reactor. ). Shaw conducted three one hundred seventy six minute runs collecting a minimum of 3 cubic meters (105.9 cubic feet) of sample.

## 2.13 Other Metals

Shaw used 40 CFR 60, Appendix A, Reference Method 29 (RM 29) *Determination of Metals Emissions From Stationary Sources* to determine antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se) concentrations of the vent gas. A stack sample was withdrawn isokinetically from the source, particulate emissions were collected in the probe and on a heated filter, and gaseous emissions were collected in an aqueous acidic solution of hydrogen peroxide and an aqueous acidic solution of potassium permanganate. The recovered samples were sent to a contract laboratory, digested, and appropriate fractions were analyzed for Sb, As, Be, Cd, Cr, Co, Pb, Mn, Ni, and Se by inductively coupled plasma-mass spectroscopy (ICP-MS) or graphite furnace atomic absorption spectroscopy (GFAAS). Shaw conducted three one hundred seventy six minute runs collecting a minimum of 3 cubic meters (105.9 cubic feet) of sample.



## 2.14 *PM/PM<sub>2.5</sub> (filterable and condensible)*

Shaw used 40 CFR 60, Appendix A, Reference Method 5 (RM 5) *Determination of Particulate Matter Emissions From Stationary Sources* and EPA Method 202 *Dry Impinger Method for Determining Condensible Particulate Emissions From Stationary Sources*, to determine filterable and condensable PM/PM<sub>2.5</sub> emissions. For reference Method 5 filterable PM, particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature of 320 ± 25°F (for entrained droplets). The PM mass, which includes any material that condenses at or above the filtration temperature, is determined gravimetrically after the removal of uncombined water.

For Method 202, the condensable particulate matter (CPM) is collected in dry impingers after filterable PM has been collected on a Reference Method 5 filter. CPM is collected in the water dropout impinger, the modified Greenburg Smith impinger, and the CPM filter of the sampling train. The impinger contents are purged with nitrogen immediately after sample collection to remove dissolved sulfur dioxide (SO<sub>2</sub>) gases from the impinger. The CPM filter is extracted with water and hexane. The impinger solution is then extracted with hexane. The organic and aqueous fractions are dried and the residues are weighed. The total of the aqueous and organic fractions represents the CPM. Shaw conducted one two-hour run and two one hundred twenty eight minute runs collecting a minimum of 2 cubic meters (70.6 cubic feet) of sample.

## 2.15 *Total Dissolved Solids (TDS) and Total Suspended Solids (TSS)*

Shaw used ASTM D5907 *10 Standard Test Methods for Filterable Matter (Total Dissolved Solids) and Nonfilterable Matter (Total Suspended Solids) in Water* to determine TDS and TSS from the wet scrubber recirculation liquid in conjunction with the RM 5 and method 202 tests. A well-mixed sample is filtered through a weighed standard glass fiber filter. The suspended solids are retained on the filter, which is dried at 105°C and weighed. The increased mass on the filter represents the nonfilterable matter (TSS). The filtrate will then be used to determine the filterable matter (TDS). The filtered sample (liquid phase) is evaporated to dryness and heated to 180°C in a tared vessel to constant weight.

## 2.16 *Ammonia (NH<sub>3</sub>)*

Shaw used Conditional Test Method 027 (CTM-027) *Procedure of Collection and Analysis of Ammonia in Stationary Sources* to determine the NH<sub>3</sub> content of the stack gas. Reference Method 5 sampling equipment was used to collect stack gas samples isokinetically. Each of the first two impingers contained 100 milliliters (ml) of 0.1N sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) solution to trap NH<sub>3</sub> in the sample gas. At the conclusion of each test, the impinger contents were transferred to

Nalgene<sup>®</sup> bottles and the glassware is rinsed with DI water. The rinses were added to the first impinger sample. The sample bottles sealed with Teflon<sup>®</sup> tape and stored on ice. At the end of the test period, the samples were sent to a contract laboratory for analysis by ion chromatography (IC). Shaw conducted one two hour run and two one hundred twenty eight minute runs collecting a minimum of 60 cubic feet of sample.



### 3.0 INSTRUMENTAL ANALYZER REFERENCE METHODS, PROCEDURES, AND SPECIFICATIONS

---

Shaw employed the use of instrumental analyzers to measure the concentrations of O<sub>2</sub>, CO<sub>2</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, and THC concentrations of the flue gas. A description of the target analytes and the applicable reference method is described below.

#### 3.1 *Excess Oxygen (O<sub>2</sub>) and Carbon Dioxide (CO<sub>2</sub>)*

Shaw used 40 CFR 60, Appendix A, Reference Method 3A (RM 3A) *Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)* to determine the O<sub>2</sub> and CO<sub>2</sub> content of the stack gas. The O<sub>2</sub> concentrations were measured with a paramagnetic O<sub>2</sub> analyzer (Servomex Model 01440C15TD/O<sub>2</sub>) and reported in percentage of O<sub>2</sub> by volume (vol% O<sub>2</sub>). The CO<sub>2</sub> concentrations were measured with a non-dispersive infrared (NDIR) CO analyzer (Servomex Model 01440C1CO<sub>2</sub>/CO<sub>2</sub>) and reported in percentage of CO<sub>2</sub> by volume (vol% CO<sub>2</sub>).

#### 3.2 *Total Hydrocarbons (THC)*

Shaw used 40 CFR 60, Appendix A, Reference Method 25A (RM 25A) *Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer* to determine THC concentrations of the stack gas. The gas sample was extracted from the source through a heated sample line and glass fiber filter to a flame ionization analyzer (FIA). Results were reported as volume concentration equivalents as propane. Shaw conducted three two-hour runs.

#### 3.3 *Carbon Monoxide (CO)*

Shaw used 40 CFR 60, Appendix A, Reference Method 10 (RM 10) *Determination of Carbon Monoxide Emissions From Stationary Sources* to determine CO concentrations of the stack gas. The CO concentrations were measured using a non-dispersive infrared (NDIR) CO analyzer and reported in ppmv. Shaw conducted three two-hour runs collecting a minimum of 60 liters of sample.

#### 3.4 *Nitrogen Oxides (NO<sub>x</sub>)*

Shaw used 40 CFR 60, Appendix A, Reference Method 7E (RM 7E) *Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure)* to determine NO<sub>x</sub> concentrations. Nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) make up total NO<sub>x</sub> and the

constituents were measured using a chemiluminescent NO-NO<sub>x</sub> gas analyzer. Shaw conducted a minimum of three two-hour runs.

### 3.5 Sulfur Dioxide (SO<sub>2</sub>)

Shaw used 40 CFR 60, Appendix A, Reference Method 6C (RM 6C) *Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)* to determine SO<sub>2</sub> concentrations. SO<sub>2</sub> was measured using a UV fluorescence SO<sub>2</sub> gas analyzer. Shaw conducted a minimum of three two-hour runs.

### 3.6 Procedures and Specifications

All reference method analyzers were calibrated with EPA-approved Protocol 1 calibration gases prior to the beginning of the test series, and periodically throughout the test. The initial calibration error checks were performed at the beginning of the test run series in accordance with the applicable reference method. After the completion of the initial calibration error check, a system bias check was performed.

Zero and mid-point calibration bias checks were performed prior at the beginning and end of each test run. The midrange calibration gas and nitrogen (for zero) for each reference method CEM was used to perform upscale bias checks for the specific analyzer. The bias check is a comparison of instrument response to gas introduced into the analyzer with gases routed throughout the entire sampling system. The maximum allowable bias was 5% of the span.

After initial calibrations, the analyzers were not adjusted during each run. The maximum allowable calibration drift was 3% of the span. Calibration drift was determined by comparing the before run and after run values. The test data values were corrected for bias and calibration drift. The following calculation, as cited in the reference method, was used to correct the measured concentrations for bias and instrument calibration drifts:

$$C_{gas} = (C_{anz} - C_o) \frac{C_{ma}}{(C_m - C_o)}$$

where:

$C_{gas}$	=	effluent gas concentration, dry basis, ppmv
$C_{anz}$	=	average gas concentration indicated by the gas analyzer, dry basis, ppmv
$C_o$	=	average of initial and final system calibration bias check responses for the zero gas, ppmv
$C_m$	=	average of initial and final system calibration bias check responses for the upscale calibration gas, ppmv
$C_{ma}$	=	actual concentration of the upscale calibration gas, ppmv.

Response time tests were performed in conjunction with the bias checks. Alternating the introduction of span and zero calibration gas during the bias checks three times and recording the time required for the monitor to reach 95% of the final stable value enabled the determination of mean upscale and downscale response times.

Access to the stack was through a shared sample line. A heated and filtered stainless steel probe was used to extract the gas sample from the stack. A heated, 1/4 inch Teflon<sup>®</sup> line transported the sample from the point of extraction to the non-contact gas conditioning chiller system. The moisture was condensed and removed from the gas stream, while the pollutant passed through to the analytical equipment. The analyzer was located in a temperature-controlled area to minimize thermal affects on the calibration of the instrument. The instrument specifications for the reference methods Shaw employed for this program are presented below on Table 17 and a diagram illustrating the sampling configuration is presented as Figure 2.

Table 17 Reference Method Instrument Specifications

Analyte	Manufacturer	Model No.	Serial No.	Span	Measurement Principal
O <sub>2</sub>	Servomex	01440C15TD/ O2	2550	0-25 vol%	Paramagnetic
CO <sub>2</sub>	Servomex	01440C1CO2/ CO2	2542	0-25 vol%	NDIR
THC	Thermo Electron	51i	1016842260	0-100 ppmv	Flame Ionization
CO	California Analytical	601P	T09028-M	0-1000 ppmv	NDIR
NO <sub>x</sub>	California Analytical	600CLD	T09031	0-100 ppmv	Chemiluminescent
SO <sub>2</sub>	Thermo Electron	43C	436409633	0-100 ppmv	UV fluorescence

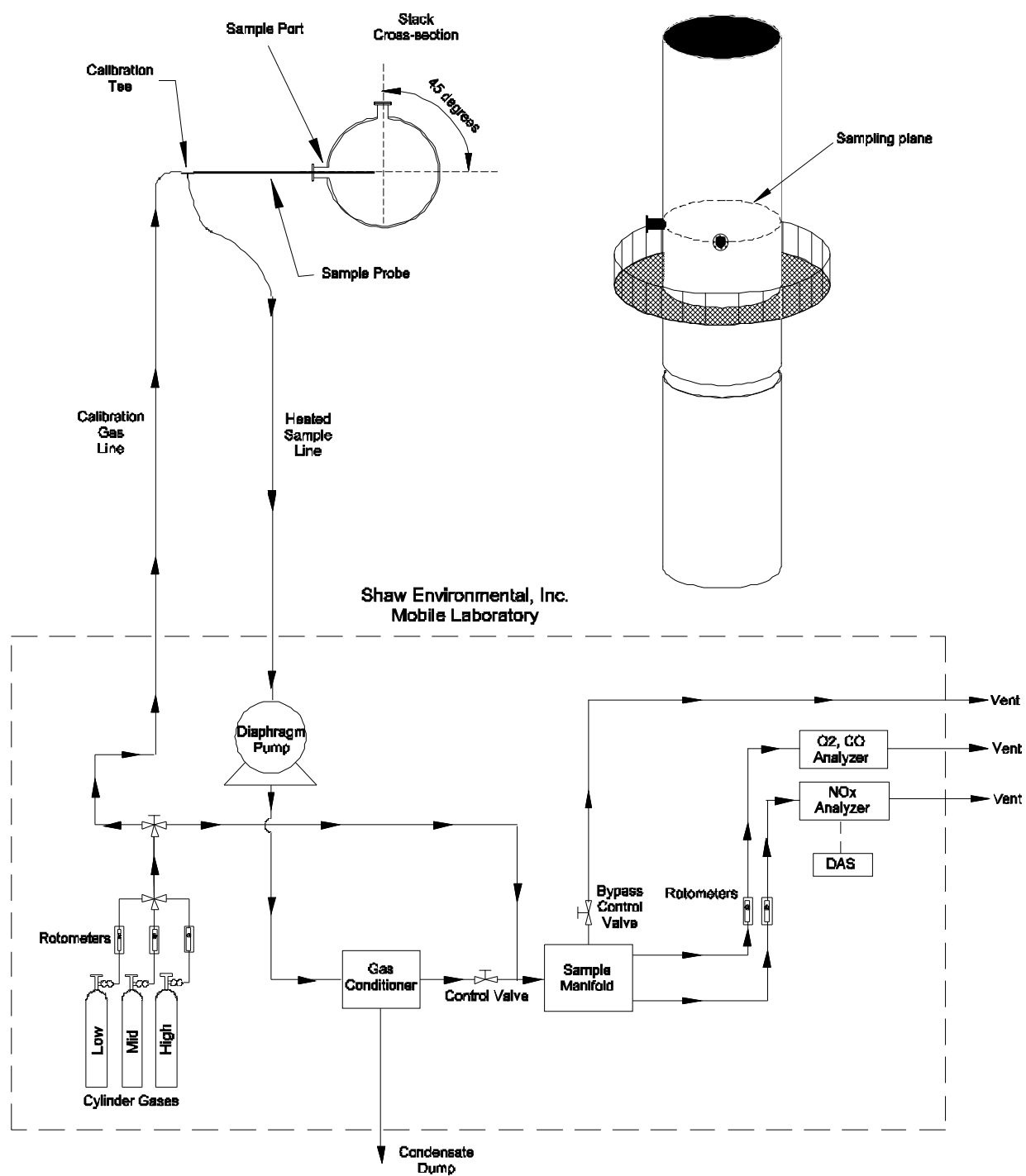


Figure 2 Mobile Test Trailer Sampling Configuration

## ***4.0 APPROVED STANDARD TEST METHOD DEVIATIONS***

---

No test method deviations were employed during this test program.

## *Appendix A*

### *Raw Field Data*

## *Appendix A1*

### *Preliminary Data*

**Probe/Pitot Tube Traverse Layout Calculation Spreadsheet  
40 CFR 60, Appendix A Method 1**

Project Name	CITGO ICR		
Project Site	LCMA		
Emission Source ID	B-CAT	Distance (ft)	Duct Diameters
Stack/duct inside diameter (inches)	96.25	A	87
Stack/duct inside diameter (ft)	8.0	calculated	B
Stack Area (in2)	7276.0		52
Stack Area (ft2)	50.5	calculated	6
Required number of traverse points (stack total)	16		
Req. traverse points on a diameter	8	calculated	
Port Length (inches)	8		

**Location of Traverse Point (Measured from Outside Edge of Sample Port)**

Traverse Point number on a diameter	2	4	6	8	10	12	14	16	18	20	22	24
1				11.08								
2				18.11								
3				26.67								
4				39.09								
5				73.16								
6				85.58								
7				94.14								
8				101.17								
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												





# **Probe/Pitot Tube Traverse Layout Calculation Spreadsheet** **40 CFR 60, Appendix A Method 1**

Project Name: **Shaw E & I**  
 Project Site: **Shaw E & I**  
 Emission Source ID: **Shaw E & I**  
 Stack/duct inside diameter (inches): **16.25**  
 Stack/duct inside diameter (ft): **1.354**  
 Stack Area (in<sup>2</sup>): **207.3**  
 Stack Area (ft<sup>2</sup>): **14.2**  
 Required number of traverse points (stack total): **10**  
 Req. traverse points on a diameter: **5**  
 Port Length (inches): **1.5**

**Location of Traverse Point (Measured from Outside Edge of Sample Port)**

Traverse Point number on a diameter	2	4	6	8	10	12	14	16	18	20	22	24
1				11.68								
2				18.11								
3				24.61								
4				31.09								
5				37.16								
6				43.58								
7				49.14								
8				101.17								
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

### Preliminary Velocity and Cyclonic Flow Check

Client: Citgo  
 Location: Sulphur, LA  
 Unit: R-Cat  
 Source: WGS  
 EPN: -  
 Date: 5/17/11  
 Personnel: J. Pilgrim

Traverse Point	$\Delta P$	$\sqrt{\Delta P}$	Stack Temperature	Yaw Angle	
	(in. H <sub>2</sub> O)	(in. H <sub>2</sub> O)	(°F)	(°)	
Port N	1	0.34	0.583	145	10
	2	0.39	0.624	145	10
	3	0.46	0.678	144	5
	4	0.50	0.707	145	5
	5	0.50	0.707	144	5
	6	0.47	0.686	145	0
	7	0.45	0.671	145	10
	8	0.47	0.686	144	15
Port E	9	0.25	0.500	144	15
	10	0.30	0.548	144	10
	11	0.37	0.608	145	5
	12	0.45	0.671	143	5
	13	0.48	0.693	143	0
	14	0.47	0.686	143	5
	15	0.50	0.707	142	15
	16	0.48	0.693	142	10
17					
18					
19					
20					
21					
22					
23					
24					

Average =

0.653	144	7.81
-------	-----	------

Signature

Date

**Field Data Sheet**

Preliminary

Client: Citgo  
 Location: Sulphur, La  
 Unit: B-Cat  
 Source: Scrubber  
 Project No: 142733  
 Run No: 1 post A  
 Date: 5-17-11  
 Personnel: D. Rink, S. Vincent

Meter Box ID: LA-H02  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996  
 Probe ID: LA-10'MS-01  
 Thermocouple ID: LA-10'MS-01  
 Pitot ID: LA-P105  
 C<sub>p</sub>: 0.840  
 Exit Thermocouple ID: LA-IMP06

Stack Diameter: 96.25 inches  
 Stack Area: \_\_\_\_\_ ft<sup>2</sup>  
 Barometric Pressure (P<sub>bar</sub>): 29.70 in Hg  
 Static Pressure (P<sub>s</sub>): 0.06 in H<sub>2</sub>O  
 Ambient Temperature: 76.8 °F  
 Nozzle ID: N/A  
 Nozzle Size: N/A inches  
 Filter ID: N/A

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures					
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	
—	1316	984.807	—	—	—	—	—	—	—	—	—	—
1	1321	986.730	0.150	0.387	0.500	1.0	145	301	N/A	66	80	
2 1	1323.30	987.640	0.150	0.387	0.500	1.0	145	300	N/A	62	80	
3 2	1328.30	989.525	0.560	0.748	0.500	1.00	144	300		58	80	
4 2	1331	990.435	0.560	0.748	0.500	1.0	144	300		61	81	
5 2												
6 3	1333.30	991.450	0.520	0.721	0.500	1.0	145	299		61	81	
3 4	1336.00	992.325			0.500	1.0	145	302		63	81	
3 4	1338.30	993.170			0.500	1.0	145	300		65	81	
4 5	1341.00	994.155			0.500	1.0	145	297		66	82	
4 5	1343.30	995.080			0.500	1.0	145	295		65	82	
4 5	1346.00	996.110	0.450	0.671	0.500	1.0	144	297		62	82	
5 6	1348.30	997.100	0.500	0.707	0.500	1.0	144	300		61	82	
5 7	1351.00	997.990			0.500	1.0	144	292		62	83	
5 7	1353.30	998.810			0.500	1.0	144	292		60	84	
6 8	1356.00	999.699	0.740		0.500	1.0	144	294		61	84	
6 8	1358.30	1000.000	0.500		0.500	1.0	144	296		62	85	
6	1401.00	1001.610			0.500	1.0	142	282		63	85	
7	1403.30	1002.560	0.380		0.500	1.0	142	278		65	86	
7	1406.00	1003.465			0.500	1.0	143	282		66	86	
7	1408.30	1004.000			0.500	1.0	143	283		64	87	
8	1411.00	1005.300	0.380		0.500	1.0	142	281		61	88	
8	1413.30	1006.310			0.500	1.0	142	277		58	89	
8	1416.00	1007.175			0.500	1.0	142	278		59	90	

\* added ice

added ice

120	22.16						
Total Sampling Time	Total Meter Volume	Average ΔP	Average SQRT ΔP	Average ΔH	Avg Stack Temperature	Avg Meter Temperature	
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(°F)	(°F)	

**Leak Checks**

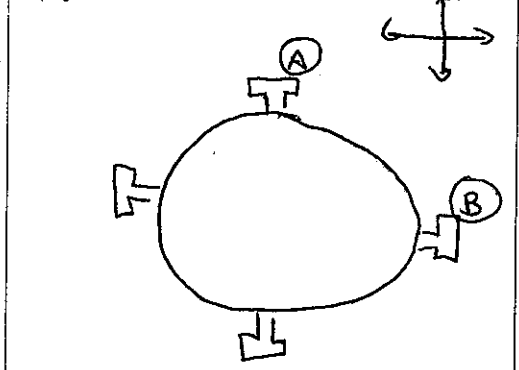
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.000 ft<sup>3</sup> @ 10.0' Hg for 1 minute  
 Train Final: \_\_\_\_\_ ft<sup>3</sup> @ \_\_\_\_\_ Hg for 1 minute

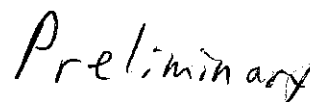
**Observations:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Operator Signature: Jetta Rink

**Sampling Schematic**





Preliminary



# TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT  
 Site Location LCMC  
 Test Location stack  
 Sample Run No.: RM4 1  
 Sample Date: 5/17/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	561.4	687.9	126.5
2	80% IPA	702.9	457.5	54.6
3	80% IPA	722.7	760.1	37.4
4	—	609.8	625.2	15.4
5	SILICA	811.3	843.5	32.2
6				
7				
8				
Total				266.1

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

## Comments:

80% IPA → 15-L2710-01  
 DT-1811-02  
 LA-OHAUSZ

Preliminary

**Field Data Sheet**

Client: CITGO  
Location: Sulphur, LA  
Unit: B CAT  
Source: Scrubber  
Project No: 142733

Meter Box ID: LA-A02  
ΔH std: 1.460 in H<sub>2</sub>O  
DGM (Y): 0.996

Stack Diameter: 96.25 inches  
Stack Area: 72 ft<sup>2</sup>

Probe ID: LA 10' MS-01  
Thermocouple ID: LA-10' MS-01  
Pilot ID: LA-PTDS  
C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.59 in Hg  
Static Pressure (P<sub>s</sub>): 81.9 in H<sub>2</sub>O  
Ambient Temperature: 81.9 °F

Run No: Run 2 port A  
Date: 05/17/2011  
Personnel: S Vincent, W Huggins

Exit Thermocouple ID: LA-IMP00

Nozzle ID: N/A  
Nozzle Size: N/A inches  
Filter ID: N/A

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
	1810	54.217	-	-	-	-	-	-	-	-	-
8	1814	55.672	0.37	0.608	0.50	1.0	143	303	N/A	54	84
8	1818	57.164			0.50	1.0	144	297		54	84
7	1822	58.623	0.55	0.742	0.50	1.0	143	295		55	84
7	1826	60.102			0.50	1.0	143	296		56	84
6	1830	61.579	0.51	0.714	0.50	1.0	143	295		56	84
6	1834	63.042			0.50	1.0	143	295		57	85
5	1836	64.532	0.48	0.693	0.50	1.0	143	295		58	85
5	1840	65.961			0.50	1.0	143	294		59	85
4	1844	67.424	0.44	0.678	0.50	1.0	143	295		59	84
4	1848	68.894			0.50	1.0	144	294		60	84
3	1852	70.374	0.49	0.700	0.50	1.0	144	293		61	84
3	1856	71.842			0.50	1.0	143	293		62	83
2	1900	73.304	0.48	0.693	0.50	1.0	143	293		63	84
2	1904	74.756			0.50	1.0	143	293		65	84
1	1908	76.243	0.41	0.640	0.50	1.0	143	291		66	83
1	1912	77.736			0.50	1.0			N/A		

64  
23.519  
Total Sampling Time (min)  
47.549  
Total Meter Volume (ft<sup>3</sup>)  
0.3769  
Average ΔP (in H<sub>2</sub>O)  
0.6289  
Average SQRT ΔP (in H<sub>2</sub>O)  
0.50  
Average ΔH (in H<sub>2</sub>O)  
0.4806  
0.6920

143.5  
Avg Stack Temperature (°F)

83.7  
Avg Meter Temperature (°F)

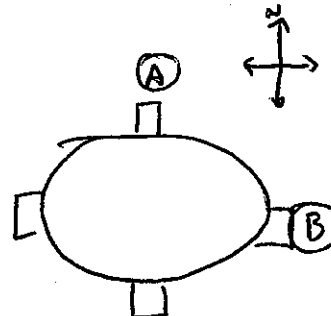
**Leak Checks**

Pilot impact:          @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static:          @ 3" H<sub>2</sub>O for 15 seconds  
Train initial:          ft<sup>3</sup> @          Hg for 1 minute  
Train final: 6.000 ft<sup>3</sup> @ 10" Hg for 1 minute

Observations: Vmstd = 22.56  
O<sub>2</sub> = 27.80  
CO<sub>2</sub> = 21.86  
moisture = 21.86  
vel. 38.72 ft/sec

Operator Signature: [Signature]

**Sampling Schematic**



**Field Data Sheet**

Preliminary

Client: CITGO  
 Location: Sulphur, LA  
 Unit: B Cat  
 Source: Scrubber  
 Project No: 142733

Meter Box ID: LA-002  
 ΔH std: 1.960 in H<sub>2</sub>O  
 OGM (Y): 6.996

Stack Diameter: 96.25 inches  
 Stack Area: \_\_\_\_\_ ft<sup>2</sup>

Probe ID: LA-1015-01  
 Thermocouple ID: LA-1015-01  
 Pitot ID: LA-PT05  
 C<sub>p</sub>: 6.840

Barometric Pressure (P<sub>bar</sub>): 29.63 in Hg  
 Static Pressure (P<sub>s</sub>): \_\_\_\_\_ in H<sub>2</sub>O  
 Ambient Temperature: 81.0 °F

Run No: Run 2 post B  
 Date: 05/17/2011  
 Personnel: S Vincent, W Huggins

Exit Thermocouple ID: LA-IMP-06

Nozzle ID: N/A  
 Nozzle Size: N/A inches  
 Filter ID: N/A

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
1650	-	30.187	-	-	-	-	-	-	-	-	-
8	1654	31.923	0.19	0.436	0.50	1.0	141	298	N/A	50	86
8	1658	33.401	-	-	0.50	1.0	144	300	-	49	86
7	1702	31.887	0.49	0.700	0.50	1.0	145	301	-	49	86
7	1706	36.374	-	-	0.50	1.0	145	294	-	50	87
6	1710	37.854	0.54	0.735	0.50	1.0	145	265	-	53	87
6	1714	39.341	-	-	0.50	1.0	145	260	-	55	87
5	1718	40.848	0.49	0.700	0.50	1.0	144	249	-	56	87
5	1724	42.326	-	-	0.50	1.0	144	249	-	58	86
4	1728	43.821	0.32	0.566	0.50	1.0	143	246	-	58	86
4	1732	45.302	-	-	0.50	1.0	143	248	-	60	85
3	1736	46.823	0.27	0.520	0.50	1.0	143	247	-	61	85
3	1740	48.343	-	-	0.50	1.0	142	243	-	63	85
2	1744	49.863	0.21	0.458	0.50	1.0	142	247	-	64	85
2	1748	51.384	-	-	0.50	1.0	142	247	-	64	85
1	1752	52.904	0.23	0.480	0.50	1.0	140	244	↓	65	84
1	1756	54.424	-	-	0.50	1.0	140	252	N/A	65	84

64	24.00	0.3425	0.571	0.50
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

Avg Stack Temperature (°F)

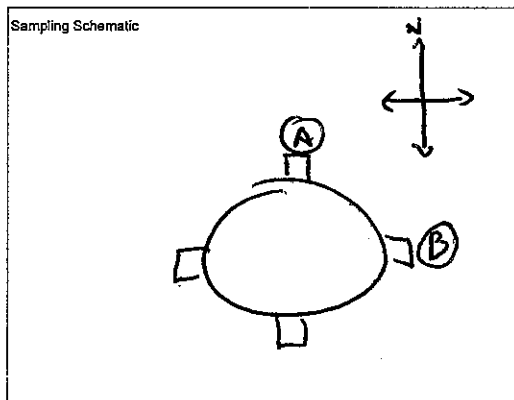
Avg Meter Temperature (°F)

**Leak Checks**

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.000 ft<sup>3</sup> @ 10' Hg for 1 minute  
 Train final: \_\_\_\_\_ ft<sup>3</sup> @ \_\_\_\_\_ Hg for 1 minute

Observations: 269.5 moisture = 36.11%

Operator Signature: [Signature]



Preliminary



# TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT  
 Site Location LCMC  
 Test Location Stack  
 Sample Run No.: RM4 2  
 Sample Date: 5/17/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	558.2	745.3	187.1
2	80% IPA	731.1	756.7	25.6
3	80% IPA	699.7	718.8	19.1
4	—	605.3	609.3	4.0
5	SILICA	851.3	885.0	33.7
6				
7				
8				
Total				269.5

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

80% IPA => 15-L2710-01 LA-OHAUS2  
15-1811-02



## *Appendix A2*

### *U.S. EPA Method 26A*

26 A



## Field Data Sheet

Client: Citgo  
 Location: Sulfur, LA  
 Unit: BCat  
 Source: Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A03  
 $\Delta H$  std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 76.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA-PT-01  
 $C_p$ : 0.840

Barometric Pressure ( $P_{bar}$ ): 29.62 in Hg  
 Static Pressure ( $P_s$ ): 0.4 in H<sub>2</sub>O  
 Ambient Temperature: 78.8 °F

Run No: 1 page 1 of 2Date: 5/18/11Personnel: Dilgisa/Rink/VincentExit Thermocouple ID: IMP-02

Nozzle ID: .275  
 Nozzle Size: 0.275 inches  
 Filter ID: —

pump off 1254  
power issues  
pump on 1345

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	$\Delta P$ (in H <sub>2</sub> O)	SQRT $\Delta P$ (in H <sub>2</sub> O)	$\Delta H$ (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
N 8	1250	330.297	0.55	0.742	2.20	3.0	140	253	255	59	80
8	1254	333.48	0.49	0.700	1.95	3.0	140	252	254	58	78
7	1349	336.52	0.57	0.755	2.30	3.0	140	255	255	46	79
7	1353	340.61	0.57	0.755	2.30	3.0	142	253	256	44	79
6	1357	342.85	0.48	0.693	1.90	3.0	142	251	254	45	80
6	1401	345.56	0.48	0.693	1.90	3.0	142	254	253	48	80
5	1405	348.61	0.51	0.714	2.05	3.0	141	254	252	47	81
5	1409	352.18	0.51	0.714	2.05	3.0	141	251	255	47	81
4	1413	354.77	0.53	0.728	2.10	3.0	140	250	253	47	81
4	1417	357.61	0.53	0.728	2.10	3.0	140	250	254	48	83
3	1421	360.84	0.53	0.728	2.10	3.0	140	252	252	48	83
3	1425	363.95	0.50	0.707	2.00	3.0	140	254	263	50	84
2	1429	366.93	0.50	0.707	2.00	3.0	140	253	262	52	85
2	1433	369.92	0.50	0.707	2.00	3.0	140	253	260	52	84
1	1437	372.81	0.47	0.686	1.90	3.0	140	258	259	53	85
1	1441	375.92	0.45	0.671	1.80	3.0	140	258	259	56	85
END	1445	378.558	—	—	—	—	—	—	—	—	—
E 8	1711	378.558	0.54	0.735	2.15	3.0	140	252	253	68	78
8	1715	381.62	0.50	0.707	2.00	3.0	141	255	255	64	78
7	1719	384.56	0.50	0.707	2.00	3.0	141	251	251	62	79
7	1723	387.50	0.51	0.714	2.05	3.0	141	250	249	62	79
6	1727	390.65	0.55	0.742	2.20	3.0	141	253	252	65	79
6	1731	393.60	0.55	0.742	2.20	4.0	140	251	250	61	79
5	1735	396.83	0.48	0.693	1.90	4.0	140	254	256	58	80
5	1739	399.56	0.48	0.693	1.90	4.0	140	255	256	58	80
4	1743	402.91	0.32	0.566	1.30	3.0	141	255	257	59	80
4	1747	405.24	0.32	0.566	1.30	3.0	141	254	253	59	81
3	1751	407.98	0.30	0.548	1.20	3.0	141	252	252	61	80
3	1755	409.93	0.30	0.548	1.20	3.0	141	255	251	62	80

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average $\Delta P$ (in H <sub>2</sub> O)	Average SQRT $\Delta P$ (in H <sub>2</sub> O)	Average $\Delta H$ (in H <sub>2</sub> O)
—	—	—	—	—

Avg Stack Temperature (°F)
—

Avg Meter Temperature (°F)
—

## Leak Checks

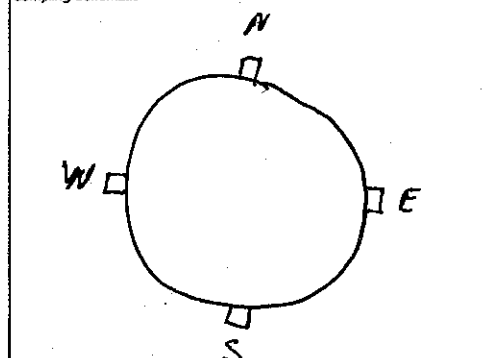
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.000 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train Final: 0.000 ft<sup>3</sup> @ 7.0 Hg for 1 minute

## Observations:

O<sub>2</sub>: 0.753  
 CO<sub>2</sub>: 17.797

K Factor: 3.924Operator Signature: [Signature]

## Sampling Schematic





**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT  
 Site Location: LCMC  
 Test Location: stack  
 Sample Run No.: 26A 7  
 Sample Date: 5/18/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1 H <sub>2</sub> SO <sub>4</sub>	651.0	1022.1	371.1
2	0.1 H <sub>2</sub> SO <sub>4</sub>	729.8	883.8	154.0
3	0.1 H <sub>2</sub> SO <sub>4</sub>	729.2	744.2	15.0
4	0.1 NaOH	715.8	722.5	6.7
5	0.1 NaOH	748.5	751.9	3.4
6	SILICA	860.0	886.0	26.0
7				
8				
Total				576.2

0.2 g Sodium Thiosulfate

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

**Comments:**

DI → DI-1811-01  
 0.1N H<sub>2</sub>SO<sub>4</sub> → SA-E1711-01  
 0.1N NaOH → NaOH-E1711-05  
 Sodium Thiosulfate → SF-E1711-01

LA-0HAUS2

Field Data Sheet

11/26/11

Client: Citgo  
Location: Salpar, LA  
Unit: B Cat  
Source: Scrubber Stack  
Project No: 142733

Meter Box ID: LA-A03  
ΔH std: 2.069 in H<sub>2</sub>O  
DGM (Y): 1.003  
Probe ID: LA-10' MS-04  
Thermocouple ID: LA-10' MS-04  
Pitot ID: 1105269  
C<sub>p</sub>: 0.840

Stack Diameter: 96.25 inches  
Stack Area: 50.53 ft<sup>2</sup>  
Barometric Pressure (P<sub>bar</sub>): 29.57 in Hg  
Static Pressure (P<sub>s</sub>): 0.33 in H<sub>2</sub>O  
Ambient Temperature: 75.2 °F  
Nozzle ID: .275  
Nozzle Size: 0.275 inches  
Filter ID: —

Run No: 2 page 1 of 2  
Date: 5/18/11  
Personnel: Pilgrim/Rink/Vincent Exit Thermocouple ID: IMP-02

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
E 8	1918	422.433	0.31	0.557	1.20	2.0	141	256	255	62	74
8	1922	424.74	0.31	0.557	1.20	2.0	141	256	250	57	74
7	1926	427.08	0.31	0.557	1.20	2.0	141	251	255	56	75
7	1930	429.71	0.30	0.548	1.20	2.0	141	250	252	55	75
6	1934	431.62	0.30	0.548	1.20	2.0	141	251	252	56	76
6	1938	433.94	0.31	0.557	1.20	2.0	141	254	258	57	76
5	1942	436.22	0.31	0.557	1.20	2.0	140	250	253	57	76
5	1946	438.30	0.31	0.557	1.20	2.0	141	252	256	57	76
4	1950	440.73	0.45	0.671	1.75	2.0	140	252	256	57	76
4	1954	443.46	0.44	0.663	1.75	2.0	140	260	253	57	77
3	1958	446.31	0.53	0.728	2.05	3.0	140	252	250	58	77
3	2002	449.34	0.53	0.728	2.05	3.0	141	251	253	59	77
2	2006	452.95	0.55	0.742	2.15	3.0	140	254	256	60	78
2	2010	455.54	0.55	0.742	2.15	3.0	140	251	258	63	79
1	2014	459.09	0.54	0.735	2.15	3.0	140	256	255	64	79
1	2018	461.67	0.54	0.735	2.15	3.0	141	260	253	65	79
END	2022	464.72	—	—	—	—	—	—	—	—	—
S 8	2031	464.72	0.50	0.707	2.00	3.0	141	257	261	67	77
8	2035	467.70	0.50	0.707	2.00	3.0	141	257	261	66	78
7	2039	470.66	0.53	0.728	2.05	3.0	141	260	258	63	78
7	2043	473.67	0.53	0.728	2.05	3.0	141	257	254	62	79
6	2047	476.68	0.57	0.755	2.20	3.0	141	258	254	55	79
6	2051	479.81	0.57	0.755	2.20	3.0	141	259	251	53	79
5	2055	483.24	0.57	0.755	2.20	3.0	141	258	250	50	80
5	2059	486.08	0.57	0.755	2.20	3.0	140	254	251	50	80
4	2103	489.30	0.43	0.656	1.70	3.0	141	253	252	50	80
4	2107	492.10	0.45	0.671	1.75	3.0	140	254	249	51	80
3	2111	494.84	0.48	0.693	1.90	3.0	141	255	250	51	80
3	2115	497.61	0.48	0.693	1.90	3.0	141	255	252	51	80

—	—	—	—	—
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

—
Avg Stack Temperature (°F)

—
Avg Meter Temperature (°F)

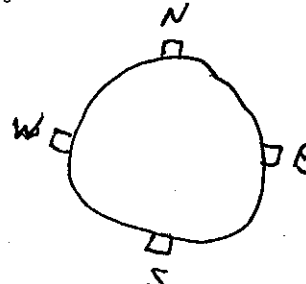
Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.002 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
Train Final: 0.001 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: O<sub>2</sub>: 0.762  
CO<sub>2</sub>: 17.501

Operator Signature: [Signature]

Sampling Schematic



### Field Data Sheet

Client: Citgo  
Location: Sulfur, LA  
Unit: B Cat  
Source: Scrubber Stack  
Project No: 142733

Meter Box ID: LA-A03  
 $\Delta H$  std: 2.069 in H<sub>2</sub>O  
DGM (Y): 7.003

Stack Diameter:  $\frac{96.25}{50.53}$  inches  
Stack Area:  $\frac{96.25}{50.53}$  ft<sup>2</sup>

Probe ID: LA-10<sup>1</sup> MS-04  
Thermocouple ID: LA-10<sup>1</sup> MS-04  
Pitot ID: 1105269  
C<sub>p</sub>: 0.840

Barometric Pressure ( $P_{\text{bar}}$ ): 29.57 in Hg  
Static Pressure ( $P_0$ ): 0.33 in H<sub>2</sub>O  
Ambient Temperature: 75.12 °F

Run No: 2 page 2 of 2  
Date: 5/18/11  
Personnel: Pilgrim/Rink/Vincent

Exit Thermocouple ID: IMP-02

Nozzle ID: 1.275  
Nozzle Size: 0.275 inches  
Filter ID: —

[illegible]

128	90.457	0.465	0.678	1.823
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SORT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

140.7  
Avg Stack  
Temperature  
(°F)

**78.0**  
Avg Meter  
Temperature  
(°F)

### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.002 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
Train Final: 0.001 ft<sup>3</sup> @ 8.0 Hg for 1 minute

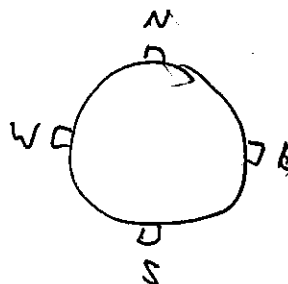
Observations:

Figure 1: Schematic representation of the experimental design. The figure shows a timeline of the experiment. At the top, a bar indicates the duration of the experiment (0 to 10 minutes). Below this, a series of horizontal bars represent the duration of different tasks. The tasks are: 'Preparation' (0 to 1 minute), 'Introduction' (1 to 2 minutes), 'Practice' (2 to 3 minutes), 'Test' (3 to 4 minutes), 'Rest' (4 to 5 minutes), 'Test' (5 to 6 minutes), 'Rest' (6 to 7 minutes), 'Test' (7 to 8 minutes), 'Rest' (8 to 9 minutes), and 'Test' (9 to 10 minutes). The 'Test' tasks are further divided into 'Test 1' and 'Test 2'.

Operator Signature:

fpy.

### Sampling Schematic



**TEST LAB DATA COLLECTION SHEET**

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT  
 Site Location LCMC  
 Test Location Stack  
 Sample Run No.: RM26A 2  
 Sample Date: 5/18/11

**CONDENSATION**

640.2

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1 H <sub>2</sub> SO <sub>4</sub>	<del>559.8</del>	915.9	275.7
2	0.1 H <sub>2</sub> SO <sub>4</sub>	697.2	933.7	236.5
3	0.1 H <sub>2</sub> SO <sub>4</sub>	696.1	709.6	13.5
4	0.1 NaOH	716.1	719.5	5.5
5	0.1 NaOH	721.7	721.6	0.1
6	SILICA	888.5	912.3	23.8
7				
8				
Total				555.1

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

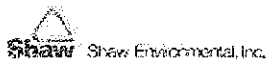
**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

**Comments:**

DI = DI-1811-01  
 0.1 H<sub>2</sub>SO<sub>4</sub> → SA-E1711-01  
 0.1 NaOH → NaOH-E1711-05  
 Sodium Trisulfate → SF-E1711-01  
 LA-OHAUS2

26A



## Field Data Sheet

Client: Citgo  
 Location: Sulfur, LA  
 Unit: RCat  
 Source: Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-04  
 Thermocouple ID: LA-10' MS-04  
 Pitot ID: 1105269  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.63 in Hg  
 Static Pressure (P<sub>s</sub>): 0.33 in H<sub>2</sub>O  
 Ambient Temperature: 80.8 °F

Run No: 3, page 1 of 2

Date: 5/19/11

Personnel: Pilgrin / Rink / Vincent

Exit Thermocouple ID: IMP-02

Nozzle ID: .275

Nozzle Size: 0.275 inches

Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
S 1	0946	513.235	0.40	0.632	1.85	2.0	139	252	254	59	80
1	0950	517.20	0.40	0.632	1.85	2.0	139	250	254	51	80
2	0954	519.21	0.49	0.700	2.25	2.0	140	252	250	53	81
2	0958	522.06	0.49	0.700	2.25	2.0	140	249	253	56	81
3	1002	525.16	0.47	0.686	2.20	2.0	139	253	250	57	82
3	1006	528.31	0.51	0.714	1.90	2.0	140	252	251	57	83
4	1010	531.21	0.45	0.671	1.70	2.0	140	250	255	59	84
4	1014	534.12	0.45	0.671	1.70	2.0	141	252	258	62	85
5	1018	536.81	0.45	0.671	1.70	2.0	140	255	258	64	85
5	1022	539.44	0.42	0.648	1.60	2.0	141	253	260	65	85
6	1026	542.61	0.47	0.686	1.75	2.0	140	252	268	63	86
6	1030	544.91	0.47	0.686	1.75	2.0	140	257	267	60	86
7	1034	547.73	0.40	0.632	1.50	2.0	139	258	267	58	88
7	1038	548.12	0.44	0.663	1.65	2.0	140	252	264	59	89
8	1042	553.44	0.44	0.663	1.65	2.0	140	258	265	59	90
8	1046	555.99	0.44	0.663	1.65	2.0	141	258	268	60	91
END	1050	558.408	—	—	—	—	—	—	—	—	—
E 1	1106	558.468	0.28	0.529	1.05	2.0	139	251	267	67	91
1	1110	560.57	0.28	0.529	1.05	2.0	140	258	265	65	91
2	1114	562.75	0.28	0.529	1.05	2.0	140	261	261	62	92
2	1118	564.92	0.28	0.529	1.05	2.0	140	262	261	62	92
3	1122	567.31	0.31	0.557	1.15	2.0	140	253	258	57	92
3	1126	569.58	0.31	0.557	1.15	2.0	140	251	255	58	92
4	1130	572.21	0.36	0.600	1.35	2.0	140	254	256	60	92
4	1134	574.12	0.36	0.600	1.35	2.0	140	251	257	62	92
5	1138	577.42	0.43	0.656	1.60	2.0	141	255	262	66	92
5	1142	579.91	0.43	0.656	1.60	2.0	141	258	261	67	92
6	1146	582.14	0.51	0.714	1.90	2.0	140	251	262	62	91
6	1150	585.28	0.51	0.714	1.90	2.0	140	251	259	61	92

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)
—	—	—	—	—

Avg Stack Temperature (°F)	Avg Meter Temperature (°F)
—	—

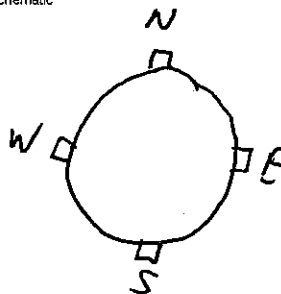
## Leak Checks

Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.003 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train final: 0.004 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: K Factor: 3.75 α<sub>2</sub>: 0.627  
CO<sub>2</sub>: 18.084

Operator Signature: [Signature]

## Sampling Schematic







**Shaw** Shaw Environmental, Inc.

### Field Data Sheet

Client: Citgo  
Location: Saltburg, LA  
Unit: BCat  
Source: Scrubber Stack  
Project No: 142733

Meter Box ID: LA-A03  
 $\Delta H$  std: 2.069 in  $H_2O$   
 DGM (Y): 1.003

Slack Diameter: 46.25 inches  
Slack Area: 50.53 ft<sup>2</sup>

Barometric Pressure ( $P_{\text{bar}}$ ): 29.63 in Hg  
Static Pressure ( $P_g$ ): 0.33 in  $\text{H}_2\text{O}$   
Ambient Temperature: 80.8 °F

Probe ID: LA-10' MS-04  
Thermocouple ID: LA-10' MS-04  
Pitot ID: 1105269  
C<sub>p</sub>: 0.840

Nozzle ID: 1.275  
Nozzle Size: 0.275 inches  
Filter ID: 1

Run No: 3 page 2 of 2  
Date: 5/1971  
Personnel: Pilgrim/Rink/Vincent

Exit Thermocouple ID: Imp-02[illegible]

128	86,131	0.422	0.647	1.645
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQR T $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

**140.0**  
Avg Slack  
Temperature  
(°F)

58.2  
Avg Meter  
Temperature  
(°F)

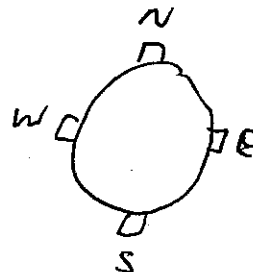
### Leak Checks

Pilot Impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.003 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
Train Final: 0.004 ft<sup>3</sup> @ 8.0 Hg for 1 minute

**Observations:**

Operator Signature: \_\_\_\_\_

### Sampling Schematic



# TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT  
 Site Location CMC  
 Test Location stack  
 Sample Run No.: RM 26A 3  
 Sample Date: 5/19/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1 H <sub>2</sub> SO <sub>4</sub>	660.0	956.4	296.4
2	0.1 H <sub>2</sub> SO <sub>4</sub>	693.4	799.1	105.7
3	0.1 H <sub>2</sub> SO <sub>4</sub>	690.1	704.2	14.1
4	0.1 NaOH	722.1	726.7	4.6
5	0.1 NaOH	718.0	717.8	-0.2
6	SILICA	862.0	884.6	22.6
7				
8				
Total				442.6

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

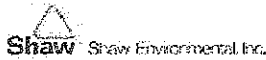
## Comments:

H25049 SA-E17H-02  
DI -> DI-1811-01  
0.1 NaOH -> NaOH-E17H-02  
Sodium Thiosulfate -> SF-E17H-01  
LA-OHAUSZ

## *Appendix A3*

### *U.S. EPA Other Test Method 29*

OTM 29



### Field Data Sheet

Client: Citgo  
 Location: Sulphur, La  
 Unit: B-Cat  
 Source: Scrubber stack  
 Project No: 142733

Meter Box ID: LA-A02  
 $\Delta H$  std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
 Stack Area: 50.50 ft<sup>2</sup>

Probe ID: LA-20' MS-02  
 Thermocouple ID: LA-10' MS-02  
 Pitot ID: LA-PT02 LA-PT10  
 $C_p$ : 0.840

Barometric Pressure ( $P_{bar}$ ): 29.62 in Hg  
 Static Pressure ( $P_s$ ): 0.400 in H<sub>2</sub>O  
 Ambient Temperature: 78.8 °F

Run No: 1 page 1 of 2

Date: 5-18-11

Personnel: J. Rink, S. Vincent, J. Pilgrim Exit Thermocouple ID: LA-IMP06

Nozzle ID: .160  
 Nozzle Size: 0.160 inches  
 Filter ID: ---

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	$\Delta P$ (in H <sub>2</sub> O)	SQRT $\Delta P$ (in H <sub>2</sub> O)	$\Delta H$ (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
1	1250	79.983	---	---	---	---	---	---	---	---	---
E 1	1254	80.556	0.150	0.387	0.065	1.0	142	243	252	67	80
1	1349	81.095	0.400	0.632	0.175	1.0	142	239	254	60	79
2	1353	82.045	0.490	0.700	0.215	1.0	143	242	249	58	80
2	1357	82.980	0.490	0.700	0.215	1.0	143	242	259	56	80
3	1401	83.865	0.400	0.632	0.175	1.0	145	232	246	59	81
3	1405	84.740	0.400	0.632	0.175	1.0	145	236	251	62	81
4	1409	85.640	0.410	0.640	0.180	1.0	143	237	245	64	81
4	1413	86.525	0.410	0.640	0.180	1.0	143	241	257	63	81
5	1417	87.410	0.380	0.616	0.165	1.0	143	239	253	60	81
5	1421	88.250	0.380	0.616	0.165	1.0	143	242	256	61	82
6	1425	89.050	0.380	0.616	0.165	1.0	143	236	256	62	82
6	1429	89.870	0.380	0.616	0.165	1.0	143	240	258	62	83
7	1433	90.695	0.300	0.548	0.125	1.0	143	235	256	60	82
7	1437	91.515	0.350	0.592	0.155	1.0	143	235	255	59	82
8	1441	92.255	0.320	0.566	0.145	1.0	143	234	264	59	83
8	1445	93.046	0.320	0.566	0.145	1.0	143	238	249	59	83
1											
1											
2											
2											
3											
3											
4											
4											
5											
5											

Power  
Tripped @ 1254  
Resumed @ 1345

added ice

13.146 0.3494 0.6079 0.1644

Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average  $\Delta P$  (in H<sub>2</sub>O) Average SQRT  $\Delta P$  (in H<sub>2</sub>O) Average  $\Delta H$  (in H<sub>2</sub>O)

Avg Stack Temperature (°F)

Avg Meter Temperature (°F)

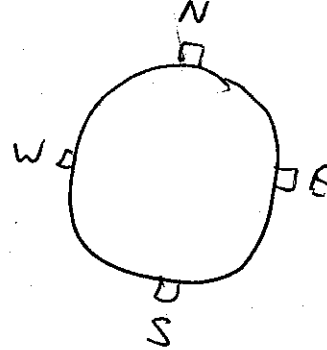
#### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.012 ft<sup>3</sup> @ 8.00 Hg for 1 minute  
 Train final: 0.010 ft<sup>3</sup> @ 5.00 Hg for 1 minute

Observations: KF = 0.426 O<sub>2</sub> = 0.753  
CO<sub>2</sub> = 17.797

Operator Signature: J. Rink

#### Sampling Schematic



# Field Data Sheet

Client: Citgo  
 Location: sulphur, La  
 Unit: B-Cat  
 Source: scrubber stack  
 Project No: 142733

Meter Box ID: 4A-A02  
 ΔH std: 1960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 94.25 inches  
 Stack Area: 50.5 ft<sup>2</sup>

Probe ID: LA-10'M5-03  
 Thermocouple ID: LA-10'M5-03  
 Pitot ID: LA-PT10  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.57 in Hg  
 Static Pressure (P<sub>s</sub>): 0.400 in H<sub>2</sub>O  
 Ambient Temperature: 80.1 °F

Run No: 1 page 2 of 2  
 Date: 5-18-11  
 Personnel: J. Rink, S. Vincent, J. P. Ginn

Exit Thermocouple ID: LA-IMP06

Nozzle ID: .160  
 Nozzle Size: 0.160 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
N1	1711	93.315									
1	1715	94.315	0.480	0.693	0.210	1.0	143	261	253	66	81
2	1719	95.325	0.480	0.693	0.210	1.0	144	257	254	65	81
3	1723	96.395	0.480	0.693	0.235	1.0	143	248	255	64	81
4	1727	97.425	0.540	0.735	0.235	1.0	143	248	255	63	81
5	1731	98.490	0.540	0.735	0.235	1.0	143	254	254	63	81
6	1735	99.550	0.540	0.735	0.235	1.0	143	255	254	64	81
7	1739	100.525	0.500	0.707	0.220	1.0	143	253	247	60	81
8	1743	101.585	0.500	0.707	0.220	1.0	143	251	246	57	81
9	1747	102.590	0.480	0.693	0.210	1.0	142	250	250	56	81
10	1751	103.585	0.470	0.686	0.205	1.0	143	250	253	56	81
11	1755	104.630	0.520	0.721	0.225	1.0	142	245	245	58	81
12	1759	105.665	0.520	0.721	0.225	1.0	143	251	255	59	81
13	1803	106.610	0.470	0.686	0.205	1.0	143	252	243	61	81
14	1807	107.550	0.400	0.632	0.175	1.0	143	251	248	63	82
15	1811	108.510	0.480	0.693	0.210	1.0	143	255	257	65	81
16	1815	109.483	0.400	0.632	0.175	1.0	144	259	242	66	82

added ice

24.231  
 12.8 542.45 0.4328 0.6350 0.1894  
 Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

143.06  
 Avg Stack Temperature (°F)

81.22  
 Avg Meter Temperature (°F)

## Leak Checks

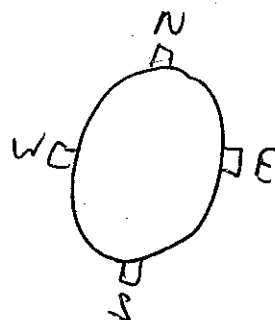
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.012 ft<sup>3</sup> @ 8.00 Hg for 1 minute  
 Train Final: 0.010 ft<sup>3</sup> @ 5.00 Hg for 1 minute

## Observations:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Operator Signature: [Signature]

## Sampling Schematic



**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT  
 Site Location: LCMC  
 Test Location: stack  
 Sample Run No.: 1 ORM 29  
 Sample Date: 5/18/11

**CONDENSATION**

Notes  
 yellow tint  
 white crystals  
 ↓

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g	pH
1	NaOH	734.8	923.5	188.7	10
2	NaOH	735.8	761.4	25.6	12
3	NaOH	736.7	752.9	16.2	14
4	NaOH	758.8	774.9	16.1	14
5	Silica	812.5	824.4	11.9	
6					
7					
8					
Total				258.5	

added  
NaOH

30 ml

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

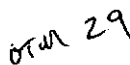
**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

6N NaOH ⇒ NaOH-E1711-01  
 0.1N NaOH ⇒ NaOH-E1711-05 / NaOH-E1711-06





LA-01AUS2

Exit Thermocouple ID: 4A-IMP06

Nozzle ID: 160  
Nozzle Size: 0.160 inches  
Filter ID: —

[illegible]

wooded ice

				0.169
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

Avg Stack  
Temperature  
(°F)

Avg Meter  
Temperature  
(°F)

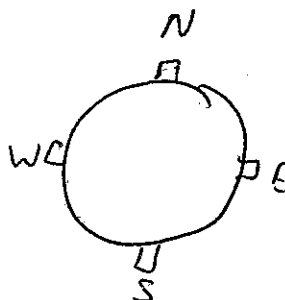
### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.009 ft<sup>3</sup> @ 9.0 Hg for 1 minute  
Train Final: 0.000 ft<sup>3</sup> @ 14.0 Hg for 1 minute

Observations:  $O_2$ : 0.762  
 $CO_2$ : 17.501

Operator Signature: Jeff Pink

### Sampling Schematic



### Field Data Sheet

Client: Citgo  
Location: Sulphur, La  
Unit: B-Cat  
Source: Scrubber  
Project No: 142733

Meter Box ID: LA-A02  
 $\Delta H$  std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Slack Diameter:  $\frac{96.25}{50.5}$  inches  
Slack Area:  $\frac{96.25}{50.5}$  ft<sup>2</sup>

Barometric Pressure ( $P_{\text{bar}}$ ): 29.57 in Hg  
Static Pressure ( $P_g$ ): 0.330 in  $H_2O$   
Ambient Temperature: 73.8 °F

Run No: 2 of 2

Date: 5-18-11

Personnel: J. Rink S. Vincent J. Pilgrim Exit Thermocouple ID: LA-IMP06

Nozzle ID: .160  
Nozzle Size: 0.160 inches

Filter ID: 6

[illegible]

128	30.111	0.467	0.6799	0.1969
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SORT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

142.9  
Avg Stack  
Temperature  
(°F)

18.3  
Avg Meter  
Temperature  
(°F)

### Leak Checks

Pilot Impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.009 ft<sup>3</sup> @ 9.0 Hg for 1 minute  
Train Final: 0.000 ft<sup>3</sup> @ 11.0 Hg for 1 minute

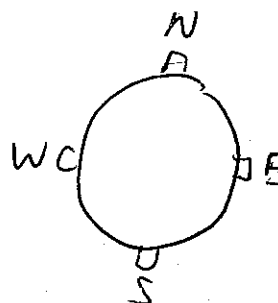
**Observations:**

[illegible]

Operator Signature: \_\_\_\_\_

e. Jeff Rink

### Sampling Schematic





**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT  
 Site Location: LCMC  
 Test Location: stack  
 Sample Run No.: OTM 29 2  
 Sample Date: 5/18/11

**CONDENSATION**

NOTES  
 yellow tint  
 white particulate  
 " "  
 " "

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	6.0 NaOH	729.2	913.6	184.4
2	6.0 NaOH	710.3	732.1	21.8
3	6.0 NaOH	717.1	730.6	13.5
4	6.0 NaOH	723.6	736.8	13.2
5	SILICA	866.0	875.5	9.5
6				
7				
8				
Total				247.4

pH	Added NaOH (ml)
10	30
11	10
12	
14	

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

**Comments:**

6.0 NaOH → NaOH - E1711-01  
 0.1 N NaOH → NaOH - E1711-05 / NaOH - E1711-06 / NaOH - E1711-07  
 LA-OHAUS2

### *Field Data Sheet*

Client: Citgo  
Location: Sulphur, La  
Unit: B-Cat  
Source: Scrubber stack  
Project No: 142733

Meter Box ID: 2A-A02  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter:  $\frac{96.25}{50.5}$  inches  
Stack Area:  $\frac{50.5}{\text{ft}^2}$

Barometric Pressure ( $P_{bar}$ ): 29.63 in Hg  
Static Pressure ( $P_g$ ): 0.330 in H<sub>2</sub>O  
Ambient Temperature: 80.8 °F

Probe ID: 4A-10'M5-03  
Thermocouple ID: 4A-10'M5-03  
Pitot ID: 4A-PT10  
Cp: 0.890

Run No: 3 page 1 of 2  
Date: 5-19-11

Personnel: J. Rink, J. Pilgrim, S. Vincent

Exit Thermocouple ID: 4A-IMP06

Nozzle ID: 0.160  
Nozzle Size: 0.160 inches  
Filter ID:           

[illegible]

64	13.920	0.4974	—	—
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

Avg Stack  
Temperature  
(°F)

Avg Meter  
Temperature  
(°F)

### Leak Checks

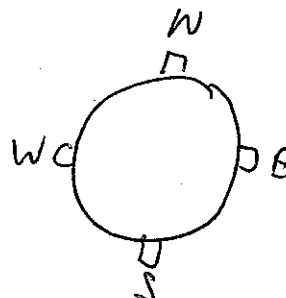
Pilot Impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.000 ft<sup>3</sup> @ 8.0 Hg for 1 minute  
Train Final: 0.008 ft<sup>3</sup> @ 12.0 Hg for 1 minute

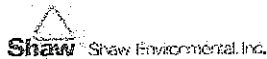
Observations: AH at point 6 reading 2 is 0.930  
 $O_2$ : 0.627  
 $CO_2$ : 18.084

Operator Signature: \_\_\_\_\_

Jeff Reik

### Sampling Schematic





### Field Data Sheet

Client: Citgo  
Location: Sulphur, La  
Unit: B-Cat  
Source: Scrubber stack  
Project No: 142733

Meter Box ID: 2A-AD2  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
Stack Area: 50.5 ft<sup>2</sup>

Barometric Pressure ( $P_{bar}$ ): 29.63 in Hg  
Static Pressure ( $P_g$ ): 0.330 in H<sub>2</sub>O  
Ambient Temperature: 80.8 °F

Run No: 3 Page 2 of 2  
Date: 5-19-11

Probe ID: CA-10'M5-03  
Thermocouple ID: CA-10'M5-03  
Pitot ID: CA-PT10  
C<sub>p</sub>: 0.840

Nozzle ID: 0.160  
Nozzle Size: 0.160 inches  
Filter ID: —

Personnel: J. Rink, J. Pilgrim, S. Vincent Exit Thermocouple ID: 4A-IMP06

[illegible]

1.28	27.768	0.4494	0.6666	0.1748
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

143.2  
Avg Stack  
Temperature  
(°F)

88.2  
Avg Meter  
Temperature  
(°F)

### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.000 ft<sup>3</sup> @ 8.0 Hg for 1 minute  
Train Final: 0.000 ft<sup>3</sup> @ 10.5 Hg for 1 minute

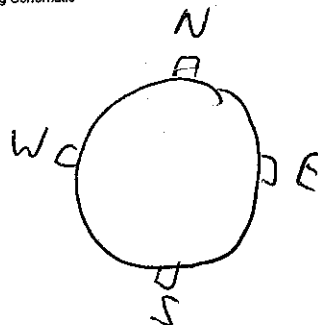
**Observations:**

[illegible]

Operator Signature: \_\_\_\_\_

Jeff Bink

### Sampling Schematic



TEST LAB DATA COLLECTION SHEET

Project Name CATCO ICR  
 Project No.: 142733  
 Source ID R-CAT  
 Site Location LCMC  
 Test Location stack  
 Sample Run No.: DTM 29, 3  
 Sample Date: 5/19/11

CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g	pH	Added NaOH (ml)
1	6.0 NaOH	721.0	893.0	172.0	10	30
2	6.0 NaOH	686.9	704.8	17.9	11	10
3	6.0 NaOH	715.8	716.0	0.2	13	—
4	6.0 NaOH	728.1	739.7	11.6	13	—
5	SILICA	858.8	865.7	6.9		
6						
7						
8						
Total				218.4		

NOTES  
 light yellow  
 white particulate  
 ↓

PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

6.0 NaOH → NaOH-E17H-02  
 0.1 NaOH → NaOH-E17H-07  
 LA-OHAUSZ

***Appendix A4***  
***SW-846 Method 0011***

Field Data Sheet

MTD 6611

Client: Citgo  
Location: Sulfur, LA  
Unit: RCat  
Source: Scrubber Stack  
Project No: 142733

Meter Box ID: LA-A03  
ΔH std: 2.069 in H<sub>2</sub>O  
DGM (Y): 1.003

Stack Diameter: 96.25 inches  
Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-04  
Thermocouple ID: LA-10' MS-04  
Pitot ID: 11205269  
C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.66 in Hg *Sampling plane*  
Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
Ambient Temperature: 84 °F

Run No: 1 Unspiked  
Date: 5/10/11  
Personnel: Pilgrim/Vincent

Exit Thermocouple ID: IMP-02

Nozzle ID: 0-2.283  
Nozzle Size: 0.283 inches  
Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
EX	1140	600.859	0.48	0.693	2.20	2.0	141	254	—	58	83
187	1144	604.60	0.48	0.693	2.20	2.0	141	251	—	57	83
6	1148	606.63	0.50	0.707	2.25	2.0	141	255	—	59	83
5	1152	609.71	0.51	0.714	2.30	2.0	140	259	—	61	84
4	1156	613.14	0.48	0.693	2.20	2.0	141	257	—	60	84
3	1200	616.51	0.48	0.693	2.20	2.0	140	255	—	62	85
2	1204	620.21	0.30	0.548	1.35	2.0	141	258	—	63	85
1	1208	622.23	0.27	0.520	1.20	2.0	141	256	—	66	85
END	1212	624.412	—	—	—	—	—	—	—	—	—
S1	1222	624.412	0.39	0.624	1.85	2.0	140	251	—	61	85
2	1226	627.71	0.46	0.678	2.10	2.0	140	249	—	53	85
3	1230	630.28	0.48	0.693	2.15	2.0	140	251	—	54	86
4	1234	633.66	0.50	0.707	2.25	2.0	141	258	—	55	86
5	1238	636.92	0.45	0.671	2.05	2.0	141	255	—	56	86
6	1242	639.95	0.42	0.648	1.90	2.0	141	258	—	58	87
7	1246	642.51	0.42	0.648	2.10	2.0	140	256	—	60	87
8	1250	645.95	0.47	0.686	2.10	2.0	140	251	—	61	87
END	1254	648.333	—	—	—	—	—	—	—	—	—

64 474710.446 0.666 2.019

Total Sampling Time (min) 64  
Total Meter Volume (ft<sup>3</sup>) 474710.446  
Average ΔP (in H<sub>2</sub>O) 0.666  
Average SQRT ΔP (in H<sub>2</sub>O) 2.019  
Average ΔH (in H<sub>2</sub>O) —

141

Avg Stack Temperature (°F) 141

85

Avg Meter Temperature (°F) 85

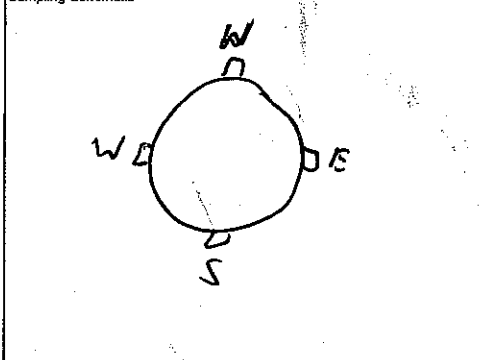
Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.002 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
Train final: 0.002 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: Kf: 4.53

Operator Signature: [Signature]

Sampling Schematic





Shaw Environmental, Inc.

## TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
Project No.: 142733  
Source ID B-CAT  
Site Location LCMC  
Test Location Stack  
Sample Run No.: 00110  
Sample Date: 5/20/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	50ml DNPH	601.9	738.6	156.7
2	50ml DNPH	810.6	901.7	91.1
3	100ml DNPH	697.1	708.1	11.0
4	100ml DNPH	709.7	710.9	1.2
5		612.4	612.7	0.3
6	SILICA	815.7	827.1	11.4
7				
8				
Total				271.7

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

## Comments:

DNPH => 173  
Meth. => 48319  
Dichloromethane => 48045  
DI-1811-01  
LA-OHAUSZ

Field Data Sheet

Client: Citgo  
 Location: Saltar, LA  
 Unit: RCat  
 Source: Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A02  
 AH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-03  
 Thermocouple ID: LA-10' MS-03  
 Pitot ID: 11205270  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 24.66 in Hg Sampling plane  
 Static Pressure (P<sub>g</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 84 °F

Run No: 1 Spiked  
 Date: 5/20/11  
 Personnel: P.grim / Vincent

Exit Thermocouple ID: Imp-06

Nozzle ID: 1.282  
 Nozzle Size: 0.282 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
51	1140	169.585	0.32	0.566	1.35	2.0	144	252	—	65	86
2	1144	173.01	0.32	0.566	1.35	2.0	144	254	—	63	86
3	1148	174.61	0.49	0.700	2.05	2.0	144	257	—	61	86
4	1152	177.12	0.49	0.700	2.05	2.0	143	255	—	63	87
5	1156	180.43	0.45	0.671	1.90	2.0	144	256	—	60	87
6	1200	182.86	0.43	0.656	1.80	2.0	144	256	—	62	87
7	1204	186.12	0.43	0.656	2.00	2.0	144	250	—	64	88
8	1208	189.41	0.42	0.648	1.80	2.0	144	252	—	66	88
END	1212	191.613	—	—	—	—	—	—	—	—	—
68	1222	191.613	0.51	0.714	2.15	2.0	144	253	—	59	88
7	1226	195.26	0.47	0.686	2.00	2.0	144	254	—	58	88
6	1230	197.55	0.54	0.735	2.30	2.0	144	256	—	59	88
5	1234	200.79	0.45	0.671	1.90	2.0	144	255	—	60	89
4	1238	203.98	0.45	0.671	1.90	2.0	144	257	—	62	89
3	1242	206.58	0.53	0.728	2.25	2.0	144	255	—	64	89
2	1246	210.77	0.33	0.574	1.40	2.0	144	252	—	66	89
1	1250	212.81	0.31	0.557	1.40	2.0	144	252	—	67	89
END	1254	215.960	—	—	—	—	—	—	—	—	—

64 46.375 0.436 0.658 1.850  
 Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

144  
 Avg Stack Temperature (°F)

88  
 Avg Meter Temperature (°F)

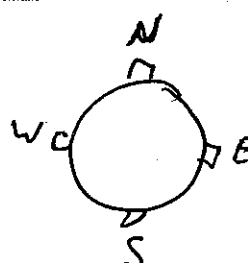
Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.001 ft<sup>3</sup> @ 16.0 Hg for 1 minute  
 Train Final: 0.002 ft<sup>3</sup> @ 7.0 Hg for 1 minute

Observations: KF: 4.23

Operator Signature: [Signature]

Sampling Schematic





**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT  
 Site Location: LCMC  
 Test Location: Stack  
 Sample Run No.: 0015 1 SPIKE  
 Sample Date: 5/20/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	50ml DNPH	632.8	765.8	133.0
2	200ml DNPH	803.3	903.0	99.7
3	100ml DNPH	700.4	719.8	19.4
4	100ml DNPH	702.7	705.2	2.5
5		606.5	607.0	0.5
6	SILICA	870.8	885.2	14.4
7				
8				
Total				269.8

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

**Comments:**

DNPH => Lot #173  
 Methanol => Lot #48319  
 Dichloromethane => Lot #48045  
 DI-1811-01  
 LA-0HAUS2

**Field Data Sheet**

MTD -0011

Client: Citgo  
 Location: Sulfur, LA  
 Unit: RCat  
 Source: Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (V): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-04  
 Thermocouple ID: LA-10' MS-04  
 Pilot ID: 11205269  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.66 in Hg @ Sample plane  
 Static Pressure (P<sub>s</sub>): 0.34 in H<sub>2</sub>O  
 Ambient Temperature: 85 °F

Run No: 2 Unspiked  
 Date: 5/20/11  
 Personnel: Pilgrim/Vincent

Exit Thermocouple ID: Imp-02

Nozzle ID: .283  
 Nozzle Size: 0.283 inches  
 Filter ID: -

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
58	1350	648.945	0.45	0.671	2.05	2.0	141	252	-	66	85
7	1354	651.98	0.47	0.686	2.10	2.0	141	252	-	62	84
6	1358	654.76	0.50	0.707	2.25	2.0	141	256	-	64	84
5	1402	658.02	0.48	0.693	2.15	2.0	141	257	-	55	85
4	1406	661.20	0.48	0.693	2.15	2.0	141	252	-	54	86
3	1410	664.48	0.43	0.656	1.95	2.0	140	251	-	56	86
2	1414	667.45	0.46	0.678	2.10	2.0	140	251	-	58	86
1	1418	670.08	0.45	0.671	2.05	2.0	140	253	-	59	87
END	1422	673.257	-	-	-	-	-	-	-	-	-
58	1425	673.257	0.45	0.671	2.05	2.0	140	254	-	68	87
7	1429	676.29	0.50	0.707	2.25	2.0	140	253	-	60	87
6	1433	679.81	0.44	0.663	2.00	2.0	140	258	-	59	87
5	1437	682.54	0.41	0.640	1.85	2.0	140	252	-	60	88
4	1441	685.43	0.45	0.671	2.05	2.0	140	257	-	61	88
3	1445	688.35	0.54	0.735	2.45	2.0	140	257	-	62	88
2	1449	691.64	0.30	0.548	1.35	2.0	141	258	-	65	88
1	1453	694.24	0.28	0.529	1.25	2.0	141	256	-	67	88
END	1457	696.609	-	-	-	-	-	-	-	-	-

64 47.664 0.443 0.664 2.003  
 Total Sampling Time (min)    Total Meter Volume (ft<sup>3</sup>)    Average ΔP (in H<sub>2</sub>O)    Average SQRT ΔP (in H<sub>2</sub>O)    Average ΔH (in H<sub>2</sub>O)

140  
 Avg Stack Temperature (°F)

87  
 Avg Meter Temperature (°F)

**Leak Checks**

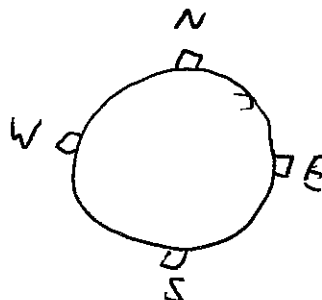
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.003 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train Final: 0.002 ft<sup>3</sup> @ 8.0 Hg for 1 minute

**Observations:**

O<sub>2</sub>: 0.865 %    O<sub>2</sub>: 0.396 %  
 CO<sub>2</sub>: 17.006 %    CO<sub>2</sub>: 17.904 %

Operator Signature: [Signature]

**Sampling Schematic**



# TEST LAB DATA COLLECTION SHEET

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT  
 Site Location: LCMC  
 Test Location: Stack  
 Sample Run No.: 00111 -2  
 Sample Date: 5/20/11

*BSX*  
*5/20/11*

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	50ml DNPA	655.0	758.6	858.6 203.6
2	200ml DNPH	820.9	901.7	871.5 50.6
3	100ml DNPH	692.5	708.1	698.6 6.1
4	100ml DNPH	716.1	711	717.7 1.6
5		610.3		611.6 1.3
6	SILICA	824.8		838.6 13.8
7				
8				
Total				277.0

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

## Comments:

DNPH 173  
Methanol 48319  
Dichloromethane 48045  
DI 1511-01  
LA-OHAUSZ

**Field Data Sheet**

MTD 0011

Client: Citgo  
 Location: Sulphur, LA  
 Unit: RCat  
 Source: Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-04  
 Thermocouple ID: LA-10' MS-04  
 Pitot ID: 11205269  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.64 in Hg  
 Static Pressure (P<sub>s</sub>): 0.35 in H<sub>2</sub>O  
 Ambient Temperature: 86 °F

Run No: 3 Unspiked  
 Date: 5/20/11  
 Personnel: Pilgrim/Vincent

Exit Thermocouple ID: Imp-02

Nozzle ID: 1283  
 Nozzle Size: 0.283 inches  
 Filter ID: -

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
E8	1540	697.224	0.45	0.671	2.05	2.0	140	248	-	68	89
7	1544	700.38	0.45	0.671	2.05	2.0	141	252	-	57	85
6	1548	703.26	0.50	0.707	2.25	2.0	141	253	-	57	85
5	1552	706.79	0.43	0.656	1.90	2.0	140	257	-	58	85
4	1556	709.83	0.45	0.671	2.05	2.0	140	252	-	60	86
3	1600	712.99	0.34	0.583	1.50	2.0	140	253	-	62	87
2	1604	715.47	0.29	0.539	1.30	2.0	140	255	-	65	87
1	1608	717.91	0.25	0.500	1.15	2.0	140	252	-	65	88
END	1612	720.221	-	-	-	-	-	-	-	-	-
S8	1616	720.221	0.47	0.686	2.10	2.0	142	251	-	67	87
7	1620	723.46	0.46	0.678	2.10	2.0	142	249	-	63	88
6	1624	726.29	0.43	0.656	1.90	2.0	142	250	-	61	87
5	1628	729.29	0.49	0.700	2.20	2.0	141	248	-	60	87
4	1632	732.49	0.41	0.640	1.85	2.0	140	253	-	62	87
3	1636	735.61	0.44	0.663	2.00	2.0	140	249	-	62	87
2	1640	738.49	0.47	0.686	2.10	2.0	140	251	-	65	87
1	1644	742.01	0.47	0.686	2.10	2.0	140	258	-	66	87
END	1648	744.455	-	-	-	-	-	-	-	-	-

64 47.23 0.425 0.649 1.913  
 Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

141  
 Avg Stack Temperature (°F)

87  
 Avg Meter Temperature (°F)

**Leak Checks**

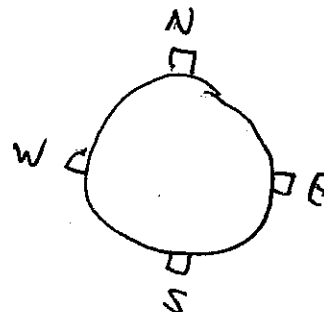
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.001 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train Final: 0.001 ft<sup>3</sup> @ 7.0 Hg for 1 minute

**Observations:**

O<sub>2</sub>: 0.519  
 CO<sub>2</sub>: 18.351

Operator Signature: [Signature]

**Sampling Schematic**



# TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT  
 Site Location LCMC  
 Test Location Stack  
 Sample Run No.: 2011U-3  
 Sample Date: 5/20/14

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	50 ml DNPH	663.6	885.9	222.3
2	100 ml DNPH	815.6	850.7	35.1
3	100 ml DNPH	692.3	697.3	5.0
4	100 ml DNPH	721.9	720.5	-1.4
5		611.7	613.2	1.5
6	Silica	850.5	865.3	14.8
7				
8				
Total				279.3

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

## Comments:

DNPH => #173  
 Methanol => 48319  
 Dichloromethane => 48045  
 DT-1811-01  
 LA-OHAUS2

***Appendix A5***  
***U.S. EPA Method 23 and Method 0010***

## Project Notes

Combined 0010 & RM 23

### Sample Identification:

0010/23 Container 1: filter

0010/23 Container 2: Front half wash (MeOH, Acetone, MeCl)

23 Container 3: Front half wash (Toluene)

0010/23 Container 4: XAD trap

0010 Container 5: Knockout condensate

0010 Container 6: Rinse (MeOH, MeCl)

# Field Data Sheet

Client: CITGO  
 Location: B-CAT stack  
 Unit: B-CAT WGS  
 Source: WGS  
 Proj. No.: 142733

Meter Box ID: LA-A03  
 AH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Barometric Pressure (P<sub>bar</sub>): 29.72 in Hg @ Sample plane  
 Static Pressure (P<sub>g</sub>): 0.35 in H<sub>2</sub>O  
 Ambient Temperature: 81 °F

Run No: 23/0010 Run 1  
 Date: 5/23/11  
 Personnel: P. Igrim / Huggins

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA PT-01  
 C<sub>p</sub>: 0.840

Nozzle ID: .265  
 Nozzle Size: 0.265 inches  
 Lot No. Filter ID: NB356571

Exit Thermocouple ID: Imp-04

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
58	10:25	745.80	0.48	0.693	1.70	3.0	140	244	266	63	80
8	10:30	749.59	0.48	0.693	1.70	3.0	140	244	259	63	80
8	10:35	752.61	0.48	0.693	1.70	3.0	141	243	257	64	81
8	10:40	755.33	0.48	0.693	1.70	4.0	141	24	258	64	82
7	10:45	759.23	0.45	0.671	1.60	4.0	140	246	259	64	82
7	10:50	762.72	0.47	0.686	1.65	4.0	140	242	261	64	83
6	10:55	766.15	0.50	0.707	1.75	4.0	140	245	260	63	84
6	11:00	769.59	0.50	0.707	1.75	4.0	140	241	258	63	84
6	11:05	773.15	0.47	0.686	1.65	4.0	140	241	255	64	85
5	11:10	776.58	0.40	0.632	1.40	3.0	140	247	255	63	84
5	11:15	779.72	0.40	0.632	1.40	3.0	140	248	253	65	85
5	11:20	783.84	0.40	0.632	1.40	3.0	140	248	256	60	84
4	11:25	785.98	0.41	0.640	1.40	3.0	140	246	252	58	86
4	11:30	789.22	0.41	0.640	1.40	3.0	141	244	253	58	86
4	11:35	792.21	0.41	0.640	1.40	3.0	140	250	255	59	86
3	11:40	795.28	0.47	0.686	1.65	4.0	140	253	250	61	86
3	11:45	798.70	0.47	0.686	1.65	4.0	140	256	250	62	86
3	11:50	802.12	0.47	0.686	1.65	4.0	140	255	254	63	87
2	11:55	805.95	0.40	0.632	1.40	3.0	140	253	256	63	87
2	12:00	808.78	0.44	0.663	1.50	3.0	140	256	254	64	87
2	12:05	812.05	0.40	0.632	1.40	3.0	140	261	255	65	88
1	12:10	815.27	0.42	0.648	1.45	3.0	140	261	255	62	88
1	12:15	818.43	0.42	0.648	1.45	3.0	139	263	257	61	88
1	12:20	821.65	0.42	0.648	1.45	3.0	140	262	255	61	88
END	12:25	824.862	-	-	-	-	-	-	-	-	-
E8	12:31	824.862	0.42	0.648	1.45	3.0	140	249	267	64	88
8	12:36	829.01	0.42	0.648	1.45	3.0	140	257	245	63	88
8	12:41	832.61	0.42	0.648	1.45	3.0	140	244	248	60	88
7	12:46	834.21	0.44	0.663	1.50	3.0	140	242	247	60	88

-	-	-	-	-
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

-
Avg Stack Temperature (°F)

-
Avg Meter Temperature (°F)

## Leak Checks

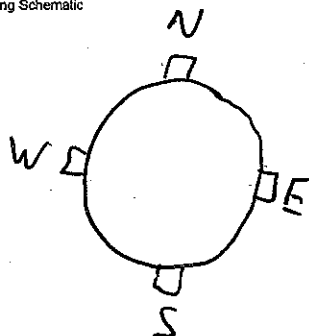
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.006 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train Final: 0.005 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: Kt: 3.49

O<sub>2</sub>: 0.629  
 CO<sub>2</sub>: 18.170

Operator Signature: [Signature]

## Sampling Schematic





# Field Data Sheet

Client: CITGO  
 Location: LCMC  
 Unit: B-CAT  
 Source: WGS  
 Project No: 142733

Meter Box ID: LA-103  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DSM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA PT-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.72 in Hg @ sample plane  
 Static Pressure (P<sub>s</sub>): 11.35 in H<sub>2</sub>O  
 Ambient Temperature: 81 °F

Run No: 23/0010 RUN 1  
 Date: 5/23/11  
 Personnel: P. J. Grim / Higgins

Exit Thermocouple ID: IMP-04

Nozzle ID: .265  
 Nozzle Size: 0.265 inches  
 Lot No. Filter ID: NB356871

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
E 7	1251	837.48	0.46	0.678	1.60	4.0	140	246	248	60	88
7	1256	841.34	0.46	0.678	1.60	4.0	140	245	248	58	89
6	1301	844.23	0.46	0.678	1.60	4.0	140	249	242	58	89
6	1306	847.54	0.46	0.678	1.60	4.0	141	256	246	59	89
6	1311	850.92	0.46	0.678	1.60	4.0	141	259	252	59	89
5	1316	854.34	0.42	0.648	1.45	4.0	140	258	247	61	88
5	1321	857.65	0.44	0.663	1.50	4.0	140	256	249	62	89
5	1326	860.89	0.44	0.663	1.50	4.0	141	250	251	62	89
4	1331	863.55	0.43	0.656	1.50	4.0	140	253	248	61	88
4	1336	867.65	0.38	0.616	1.30	4.0	140	253	246	60	88
4	1341	870.62	0.38	0.616	1.30	4.0	140	249	243	60	89
3	1346	874.02	0.27	0.520	0.94	3.0	140	254	249	61	88
3	1351	876.54	0.27	0.520	0.94	3.0	140	249	243	61	88
3	1356	879.01	0.27	0.520	0.94	3.0	140	252	247	62	89
2	1401	881.92	0.38	0.616	1.30	3.0	140	252	246	60	89
2	1406	884.50	0.38	0.616	1.30	3.0	140	251	247	59	89
2	1411	887.57	0.38	0.616	1.30	3.0	140	254	249	59	89
1	1416	890.83	0.34	0.583	1.20	3.0	140	258	250	60	90
1	1421	893.59	0.34	0.583	1.20	3.0	141	259	251	60	90
1	1426	896.53	0.34	0.583	1.20	3.0	140	256	252	59	90
ENA	1431	899.540	-	-	-	-	-	-	-	-	-

240 153.738 0.419 0.646 1.457

Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

140

Avg Stack Temperature (°F)

87

Avg Meter Temperature (°F)

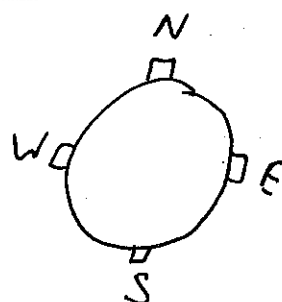
## Leak Checks

Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.006 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train Final: 0.005 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: kf: 3.49

Operator Signature: [Signature]

## Sampling Schematic





Shaw Environmental, Inc.

## TEST LAB DATA COLLECTION SHEET

Project Name 142733  
Project No.: COT601CR  
Source ID B-CAT  
Site Location LCMC Stack  
Test Location 23/0010 RUN 1  
Sample Run No.: 1  
Sample Date: 5/23/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	348.1	973.0	624.9
2	H <sub>2</sub> O	708.6	927.0	218.4
3	H <sub>2</sub> O	689.9	700.5	10.6
4	—	619.8	621.0	1.2
5	SILICA	825.6	908.6	33.0
6				
7				
8				
Total				888.1

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

DI-1811-01  
Dimethyl  
Acetate

# Field Data Sheet

Client: CITGO  
 Location: LCMC  
 Unit: B-CAT  
 Source: WGS  
 Project No: 142733  
 Run No: 23/0010 - 2  
 Date: 5/23/11  
 Personnel: W

Meter Box ID: LA-A03  
 AH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003  
 Probe ID: LA-10MS-02  
 Thermocouple ID: LA-10MS-04  
 Pitot ID: LA-10MS-02  
 C<sub>p</sub>: 0.64  
 Exit Thermocouple ID: LA-TMP-04

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>  
 Barometric Pressure (P<sub>bar</sub>): 29.69 in Hg  
 Static Pressure (P<sub>s</sub>): 1.36 in H<sub>2</sub>O  
 Ambient Temperature: 88 °F  
 Nozzle ID: 0.252  
 Nozzle Size: 0.252 inches  
 Filter ID: NR35691

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	16:28	903.655	0.45	0.67	1.32	3	140	250	249	65	84
1	16:32	907.5	0.40	0.63	1.17	3	141	250	249	66	84
1	16:37	910.4	0.45	0.67	1.33	3	141	252	248	66	84
2	16:42	913.4	0.45	0.67	1.33	3	141	255	250	67	84
2	16:47	916.5	0.45	0.67	1.32	3	140	256	250	66	85
2	16:52	919.5	0.47	0.68	1.38	3	140	256	252	67	85
3	16:57	922.6	0.45	0.67	1.32	3	140	255	250	68	86
3	17:02	925.6	0.49	0.70	1.44	3	140	252	248	68	86
3	17:07	928.7	0.49	0.70	1.44	3	140	252	249	68	87
4	17:12	931.8	0.45	0.67	1.32	3	140	252	248	70	87
4	17:17	934.9	0.48	0.69	1.41	3	143	251	249	67	88
4	17:22	938.0	0.40	0.63	1.17	3	143	250	248	65	88
5	17:27	941.0	0.40	0.63	1.17	3	143	249	249	65	88
5	17:32	943.8	0.38	0.62	1.12	3	143	248	249	64	88
5	17:37	946.7	0.38	0.62	1.12	3	143	248	249	65	88
6	17:42	949.5	0.27	0.52	0.79	3	143	250	248	64	87
6	17:47	952.0	0.27	0.52	0.79	3	143	249	248	66	87
6	17:52	954.4	0.27	0.52	0.79	3	143	249	249	66	87
7	17:57	956.7	0.27	0.52	0.79	3	140	248	250	67	87
7	18:02	959.1	0.25	0.50	0.73	2	139	248	248	68	87
7	18:07	961.3	0.26	0.51	0.76	2	136	248	249	68	87
8	18:12	963.6	0.22	0.47	0.65	2	122	249	252	70	86
8	18:17	965.8	0.22	0.47	0.65	2	142	256	254	67	86
8	18:22	967.9	0.22	0.47	0.65	2	140	252	249	67	86
PC	18:28	970.040	—	—	—	—	—	—	—	—	—
START	18:35	970.040	0.47	0.69	1.38	3	142	247	249	76	86
1	18:40	973.0	0.47	0.69	1.38	3	141	247	248	54	86
1	18:45	976.1	0.47	0.69	1.38	3	141	250	261	47	87
2	18:50	979.3	0.50	0.71	1.47	5	141	250	261	54	86

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)
—	—	—	—	—

Avg Stack Temperature (°F)
—

Avg Meter Temperature (°F)
—

## Leak Checks

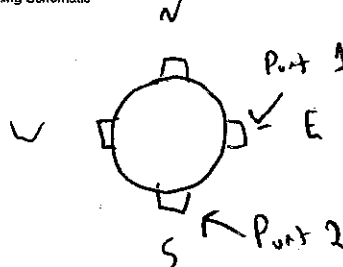
Pitot impact: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 0.5 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 0.5 Hg for 1 minute

Observations: KF-2.84

O<sub>2</sub>: 0.794  
 CO<sub>2</sub>: 18.058

Operator Signature: K. H. C.

## Sampling Schematic



**Field Data Sheet**

Client: Citgo  
 Location: LCMC  
 Unit: B-Cat Scrubber  
 Source: WGS  
 Project No: 142733  
  
 Run No: 23/0010 - 2  
 Date: 5-23-11  
 Personnel: VC

Meter Box ID: LA-A03 2.069  
 ΔH std: 2.088 in H<sub>2</sub>O  
 DGM (Y): 1.003  
  
 Probe ID: LA-10MS-02  
 Thermocouple ID: LA-10MS-02  
 Pitot ID: LA-10MS-02  
 C<sub>p</sub>: 0.89  
  
 Exit Thermocouple ID: LA-IMP-04

Stack Diameter: 96.25 inches  
 Stack Area: 50.93 ft<sup>2</sup>  
  
 Barometric Pressure (P<sub>bar</sub>): 29.69 in Hg  
 Static Pressure (P<sub>s</sub>): 1.36 in H<sub>2</sub>O  
 Ambient Temperature: 88 °F  
  
 Nozzle ID: 0.25  
 Nozzle Size: 0.25 inches  
 Filter ID: HB356671

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
2	18:55	982.5	0.51	0.71	1.50	5	141	281	262	55	86
2	19:00	985.8	0.51	0.71	1.50	5	141	281	259	55	87
3	19:05	989.0	0.47	0.69	1.38	5	141	279	263	52	87
3	19:10	992.2	0.47	0.69	1.38	5	141	279	261	51	87
3	19:15	995.2	0.47	0.69	1.38	5	141	279	260	52	87
4	19:20	998.3	0.40	0.63	1.17	5	141	280	261	53	87
4	19:25	1001.2	0.40	0.63	1.17	4	141	279	260	53	87
4	19:30	1004.1	0.40	0.63	1.17	4	140	280	262	54	87
5	19:35	1007.0	0.38	0.62	1.12	4	141	278	262	55	87
5	19:40	1009.8	0.39	0.62	1.12	4	141	278	262	56	87
5	19:45	1012.5	0.38	0.62	1.12	4	141	278	260	57	87
6	19:50	1015.3	0.40	0.63	1.17	4	140	276	264	57	86
6	19:55	1018.1	0.40	0.63	1.17	4	140	276	257	58	86
6	20:00	1020.4	0.40	0.63	1.17	4	140	278	257	59	85
7	20:05	1023.7	0.43	0.66	1.26	4	140	276	254	55	85
7	20:10	1026.6	0.43	0.66	1.26	4	140	276	256	55	85
7	20:15	1029.5	0.43	0.66	1.26	4	139	277	256	55	85
8	20:20	1032.3	0.47	0.69	1.38	5	131	278	264	55	85
8	20:25	1035.3	0.47	0.69	1.38	5	139	276	255	56	85
8	20:30	1038.4	0.47	0.69	1.38	5	141	276	256	57	85
END	20:35	1041.426	-	-	-	-	-	-	-	-	-

240 | 137.79 | 0.405 | 0.636 | 1.19  
 Total Sampling Time (min)    Total Meter Volume (ft<sup>3</sup>)    Average ΔP (in H<sub>2</sub>O)    Average SQRT ΔP (in H<sub>2</sub>O)    Average ΔH (in H<sub>2</sub>O)

140.23  
 Avg Stack Temperature (°F)

86.25  
 Avg Meter Temperature (°F)

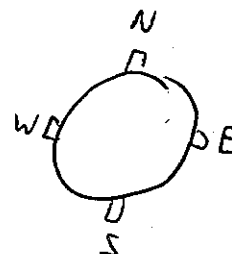
**Leak Checks**

Pitot impact: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 1.5 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 1.5 Hg for 1 minute

Observations: KE-2.84

Operator Signature: MAH

**Sampling Schematic**



### TEST LAB DATA COLLECTION SHEET

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT WGS  
 Site Location: LCMC  
 Test Location: WGS  
 Sample Run No.: 0010/23 RUN 2  
 Sample Date: 5/23/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	384.9	1092.6	707.7
2	H <sub>2</sub> O	705.9	784.9	79.0
3	H <sub>2</sub> O	690.3	692.7	2.4
4	—	605.1	606.4	1.3
5	SILICA	933.1	977.6	44.5
6				
7				
8				
Total				834.9

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

**Field Data Sheet**

Client: Citgo  
 Location: Sulfur, LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber Stack  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (γ): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA Pt-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.67 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 82 °F

Run No: 23/0010R3  
 Date: 5/24/11  
 Personnel: Pilgrim/Walton

Exit Thermocouple ID: Imp-02

Nozzle ID: 0.265  
 Nozzle Size: 0.265 inches  
 Lot# Filter ID: HR35671

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
58	0835	41.810	0.48	0.693	1.70	3.0	140	237	247	63	79
8	0840	45.03	0.48	0.693	1.70	5.0	141	243	261	48	79
8	0845	48.31	0.48	0.693	1.70	5.0	140	256	261	47	80
7	0850	51.73	0.53	0.728	1.85	6.0	140	257	260	48	80
7	0855	55.22	0.53	0.728	1.85	6.0	140	255	264	49	82
7	0900	58.79	0.53	0.728	1.85	6.0	140	259	262	50	82
6	0905	63.23	0.50	0.707	1.75	6.0	140	260	257	52	83
6	0910	65.95	0.50	0.707	1.75	6.0	140	262	253	53	83
6	0915	69.35	0.50	0.707	1.75	6.0	140	258	250	55	83
5	0920	73.12	0.42	0.648	1.50	6.0	140	254	261	55	84
5	0925	75.98	0.42	0.648	1.50	6.0	140	253	262	57	85
5	0930	79.18	0.42	0.648	1.50	6.0	140	253	261	58	85
4	0935	82.45	0.51	0.714	1.80	6.0	140	251	257	61	87
4	0940	86.03	0.53	0.728	1.85	6.0	140	256	263	62	87
4	0945	89.70	0.53	0.728	1.85	6.0	140	262	263	63	87
3	0950	93.31	0.46	0.678	1.60	6.0	140	248	259	57	87
3	0955	96.76	0.46	0.678	1.60	6.0	140	243	257	54	87
3	1000	99.98	0.46	0.678	1.60	6.0	140	249	258	53	87
2	1005	103.56	0.42	0.648	1.50	6.0	140	249	260	53	88
2	1010	106.66	0.42	0.648	1.50	6.0	139	252	261	53	88
2	1015	109.91	0.42	0.648	1.50	6.0	139	248	257	54	88
1	1020	113.29	0.40	0.632	1.40	6.0	138	247	260	55	88
1	1025	116.64	0.40	0.632	1.40	6.0	137	246	258	56	89
1	1030	119.52	0.40	0.632	1.40	6.0	137	247	257	56	88
ENA	1035	122.645	-	-	-	-	-	-	-	-	-
58	1039	122.645	0.42	0.648	1.50	6.0	140	245	260	61	88
8	1044	125.86	0.42	0.648	1.50	6.0	140	244	255	52	88
8	1049	129.59	0.45	0.671	1.60	6.0	140	244	259	52	88
7	1054	132.94	0.49	0.700	1.70	7.0	140	247	259	52	88

-	-	-	-	-
Total Sampling Time	Total Meter Volume	Average ΔP	Average SQRT ΔP	Average ΔH
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

-
Avg Stack Temperature
(°F)

-
Avg Meter Temperature
(°F)

**Leak Checks**

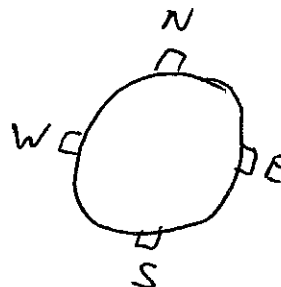
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.003 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train Final: 0.002 ft<sup>3</sup> @ 10.0 Hg for 1 minute

Observations: Kf: 3.49

O<sub>2</sub>: 0.504  
 CO<sub>2</sub>: 18.049

Operator Signature: [Signature]

**Sampling Schematic**



**Field Data Sheet**

Client: Citgo  
 Location: Sulfur LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (V): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LAPT-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.67 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 82 °F

Run No: 23/0010 R3  
 Date: 5/24/11  
 Personnel: Pilgrim/Walton

Exit Thermocouple ID: IMP-02

Nozzle ID: 1.265  
 Nozzle Size: 0.265 inches  
 Lot # Filter ID: 48356871

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
E7	1059	136.57	0.49	0.700	1.70	7.0	140	250	253	53	86
7	1104	139.72	0.49	0.700	1.70	7.0	140	247	264	53	87
6	1109	142.93	0.48	0.693	1.70	7.0	140	248	257	54	88
6	1114	146.41	0.48	0.693	1.70	7.0	140	248	249	48	87
6	1119	149.41	0.48	0.693	1.70	7.0	140	258	265	44	87
5	1124	153.71	0.54	0.735	1.90	7.0	140	254	247	42	87
5	1129	156.99	0.54	0.735	1.90	7.0	140	252	246	44	87
5	1134	160.72	0.51	0.714	1.80	7.0	140	254	243	45	87
4	1139	164.50	0.40	0.632	1.40	7.0	140	247	244	45	87
4	1144	167.67	0.40	0.632	1.40	7.0	140	244	247	46	87
4	1149	170.60	0.40	0.632	1.40	7.0	140	246	241	46	87
3	1154	173.78	0.37	0.608	1.30	7.0	140	243	243	47	86
3	1159	176.63	0.37	0.608	1.30	7.0	140	247	243	47	87
3	1204	179.70	0.37	0.608	1.30	7.0	140	245	242	48	87
2	1209	182.85	0.32	0.566	1.10	6.0	140	249	241	50	88
2	1214	185.41	0.32	0.566	1.10	6.0	140	251	241	51	88
2	1219	188.18	0.32	0.566	1.10	6.0	140	247	243	52	87
1	1224	191.35	0.28	0.529	0.98	6.0	140	251	244	52	87
1	1229	193.21	0.28	0.529	0.98	6.0	139	247	251	53	88
1	1234	196.18	0.27	0.520	0.94	5.0	139	249	253	53	88
END	1239	198.843	-	-	-	-	-	-	-	-	-

**240** **157.033** **0.439** **0.660** **1.544**  
 Total Sampling Time (min)    Total Meter Volume (ft<sup>3</sup>)    Average ΔP (in H<sub>2</sub>O)    Average SQRT ΔP (in H<sub>2</sub>O)    Average ΔH (in H<sub>2</sub>O)

**140**  
 Avg Stack Temperature (°F)

**86**  
 Avg Meter Temperature (°F)

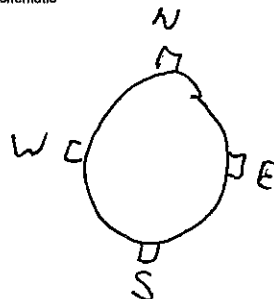
**Leak Checks**

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.002 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train Final: 0.002 ft<sup>3</sup> @ 10.0 Hg for 1 minute

Observations: KF: 3.94

Operator Signature: \_\_\_\_\_

**Sampling Schematic**



### TEST LAB DATA COLLECTION SHEET

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT WGS  
 Site Location: LCMC  
 Test Location: WGS  
 Sample Run No.: 0010/23 RUN 3  
 Sample Date: 5/23/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	—	348.1	1006.2	658.1
2	H <sub>2</sub> O	690.0	932.6	242.6
3	H <sub>2</sub> O	700.5	698.3	-2.2
4	—	620.8	624.6	3.8
5	SILICA	852.8	887.9	35.1
6				
7				
8				
Total				937.4

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---



***Appendix A6***  
***SW-846 Method 0061***

## Field Data Sheet

C-16

Client: Citgo  
 Location: Salt Lake, CA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pilot ID: LAPT-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.64 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 87 °F

Run No: 1 SW 846 0061  
 Date: 5/25/11  
 Personnel: Pilgrim/Haggins

Exit Thermocouple ID: IMP-04

Nozzle ID: .283  
 Nozzle Size: 0.283 inches  
 Filter ID: -

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
S8	1110	199.422	0.48	0.693	2.10	2.0	140	-	-	73	86
8	1115:30	203.58	0.48	0.693	2.05	2.0	140	-	-	66	86
7	1121	207.73	0.49	0.700	2.10	2.0	140	-	-	64	87
7	1126:30	212.00	0.49	0.700	2.10	2.0	140	-	-	64	87
6	1132	216.09	0.48	0.693	2.05	2.0	139	-	-	61	88
6	1137:30	220.26	0.47	0.686	2.00	2.0	139	-	-	60	89
S	1143	224.39	0.50	0.707	2.10	2.0	139	-	-	61	90
S	1148:30	227.62	0.50	0.707	2.10	2.0	139	-	-	62	90
4	1154	232.14	0.44	0.663	1.90	2.0	140	-	-	64	90
4	1159:30	236.92	0.44	0.663	1.90	2.0	140	-	-	64	91
7	1205	241.02	0.45	0.671	1.90	2.0	139	-	-	65	91
3	1210:30	244.62	0.45	0.671	1.90	2.0	140	-	-	65	91
2	1216	246.95	0.45	0.671	1.90	2.0	140	-	-	65	91
2	1221:30	252.94	0.45	0.671	1.90	2.0	139	-	-	63	91
1	1227	256.85	0.43	0.656	1.80	2.0	137	-	-	63	91
1	1232:30	260.80	0.43	0.656	1.80	2.0	138	-	-	65	91
END	1238	264.320	-	-	-	-	-	-	-	-	-
E8	1251	264.720	0.42	0.648	1.80	2.0	140	-	-	68	90
8	1256:30	268.67	0.46	0.678	1.95	2.0	140	-	-	59	89
7	1302	272.61	0.49	0.700	2.10	2.0	140	-	-	59	90
7	1307:30	276.44	0.49	0.700	2.10	2.0	140	-	-	60	90
6	1313	281.03	0.47	0.686	2.00	2.0	140	-	-	62	90
6	1318:30	285.16	0.47	0.686	2.00	2.0	140	-	-	63	90
S	1324	289.52	0.43	0.656	1.80	2.0	140	-	-	65	90
S	1329:30	294.21	0.43	0.656	1.80	2.0	140	-	-	66	91
4	1335	297.73	0.38	0.616	1.60	2.0	140	-	-	60	90
4	1340:30	300.85	0.38	0.616	1.60	2.0	140	-	-	60	90
3	1346	304.85	0.32	0.566	1.40	2.0	139	-	-	61	90
3	1351:30	308.29	0.32	0.566	1.40	2.0	140	-	-	62	90

-	-	-	-	-
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

-
Avg Stack Temperature (°F)

-
Avg Meter Temperature (°F)

## Leak Checks

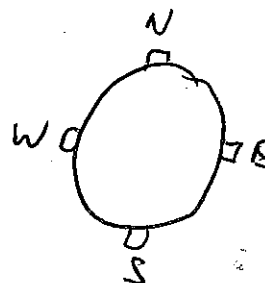
Pilot Impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train Initial: 0.008 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train Final: 0.007 ft<sup>3</sup> @ 8.0 Hg for 1 minute

Observations: Kf: 4.27<sup>10</sup> 4.43<sup>10</sup> 4.32<sup>10</sup> 4.04<sup>10</sup>  
4.26

O<sub>2</sub>: 0.579 CO<sub>2</sub>: 17.920

Operator Signature: [Signature]

## Sampling Schematic





### TEST LAB DATA COLLECTION SHEET

Project Name: CFT60 ICR  
 Project No.: 142733  
 Source ID: B-CAT WGS  
 Site Location: B-CAT LCMC  
 Test Location: Stack  
 Sample Run No.: SW 846 0061 - 1  
 Sample Date: 5/25/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1M KOH	506.5	507.0	0.5
2	W/O 0.1M KOH	440.6	529.8	89.1
3	0.1M KOH	415.4	523.1	107.7
4	TOP	337.6	557.7	215.1
5	SILICA	894.0	1146.8	252.8
6				
7				
8				
Total				665.2

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

KOH - E2411

# Field Data Sheet

Client: Citgo  
 Location: Sulphur, LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA PT-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.6 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 86 °F

Run No: 2 SW 846 0061  
 Date: 5/25/11  
 Personnel: H. Wallen / S. Vincent

Exit Thermocouple ID: IMP-04

Nozzle ID: 283  
 Nozzle Size: 0.283 inches  
 Filter ID: -

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
E8	1606	326.075	.41	.640	1.95	2.0	140	-	-	67	87
8	1611:30	323.824	.41	.640	1.95	2.0	140	-	-	59	86
7	1617	334.101	.44	.663	2.08	2.0	140	-	-	61	87
7	1622:30	338.707	.44	.663	2.08	2.0	139	-	-	65	87
6	1628	342.728	.47	.686	2.20	2.0	140	-	-	67	88
6	1633:30	347.209	.47	.686	2.20	2.0	140	-	-	71	88
5	1639	351.615	.45	.671	2.15	2.0	143	-	-	71	89
5	1644:30	355.182	.44	.663	2.08	2.0	139	-	-	72	89
4	1650	358.797	.26	.500	1.20	2.0	140	-	-	74	90
4	1655:30	363.517	.25	.500	1.20	2.0	140	-	-	75	89
3	1701	366.224	.26	.510	1.25	2.0	139	-	-	74	89
3	1706:30	369.880	.26	.510	1.25	2.0	139	-	-	73	90
2	1712	373.721	.24	.490	1.15	2.0	140	-	-	74	90
2	1717:30	376.700	.24	.490	1.15	2.0	140	-	-	74	90
1	1723	380.886	.23	.480	1.10	2.0	140	-	-	75	90
1	1728:30	383.074	.24	.490	1.15	2.0	140	-	-	76	90
PC	1734	386.246	-	-	-	-	-	-	-	-	-
S 8	1747	386.246	.44	.663	2.10	2.0	140	-	-	75	89
8	1752:30	390.161	.44	.663	2.10	2.0	140	-	-	57	88
7	1758	394.746	.47	.686	2.20	2.0	140	-	-	58	88
7	1803:30	399.128	.48	.693	2.25	2.0	140	-	-	58	90
6	1809	403.498	.48	.693	2.25	2.0	140	-	-	58	89
6	1814:30	407.791	.42	.648	2.00	2.0	140	-	-	58	89
5	1820	412.468	.47	.686	2.00	2.0	140	-	-	60	89
5	1825:30	416.676	.42	.648	1.90	2.0	140	-	-	60	89
4	1831	420.723	.41	.640	1.75	2.0	140	-	-	61	90
4	1836:30	424.658	.41	.640	1.75	2.0	140	-	-	62	90
3	1842	428.542	.45	.671	1.90	2.0	140	-	-	62	90
3	1847:30	432.655	.45	.671	1.90	2.0	140	-	-	63	90

-	-	-	-	-
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

-
Avg Stack Temperature (°F)

-
Avg Meter Temperature (°F)

## Leak Checks

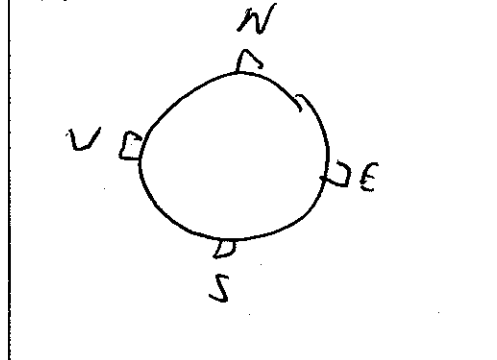
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.006 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train Final: 0.000 ft<sup>3</sup> @ 15.0 Hg for 1 minute

## Observations:

4.26 HW  
4.73 HW  
K = 4.26 O<sub>2</sub>: 0.666  
 CO<sub>2</sub>: 18.067

Operator Signature: H. Wallen

## Sampling Schematic



### Field Data Sheet

Client: Citgo  
Location: Sulphur, LA  
Unit: B-Cat  
Source: Wet Gas Scrubber  
Project No: 142733

Meter Box ID: LA-1403  
 $\Delta H$  std: 2.069 in H<sub>2</sub>O  
DGM (Y): 1.003

Stack Diameter: 96.23 inches  
Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
Thermocouple ID: LA-10' MS-01  
Pilot ID: LA-PT 01  
C<sub>p</sub>: = 340

Barometric Pressure ( $P_{\text{bar}}$ ): 29.6 in Hg  
Static Pressure ( $P_g$ ): 0.36 in H<sub>2</sub>O  
Ambient Temperature: 86 °F

Run No: 2 SW 846 0061  
Date: 5/25/11  
Personnel: H. Watten / S. Vincent

Exit Thermocouple ID: IMP-04

Nozzle ID: 283  
Nozzle Size: 0.283 inches  
Filter ID: —

[illegible]

176	127.57	3975	.626	1.82
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

140  
Avg Stack  
Temperature  
(°F)

89.03  
Avg Meter  
Temperature  
(°F)

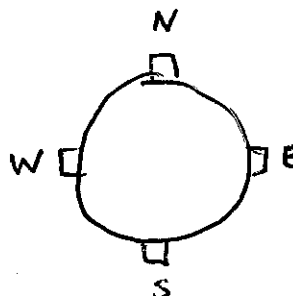
### Leak Checks

Pilot Impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.006 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
Train Final: 0.006 ft<sup>3</sup> @ 15.0 Hg for 1 minute

Observations:  $K = 4, 260$

Operator Signature: \_\_\_\_\_

### Sampling Schematic



# TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID B-CAT WGS  
 Site Location B-CAT LCMC  
 Test Location Stack  
 Sample Run No.: SW8460061-2  
 Sample Date: 5/25/11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1M KOH	485.9	475.5	-10.4
2	0.1M KOH	421.0	449.4	28.4
3	0.1M KOH	426.8	487.8	61.0
4		330.3	497.5	267.2
5	SILICA	843.0	884.7	41.7
6		328.1	629.3	301.2
7			41.8-26-11	
8				
Total				735.1

Added another empty due to high moisture

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

KOH E2411

Field Data Sheet

Client: CITGO  
 Location: Sulphur, LA  
 Unit: B-1 Cat  
 Source: Scrubber  
 Project No: 142733

Meter Box ID: LA-A63 2.069  
 ΔH sid: 12.676 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.25 ft<sup>2</sup>

Probe ID: LA-PT10 LA-10' MS01  
 Thermocouple ID: LA-10' MS01  
 Pitot ID: LA-PT10  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.67 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 52.0 °F

Run No: Run 3 50846-0061

Date: 05-26-2011

Personnel: S. Vincent

Exit Thermocouple ID: LA-TMP-24

Nozzle ID: 0.256

Nozzle Size: 0.256 inches

Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
Start	0645	453.89	—	—	—	—	—	—	—	—	—
8	0850.5	457.893	0.42	0.648	1.92	1.0	146	—	—	69	84
8	0856	461.423	0.42	0.648	1.92	1.0	146	—	—	59	84
7	0901.5	465.423	0.44	0.663	2.02	1.0	146	—	—	55	85
7	0907	468.603	0.44	0.663	2.02	1.0	146	—	—	53	85
6	0912.5	472.159	0.45	0.663	2.01	1.0	142	—	—	59	89
6	0918	476.492	0.45	0.663	2.01	1.0	142	—	—	57	90
5	0923.5	480.877	0.42	0.648	1.95	1.0	146	—	—	56	91
5	0929	484.519	0.42	0.648	1.95	1.0	140	—	—	56	92
4	0934.5	488.764	0.39	0.624	1.87	1.0	139	—	—	56	93
4	0940	492.696	0.39	0.624	1.87	1.0	139	—	—	56	93
3	0945.5	496.414	0.43	0.656	2.0	1.0	139	—	—	57	94
3	0951	500.466	0.43	0.656	2.0	1.0	139	—	—	56	95
2	0956.5	504.614	0.42	0.656	1.96	1.0	138	—	—	58	96
2	1002	508.374	0.42	0.656	1.96	1.0	139	—	—	59	96
1	1007.5	512.352	0.36	0.600	1.67	1.0	139	—	—	59	97
1	1013	515.869	0.36	0.600	1.67	1.0	139	—	—	59	98
End	—	515.869	—	—	—	—	—	—	—	—	—
Start	1030	515.869	—	—	—	—	—	—	—	—	—
8	1035.5	519.871	0.45	0.67	2.10	1.0	139	—	—	55	97
8	1041	523.768	0.45	0.67	2.10	1.0	139	—	—	54	97
7	1046.5	527.677	0.45	0.67	2.10	1.0	139	—	—	55	97
7	1052	531.591	0.45	0.67	2.10	1.5	139	—	—	56	98
6	1057.5	535.504	0.45	0.67	2.10	1.5	135	—	—	57	99
6	1103	539.418	0.45	0.67	2.10	1.5	139	—	—	58	99
5	1108.5	543.332	0.45	0.67	2.10	1.5	135	—	—	58	99
5	1114	547.246	0.28	0.53	1.32	1.5	139	—	—	59	100
4	1119.5	551.160	0.28	0.53	1.32	1.5	139	—	—	59	99
4	1125	555.074	0.28	0.53	1.32	1.0	139	—	—	61	100

—	—	—	—	—
Total Sampling Time	Total Meter Volume	Average ΔP	Average SQRT ΔP	Average ΔH
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

—
Avg Stack Temperature
(°F)

—
Avg Meter Temperature
(°F)

Leak Checks

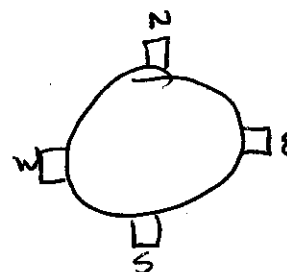
Pitot impact: 6000 @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: 6000 @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute  
 Train final: 0.01 ft<sup>3</sup> @ 6 Hg for 1 minute

Observations: K. Factor 4.44

O<sub>2</sub>: 0.674  
 CO<sub>2</sub>: 17.978

Operator Signature: [Signature]

Sampling Schematic







### Field Data Sheet

Client: CIT 60  
Location: Sulphur, LA  
Unit: B-Cat  
Source: Seawater  
Project No: 142733

Run No: Run 3  
Date: 05-26-2004  
Personnel: Swincer +

Meter Box ID: LA-403  
 $\Delta H$  std: 2.069 in  $H_2O$   
DGM (Y): 1.003  
  
Probe ID: LA-40' MS-01  
thermocouple ID: LA-10' MS-01  
Pilot ID: LA-PT10  
 $C_p$ : 0.840  
  
thermocouple ID: LA-Imp-06

Slack Diameter: 96.25 inches  
Slack Area: 50.25 ft<sup>2</sup>

Barometric Pressure ( $P_{\text{bar}}$ ): 29.67 in Hg  
Static Pressure ( $P_g$ ): 0.36 in H<sub>2</sub>O  
Ambient Temperature: 82.0 °F

Nozzle ID: 0.286  
Nozzle Size: 0.286 inches  
Filter ID:           

[illegible]

1.76	119.47	0.337	0.63	1.73
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

139.34  
Avg Stack  
Temperature  
(°F)

92.156  
~~92.125~~ 5kV  
Avg Meter  
Temperature  
(°F)

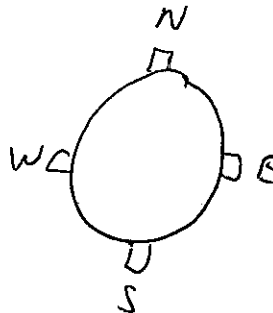
### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute  
Train Final: 0.00 ft<sup>3</sup> @ 6 Hg for 1 minute

Observations:

Operator Signature

### Sampling Schematic



# TEST LAB DATA COLLECTION SHEET

Project Name CTGO ICR  
 Project No.: 142733  
 Source ID R-CAT WGS  
 Site Location R-CAT LCMC  
 Test Location STACK  
 Sample Run No.: SW 846 0061-3  
 Sample Date: 5-26-11

## CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1N KOH	489.7	483.4	-6.305A
2	0.1N KOH	442.7	519.3	76.6
3	0.1N KOH	395.2	518.2	123.0
4	EMPTY	338.2	539.1	300.9
5	EMPTY	351.5	522.6	171.1
6	SILICA GEL	932.9	994.1	61.2
7				
8				
Total				726.5

## PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

## TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

## VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

## QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

***Appendix A7***  
***ASTM D6784-02 (Hg)***

**Field Data Sheet**

Hg

Client: Citgo  
Location: LCMC  
Unit: B-Cat  
Source: Scrubber  
Project No: 142733

Meter Box ID: LA-A02  
ΔH std: 1.960 in H<sub>2</sub>O  
DGM (V): 0.996  
Probe ID: LA-10MS-02  
Thermocouple ID: LA-10MS-02  
Pilot ID: LA-10MS-02  
C<sub>p</sub>: 0.84

Stack Diameter: 96.25 inches  
Stack Area: 50.53 ft<sup>2</sup>  
Barometric Pressure (P<sub>bar</sub>): 29.64 in Hg  
Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
Ambient Temperature: 86 °F

Run No: ASTM D6754-21  
Date: 5-25-11  
Personnel: KC

Exit Thermocouple ID: LA-DNP-06

Nozzle ID: 0.282  
Nozzle Size: 0.282 inches  
Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	11:10	216.625	0.29	0.54	1.2	3	140	252	252	79	89
1	11:15.5	219.8	0.29	0.54	1.2	3	140	248	251	77	89
2	11:20.5	222.8	0.31	0.56	1.28	3	140	248	249	76	90
2	11:26.5	225.8	0.31	0.56	1.28	3	140	248	248	78	91
2	11:32.5	228.6	0.31	0.56	1.28	3	141	248	248	79	91
3	11:37.5	231.9	0.31	0.56	1.28	3	143	247	248	79	93
4	11:43	235.2	0.28	0.53	1.17	3	147	247	249	79	93
4	11:46.5	238.3	0.28	0.53	1.17	3	146	247	249	78	93
5	11:54	241.5	0.28	0.53	1.17	3	146	246	247	79	93
5	11:59.5	244.2	0.47	0.69	1.94	4	146	246	247	65	88
6	12:05	247.7	0.47	0.69	1.94	4	146	246	245	63	87
6	12:10.5	253.2	0.47	0.69	1.94	4	146	247	242	64	88
7	12:16	257.3	0.47	0.69	1.94	4	146	248	245	65	88
7	12:21.5	261.0	0.47	0.69	1.94	4	146	249	252	67	88
8	12:27	265.4	0.45	0.67	1.85	4	146	247	251	68	88
8	12:32.5	269.0	0.45	0.67	1.85	4	146	246	252	70	88
PC	12:38	273.356	—	—	—	—	—	—	—	—	—
START	12:51	273.356	0.33	0.57	1.38	3.5	146	300	296	79	93
1	12:56.5	276.1	0.33	0.57	1.38	3.5	140	295	284	78	93
2	13:02	279.9	0.41	0.64	1.71	4	140	286	285	80	93
2	13:07.5	283.2	0.41	0.64	1.71	4	140	283	282	81	93
3	13:13	287.3	0.41	0.64	1.71	4	140	276	277	85	94
3	13:18.5	291.3	0.41	0.64	1.71	4	140	260	291	84	93
4	13:24	295.3	0.39	0.62	1.63	4	143	271	291	84	93
4	13:29.5	299.1	0.41	0.64	1.71	4	145	273	283	75	94
5	13:35	302.9	0.38	0.62	1.57	4	147	274	290	72	94
5	13:40.5	306.6	0.38	0.62	1.57	4	147	275	288	70	95
6	13:46	310.2	0.44	0.66	1.84	4	147	272	289	71	94
6	13:51.5	314.1	0.44	0.66	1.84	4	147	270	291	73	95

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)

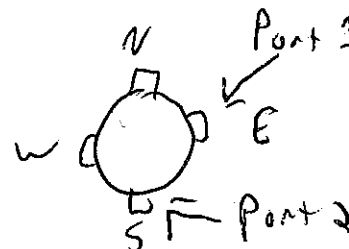
**Leak Checks**

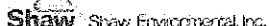
Pilot impact: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
Pilot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute  
Train Final: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute

Observations: KF = 3.98 3.96  
3.54 4.65  
O<sub>2</sub>: 0.579 CO<sub>2</sub>: 17.920

Operator Signature: V. AG

**Sampling Schematic**





Meter Box ID: LA-A02  
 ΔH std: 1.860 in H<sub>2</sub>O  
 DGM (Y): 0.146

Client: Citigroup  
Location: LCMC  
Unit: B-Cat  
Source: Scrubber  
Project No: 142733

Run No: AS1A06784-2 1  
Date: 5-25-11  
Personnel: KLC

Slack Diameter: 96.25 inches

Slack Area: 50.53 ft<sup>2</sup>

Barometric Pressure ( $P_{\text{bar}}$ ): 29.64 in Hg

Static Pressure ( $P_g$ ): 0.36 in H<sub>2</sub>O

Ambient Temperature: 86 °F

Nozzle ID: 0.282

Nozzle Size: 0.282 inches

Filter ID: —

[illegible]

176	118.04	0.39	0.62	1.62
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

144  
Avg Slack  
Temperature  
(°F)

41.81  
Avg Meter  
Temperature  
(°F)

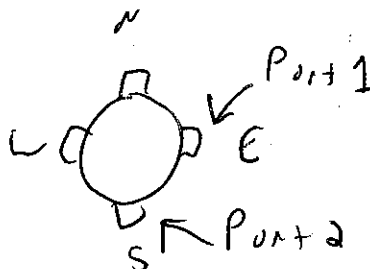
## Leak Checks

Pilot impact: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 5.7 Hg for 1 minute

**Observations:**

Operator Signature: \_\_\_\_\_

### Sampling Schematic



**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR B-CAT  
 Project No.: 142733  
 Source ID: WGS  
 Site Location: LCMC  
 Test Location: Stack  
 Sample Run No.: ASTM D6784-02 - RUN 1  
 Sample Date: 5/25/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1 N KCl	732.3	904.8	172.6
2	0.1 N KCl	722.1	916.5	194.4
3	0.1 N KCl	726.9	870.8	143.9
4	—	613.1	747.1	134.0
5	5% HNO <sub>3</sub> / 10% H <sub>2</sub> O <sub>2</sub>	725.6	725.6	0.0
6	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	695.0	696.4	1.4
7	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	708.2	708.2	0.0
8	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	697.3	696.9	-0.4
Total	SILICA	870.2	902.2	52.0
		850.2		697.9

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:  
 0.1 N KCl E2411  
 5% HNO<sub>3</sub> / 10% H<sub>2</sub>O<sub>2</sub> E2411  
 10% H<sub>2</sub>SO<sub>4</sub> / 4% KMnO<sub>4</sub> E2411

# Field Data Sheet

Client: Citgo  
 Location: LCMC  
 Unit: B-Cat  
 Source: Scrubber  
 Project No: VH2733  
 Run No: ASIM06704-2 2  
 Date: 5-25-11  
 Personnel: VLC

Meter Box ID: LA-A2  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996  
 Probe ID: 105270  
 Thermocouple ID: 105270  
 Pitot ID: 105270  
 C<sub>p</sub>: 0.64  
 Exit Thermocouple ID: LA-3AP-02

Stack Diameter: 9625 inches  
 Stack Area: 50.53 ft<sup>2</sup>  
 Barometric Pressure (P<sub>bar</sub>): 29.60 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 86 °F  
 Nozzle ID: 0.282  
 Nozzle Size: 0.282 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SORT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	16:06	355.047	0.39	0.62	1.60	3	140	252	248	64	90
1	16:11.5	338.8	0.39	0.62	1.60	3	140	251	248	63	90
2	16:17	342.4	0.39	0.62	1.60	3	143	253	247	61	90
2	16:22.5	345.7	0.39	0.62	1.60	3	143	252	252	71	90
3	16:28	349.7	0.41	0.64	1.68	3	143	253	250	75	91
3	16:33.5	353.5	0.41	0.64	1.68	4	144	246	266	76	91
4	16:39	357.3	0.36	0.60	1.48	3	143	248	265	76	92
4	16:44.5	360.8	0.36	0.60	1.48	3	143	247	274	77	92
5	16:50	364.0	0.36	0.60	1.48	3	143	253	267	76	92
5	16:55.5	367.2	0.38	0.62	1.57	3	143	244	272	77	93
6	17:06	370.9	0.42	0.65	1.73	3.5	143	252	265	73	93
6	17:06.5	374.7	0.42	0.65	1.73	3.5	144	252	264	74	94
7	17:12	379.3	0.41	0.64	1.69	3.5	144	253	269	75	94
7	17:17.5	383.1	0.41	0.64	1.69	3.5	143	258	273	77	94
8	17:23	386.9	0.40	0.63	1.65	3.5	143	249	270	77	94
8	17:28.5	390.8	0.40	0.63	1.65	3.5	144	249	273	76	94
PC	17:39	394.964	—	—	—	—	—	—	—	—	—
START	17:47	394.964	0.20	0.44	0.82	2.5	143	252	256	62	93
1	17:52.5	397.6	0.20	0.44	0.82	2.5	143	251	257	57	92
2	17:58	400.2	0.21	0.46	0.87	2.5	143	252	258	55	92
2	18:03.5	402.9	0.21	0.46	0.87	2.5	143	252	257	55	92
3	18:09	405.7	0.21	0.46	0.87	2.5	143	251	243	56	91
3	18:14.5	408.4	0.21	0.46	0.87	2.5	144	251	243	58	92
4	18:20	411.2	0.22	0.47	0.91	3	143	250	245	60	92
4	18:25.5	413.9	0.23	0.49	0.95	3	143	251	245	62	92
5	18:31	416.9	0.42	0.65	1.73	4	143	252	244	65	92
5	18:36.5	420.7	0.42	0.65	1.73	4	143	251	241	67	92
6	18:41	424.5	0.44	0.66	1.81	4	143	252	246	70	92
6	18:47.5	428.5	0.44	0.66	1.81	4	144	248	243	73	93

—	—	—	—	—
Total Sampling Time	Total Meter Volume	Average ΔP	Average SORT ΔP	Average ΔH
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

—
Avg Stack Temperature
(°F)

—
Avg Meter Temperature
(°F)

## Leak Checks

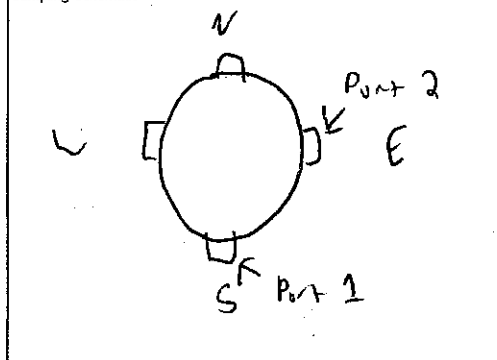
Pilot impact: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 5.2 Hg for 1 minute

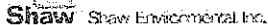
## Observations:

KF = 3.94  
O<sub>2</sub>: 0.666  
CO<sub>2</sub>: 18.067

Operator Signature: KAC

## Sampling Schematic





Meter Box ID: LA-A02  
 $\Delta H$  std: 1.960 in  $H_2O$   
DGM (°): 0.996  
Probe ID: 105270  
thermocouple ID: 105270  
Pilot ID: 105270  
 $C_p$ : 0.84  
thermocouple ID: LA-Tmp.02

Client: Citgo  
Location: LCM2  
Unit: B-Cat  
Source: Scrubber  
Project No: 142733

Run No: ASIND676422  
Date: 5-25-11  
Personnel: HC

Slack Diameter: 9625 inches  
Slack Area: 50.53 ft<sup>2</sup>

Barometric Pressure ( $P_{bar}$ ): 29.60 in Hg  
Static Pressure ( $P_g$ ): 0.36 in H<sub>2</sub>O  
Ambient Temperature: 86 °F

Nozzle ID: 0.262  
Nozzle Size: 0.282 inches  
Filter ID: —

[illegible]

176	113.252	0.36	0.60	1.42
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

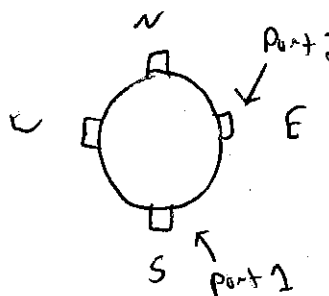
143.19  
Avg Stack  
Temperature  
(°F)

92.19  
Avg Meter  
Temperature  
(°F)

Pitot impact: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute  
Train Final: 0 ft<sup>3</sup> @ 5.3 Hg for 1 minute

Observations:

Operator Signature:





**TEST LAB DATA COLLECTION SHEET**

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: WGS  
 Site Location: B-CAT LCMC  
 Test Location: Stack  
 Sample Run No.: ASTM D1678-02 (Ontario Hydro) RUN 2  
 Sample Date: 5/25/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1 N KCl	706.9	947.3	240.4
2	0.1 N KCl	710.4	976.9	266.5
3	0.1 N KCl	688.9	808.9	120.0
4	—	608.5	611.6	3.1
5	5% HNO <sub>3</sub> / 10% H <sub>2</sub> O <sub>2</sub>	706.8	707.1	0.3
6	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	705.3	706.5	1.2
7	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	712.2	712.9	0.7
8	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	701.9	703.1	1.2
Total	SILICA	853.0	879.4	26.4

659.8

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

**Comments:**

0.1 N KCl E2411  
 5% HNO<sub>3</sub> / 10% H<sub>2</sub>O<sub>2</sub> E2411  
 10% H<sub>2</sub>SO<sub>4</sub> / 4% KMnO<sub>4</sub> E2411

**Field Data Sheet**

Client: C460  
 Location: LCME  
 Unit: B-Cat  
 Source: Scrubber  
 Project No: 142733  
 Run No: AST-DC764-023  
 Date: 5-26-11  
 Personnel: KC

Meter Box ID: LA-AV2  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996  
 Probe ID: 1105270  
 Thermocouple ID: 1105270  
 Pitot ID: 1105270  
 C<sub>p</sub>: 0.64  
 Exit Thermocouple ID: LA-TMP-06

Stack Diameter: 96.25 inches  
 Stack Area: 5253 ft<sup>2</sup>  
 Barometric Pressure (P<sub>bar</sub>): 29.67 in Hg  
 Static Pressure (P<sub>g</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 82 °F  
 Nozzle ID: 0.282  
 Nozzle Size: 0.282 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	08:45	448.816	0.28	0.53	1.14	3	143	246	242	65	81
1	08:52.5	452.0	0.28	0.53	1.14	3	143	246	242	65	82
2	08:56	455.1	0.28	0.53	1.14	3	143	247	243	65	83
2	09:01.5	458.3	0.28	0.53	1.14	3	143	247	252	66	84
3	09:07	461.4	0.28	0.53	1.14	3	143	245	251	67	86
3	09:12.5	464.5	0.28	0.53	1.14	3	145	243	253	70	88
4	09:18	467.6	0.40	0.63	1.65	3	145	242	253	72	89
4	09:23.5	471.3	0.40	0.63	1.65	3	144	241	251	75	89
5	09:29	475.1	0.47	0.69	1.95	4	143	242	250	75	91
5	09:34.5	479.1	0.47	0.69	1.95	4	143	245	250	79	92
6	09:40	483.2	0.47	0.69	1.95	4	143	247	261	78	92
6	09:45.5	487.2	0.47	0.69	1.95	4	143	245	259	66	92
7	09:51	491.3	0.47	0.69	1.95	4	143	248	261	63	93
7	09:56.5	495.3	0.47	0.69	1.95	4	143	245	258	59	94
8	10:02	499.4	0.42	0.65	1.76	4	142	246	261	59	95
8	10:07.5	503.3	0.42	0.65	1.76	4	143	247	264	59	96
PC	10:13	507.45	—	—	—	—	—	—	—	—	—
START	10:13	507.45	0.41	0.64	1.71	4	143	267	261	64	95
1	10:25.5	511.0	0.41	0.64	1.71	4	143	246	291	60	95
2	10:41	514.9	0.46	0.68	1.92	4	144	290	291	62	96
2	10:46.5	518.4	0.46	0.68	1.92	4	144	287	291	64	97
3	10:52	522.9	0.46	0.68	1.92	4.5	144	287	291	68	97
3	10:57.5	527.0	0.46	0.68	1.92	4.5	143	280	284	69	99
4	11:03	531.0	0.46	0.68	1.92	4.5	143	269	286	71	99
4	11:08.5	535.1	0.46	0.68	1.92	4.5	142	259	286	73	97
5	11:14	539.1	0.41	0.64	1.73	4.5	143	257	286	76	99
5	11:19.5	543.1	0.41	0.64	1.73	4.5	143	264	287	74	100
6	11:25.5	546.9	0.46	0.68	1.94	5	142	252	287	70	100
6	11:30.5	551.6	0.46	0.68	1.94	5	143	244	285	70	101

—	—	—	—	—	—	—
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)

**Leak Checks**

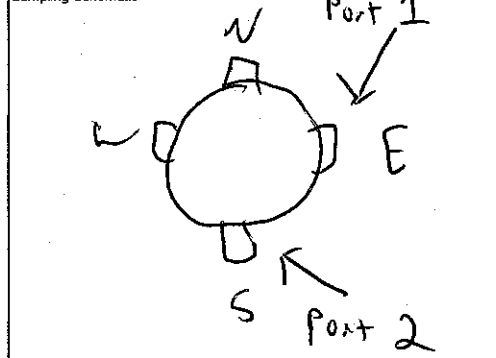
Pitot impad: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: ✓ @ 3" H<sub>2</sub>O for 15 seconds  
 Train Initial: 0 ft<sup>3</sup> @ 0 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 0 Hg for 1 minute

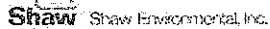
**Observations:**

KF=3.98  
O<sub>2</sub>: 0.674  
CO<sub>2</sub>: 17.978

Operator Signature: KAC

**Sampling Schematic**





Meter Box ID: LA-A02  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996  
 Probe ID: 1105270  
 Thermocouple ID: 1105270  
 Pitot ID: 1105270  
 C<sub>p</sub>: 0.84

Run No: ASPM 06784-03  
Date: 5-26-11  
Personnel: V.C.

Barometric Pressure ( $P_{\text{bar}}$ ): 29.47 in Hg  
Static Pressure ( $P_g$ ): 6.36 in H<sub>2</sub>O  
Ambient Temperature: 82 °F

Nozzle ID: 0.282  
Nozzle Size: 0.282 inches  
Filter ID: —

176	121.43	0.41	0.64	1.71
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQR T $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

143.16  
Avg Stack  
Temperature  
(°F)

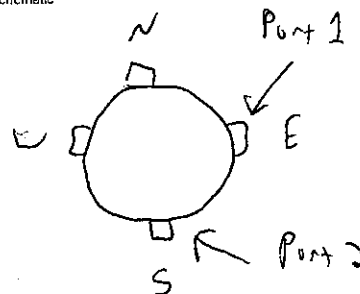
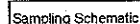
94.03  
Avg Meter  
Temperature  
(°F)

### Leak Checks

Pitot impact: V @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: V @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 5 R<sup>3</sup> @ 5 Hg for 1 minute  
Train Final: 0 R<sup>3</sup> @ 8 Hg for 1 minute

Observations:

Operator Signature: \_\_\_\_\_



**TEST LAB DATA COLLECTION SHEET**

Project Name CITGO ICR  
 Project No.: 142733  
 Source ID WGS  
 Site Location B-CAT LCMC  
 Test Location stack  
 Sample Run No.: RUN 3 (Hg)  
 Sample Date: 5/25/11 & 5/26/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1N KCl	729.4734.2	947.3	2094
2	0.1N KCl	709.2722.1	976.9	204
3	0.1N KCl	685.7	901.8	216.1
4	—	616.1	666.2	50.1
5	5% HNO <sub>3</sub> / 10% H <sub>2</sub> O <sub>2</sub>	733.3	739.7	6.4
6	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	706.1	708.1	2
7	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	717.6	718.7	1.1
8	10% H <sub>2</sub> SO <sub>4</sub> / 4% KMnO <sub>4</sub>	711.7	715.3	3.6
Total	SILICA	850.8	877.3	26.5

943.6  
926.1

714.2

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

***Appendix A8***  
***U.S. EPA Method 5B/202 and ASTM D5907***

**Field Data Sheet**

Client: C.H. Co.  
 Location: LCNC  
 Unit: B-CAT  
 Source: Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Barometric Pressure (P<sub>bar</sub>): 29.60 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 45 °F

Run No: SB 202 PM-1  
 Date: 5-26-11  
 Personnel: KLC

Probe ID: LA-MS-10-02  
 Thermocouple ID: LA-MS-10-04  
 Pitot ID: LA-MS-10-02  
 Cp: 0.64

Nozzle ID: 0.283  
 Nozzle Size: 0.283 inches  
 Filter ID: 3630

Exit Thermocouple ID: LA-TP-06

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	16:15	574.4	0.45	0.67	1.85	2	140	315	304	54	95
2	16:22.5	580.0	0.45	0.67	1.65	2	140	315	304	54	95
3	16:30	584.7	0.49	0.70	2.02	2	140	313	299	50	95
4	16:35.5	591.6	0.49	0.70	2.02	2	138	296	296	57	96
5	16:41.5	596.6	0.48	0.63	1.65	2	140	317	324	59	97
6	16:52.5	599.6	0.40	0.63	1.65	2	140	322	324	51	98
7	17:00	606.9	0.27	0.52	1.12	2	140	327	327	61	99
8	17:07.5	611.2	0.24	0.49	1.00	2	140	325	346	62	100
PC	17:15	615.329	—	—	—	—	—	—	—	—	—
START	17:44	615.329	0.45	0.69	1.99	2	140	346	351	74	98
2	17:56.5	620.7	0.48	0.69	1.99	2	140	347	352	57	98
3	18:04	626.4	0.48	0.69	1.99	2	140	338	335	61	99
4	18:11.5	632.0	0.45	0.67	1.87	2	140	322	350	62	99
5	18:19	637.5	0.38	0.62	1.58	2	138	327	351	64	100
6	18:26.5	642.6	0.44	0.66	1.84	2	138	334	352	68	101
7	18:34	648.1	0.44	0.66	1.84	2	140	332	354	68	102
8	18:41.5	653.7	0.44	0.66	1.84	2	139	328	352	68	103
END	18:49	659.123	—	—	—	—	—	—	—	—	—

120 84.23 0.42 0.65 1.76  
 Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

139.56  
 Avg Stack Temperature (°F)

98.44  
 Avg Meter Temperature (°F)

**Leak Checks**

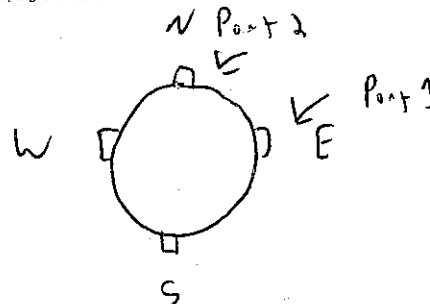
Pitot impact: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 5 Hg for 1 minute  
 Train final: 0 ft<sup>3</sup> @ 5 Hg for 1 minute

**Observations:**

O<sub>2</sub>: 0.503  
 CO<sub>2</sub>: 18.452

Operator Signature: KLC

**Sampling Schematic**



### TEST LAB DATA COLLECTION SHEET

Project Name: CGO ICR  
 Project No.: 142733  
 Source ID: B-CAWGS  
 Site Location: LCMG  
 Test Location: Stack  
 Sample Run No.: RM 207 - 1  
 Sample Date: 5/26/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	357.3	741.0	383.7
2	EMPTY	408.0	627.9	19.9
3	H <sub>2</sub> O	740.3	779.5	171.5
4	Silica	843.4	864.9	21.5
5				
6				
7				
8				
Total				596.6

- w/o neck

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

### Field Data Sheet

Client: Citgo  
 Location: Sulfur, LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: 1105270  
 C<sub>p</sub>: 0.848

Barometric Pressure (P<sub>bar</sub>): 29.69 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 86 °F

Run No: 2 PM  
 Date: 5/27/11  
 Personnel: D. Igrim / Huggins

Exit Thermocouple ID: JMP-04

Nozzle ID: 1253  
 Nozzle Size: 0.283 inches  
 Filter ID: 3629

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SORT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures					Filter OK
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	
F1	1042	659.54	0.28	0.529	1.10	2.0	139	323	334	63	89	80
1	1048	662.11	0.28	0.529	1.10	2.0	139	327	336	63	89	78
2	1050	665.18	0.30	0.548	1.20	2.0	139	329	337	63	89	78
2	1054	666.67	0.30	0.548	1.20	2.0	140	328	341	61	90	77
3	1058	668.45	0.33	0.574	1.30	2.0	139	340	340	61	90	77
3	1102	671.21	0.33	0.574	1.30	2.0	139	344	340	61	91	75
4	1106	674.33	0.45	0.671	1.75	2.0	139	341	339	61	92	75
4	1110	676.51	0.45	0.671	1.75	2.0	139	338	348	61	93	76
5	1114	680.41	0.47	0.686	1.85	2.0	139	334	340	60	93	75
5	1118	683.01	0.47	0.686	1.85	2.0	139	337	340	59	94	77
6	1122	685.53	0.51	0.714	2.00	2.0	139	336	340	56	94	79
6	1126	687.53	0.51	0.714	2.00	2.0	139	337	348	56	94	79
7	1130	691.21	0.50	0.707	2.00	2.0	139	340	344	56	94	78
7	1134	693.78	0.50	0.707	2.00	2.0	139	342	342	55	94	78
8	1138	697.80	0.48	0.693	1.90	2.0	139	338	344	55	94	78
8	1142	699.54	0.48	0.693	1.90	2.0	139	339	340	55	94	78
END	1146	702.58	-	-	-	-	-	-	-	-	-	-
N4	1202	702.58	0.44	0.663	1.70	2.0	140	340	342	64	94	80
1	1206	706.11	0.44	0.663	1.70	2.0	139	344	341	59	94	76
2	1210	708.63	0.49	0.700	1.90	2.0	139	340	338	60	94	75
2	1214	711.94	0.49	0.700	1.90	2.0	140	337	335	61	94	76
3	1218	714.56	0.51	0.714	2.00	2.0	140	338	333	62	94	77
3	1222	716.82	0.51	0.714	2.00	2.0	140	331	331	63	94	77
4	1226	719.90	0.40	0.632	1.55	2.0	140	330	328	64	94	78
4	1230	722.24	0.40	0.632	1.55	2.0	140	329	328	64	94	78
5	1234	725.89	0.40	0.632	1.55	2.0	140	328	328	65	94	79
5	1238	728.40	0.40	0.632	1.55	2.0	140	327	331	63	94	79
6	1242	731.37	0.43	0.656	1.70	2.0	140	322	330	65	94	80
6	1246	734.51	0.43	0.656	1.70	2.0	140	325	329	65	94	81

Total Sampling Time	Total Meter Volume	Average ΔP	Average SORT ΔP	Average ΔH
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)
-	-	-	-	-

Avg Stack Temperature	Avg Meter Temperature
(°F)	(°F)
-	-

#### Leak Checks

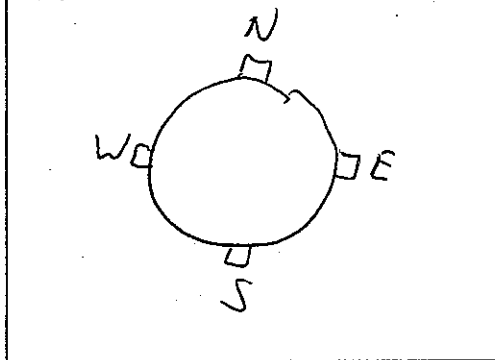
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.004 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train final: 0.003 ft<sup>3</sup> @ 6.0 Hg for 1 minute

Observations: AF: 3.92

O<sub>2</sub>: 19.804 0.658  
 CO<sub>2</sub>: 17.064 18.191

Operator Signature: [Signature]

#### Sampling Schematic









Shaw Environmental, Inc.

### TEST LAB DATA COLLECTION SHEET

Project Name CITGO ICR  
Project No.: 142733  
Source ID B-CAT WGS  
Site Location LCMC  
Test Location STACK  
Sample Run No.: M 202 - 2  
Sample Date: 05/27/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	<del>385.4</del> 353.4	812.0	458.6
2	EMPTY	616.2	<del>733.9</del> 616.8	0.6
3	H <sub>2</sub> O	714.6	<del>616.8</del> 733.6	19
4	SILICA GEL	883.2	907.6	24.4
5				
6				
7				
8				
Total				502.6

- W/o neck

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---

---

---

---

### Field Data Sheet

Client: City of Sulfur, LA  
 Location: Sulfur, LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A03  
 ΔH std: 2.069 in H<sub>2</sub>O  
 DGM (Y): 1.003

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-10' MS-01  
 Thermocouple ID: LA-10' MS-01  
 Pitot ID: LA-P1-01  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.63 in Hg  
 Static Pressure (P<sub>g</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 85 °F

Run No: 3 PM  
 Date: 5/27/11  
 Personnel: Pilgrim/Walton

Exit Thermocouple ID: IMP-04

Nozzle ID: 1.283  
 Nozzle Size: 0.283 inches  
 Filter ID: 3633

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures					Filter OF
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)	
E1	1458	746.567	0.28	0.529	1.10	2.0	140	322	326	68	85	83
1	1502	751.01	0.28	0.529	1.10	2.0	140	325	326	68	85	83
2	1506	754.36	0.31	0.557	1.20	2.0	140	327	329	64	85	78
2	1510	755.21	0.31	0.557	1.20	2.0	140	327	330	64	85	78
3	1514	758.30	0.34	0.583	1.30	2.0	140	328	333	61	86	78
3	1518	761.00	0.34	0.583	1.30	2.0	140	330	331	61	86	78
4	1522	762.33	0.38	0.616	1.50	2.0	140	331	330	57	86	79
4	1526	764.85	0.38	0.616	1.50	2.0	140	327	328	58	86	79
5	1530	767.56	0.50	0.707	1.95	2.0	140	328	328	60	88	79
5	1534	770.10	0.50	0.707	1.95	2.0	140	330	328	61	88	79
6	1538	774.01	0.49	0.700	1.90	2.0	140	330	329	63	88	80
6	1542	776.01	0.49	0.700	1.90	2.0	140	334	328	63	88	80
7	1546	779.22	0.41	0.640	1.60	2.0	140	333	330	64	89	81
7	1550	781.98	0.41	0.640	1.60	2.0	140	336	327	64	89	81
8	1554	784.49	0.48	0.693	1.90	2.0	140	339	326	63	89	81
8	1558	786.91	0.48	0.693	1.90	2.0	140	338	329	61	89	82
END	1602	790.026										
N1	1612	790.026	0.44	0.663	1.70	2.0	141	326	330	65	88	83
1	1616	792.66	0.44	0.663	1.70	2.0	141	324	331	64	88	83
2	1620	795.55	0.45	0.671	1.75	2.0	141	323	330	64	88	82
2	1624	798.68	0.45	0.671	1.75	2.0	141	321	329	63	88	81
3	1628	801.92	0.47	0.686	1.85	2.0	141	322	330	62	88	80
3	1632	804.22	0.47	0.686	1.85	2.0	141	322	327	62	88	80
4	1636	807.85	0.41	0.640	1.60	2.0	140	323	326	65	89	78
4	1640	809.50	0.41	0.640	1.60	2.0	140	320	325	64	89	78
5	1644	812.89	0.40	0.632	1.55	2.0	140	322	326	63	88	78
5	1648	816.05	0.40	0.632	1.55	2.0	140	322	327	63	88	77
6	1652	818.31	0.37	0.608	1.45	2.0	140	324	330	62	88	77
6	1656	820.46	0.37	0.608	1.45	2.0	140	321	329	60	89	77

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)

Avg Stack Temperature  
(°F)

Avg Meter Temperature  
(°F)

#### Leak Checks

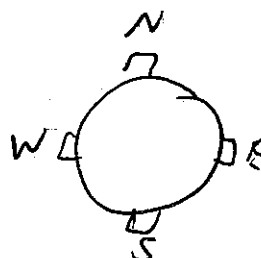
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.001 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train final: 0.001 ft<sup>3</sup> @ 5.0 Hg for 1 minute

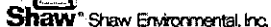
#### Observations:

O<sub>2</sub>: 0.801 to 0.616  
 CO<sub>2</sub>: 17.069 to 18.011

Operator Signature: [Signature]

#### Sampling Schematic





Meter Box ID: LA-A03  
 $\Delta H$  std: 2.069 in H<sub>2</sub>O  
DGM (Y): 1.003

Run No: 3 pm  
Date: 5/27/11  
Personnel: Pilgrim/Walton

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>  
 Barometric Pressure ( $P_{\text{bar}}$ ): 29.63 in Hg  
 Static Pressure ( $P_{\text{st}}$ ): ~~0.85~~ 0.86 in H<sub>2</sub>O  
 Ambient Temperature: 85 °F  
 Nozzle ID: 1.283  
 Nozzle Size: 0.283 inches  
 Filter ID: 3633

[illegible]

128	83.60	0.402	0.632	1.569
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

140  
Avg Stack  
Temperature  
(°F)

88  
Avg Meter  
Temperature  
(°F)

### Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.001 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
Train Final: 0.001 ft<sup>3</sup> @ 5.0 Hg for 1 minute

**Observations:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

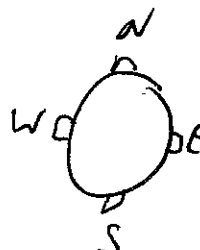
\_\_\_\_\_

\_\_\_\_\_

/

**Operator Signature:**

### Sampling Schematic



### TEST LAB DATA COLLECTION SHEET

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-CAT WGS  
 Site Location: LCMC  
 Test Location: STACK  
 Sample Run No.: M202 - 3  
 Sample Date: 05/27/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	358.0	741.8	383.8
2	EMPTY	607.4	620.0	12.6
3	H <sub>2</sub> O	704.4	765.3	60.9
4	SILICA GEL	864.9	888.8	23.9
5				
6				
7				
8				
Total				481.2

- w/o NERIC

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

***Appendix A9***  
***U.S. EPA Conditional Test Method 027 (CTM-027)***

### Field Data Sheet

Client: Citgo  
 Location: LCMC  
 Unit: B-Cat  
 Source: Sumlbar  
 Project No: 142733

Meter Box ID: LA-A02  
 ΔH std: 1.096 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
 Stack Area: 50.52 ft<sup>2</sup>

Barometric Pressure (P<sub>bar</sub>): 29.60 in Hg  
 Static Pressure (P<sub>g</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 45 °F

Run No: ETM-027 A-1  
 Date: 5-26-11  
 Personnel: UC

Probe ID: LA-8MS-03  
 Thermocouple ID: LA-8MS-03  
 Pilot ID: LA-8MS-03  
 C<sub>p</sub>: 0.851

Nozzle ID: 4.25 inches  
 Nozzle Size: 0.25 inches  
 Filter ID: —

Exit Thermocouple ID: LA-TMP-02

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
START	16:18	578.35	0.45	0.67	1.78	3	141	241	283	65	98
2	16:25.5	574.4	0.45	0.67	1.78	3	141	242	283	65	98
3	16:33	580.7	0.40	0.63	1.78	3	141	242	277	67	98
4	16:40.5	586.7	0.40	0.63	1.78	3	141	243	276	71	98
5	16:48	592.1	0.35	0.59	1.45	3	141	243	274	72	100
6	16:55.5	596.6	0.30	0.55	1.24	3	141	246	273	72	101
7	17:03	601.4	0.30	0.55	1.34	3	141	247	270	72	102
8	17:10.5	606.1	0.26	0.51	1.17	3	141	248	267	75	103
PC	17:18	610.362	—	—	—	—	—	—	—	—	—
START	17:50	610.362	0.18	0.42	0.80	3	142	247	293	65	101
2	17:57.5	614.0	0.18	0.42	0.80	3	141	247	290	66	100
3	18:05	617.6	0.21	0.46	0.94	3	141	245	291	67	100
4	18:12.5	621.5	0.22	0.45	1.03	3	141	242	285	69	100
5	18:20	625.7	0.33	0.37	1.66	3.5	141	247	285	69	101
6	18:27.5	630.4	0.39	0.39	1.75	5	141	242	285	72	102
7	18:35	635.2	0.25	0.50	1.12	7	141	248	278	72	103
8	18:42.5	640.3	0.25	0.50	1.12	4.5	142	246	260	65	104
END	18:50	644.585	—	—	—	—	—	—	—	—	—

120 77.34 0.31 0.56 1.35  
 Total Sampling Time (min) Total Meter Volume (ft<sup>3</sup>) Average ΔP (in H<sub>2</sub>O) Average SQRT ΔP (in H<sub>2</sub>O) Average ΔH (in H<sub>2</sub>O)

141.13  
 Avg Stack Temperature (°F)

106.69  
 Avg Meter Temperature (°F)

#### Leak Checks

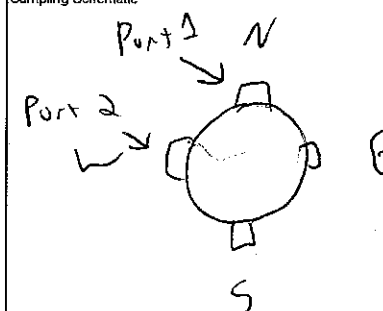
Pitot impact: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: ☒ @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0 ft<sup>3</sup> @ 5 Hg for 1 minute  
 Train Final: 0 ft<sup>3</sup> @ 5 Hg for 1 minute

Observations: KF = 4.21

O<sub>2</sub>: 0.503  
CO<sub>2</sub>: 18.452

Operator Signature: KAC

#### Sampling Schematic





Shaw Environmental, Inc.

**TEST LAB DATA COLLECTION SHEET**

Project Name PITGO ICR  
 Project No.: 142733  
 Source ID B-CAT WGS  
 Site Location SULPHUR, LA  
 Test Location STACK  
 Sample Run No.: CTM-027 Run 1  
 Sample Date: 05/26/11

**CONDENSATION**

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1N H <sub>2</sub> SO <sub>4</sub>	690.3	949.7	259.4
2	0.1N H <sub>2</sub> SO <sub>4</sub>	684.1	788.6	104.5
3	0.1N H <sub>2</sub> SO <sub>4</sub>	696.9	702.6	5.7
4	EMPTY	587.2	595.7	8.5
5	SILICAGE	880.1	898.4	18.3
6				
7				
8				
Total				396.4

**PARTICULATE**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

**TOTAL PARTICULATE COLLECTED**

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

**VOLUME OF SAMPLE COLLECTED**

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

**QA PROBE WASH( as required)**

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---



# Field Data Sheet

Client: Citgo  
 Location: Sulfur, LA  
 Unit: R-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-A02  
 ΔH std: 1.950 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
 Stack Area: 50.52 ft<sup>2</sup>

Probe ID: LA-8' MS '03  
 Thermocouple ID: LA-8' MS '03  
 Pitot ID: 1016078  
 C<sub>0</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.69 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 86 °F

Run No: 2 CTM-027  
 Date: 5/27/11  
 Personnel: Pilgrim/Huggins

Exit Thermocouple ID: 2mp-02

Nozzle ID: .280  
 Nozzle Size: 0.280 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
N 1	1042	646.61	0.42	0.648	1.75	9.0	143	250	263	59	89
1	1046	649.91	0.42	0.648	1.75	9.0	143	251	262	59	89
2	1050	653.50	0.48	0.693	2.00	4.0	143	253	259	59	89
2	1054	656.88	0.48	0.693	2.00	4.0	143	255	260	60	90
3	1058	658.21	0.45	0.670	1.90	6.0	144	259	263	63	91
3	1102	661.25	0.45	0.670	1.90	6.0	144	255	261	63	91
4	1106	663.95	0.40	0.632	1.70	5.0	144	251	263	63	93
4	1110	667.05	0.40	0.632	1.70	5.0	144	252	261	61	93
5	1114	669.75	0.40	0.632	1.70	4.0	144	257	263	60	94
5	1118	673.61	0.40	0.632	1.70	4.0	144	264	258	61	94
6	1122	675.34	0.33	0.574	1.40	3.0	144	261	264	62	94
6	1126	677.51	0.33	0.574	1.40	3.0	144	260	260	62	94
7	1130	680.12	0.33	0.574	1.40	3.0	144	263	268	62	93
7	1134	682.94	0.33	0.574	1.40	3.0	143	261	262	59	93
8	1138	685.48	0.45	0.670	1.90	4.0	144	260	259	58	93
8	1142	688.25	0.45	0.670	1.90	4.0	144	266	264	56	93
END	1146	691.154	—	—	—	—	—	—	—	—	—
W 1	1202	691.184	0.45	0.670	1.90	4.0	145	242	251	64	94
1	1206	695.01	0.45	0.671	1.90	4.0	144	244	248	61	94
2	1210	696.71	0.45	0.671	1.90	4.0	144	241	248	61	94
2	1214	700.02	0.41	0.640	1.70	4.0	144	249	250	62	94
3	1218	702.61	0.38	0.616	1.60	4.0	144	243	251	64	94
3	1222	705.21	0.38	0.616	1.60	4.0	144	240	252	63	94
4	1226	708.00	0.45	0.670	1.90	4.0	144	245	250	59	95
4	1230	710.88	0.45	0.670	1.90	4.0	144	248	250	59	95
5	1234	713.35	0.31	0.557	1.30	4.0	144	250	251	61	95
5	1238	716.28	0.31	0.557	1.30	4.0	144	251	252	62	96
6	1242	719.03	0.30	0.548	1.25	4.0	144	250	258	63	96
6	1246	722.61	0.30	0.548	1.25	4.0	144	252	260	63	98

Total Sampling Time (min) —  
 Total Meter Volume (ft<sup>3</sup>) —  
 Average ΔP (in H<sub>2</sub>O) —  
 Average SQRT ΔP (in H<sub>2</sub>O) —  
 Average ΔH (in H<sub>2</sub>O) —

Avg Stack Temperature (°F) —

Avg Meter Temperature (°F) —

## Leak Checks

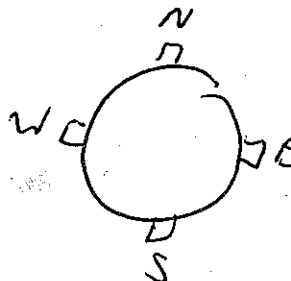
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.003 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train final: 0.003 ft<sup>3</sup> @ 14.0 Hg for 1 minute

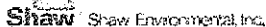
Observations: Kf: 4.21

O<sub>2</sub>: 0.80% 0.658  
 CO<sub>2</sub>: 17.06% 18.191

Operator Signature: [Signature]

## Sampling Schematic





Meter Box ID: LA-402

Meter Box ID: LA-102  
 $\Delta H$  std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Barometric Pressure ( $P_{\text{bar}}$ ): 29.69 in Hg  
 Static Pressure ( $P_g$ ): 0.36 in  $\text{H}_2\text{O}$   
 Ambient Temperature: 86 °F

Probe ID: LA-81MS-03  
Thermocouple ID: LA-81MS-03  
Pitot ID: 1010078  
Cp: 0.540

Nozzle ID: 0.280  
Nozzle Size: 0.280 inches  
Filter ID: \_\_\_\_\_

Exit Thermocouple ID: IMP-02[illegible]

128	87.767	0.386	0.619	1.625
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SORT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

144  
Avg Stack  
Temperature  
(°F)

91  
Avg Meter  
Temperature  
(°F)

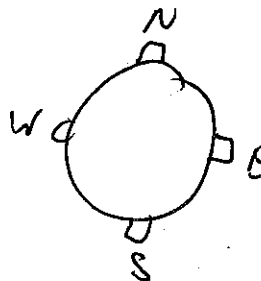
## Leak Checks

Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.003 ft<sup>3</sup> @ 15.5 Hg for 1 minute  
 Train Final: 0.003 ft<sup>3</sup> @ 14.0 Hg for 1 minute

**Observations:**

Operator Signature: \_\_\_\_\_

### Sampling Schematic



### TEST LAB DATA COLLECTION SHEET

Project Name: CITGO ICR  
 Project No.: 142733  
 Source ID: B-QAT WGS  
 Site Location: LEMC  
 Test Location: STACK  
 Sample Run No.: CTM-027 Run 2  
 Sample Date: 05/27/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1N H <sub>2</sub> SO <sub>4</sub>	701.8	961.2	259.4
2	0.1N H <sub>2</sub> SO <sub>4</sub>	686.0	928.2	242.2
3	0.1N H <sub>2</sub> SO <sub>4</sub>	692.2	702.5	10.3
4	Empty	613.5	616.0	1.5
5	SILICA GEL	883.3	905.5	22.2
6				
7				
8				
Total				535.6

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

**Field Data Sheet**

Client: Citgo  
 Location: S. Fur, CA  
 Unit: K-Cat  
 Source: Wet Gas Scrubber  
 Project No: 142733

Meter Box ID: LA-402  
 ΔH std: 1.960 in H<sub>2</sub>O  
 DGM (Y): 0.996

Stack Diameter: 96.25 inches  
 Stack Area: 50.53 ft<sup>2</sup>

Probe ID: LA-8' MS-03  
 Thermocouple ID: LA-8' MS-03  
 Pitot ID: 1010078  
 C<sub>p</sub>: 0.840

Barometric Pressure (P<sub>bar</sub>): 29.63 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 85 °F

Run No: 3 CTM-027  
 Date: 5/23/11  
 Personnel: P. Ingram / Walton

Exit Thermocouple ID: IMP-02

Nozzle ID: .280  
 Nozzle Size: 0.280 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
N 1	1450	234.84	0.42	0.648	1.75	2.0	144	248	258	66	89
1	1502	237.50	0.42	0.648	1.75	2.0	144	252	260	65	90
2	1506	240.61	0.45	0.671	1.90	3.0	144	255	256	62	91
2	1510	243.36	0.45	0.671	1.90	3.0	144	251	251	62	91
3	1514	245.92	0.46	0.678	1.90	3.0	144	249	254	62	91
3	1518	248.55	0.46	0.678	1.90	3.0	144	252	262	62	91
4	1522	252.01	0.40	0.632	1.70	3.0	144	250	260	63	91
4	1526	254.83	0.40	0.632	1.70	3.0	144	250	259	63	91
5	1530	258.60	0.40	0.632	1.70	3.0	143	249	256	64	92
5	1534	260.23	0.40	0.632	1.70	3.0	143	250	255	64	92
6	1538	263.61	0.35	0.592	1.50	3.0	143	249	256	63	93
6	1542	265.75	0.35	0.592	1.50	3.0	143	249	253	64	93
7	1546	268.60	0.35	0.592	1.50	3.0	143	251	250	64	93
7	1550	271.51	0.35	0.592	1.50	3.0	143	250	249	63	93
8	1554	273.59	0.42	0.648	1.75	3.0	143	252	249	61	93
8	1558	276.00	0.42	0.648	1.75	3.0	143	255	248	61	94
END	1602	279.03	—	—	—	—	—	—	—	—	—
W 1	1612	279.03	0.40	0.632	1.70	3.0	145	247	255	62	92
1	1616	281.66	0.40	0.632	1.70	3.0	145	250	251	63	92
2	1620	284.31	0.43	0.656	1.80	3.0	144	251	256	63	92
2	1624	287.42	0.43	0.656	1.80	3.0	144	250	258	63	92
3	1628	290.30	0.42	0.648	1.75	3.0	144	250	250	63	92
3	1632	293.61	0.42	0.648	1.75	3.0	144	251	250	63	92
4	1636	295.86	0.40	0.632	1.70	3.0	144	247	250	61	93
4	1640	298.30	0.40	0.632	1.70	3.0	143	244	252	59	93
5	1644	301.26	0.32	0.566	1.35	3.0	143	248	251	60	93
5	1648	303.92	0.32	0.566	1.35	3.0	143	249	250	60	93
6	1652	306.18	0.30	0.548	1.30	3.0	143	249	251	61	93
6	1656	309.00	0.30	0.548	1.30	3.0	143	251	251	61	93

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)
—	—	—	—	—

Avg Stack Temperature (°F)
—

Avg Meter Temperature (°F)
—

**Leak Checks**

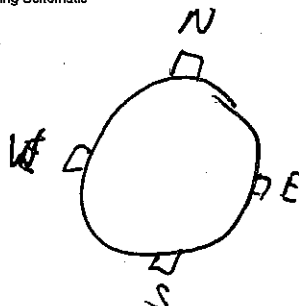
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.002 ft<sup>3</sup> @ 15.0 Hg for 1 minute  
 Train final: 0.002 ft<sup>3</sup> @ 6.0 Hg for 1 minute

**Observations:**

O<sub>2</sub>: 0.616  
 CO<sub>2</sub>: 18.011

Operator Signature: [Signature]

**Sampling Schematic**







Shaw Environmental, Inc.

### TEST LAB DATA COLLECTION SHEET

Project Name: OUTGO ICR  
Project No.: 142733  
Source ID: P-CAT WGS  
Site Location: SULPHUR, LA  
Test Location: STACK  
Sample Run No.: CTM-027 Run 2  
Sample Date: 05/27/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	0.1N H <sub>2</sub> SO <sub>4</sub>	704.0	969.80	265.0
2	0.1N H <sub>2</sub> SO <sub>4</sub>	685.0	913.0	228.0
3	0.1N H <sub>2</sub> SO <sub>4</sub>	702.5	711.6	9.1
4	EMPTY	587.8	594.1	6.3
5	SILICA GEL	898.4	913.2	14.8
6				
7				
8				
Total				523.2

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---

---

---

---

## ***Appendix A10***

### ***U.S. EPA Method 29***

# Field Data Sheet

Client: CITGO  
 Location: Sulphur, LA  
 Unit: B-CAT  
 Source: Seaboard  
 Project No: 192733

Meter Box ID: LA-A04  
 ΔH std: 12.052 in H<sub>2</sub>O  
 DGM (Y): 1.006 1.024

Stack Diameter: 96.25 inches  
 Stack Area: 50.25 ft<sup>2</sup>

Barometric Pressure (P<sub>bar</sub>): 29.57 in Hg  
 Static Pressure (P<sub>s</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 95 °F

Probe ID: New  
 Thermocouple ID: New  
 Pitot ID: New  
 C<sub>p</sub>: 0.840

Nozzle ID: 0.282  
 Nozzle Size: 0.282 inches  
 Filter ID: —

Run No: Run 1 Metals  
 Date: 05-26-2011  
 Personnel: S Vincent

Exit Thermocouple ID: LA-IMP-04

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
Start	1615	261.126	—	—	—	—	—	—	—	—	—
8	1620.5	264.923	0.45	0.67	2.01	0.00	140	192	223	79	98
8	1626	268.756	0.45	0.67	2.01	0.00	139	250	242	77	98
7	1631.5	272.753	0.42	0.65	1.88	0.00	137	249	241	71	99
7	1637	276.689	0.42	0.65	1.88	0.00	138	252	242	54	101
6	1642.5	280.419	0.43	0.656	1.93	0.00	138	252	241	65	101
6	1658	284.367	0.43	0.656	1.93	0.00	137	251	242	57	102
5	1703.5	288.356	0.42	0.656	1.93	0.00	139	251	242	55	102
5	1709	292.272	0.42	0.656	1.93	0.00	138	251	241	55	103
4	1714.5	296.147	0.42	0.656	1.89	0.00	139	250	242	57	103
4	1720	300.824	0.42	0.656	1.89	0.00	137	251	241	57	104
3	1725.5	304.624	0.45	0.671	2.03	0.00	139	251	242	57	105
3	1731	308.126	0.45	0.671	2.03	0.00	139	251	242	61	104
2	1736.5	313.016	0.44	0.663	1.97	0.00	140	251	247	67	105
2	1742	316.684	0.44	0.663	1.97	0.00	146	251	247	67	107
1	1747.5	320.429	0.41	0.64	1.85	0.00	140	251	247	67	104
1	1753	324.072	0.41	0.64	1.85	0.00	140	251	247	67	104
End	1744	—	—	—	—	—	—	—	—	—	—
Start	1807	324.072	0.44	0.67	2.03	0.00	—	—	—	—	—
8	1817.5	327.861	0.44	0.67	1.98	0.00	139	251	237	59	102
6	1818.5	331.696	0.44	0.67	1.98	0.00	139	251	238	61	104
7	1818.5	335.302	0.45	0.672	2.03	0.00	139	251	237	61	104
7	1824	339.724	0.45	0.672	2.03	0.00	139	252	239	65	105
6	1829.5	343.427	0.44	0.66	1.97	0.00	139	252	240	68	105
6	1835	347.787	0.44	0.66	1.97	0.00	139	251	240	72	105
5	1840.5	351.621	0.43	0.656	1.94	0.00	140	251	241	63	106
5	1846	355.477	0.35	0.571	1.88	0.00	141	250	241	62	106
4	1851.5	359.261	0.26	0.51	1.08	0.00	141	250	241	63	105
4	1857	361.021	0.26	0.51	1.18	0.00	140	251	240	64	105

Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)
—	—	—	—	—	—	—

## Leak Checks

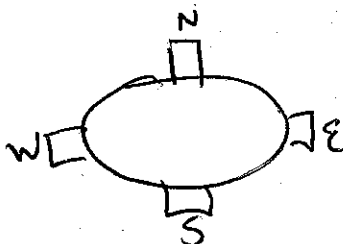
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pilot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute  
 Train Final: 0.00 ft<sup>3</sup> @ 6 Hg for 1 minute

Observations: IK Factor - 4.23

O<sub>2</sub>: 0.503  
 CO<sub>2</sub>: 18.452

Operator Signature: [Signature]

## Sampling Schematic







### TEST LAB DATA COLLECTION SHEET

Project Name: 0160 ICR  
 Project No.: 142733  
 Source ID: B-0AT WGS  
 Site Location: B-0AT LOWC  
 Test Location: STACK  
 Sample Run No.: RN29 RUN 1  
 Sample Date: 05/26/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	559.0	916.5	357.5
2	5% HNO <sub>3</sub> / 10% H <sub>2</sub> O <sub>2</sub>	707.0	918.0	211.0
3	5% HNO <sub>3</sub> / 10% H <sub>2</sub> O <sub>2</sub>	678.6	706.5	27.9
4	EMPTY	599.7	602.7	3.0
5	SILICA GEL	871.5	900.3	28.8
6				
7				
8				
Total				628.2

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

# Field Data Sheet

Client: CITGO  
 Location: Sulphur, LA  
 Unit: B-Cor  
 Source: Scrubber  
 Project No: 142733

Meter Box ID: LA-AD4 1,962  
 ΔH std: 0.205 in H<sub>2</sub>O  
 DGM (Y): 101.000 1,024

Stack Diameter: 96.25 inches  
 Stack Area: 50.23 ft<sup>2</sup>  
 Barometric Pressure (P<sub>ba</sub>): 29.69 in Hg  
 Static Pressure (P<sub>g</sub>): 0.34 in H<sub>2</sub>O  
 Ambient Temperature: 85.6 °F

Run No: Run 2 Metals (RM 29)  
 Date: 05-27-2011  
 Personnel: S. Vincent / W. Huggins

Probe ID: LA-10-MS-01  
 Thermocouple ID: LA-10-MS-01  
 Pitot ID: LA-PT-10  
 C<sub>p</sub>: 0.840

Nozzle ID: 0.782  
 Nozzle Size: 0.282 inches  
 Filter ID: —

Exit Thermocouple ID: LA-IMP-06

Traverse Point	Clock Time	Meter Volume (ft <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
South Port	Start	1042	379.279	—	—	—	—	—	—	—	—
	8	1047.5	383.214	0.45	0.67	1.96	0.00	141	270	278	53
	8	1053	387.127	0.45	0.67	1.96	0.00	141	270	278	53
	7	1058.5	391.036	0.45	0.67	1.98	0.00	141	270	278	53
	2	1104	394.926	0.45	0.67	1.98	0.00	141	270	278	53
	6	1109.5	398.856	0.45	0.67	1.99	0.00	141	270	278	53
	6	1115	402.782	0.45	0.67	1.99	0.00	141	270	278	53
	5	1120.5	406.732	0.43	0.66	1.91	0.00	141	270	278	53
	5	1126	410.584	0.43	0.66	1.91	0.00	141	270	278	53
	4	1131.5	414.312	0.39	0.62	1.74	0.00	141	270	278	53
	4	1137	418.075	0.39	0.62	1.74	0.00	141	270	278	53
	3	1142.5	421.802	0.37	0.61	1.74	0.00	141	270	278	53
	3	1148	425.543	0.37	0.61	1.74	0.00	141	270	278	53
	2	1153.5	429.236	0.43	0.66	1.92	0.00	141	270	278	53
	2	1159	433.426	0.43	0.66	1.92	0.00	141	270	278	53
	1	1204.5	437.274	0.44	0.66	1.97	0.00	141	270	278	53
	1	1210	441.239	0.44	0.66	1.97	0.00	141	270	278	53
	End	—	—	—	—	—	—	—	—	—	—
Port change - East Port	Start	1220	441.239	0.45	0.67	2.01	0.00	141	270	278	53
	8	1225.5	445.126	0.45	0.67	2.01	0.00	141	270	278	53
	8	1231	449.157	0.45	0.67	2.01	0.00	141	270	278	53
	7	1236.5	453.014	0.45	0.67	2.01	0.00	141	270	278	53
	3	1242	457.096	0.45	0.67	2.01	0.00	141	270	278	53
	6	1247.5	461.057	0.45	0.67	2.01	0.00	141	270	278	53
	6	1253	465.081	0.45	0.67	2.01	0.00	141	270	278	53
	5	1258.5	469.061	0.45	0.67	2.01	0.00	141	270	278	53
	5	1304	473.021	0.45	0.67	2.01	0.00	141	270	278	53
	4	1309.5	476.922	0.44	0.66	1.97	0.00	141	270	278	53
	4	1315	480.763	0.44	0.66	1.97	0.00	141	270	278	53
	End	—	—	—	—	—	—	—	—	—	—

Total Sampling Time (min) —  
 Total Meter Volume (ft<sup>3</sup>) —  
 Average ΔP (in H<sub>2</sub>O) —  
 Average SQRT ΔP (in H<sub>2</sub>O) —  
 Average ΔH (in H<sub>2</sub>O) —

Avg Stack Temperature (°F) —

Avg Meter Temperature (°F) —

## Leak Checks

Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.00 ft<sup>3</sup> @ 6 Hg for 1 minute  
 Train final: 0.00 ft<sup>3</sup> @ 5.5 Hg for 1 minute

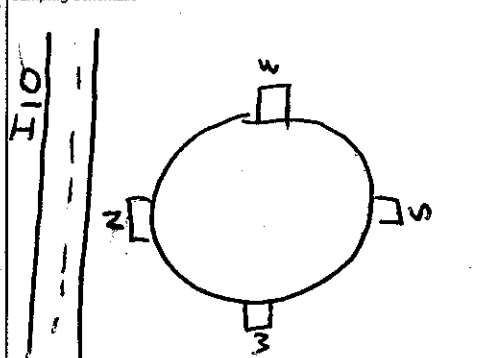
## Observations

K Factor 4.23  
(3 hr Runtime / 176 Min) (11 min point change) (5.5 min Record)  
(98 min a port)

O<sub>2</sub>: 0.805 0.658 Page 1 of 2  
 CO<sub>2</sub>: 17.069 18.191

Operator Signature: [Signature]

## Sampling Schematic



### Field Data Sheet

Client: CITGO  
Location: Sulphur, LA  
Unit: B-Cat  
Source: Scribner  
Project No: ~~14280~~ 142733

Meter Box ID: 20-1004 1.962  
 $\Delta H$  std: P.E. 0.052 in  $H_2O$   
DGM (Y): 20-1004 1.024

Stack Diameter: 96.25 inches  
Stack Area: 50.25 ft<sup>2</sup>

Barometric Pressure ( $P_{bar}$ ): 29.69 in Hg  
Static Pressure ( $P_s$ ): 0.34 in  $H_2O$   
Ambient Temperature: 85.6 °F

Run No: Run 2 Models (RM 29)  
Date: 05-27-2011  
Personnel: S. Vincent / W. Huggins

Probe ID: LA-10/MS-01  
Thermocouple ID: LA-10/MS-01  
Pitot ID: LA-PF10  
C<sub>p</sub>: 0.840

Exit Thermocouple ID: LA-IMP-02

Nozzle ID: 0.282  
Nozzle Size: 0.282 inches  
Filter ID: —

[illegible]

176	119.546	0.399	0.63	1.80
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SORT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

140.81  
Avg Stack  
Temperature  
(°F)

97.593  
44 skew  
Avg Meter  
Temperature  
(°F)

### Leak Checks

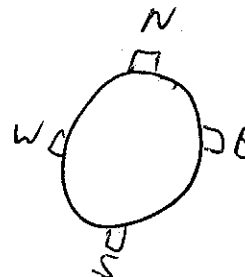
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.00 ft<sup>3</sup> @ 6 Hg for 1 minute  
Train Final: 0.00 ft<sup>3</sup> @ 5.5 Hg for 1 minute

Observations:  $K$  Factor 4.23

Page 2 of 2

Operator Signature: \_\_\_\_\_

### Sampling Schematic



### TEST LAB DATA COLLECTION SHEET

Project Name: CIT60 ICR  
 Project No.: 142733  
 Source ID: B-CAT WGS  
 Site Location: LEMC  
 Test Location: STACK  
 Sample Run No.: RM 29 Run 2  
 Sample Date: 05/27/11

#### CONDENSATION

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	559.6	961.6	402.0
2	5% HNO <sub>3</sub> /10% H <sub>2</sub> O <sub>2</sub>	712.6	948.1	235.5
3	5% HNO <sub>3</sub> /10% H <sub>2</sub> O <sub>2</sub>	692.4	728.7	36.3
4	EMPTY	603.4	608.0	4.6
5	SILICA GEL	859.1	883.6	24.5
6				
7				
8				
Total				702.9

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



---



---

# Field Data Sheet

Client: CT60  
 Location: Sulphur, LA  
 Unit: B-CAT  
 Source: Scrubber  
 Project No: 142733

Meter Box ID: LA-204 1.962  
 AH std: 2.062 in H<sub>2</sub>O  
 DGM (Y): 1.024

Stack Diameter: 96.25 inches  
 Stack Area: 50.23 ft<sup>2</sup>

Barometric Pressure (P<sub>bar</sub>): 29.63 in Hg  
 Static Pressure (P<sub>g</sub>): 0.36 in H<sub>2</sub>O  
 Ambient Temperature: 56.7 °F

Probe ID: New-1165269  
 Thermocouple ID: New-1165269  
 Pitot ID: New  
 C<sub>p</sub>: 0.840

Run No: Run 3 Metals (RM 025)  
 Date: 05-27-2011  
 Personnel: S Vincent + H. Wickett

Exit Thermocouple ID: LA IMP-06

Nozzle ID: 0.252  
 Nozzle Size: 0.252 inches  
 Filter ID: —

Traverse Point	Clock Time	Meter Volume (m <sup>3</sup> )	ΔP (in H <sub>2</sub> O)	SQRT ΔP (in H <sub>2</sub> O)	ΔH (in H <sub>2</sub> O)	Vacuum (in Hg)	Temperatures				
							Stack (°F)	Probe (°F)	Filter Box (°F)	Impinger Exit (°F)	Gas Meter (°F)
Start	1458	499.343	—	—	—	—	—	—	—	—	—
8	1503.5	502.646	0.45	0.67	2.01	0.00	141	275	234	60	160
8	1509.5	505.549	0.45	0.67	2.01	0.00	141	275	224	64	161
7	1514.5	509.263	0.40	0.63	1.79	0.00	140	270	240	59	161
7	1520	512.349	0.40	0.63	1.79	0.00	140	275	245	56	162
6	1525.5	515.579	0.41	0.64	1.89	0.00	140	277	247	61	163
6	1531	518.964	0.41	0.64	1.89	0.00	140	275	253	64	164
5	1536.5	522.615	0.46	0.68	2.02	0.00	140	272	250	65	164
5	1542	526.626	0.44	0.66	2.02	0.00	140	271	250	67	166
4	1547.5	530.723	0.45	0.67	2.04	0.00	140	270	231	62	166
4	1553	534.814	0.45	0.67	2.04	0.00	140	270	236	63	168
3	1558.5	538.964	0.45	0.67	2.05	0.00	140	267	237	65	169
3	1604	542.892	0.45	0.67	2.05	0.00	140	269	236	68	169
2	1609.5	546.997	0.45	0.67	2.05	0.00	140	273	240	68	170
2	1615	550.998	0.45	0.67	2.05	0.00	141	271	239	67	171
1	1620.5	553.891	0.45	0.67	2.05	0.00	141	273	243	67	171
1	1626	556.491	0.45	0.67	2.05	0.00	141	272	243	68	172
End	—	—	—	—	—	—	—	—	—	—	—
Start	1632	558.491	—	—	—	—	—	—	—	—	—
8	1637.5	562.376	0.44	0.66	2.01	0.00	140	230	229	58	171
8	1643	566.397	0.44	0.66	2.01	0.00	140	231	230	56	171
7	1648.5	570.432	0.46	0.67	2.05	0.00	140	231	230	55	171
7	1654.5	574.572	0.45	0.67	2.05	0.00	140	231	229	56	171
6	1659.5	578.532	0.45	0.67	2.05	0.00	140	230	229	56	171
6	1705	582.742	0.45	0.67	2.05	0.00	141	232	229	57	171
5	1710.5	586.849	0.45	0.67	2.05	0.00	141	231	230	68	171
5	1716.5	590.854	0.45	0.67	2.05	0.00	141	231	228	54	171
4	1721.5	594.264	0.25	0.51	1.28	0.00	141	232	228	55	171
4	1727	597.264	0.25	0.51	1.28	0.00	140	232	229	56	171

—	—	—	—	—	—	—
Total Sampling Time (min)	Total Meter Volume (ft <sup>3</sup> )	Average ΔP (in H <sub>2</sub> O)	Average SQRT ΔP (in H <sub>2</sub> O)	Average ΔH (in H <sub>2</sub> O)	Avg Stack Temperature (°F)	Avg Meter Temperature (°F)

## Leak Checks

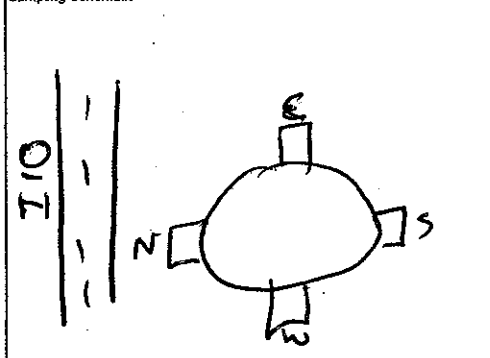
Pitot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Pitot static: Good @ 3" H<sub>2</sub>O for 15 seconds  
 Train initial: 0.60 ft<sup>3</sup> @ 5 Hg for 1 minute  
 Train final: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute

Observations: U Factor 4.27  
(176 min Run / 85 min a post)  
(5.5 min a reading) (11 min point change)

O<sub>2</sub>: 0.618  
 CO<sub>2</sub>: 18.011

Operator Signature: [Signature]

## Sampling Schematic



### Field Data Sheet

Client: CIT 610  
Location: Sulphur, LA  
Unit: B-Cat  
Source: Scrubbers  
Project No: 142733

Meter Box ID: 1A-20-1 1.962  
 $\Delta H$  std: 2.082 in H<sub>2</sub>O  
DGM (Y): 11.666 1.024

Stack Diameter: 96.25 inches  
Stack Area: 50.23 ft<sup>2</sup>

Barometric Pressure ( $P_{\text{bar}}$ ): 29.63 in Hg  
Static Pressure ( $P_g$ ): 0.36 in  $\text{H}_2\text{O}$   
Ambient Temperature: 86.7 °F

Run No: Run # 3 (Micks) (CMAA)  
Date: 05-27-2011  
Personnel: Supinaant / M. Watson

Probe ID: New - 1105269  
Thermocouple ID: New - 1105269  
Pilot ID: New  
Co: 0.840

Exit Thermocouple ID: LA-IMP04

Nozzle ID: 0.282  
Nozzle Size: 0.282 inches  
Filter ID: -

[illegible]

174	116.882	0.3918	0.617	1.81
Total Sampling Time	Total Meter Volume	Average $\Delta P$	Average SQRT $\Delta P$	Average $\Delta H$
(min)	(ft <sup>3</sup> )	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)	(in H <sub>2</sub> O)

140.4  
Avg Stack  
Temperature  
(°F)

107.94  
Avg Meter  
Temperature  
(°F)

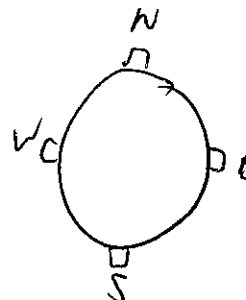
### Leak Checks

Good @ 3" H<sub>2</sub>O for 15 seconds  
Pilot impact: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train static: Good @ 3" H<sub>2</sub>O for 15 seconds  
Train initial: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute  
Train Final: 0.00 ft<sup>3</sup> @ 5 Hg for 1 minute

Observations: *IC Fache 4.23*

Operator Signature: \_\_\_\_\_

### Sampling Schematic



### TEST LAB DATA COLLECTION SHEET

Project Name: CIT60 ICR  
 Project No.: 142733  
 Source ID: BCAT WGS  
 Site Location: BCAT CMC  
 Test Location: stack  
 Sample Run No.: RM29 RUN3  
 Sample Date: 05/29/11

#### CONDENSATION

559.8

Impinger No.	Reagent	Initial Vol., ml/g	Final Vol., ml/g	Net Gain, ml/g
1	EMPTY	0	956.5	296.7
2	5% H <sub>2</sub> O <sub>2</sub> /10% H <sub>2</sub> O	602.7	925.1	220.6
3	5% H <sub>2</sub> O <sub>2</sub> /10% H <sub>2</sub> O	686.4	719.0	32.6
4	EMPTY	602.7	609.3	6.6
5	SILICA	900.3	918.9	18.6
6				
7				
8				
Total				675.1

#### PARTICULATE

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g
Probe Wash			
Reagent Blank			
Corrected Probe Wash			
Sample Filter			
Blank Filter			
Corrected Filter Weight			

#### TOTAL PARTICULATE COLLECTED

Particulate Collected (excluding impinger catch)	
Particulate Collected (including impinger catch)	

#### VOLUME OF SAMPLE COLLECTED

Sample	Sample Volume, ml	Rinsate Volume, ml	Total Volume, ml
Container 1			
Container 2			
Container 3			
Container 4			
Total			

#### QA PROBE WASH( as required)

Sample/I.D. No.	Initial Weight, g	Final Weight, g	Net Weight, g

Comments:

---



---



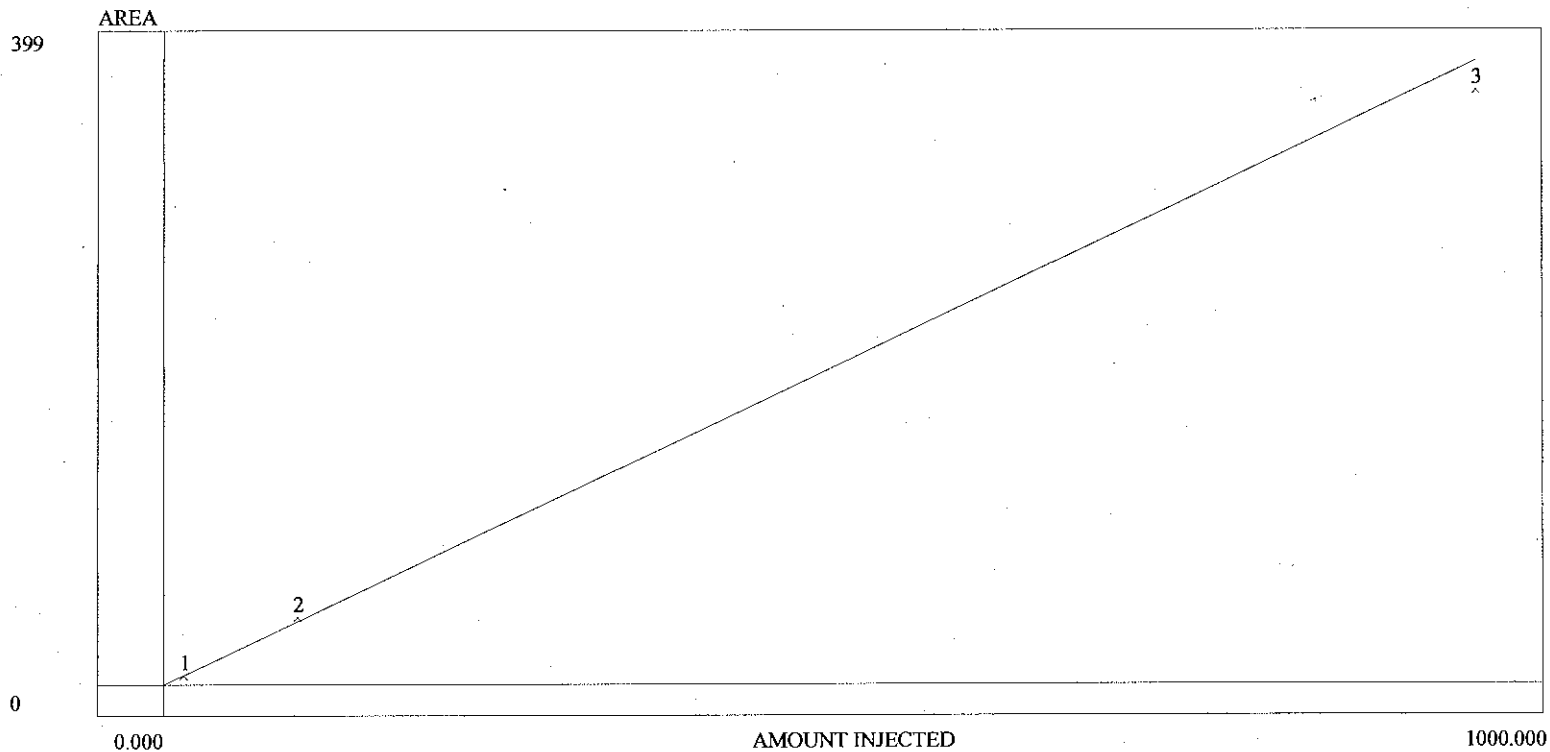
---



---



***Appendix A11***  
***U.S. EPA Method 18 (Methane and Ethane)***



Avg slope of curve: 0.40

Y-axis intercept: 0.00

Linearity: 1.00

Number of levels: 3

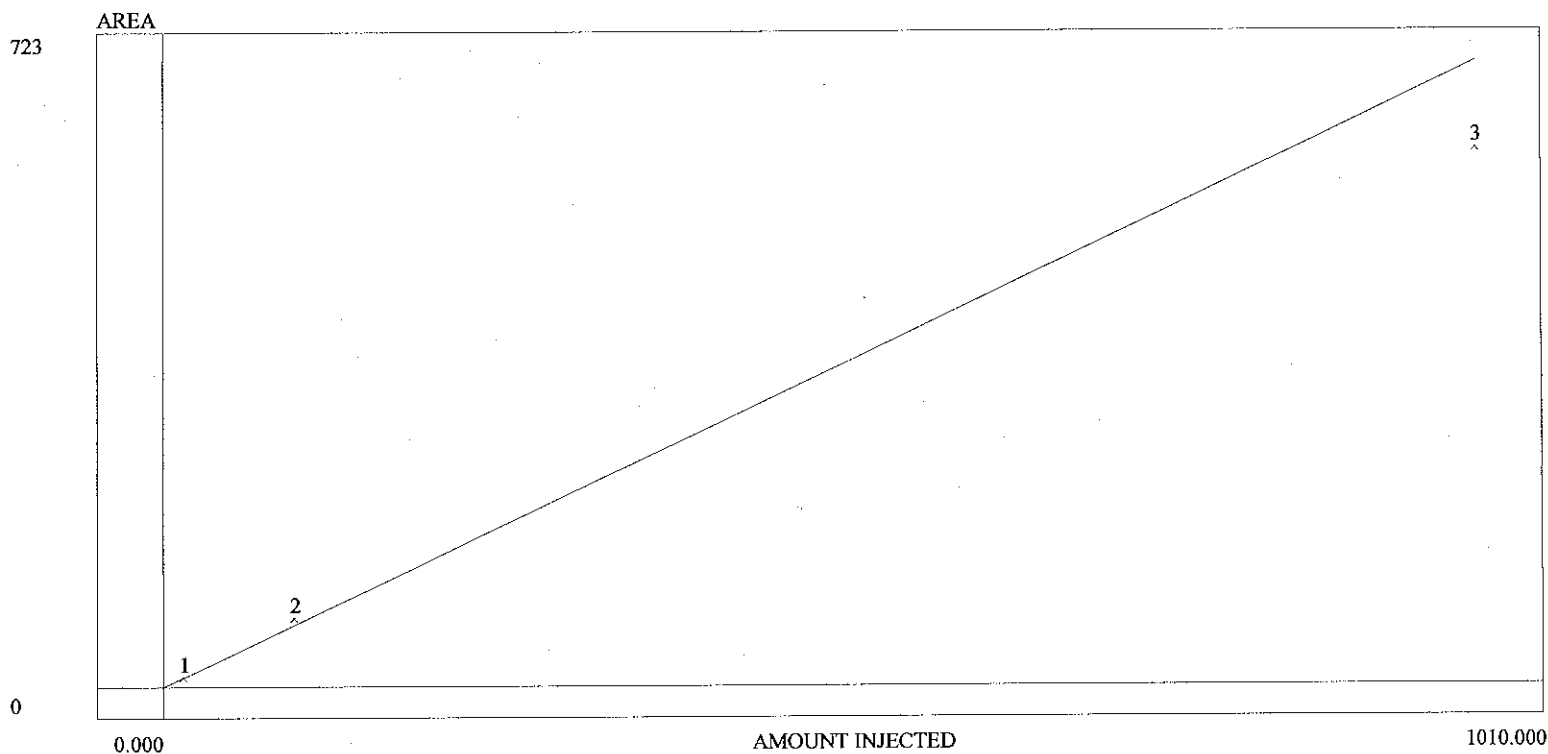
SD/rel SD of CF's: 0.0/6.0

Y=0.3993X

r2: 0.9999

Last calibrated: Tue May 17 16:33:43 2011

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	5.881	15.000	0.392	5.881	N/A	N/A
2	43.018	101.000	0.426	43.018	N/A	N/A
3	380.055	1000.000	0.380	380.055	N/A	N/A



Avg slope of curve: 0.72

Y-axis intercept: 0.00

Linearity: 1.00

Number of levels: 3

SD/rel SD of CF's: 0.1/12.7

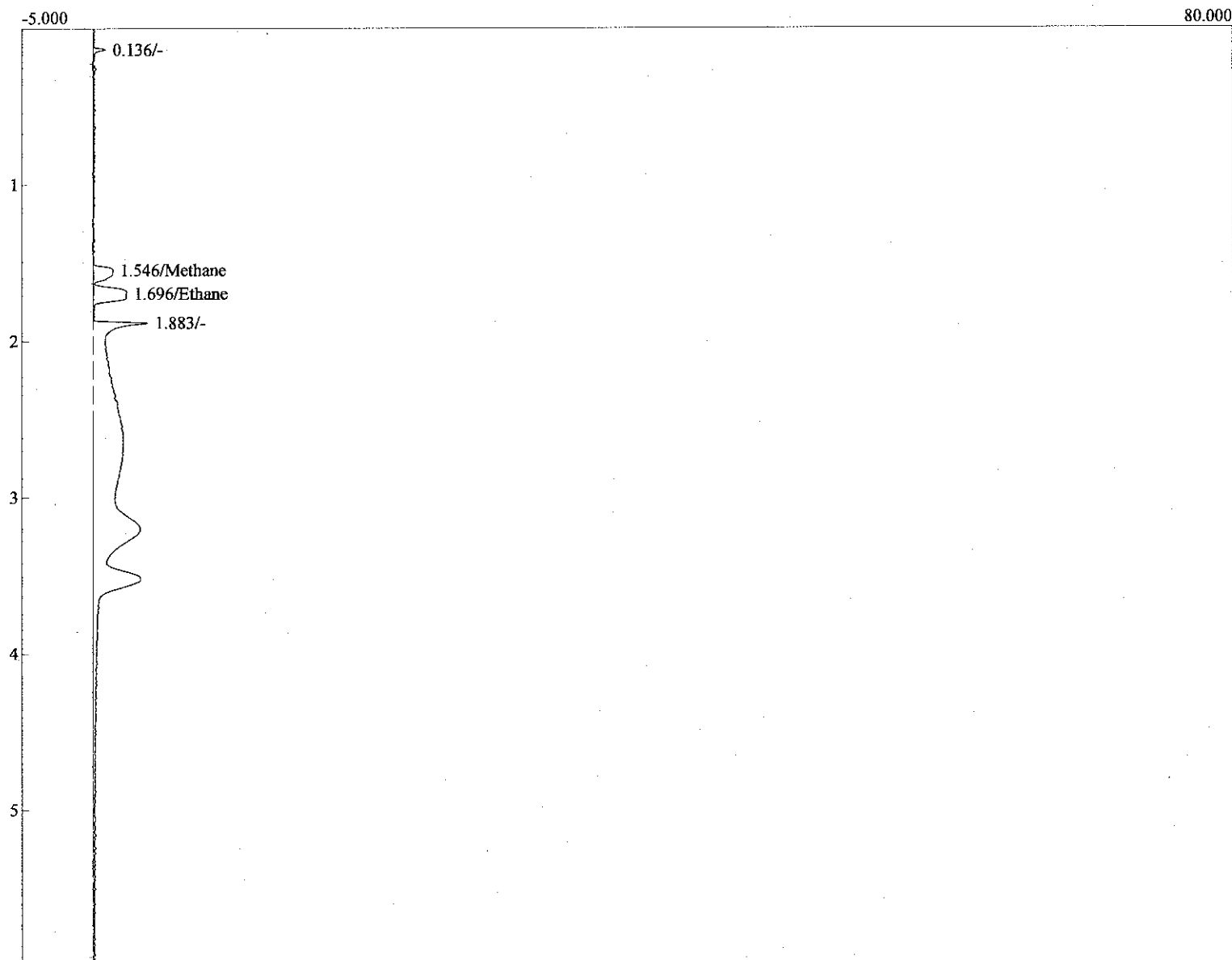
Y=0.7159X

r2: 0.9994

Last calibrated: Tue May 17 16:34:08 2011

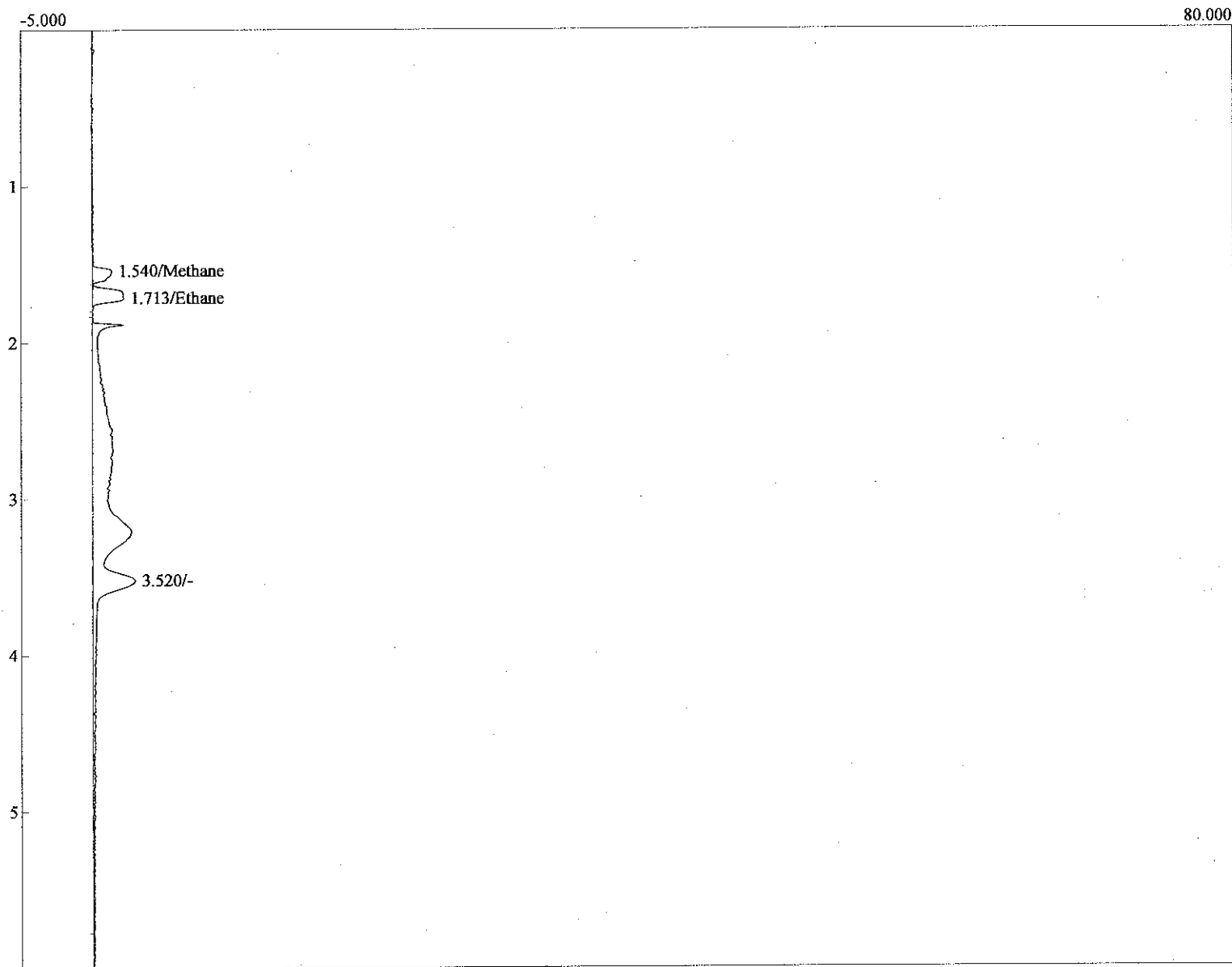
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	11.070	15.000	0.738	11.070	N/A	N/A
2	79.380	100.000	0.794	79.380	N/A	N/A
3	622.110	1010.000	0.616	622.110	N/A	N/A

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 13:17:48  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C07 ()  
 Operator: RI



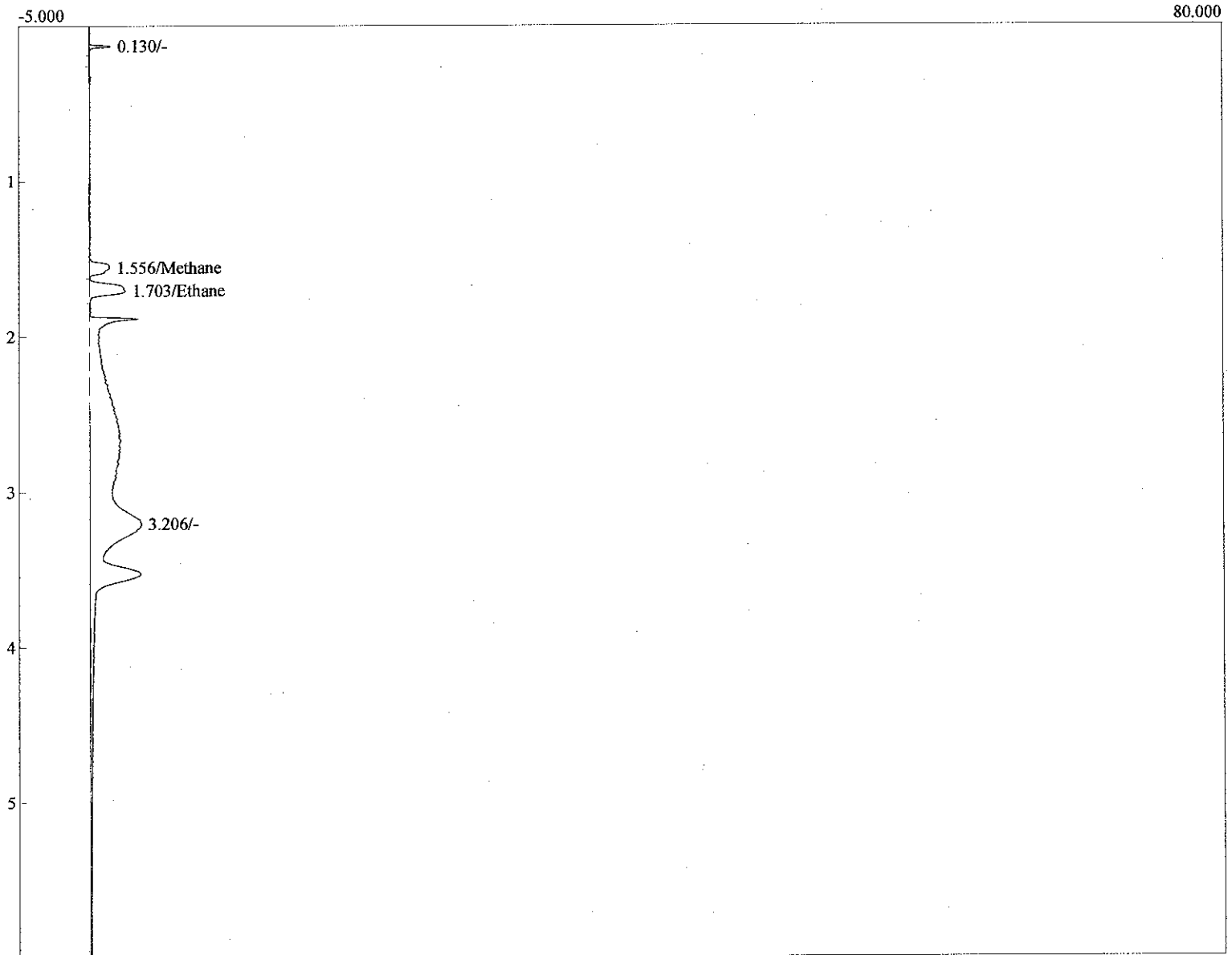
Component	Retention	Area	External	Units
Methane	1.546	6.66	15.0000	ppmv
Ethane	1.696	12.54	15.0000	ppmv
		19.20	30.0000	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 13:30:58  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C08 ()  
 Operator: RI



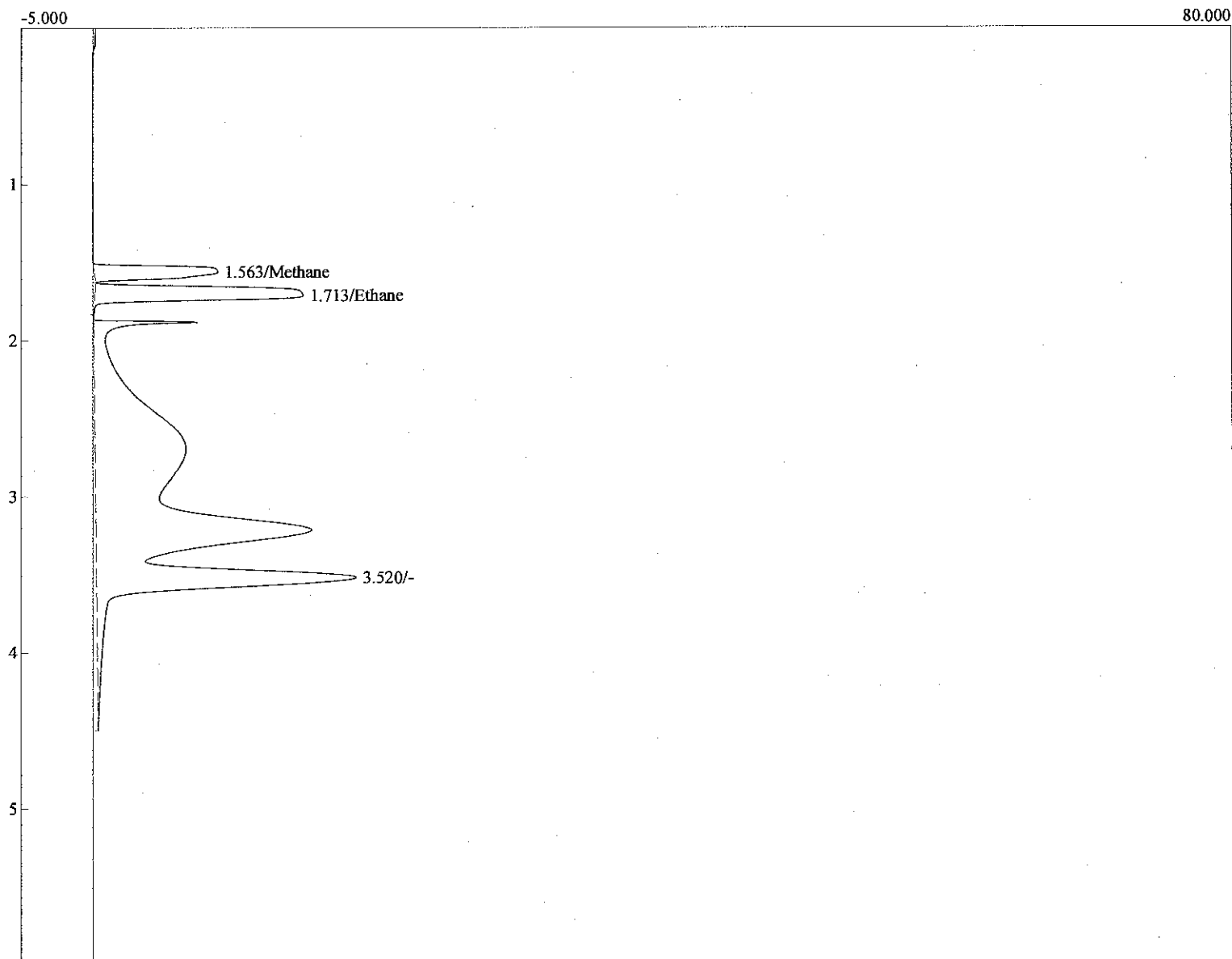
Component	Retention	Area	External	Units
Methane	1.540	6.31	15.0000	ppmv
Ethane	1.713	11.48	15.0000	ppmv
		17.79	30.0000	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 12:56:03  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C06 ()  
 Operator: RI



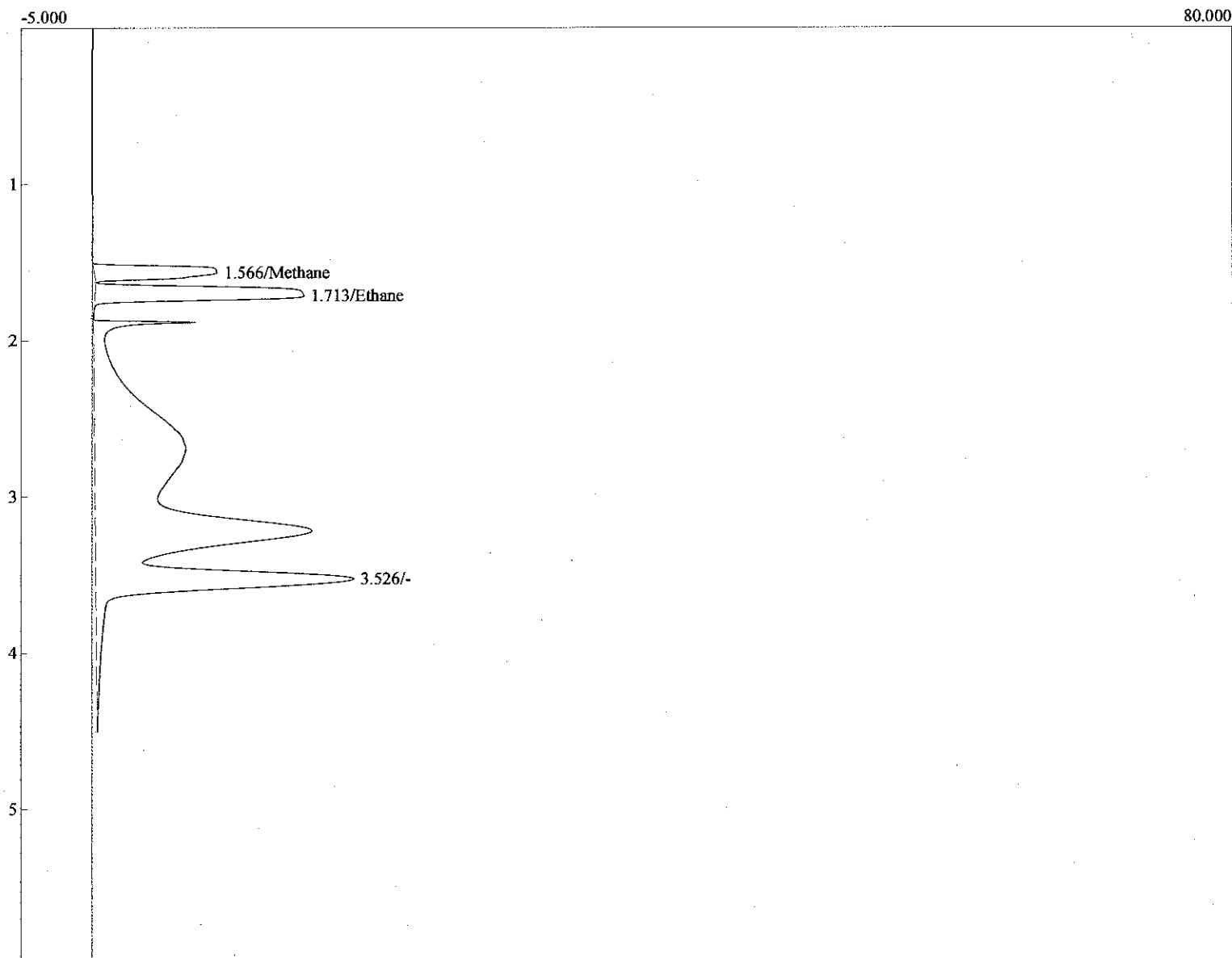
Component	Retention	Area	External	Units
Methane	1.556	5.88	15.0000	ppmv
Ethane	1.703	11.07	15.0000	ppmv
		16.95	30.0000	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 15:44:52  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C12. ()  
 Operator: RI



Component	Retention	Area	External	Units
Methane	1.563	42.60	104.6934	ppmv
Ethane	1.713	78.74	103.2369	ppmv
		121.35	207.9304	

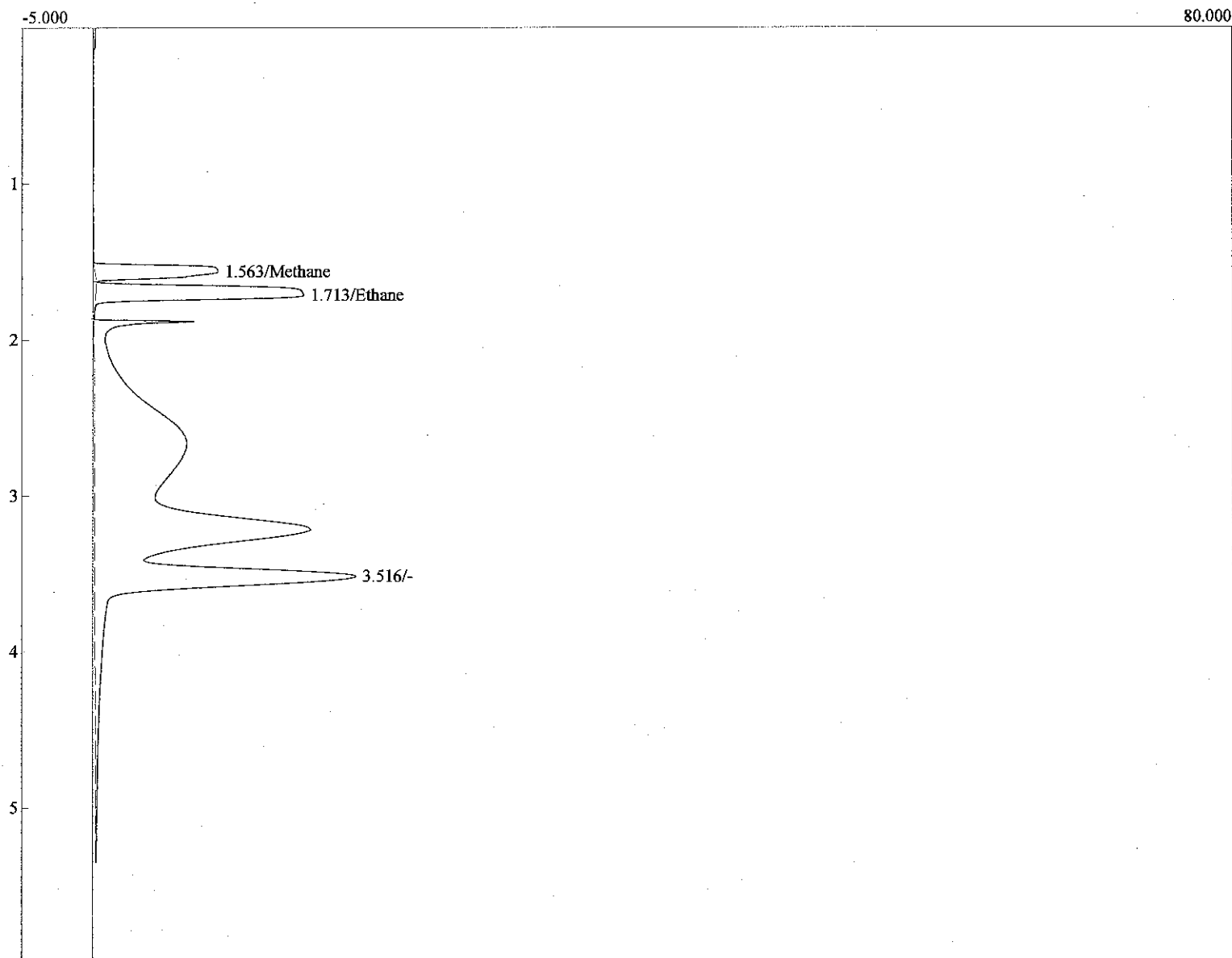
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 15:53:00  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C13.ASC ()  
 Operator: RI



Component	Retention	Area	External	Units
Methane	1.566	42.85	104.9798	ppmv
Ethane	1.713	79.25	103.5577	ppmv
		122.10	208.5374	

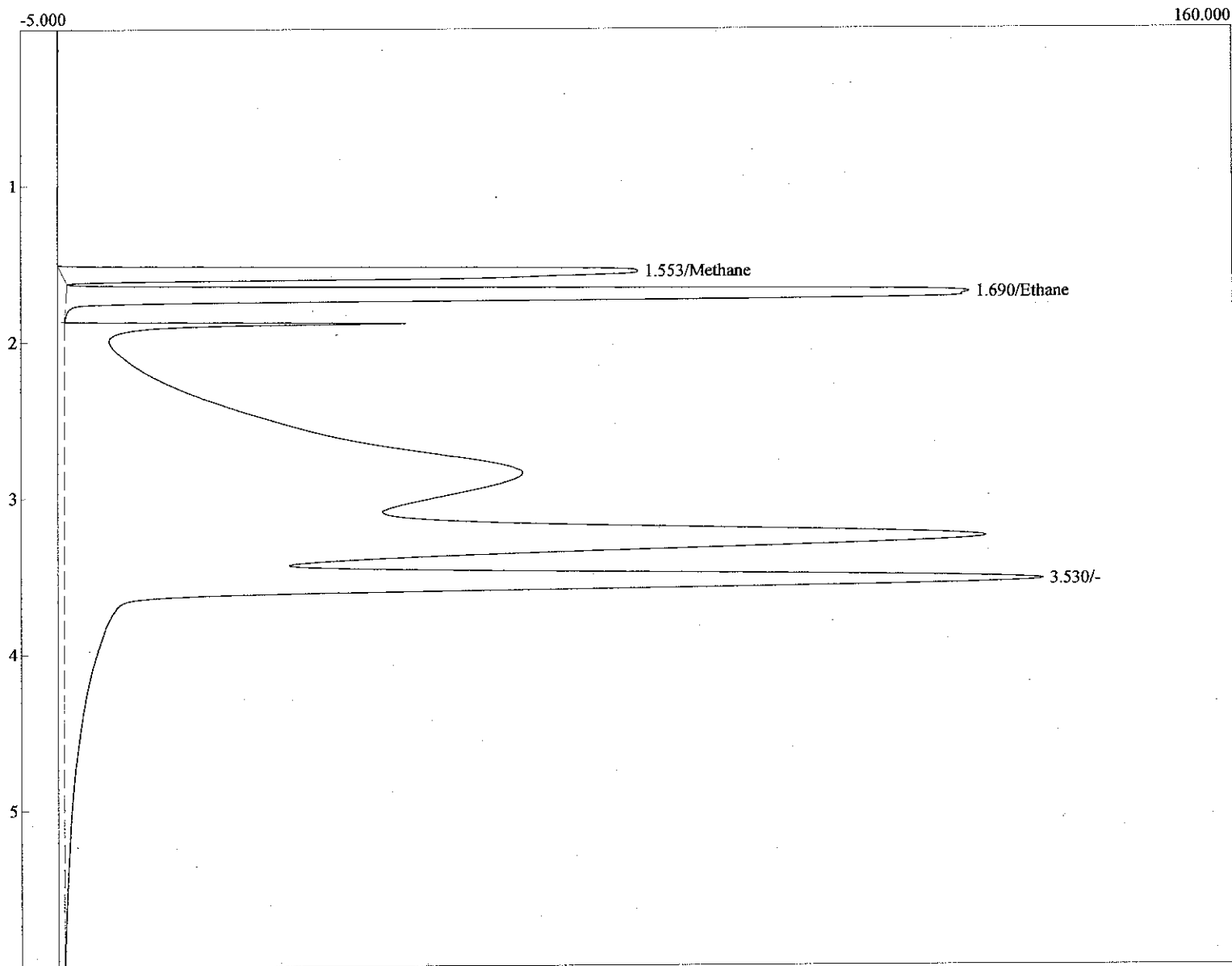


Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 15:58:50  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C14.ASC ()  
 Operator: RI



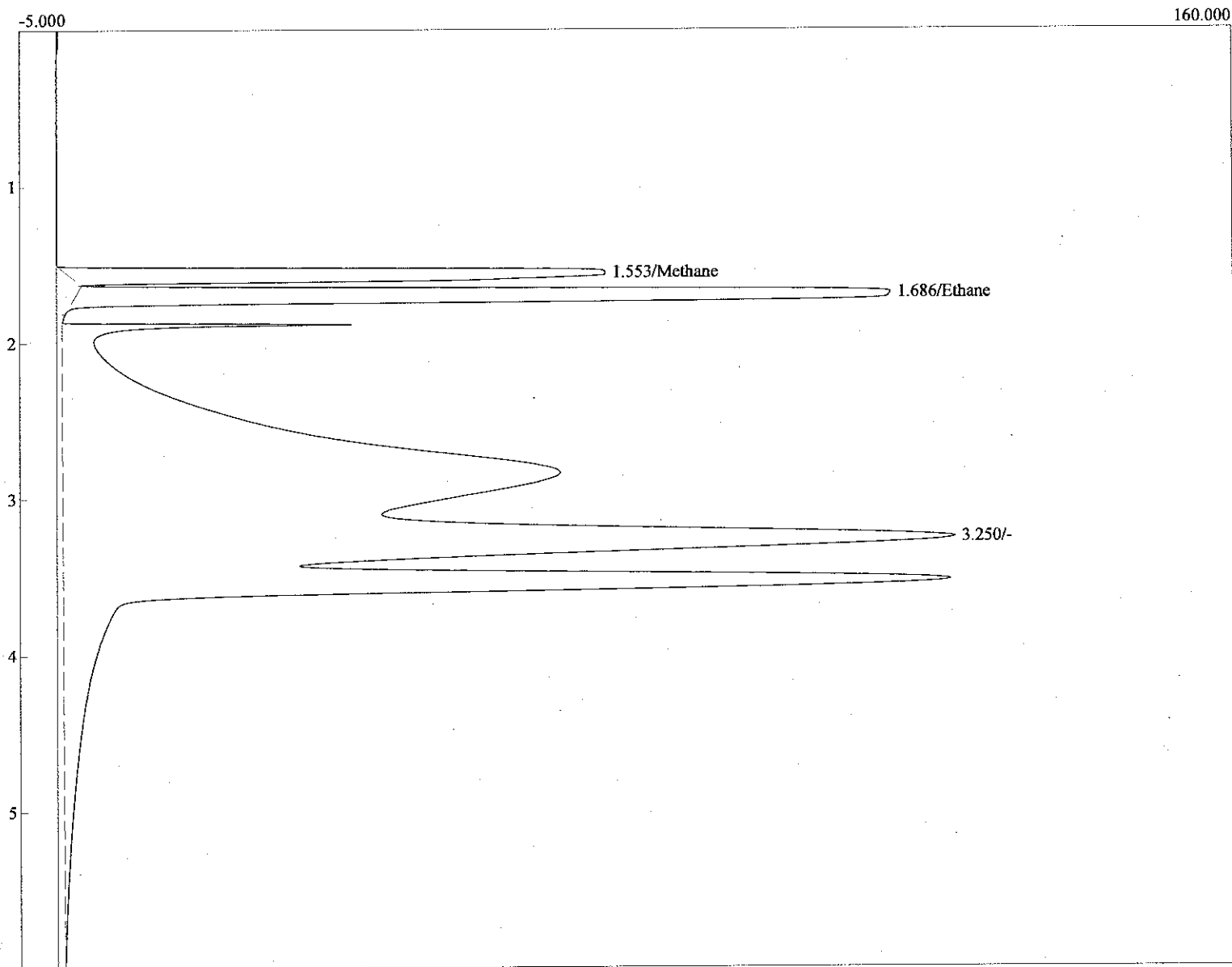
Component	Retention	Area	External	Units
Methane	1.563	43.02	105.1806	ppmv
Ethane	1.713	79.38	103.6404	ppmv
		122.40	208.8210	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 16:07:38  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C15.ASC ()  
 Operator: RI



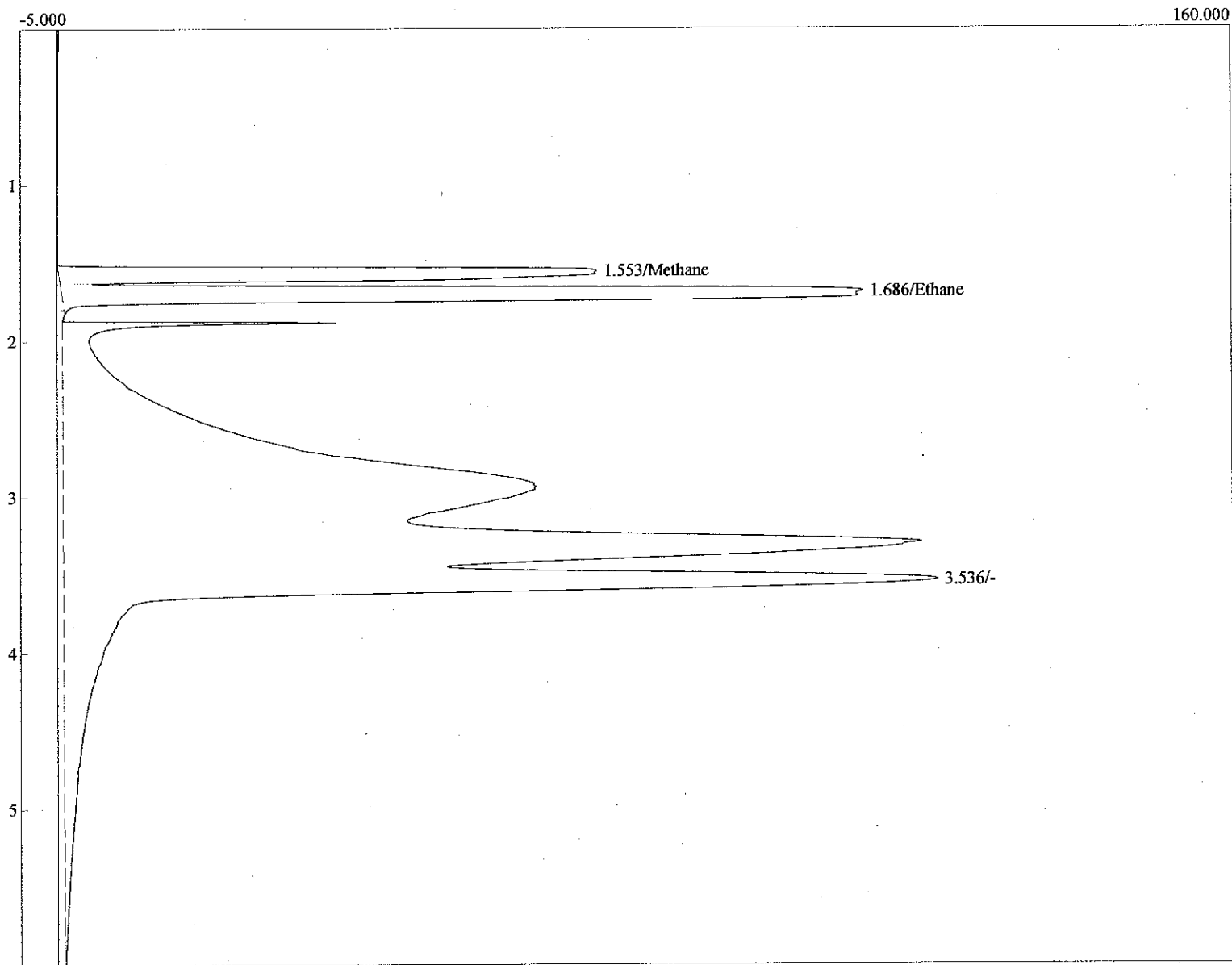
Component	Retention	Area	External	Units
Methane	1.553	363.21	888.0479	ppmv
Ethane	1.690	621.98	812.0750	ppmv
		985.19	1700.1230	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 16:16:31  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C16.ASC ()  
 Operator: RI



Component	Retention	Area	External	Units
Methane	1.553	373.56	948.7732	ppmv
Ethane	1.686	619.68	809.0763	ppmv
		993.25	1757.8495	

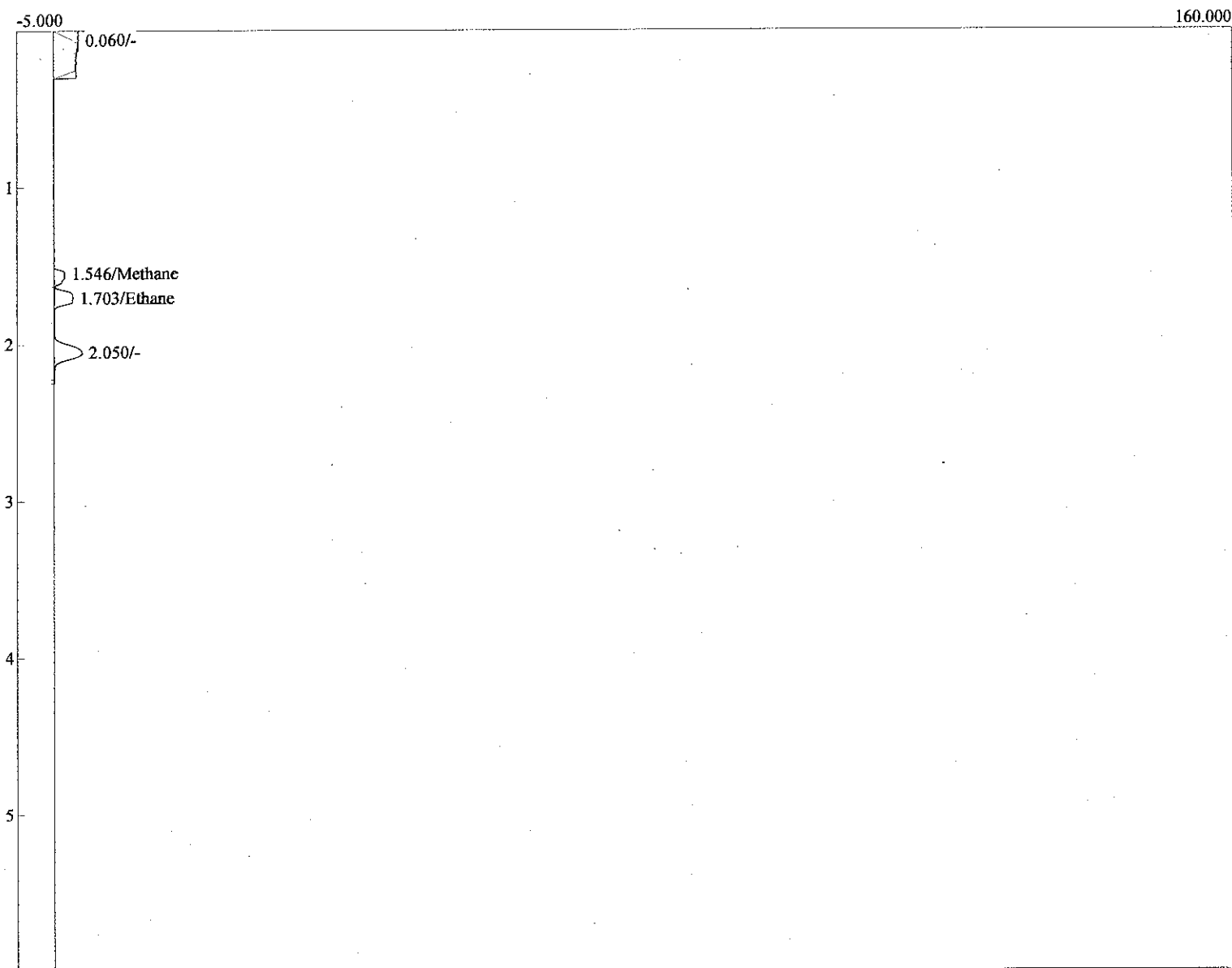
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 16:25:54  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C17.ASC ()  
 Operator: RI



Component	Retention	Area	External	Units
Methane	1.553	380.05	956.8706	ppmv
Ethane	1.686	622.11	869.9301	ppmv
		1002.16	1826.8007	

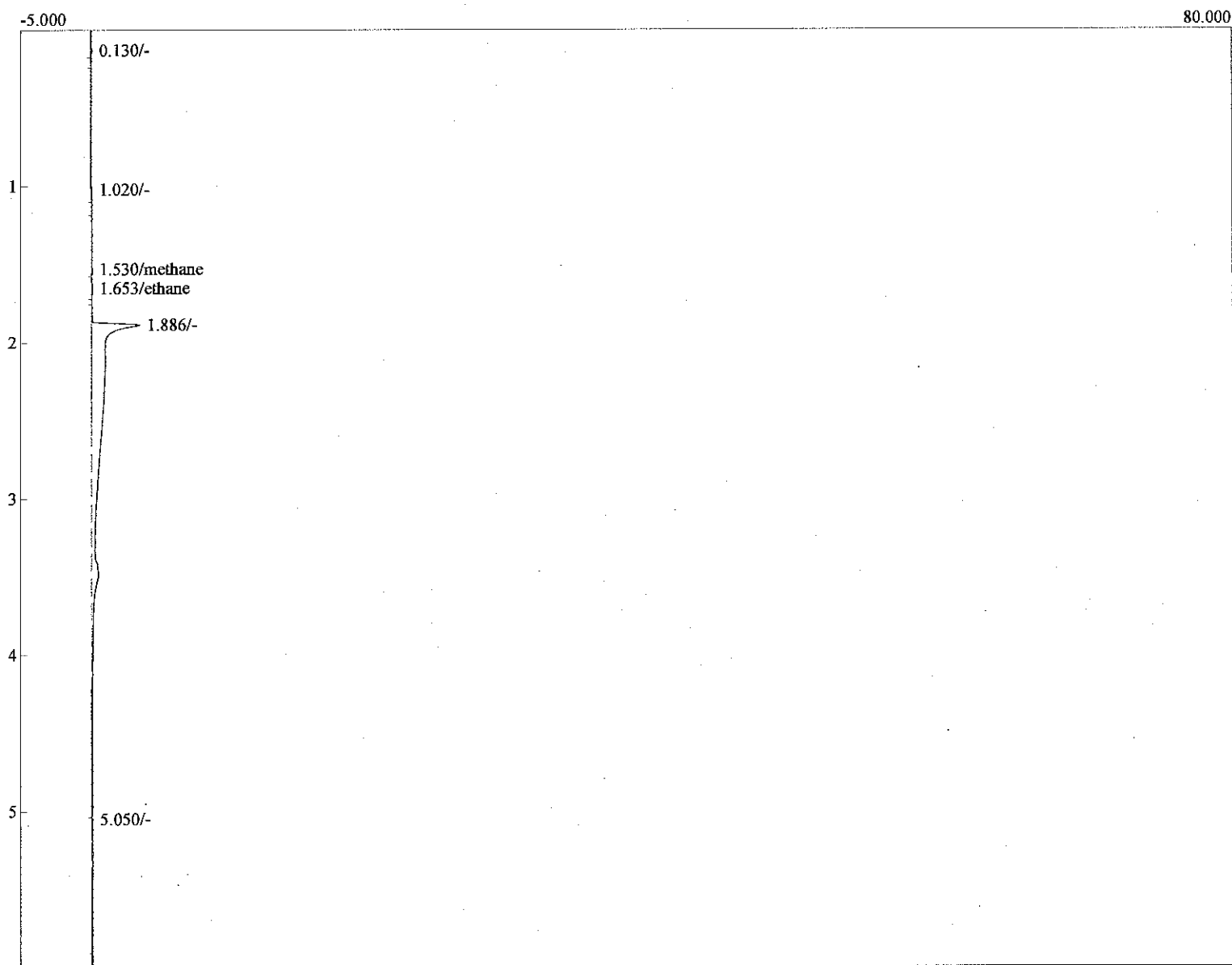
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:25:57  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 .ASC ()  
 Operator: RI

*15 ppm check*



Component	Retention	Area	External Units
Methane	1.546	6.87	0.0 ppmv
Ethane	1.703	13.57	0.0 ppmv
		20.45	0.0

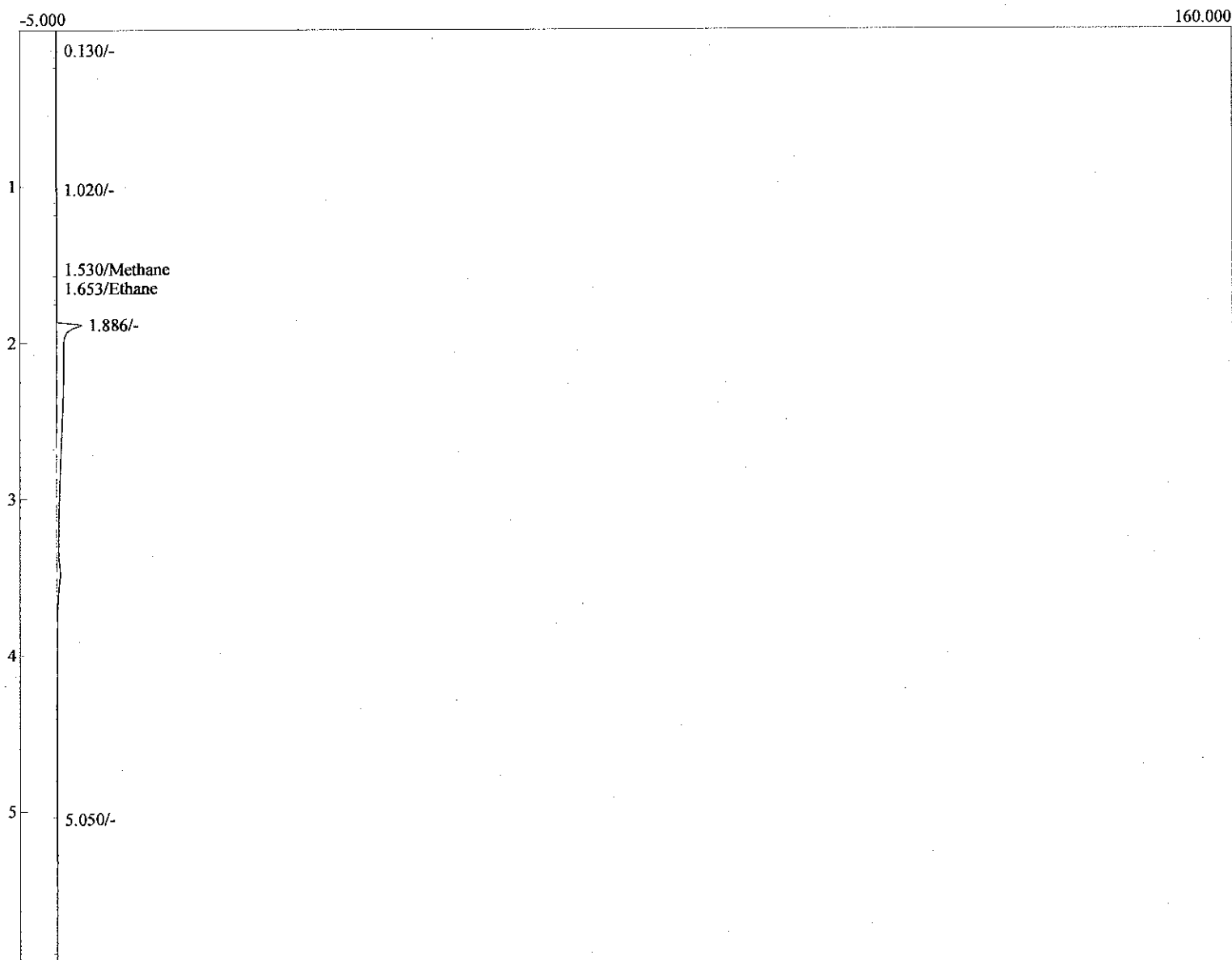
Lab name: Sbaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:01:53  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C18.ASC ()  
 Sample: Test Run 1  
 Operator: RI



Component	Retention	Area	External	Units
methane	1.530	0.14	0.3611	ppmv
ethane	1.653	0.22	0.3106	ppmv
		0.37	0.6717	

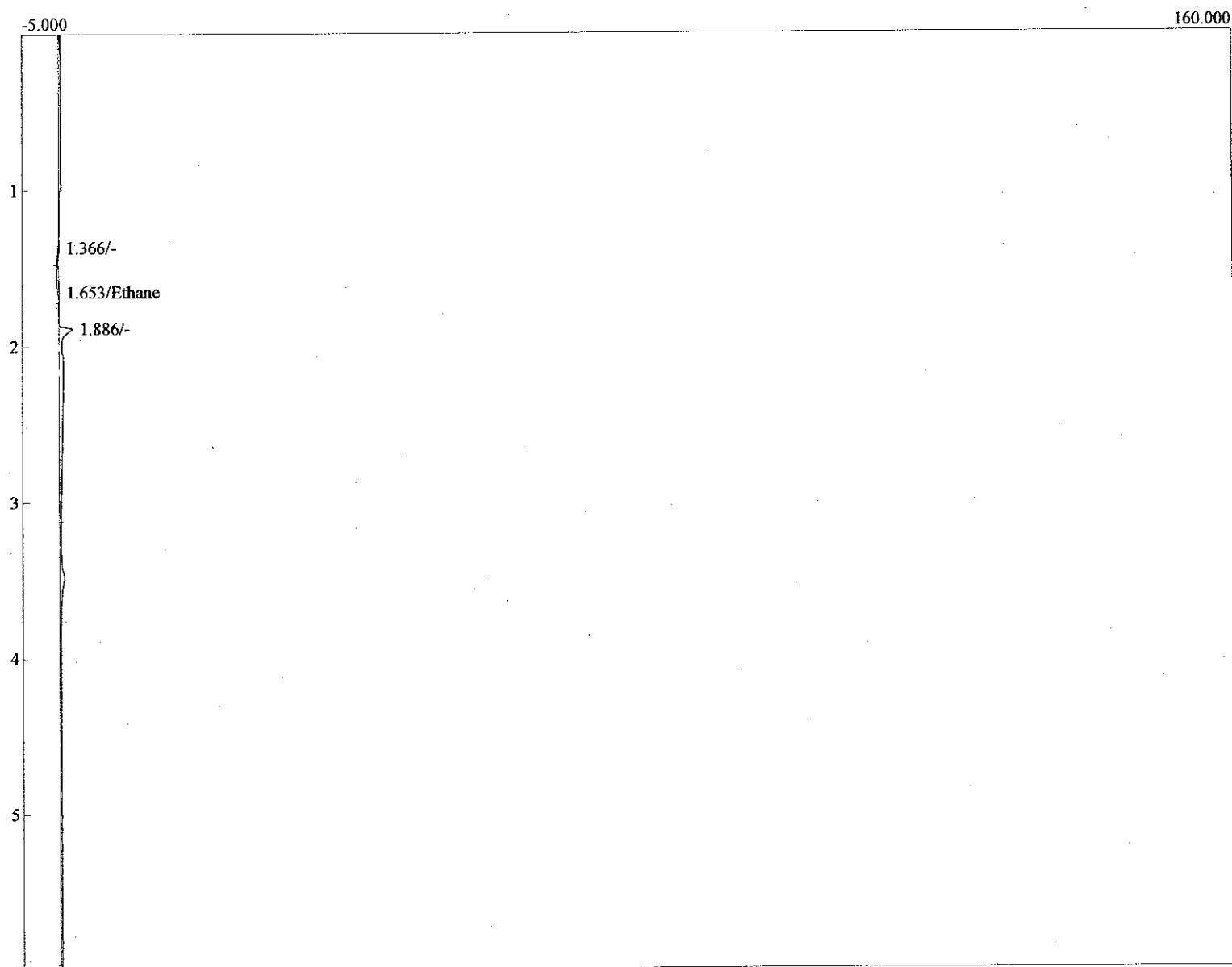
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:01:53  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C18.ASC ()  
 Operator: RJ

RW1



Component	Retention	Area	External Units
Methane	1.530	0.14	0.4 ppmv
Ethane	1.653	0.22	0.3 ppmv
		0.37	0.7

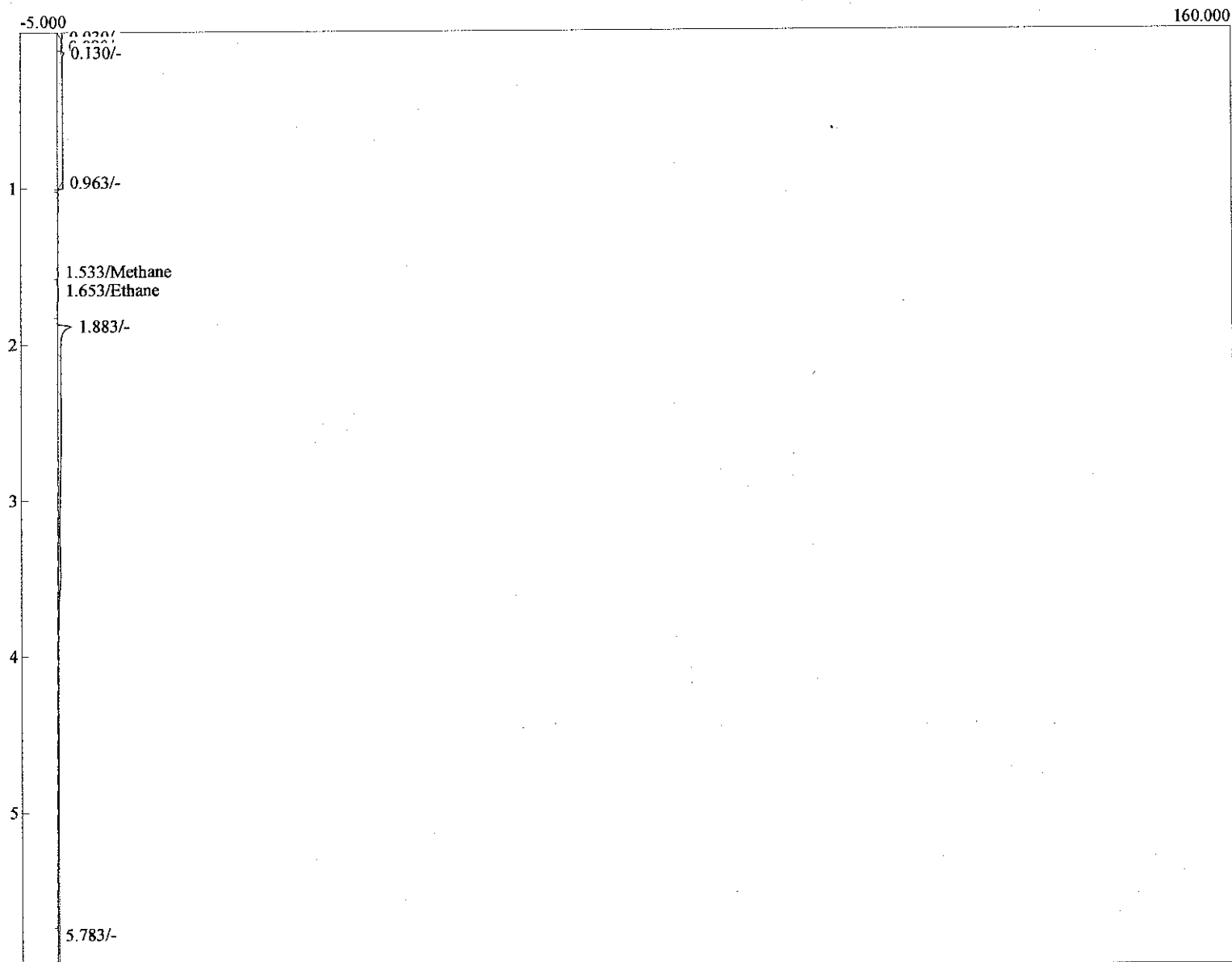
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:10:02  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1 *Run 1*  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C19.ASC ()  
 Operator: RI



Component	Retention	Area	External	Units
Ethane	1.653	1.33	1.9	ppmv
		1.33	1.9	

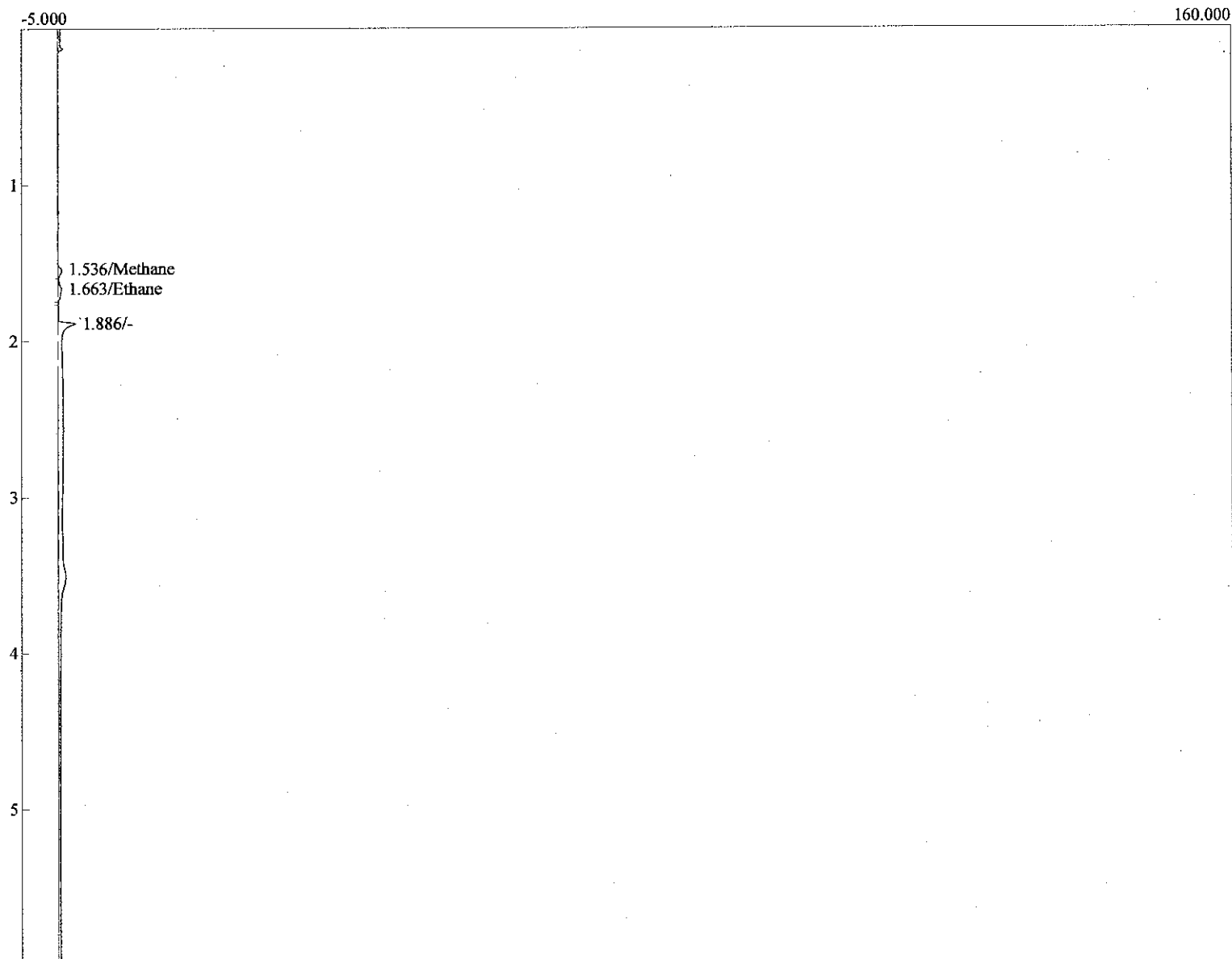


Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:19:44  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1 *Run 1*  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C20.ASC ()  
 Operator: RI



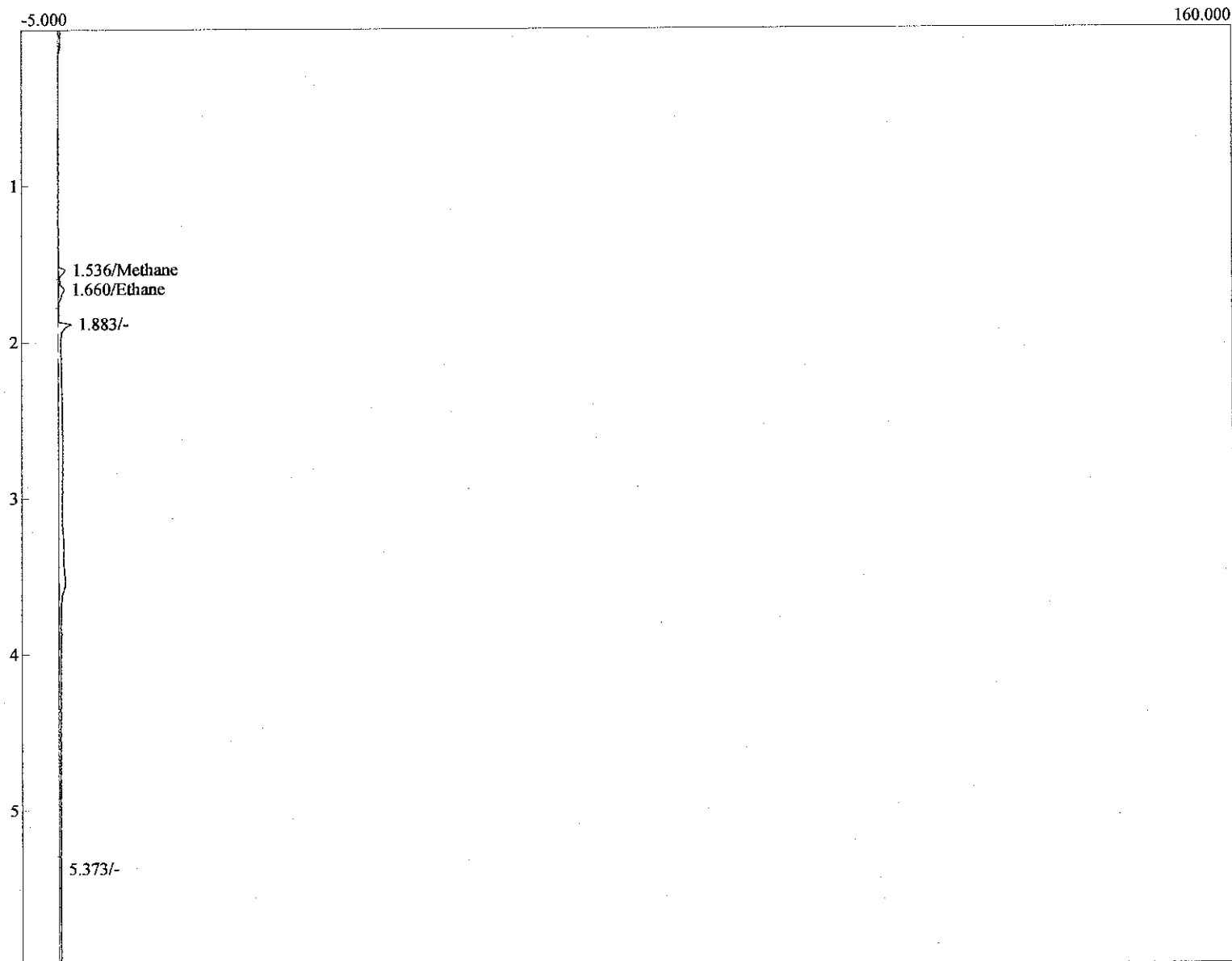
Component	Retention	Area	External Units
Methane	1.533	0.17	0.4 ppmv
Ethane	1.653	0.44	0.6 ppmv
		0.61	1.0

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:37:17  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 01.ASC ()  
 Operator: RI



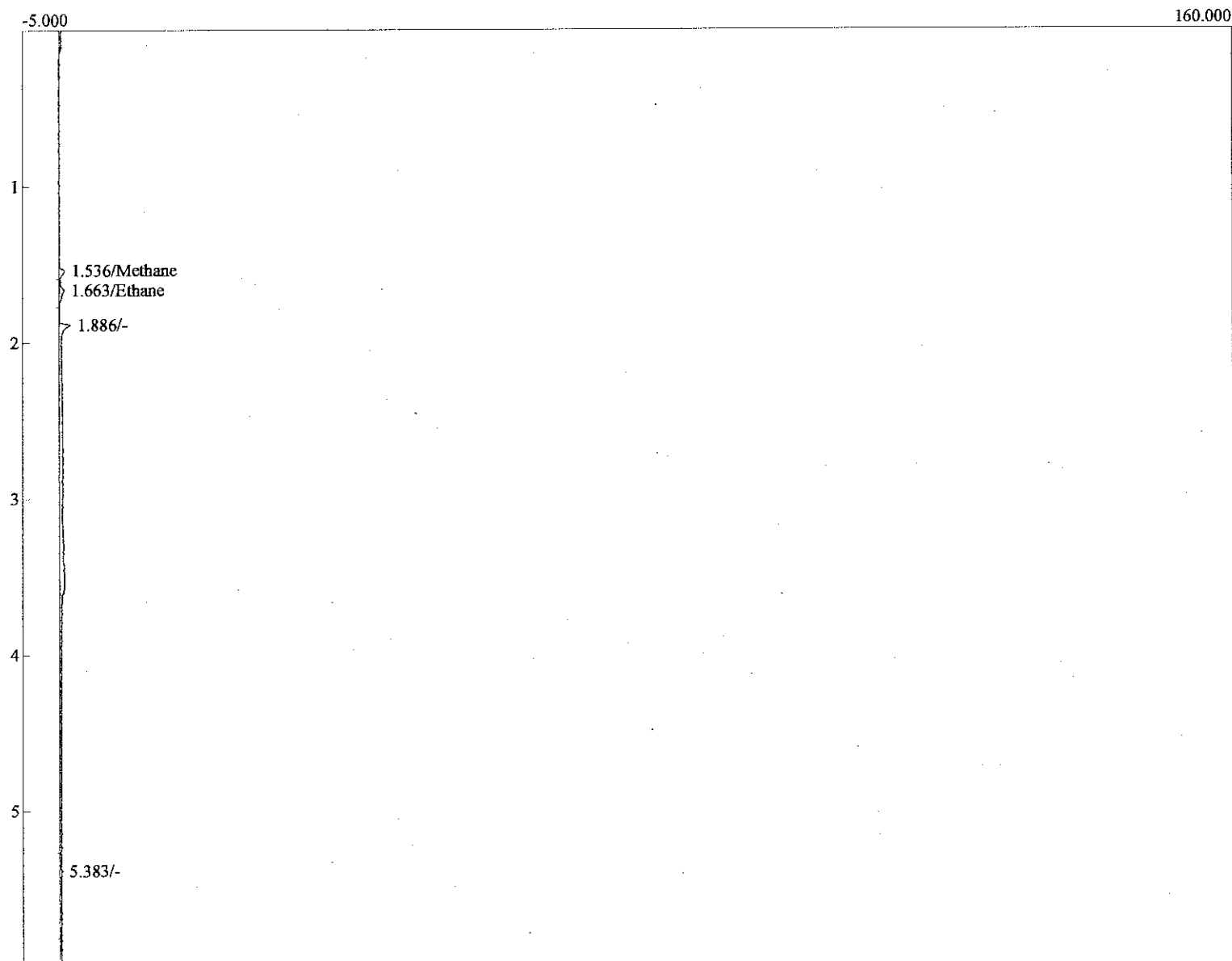
Component	Retention	Area	External	Units
Methane	1.536	1.25	3.1	ppmv
Ethane	1.663	1.84	2.6	ppmv
		3.09	5.7	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:45:29  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 02.ASC ()  
 Operator: RI



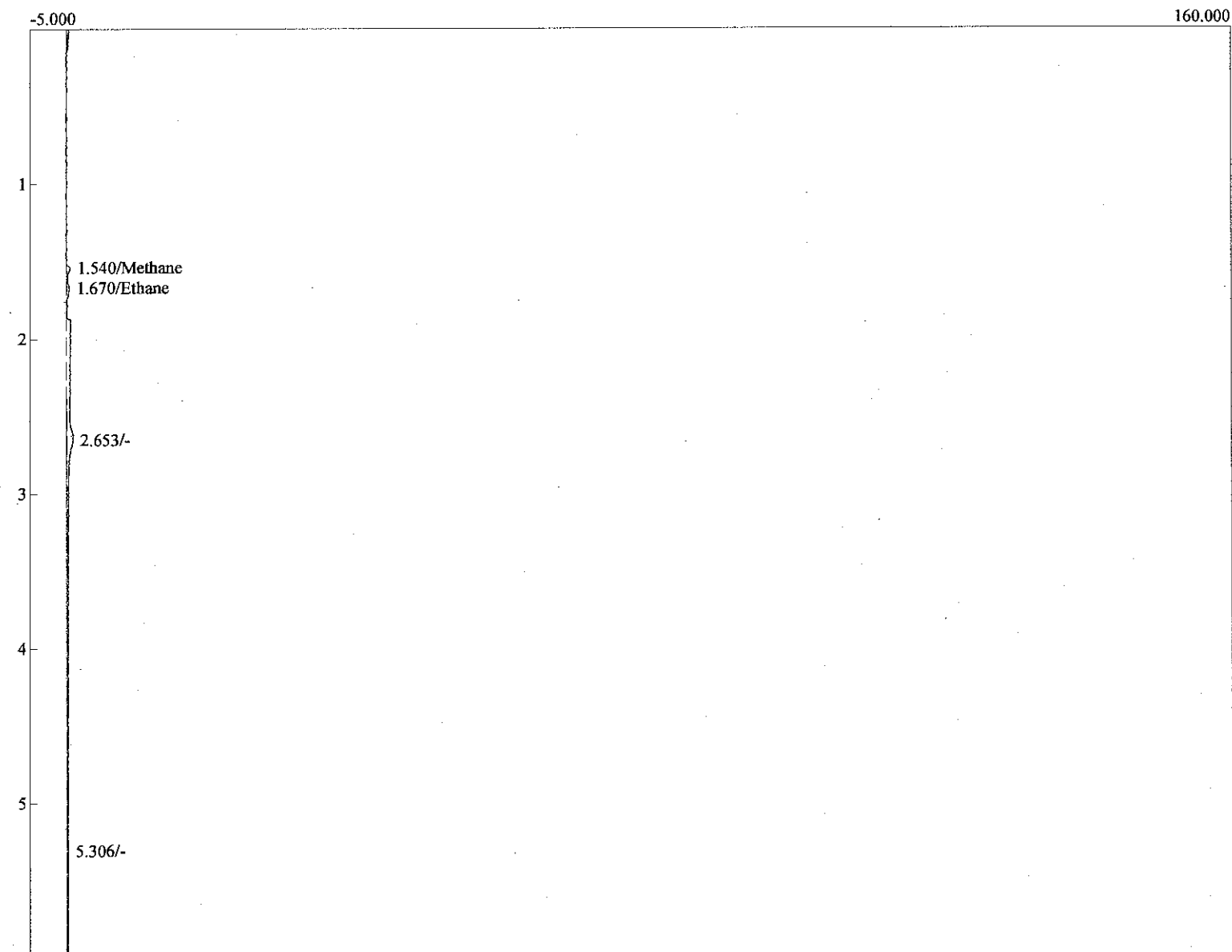
Component	Retention	Area	External	Units
Methane	1.536	1.98	5.0	ppmv
Ethane	1.660	2.97	4.1	ppmv
		4.95	9.1	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:54:44  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 03.ASC ()  
 Operator: RI



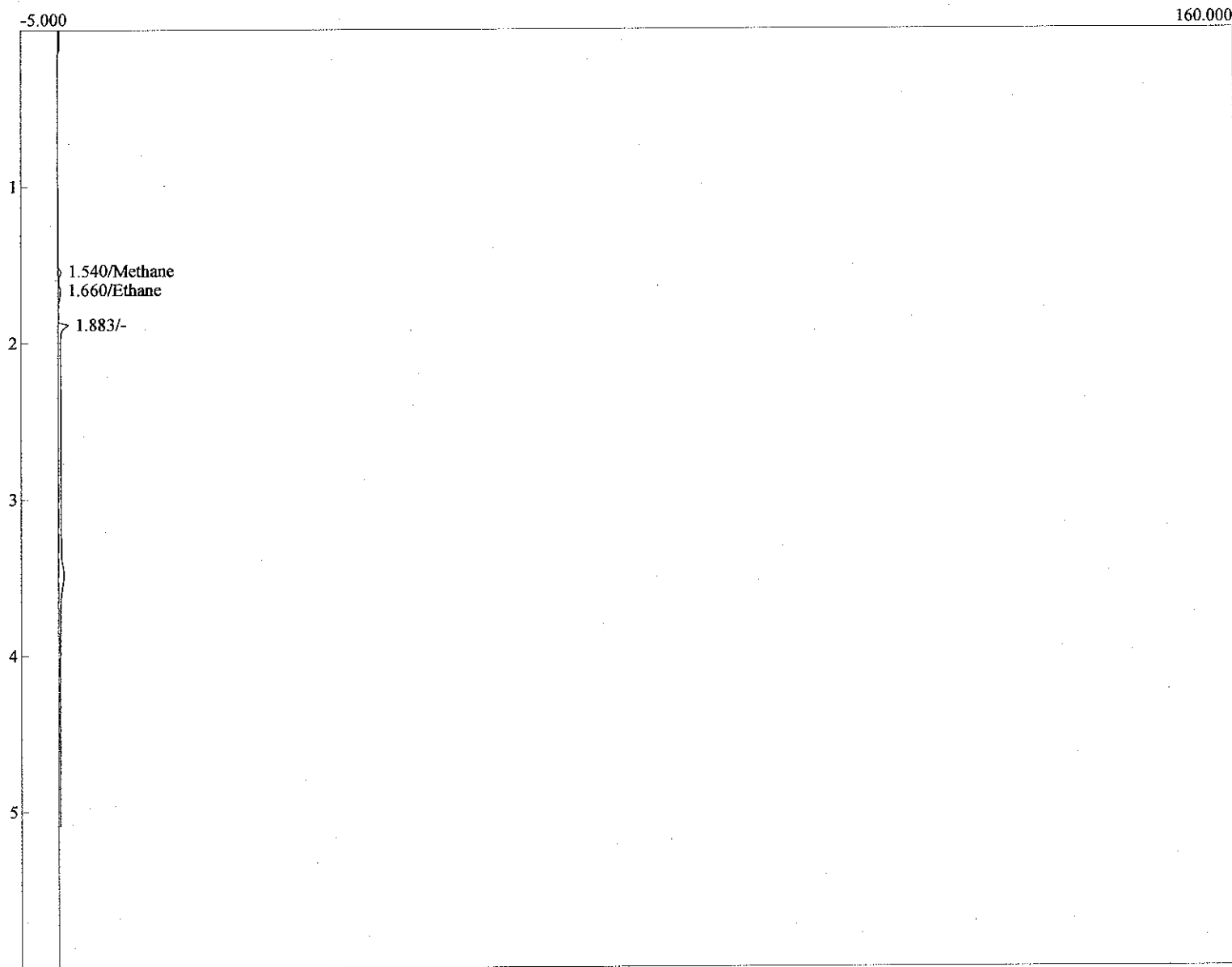
Component	Retention	Area	External	Units
Methane	1.536	1.69	4.2	ppmv
Ethane	1.663	2.33	3.3	ppmv
		4.02	7.5	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:13:57  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO Cat B WGS C1 and C17.ASC ()  
 Operator: RI



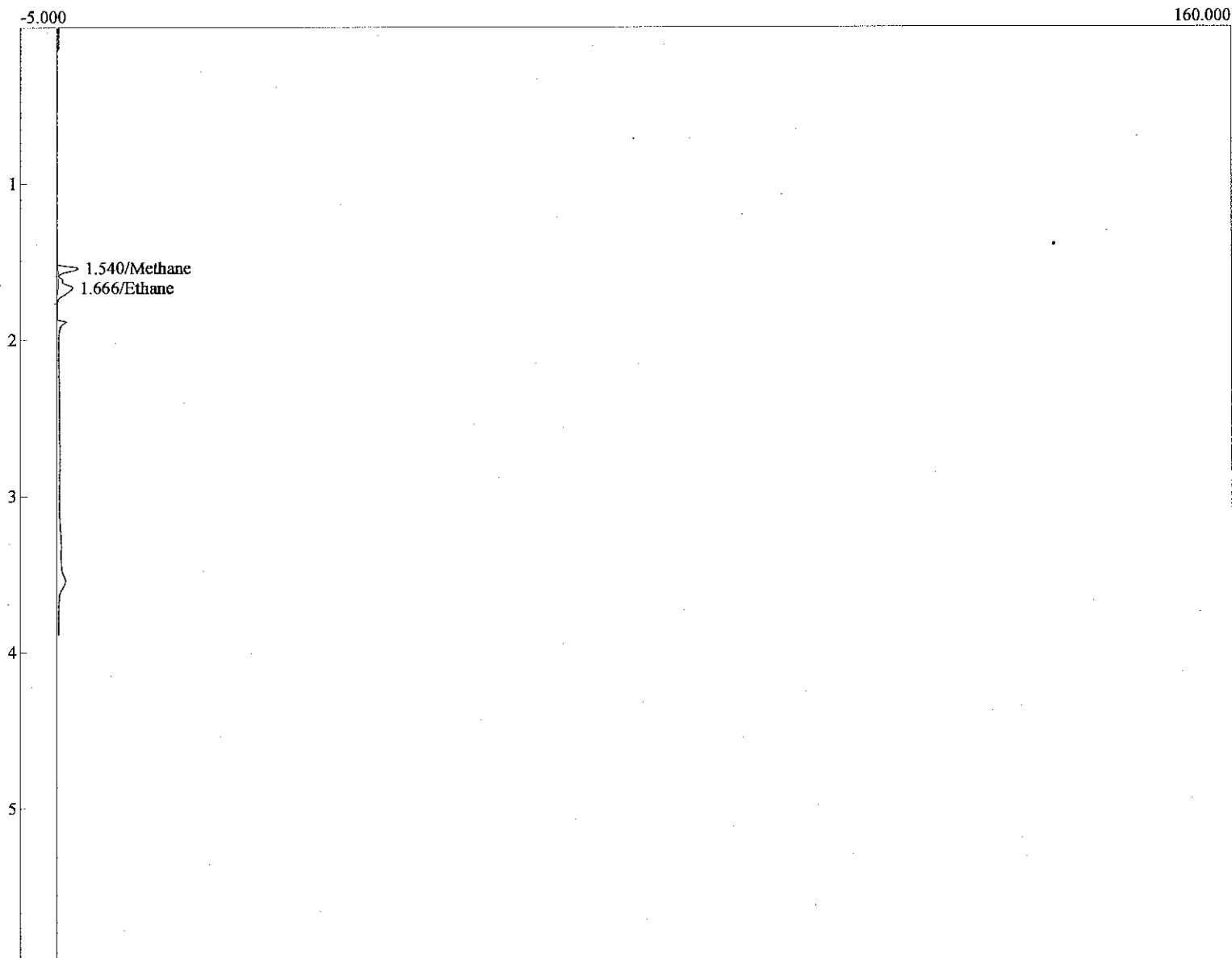
Component	Retention	Area	External	Units
Methane	1.540	1.18	3.0	ppmv
Ethane	1.670	1.56	2.2	ppmv
		2.74	5.1	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:23:13  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO Cat B WGS C1 and C18.ASC ()  
 Operator: RI



Component	Retention	Area	External Units
Methane	1.540	0.88	2.2 ppmv
Ethane	1.660	1.20	1.7 ppmv
		2.08	3.9

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:28:46  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO Cat B WGS C1 and C19.ASC ()  
 Operator: RI



Component	Retention	Area	External Units
Methane	1.540	5.89	14.7 ppmv
Ethane	1.666	8.36	11.7 ppmv
		14.24	26.4

***Appendix A12***  
***U.S. EPA Method 18 and Method 308***



## Field Data Sheet

SPECIATED  
V6 HAPS

TRANS 1-2

LFM-3

Y=1.050

Client:	CITGO
Location:	Lago Charley, LA
Source:	C-4 1
Method:	UNSPIKE
Date:	5-20-97
Sampler:	RC
Test No:	1

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	11:40	0	98	1 L/M	5
1	11:45	5.01	98		5
2	11:50	<del>5.70</del> 10.9	96		5
3	11:55	15.96	96		2
4	12:00	20.4	97		2
5	12:05	25.9	97		2
6	12:10	30.7	97		2
7	12:15	35.7	98		2
8	12:20	<del>40.5</del> 40.9	98		2
9	12:25	45.6	98		2
10	12:30	50.6	98		2
11	12:35	55.9	98		2
12	12:40	61.136	98		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60.00	61.136	97.46	1 L/M	2.69

Barometric P: 29.66 in Hg  
 Ambient Temp: 91 °F

Sampling Point

Notes / Observations:

Signature:

KAC

## Field Data Sheet

Client:	Lake Charles, LA
Location:	CITG
Source:	C-4 1
Method:	18 UNSPIKE
Date:	5-20-11
Sampler:	KC
Test No:	2

LFA-3  
Y=1.050

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	13:50	0	96	1 L/M	2
1	13:55	5.5	96		2
2	14:00	15.0 <del>10.6</del>	97		2
3	14:05	15.9	97		2
4	14:10	21.1	98		2
5	14:15	26.1	98		2
6	14:20	31.1	99		2
7	14:25	35.9	99		2
8	14:30	40.7	100		2
9	14:35	45.4	100		2
10	14:40	50.1	101		2
11	14:45	55.0	101		2
12	14:50	60.411	101		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	60.411	98.69	1 L/M	2

Barometric P: 29.66 in Hg  
Ambient Temp: 89 °F

Notes / Observations:

Signature: *K. A. G.*

## Field Data Sheet

LFM-3  
421.090

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 1
Method:	18 UNRIKE
Date:	5-20-11
Sampler:	KC
Test No:	3

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	15:46	0	98	1 L/m	2
1	15:45	5.1	98		2
2	15:50	10.5	99		2
3	15:55	15.9	100		2
4	16:00	21.3	101		2
5	16:05	26.5	101		2
6	16:10	31.7	101		2
7	16:15	36.8	101		2
8	16:20	41.5	102		2
9	16:25	43.5	101		2
10	16:30	49.5	102		2
11	16:35	54.3	102		2
12	16:40	60.381	102		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	60.381	100.62	1 L/m	2

Barometric P: 29.66 in Hg  
Ambient Temp: 91 °F

Notes / Observations:

Signature: *KW*

## Field Data Sheet

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 2
Method:	18 SPIKE
Date:	5-20-11
Sampler:	KC
Test No:	1

LA-LM02

Y = 0.976

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	11:40	0	93	1 L/M	2
1	11:45	5.70	94		2
2	11:50	11.2	94		2
3	11:55	16.2	94		2
4	12:00	21.2	95		2
5	12:05	26.1	95		2
6	12:10	30.7	95		2
7	12:15	35.0	95		2
8	12:20	39.0	95		2
9	12:25	43.9	95		2
10	12:30	50.0	95		2
11	12:35	55.8	95		2
12	12:40	61.226	95		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	61.226	94.92	1 L/M	2

Barometric P: 29.66 in Hg  
 Ambient Temp: 91 °F

Notes / Observations:

Signature: *KAC*

## Field Data Sheet

LA-LM02  
Y = 0.976

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 2
Method:	18 SPIKE
Date:	5-20-11
Sampler:	KC
Test No:	2

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	13:50	0	94	1 L/M	2
1	13:55	5.0	94		2
2	14:00	10.7	94		2
3	14:05	16.3	94		2
4	14:10	21.4	94		2
5	14:15	26.2	94		2
6	14:20	31.1	94		2
7	14:25	35.9	95		2
8	14:30	40.7	95		2
9	14:35	45.5	96		2
10	14:40	50.3	96		2
11	14:45	55.1	97		2
12	14:50	60.048	97		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	60.048	94.92	1 L/M	2

Barometric P: 29.66 in Hg  
Ambient Temp: 89 °F

Notes / Observations:

Signature: KAC

## Field Data Sheet

LA- LM02

Y = 0.976

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 2
Method:	18 SPIKE
Date:	5-20-11
Sampler:	KL
Test No:	3

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	15:40	0	97	1 L/m	2
1	15:45	5.4	97		2
2	15:50	4.9 10.8	97		2
3	15:55	15.5	98		2
4	16:00	21.6	98		2
5	16:05	27.0	98		2
6	16:10	32.0	100		2
7	16:15	36.6	100		2
8	16:20	41.2	101		2
9	16:25	45.8	101		2
10	16:30	50.4	101		2
11	16:35	55.1	102		2
12	16:40	60.591	102		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
6.6	60.591	99.38	1 L/m	2

Barometric P: 29.66 in Hg  
 Ambient Temp: 91 °F

Notes / Observations:

Signature: KAC

## Field Data Sheet

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 3
Method:	308
Date:	5-20-01
Sampler:	KC
Test No:	1

LA-LM01

V = 1.02 l

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	11:40	0	95	1 L/m	2.5
1	11:45	5.67	93		2.5
2	11:50	11.1	98		2.5
3	11:55	15.9	99		2.5
4	12:00	20.8	99		2.5
5	12:05	25.9	99		2
6	12:10	30.4	100		2.5
7	12:15	35.1	100		2
8	12:20	40.4	101		2.5
9	12:25	45.3	101		2.5
10	12:30	50.3	101		2.5
11	12:35	55.2	101		2.5
12	12:40	60.307	101		2.5
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	60.307	99.08	1 L/m	2.42

Barometric P: 29.66 in Hg  
 Ambient Temp: 91 °F

Notes / Observations:

Signature: *KAC*

## Field Data Sheet

LA-LM01

Y=1.021

Client:	Catgo
Location:	Lake Charles, LA
Source:	C-4 3
Method:	E-4 3 u 308
Date:	5-20-11
Sampler:	KC
Test No:	2

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	13:50	0	99	1 L/M	2
1	13:55	5.1	99		2
2	14:00	9.7	100		2
3	14:05	15.2	101		2.5
4	14:10	20.9	101		3
5	14:15	26.6	102		2.5
6	14:20	32.2	102		2.5
7	14:25	37.1	102		2
8	14:30	41.2	103		2
9	14:35	45.3	103		2.5
10	14:40	49.7	104		2.5
11	14:45	55.2	104		2
12	14:50	60.271	104		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	60.271	101.85	1 L/M	2.27

Barometric P: 29.66 in Hg  
 Ambient Temp: 89 °F

Notes / Observations:

Signature: *Kin*



## Field Data Sheet

Client:	Citgo
Location:	Lake Charles, LA
Source:	C-4 3
Method:	308
Date:	5-20-01
Sampler:	UC
Test No:	3

LA-LM01  
Y-1.021

Sample Point	Clock Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
Start	15:46	0	103	1 L/M	2.5
1	15:45	4.9	103		2.5
2	15:50	10.2	103		2
3	15:55	16.3	104		3
4	16:00	20.9	105		2.5
5	16:05	26.3	106		2.5
6	16:10	31.6	106		2
7	16:15	36.5	106		2
8	16:20	41.4	107		2.5
9	16:25	46.2	107		2.5
10	16:30	51.2	107		2
11	16:35	56.1	107		2
12	16:40	61.033	107		2
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
END					

Elapsed Time	Meter Volume (L)	Meter Temperature (°F)	Sample Flow (Unitless)	Meter Pressure (in. H <sub>2</sub> O)
60	61.033	105.46	1 L/M	2.31

Barometric P: 29.66 in Hg  
Ambient Temp: 91 °F

Notes / Observations:

Signature: *K. C.*

## ***Appendix B***

### ***Reference Method Instrument Data***

Calibration Error Test, Run : TRACA Version 3.01

Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat  
 Reference Cylinder Numbers  
 Zero Low-range Mid-range High-range  
 O2 KC025088B Ambient Air  
 CO2 CC171113 CC221405  
 CO CC232622 CC137872  
 SO2 CC216331 CC33459  
 NOx CC281221 CC56126

Date/Time 05-17-2011 12:25:48 PASSED  
 Analyze O2 CO2 CO NO2 NOx  
 Units % % ppm ppm ppm  
 Zero Ref Cyl 0.000 0.000 0.00 0.00 0.00  
 Zero Avg 0.003 0.221 0.38 -0.21 0.04  
 Zero Error% 0.2% 1.1% 0.4% 0.2% 0.0%  
 Low Ref Cyl  
 Low Avg  
 Low Error%  
 Mid Ref Cyl 9.996 9.991 50.78 51.07 49.14  
 Mid Avg 10.102 9.808 51.34 51.04 50.12  
 Mid Error% 0.7% 0.9% 0.6% 0.0% 1.0%  
 High Ref Cyl 20.990 18.930 95.05 101.50 95.76  
 High Avg 21.004 18.927 94.96 99.76 97.35  
 High Error% 0.4% 0.0% 0.1% 1.7% 1.6%  
 Calibration Error Test End

Prelim

Initial System Bias Check, R STRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
O2 XCD25088B  
CO2 CCI71113  
CO CC232622  
SO2 CC216331  
SOx CC281221

Date/Time	05-17-2011	12:51:28	FASSEN		
Analyte	O2	CO2	CO	SO2	NOx
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.00	0.00	0.00
Zero Cal	0.053	0.221	0.38	-0.21	0.04
Zero Avg	0.256	0.226	0.05	-0.03	0.04
Zero Bias%	0.8%	0.0%	0.3%	0.2%	0.0%
Zero Drift%					
Span Ref Cyl	9.936	9.991	50.78	51.07	49.14
Span Cal	10.102	9.800	51.34	51.04	50.12
Span Avg	10.000	9.348	46.46	46.16	47.95
Span Bias%	0.4%	2.3%	4.5%	4.8%	2.2%
Span Drift%					

System Bias Check End

Test Run 1 STRATA Version 3

	O <sub>2</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NO <sub>x</sub> ppm
Begin calculating run averages					
05-17-2011 13:18:27	1.101	16.704	38.33	0.33	19.52
05-17-2011 13:19:28	1.074	16.618	47.34	0.22	14.50
05-17-2011 13:20:27	1.043	16.665	68.98	0.19	13.26
05-17-2011 13:21:26	0.975	16.827	52.91	0.16	15.11
05-17-2011 13:22:27	1.049	16.773	45.12	0.24	17.13
05-17-2011 13:23:26	1.056	16.975	40.04	0.20	18.56
05-17-2011 13:24:27	1.129	17.085	38.17	0.11	21.68
05-17-2011 13:25:28	1.052	16.934	37.64	0.16	19.79
05-17-2011 13:26:26	0.961	16.973	42.81	0.08	17.87
05-17-2011 13:27:27	0.899	17.025	49.66	0.15	14.71
05-17-2011 13:28:27	0.924	16.990	48.48	0.15	17.02
05-17-2011 13:29:28	0.894	16.997	43.74	0.16	16.38
05-17-2011 13:30:28	0.826	17.073	54.70	0.20	14.18
05-17-2011 13:31:27	0.628	17.293	88.76*	0.06	9.53
05-17-2011 13:32:28	0.678	17.213	110.69*	0.11	9.45
05-17-2011 13:33:27	0.798	17.013	89.90*	0.09	11.03
05-17-2011 13:34:27	0.649	17.166	105.16*	0.06	10.08
05-17-2011 13:35:26	0.780	17.144	74.88	0.09	12.51
05-17-2011 13:36:27	0.790	17.172	62.27	0.07	13.25
05-17-2011 13:37:28	0.937	16.818	49.42	-0.02	14.68
05-17-2011 13:38:26	0.830	16.811	38.30	-0.01	12.44
05-17-2011 13:39:27	0.692	16.926	89.57*	-0.05	10.31
05-17-2011 13:40:27	0.844	16.804	65.44	-0.07	12.22
05-17-2011 13:41:28	0.744	16.910	73.84*	0.01	10.82
05-17-2011 13:42:26	0.785	16.946	72.76*	0.10	12.57
05-17-2011 13:43:27	0.771	16.971	82.41*	-0.01	10.44
05-17-2011 13:44:26	0.681	17.021	110.68*	-0.04	8.72
05-17-2011 13:45:27	0.920	16.834	74.07*	0.06	12.83
05-17-2011 13:46:27	0.883	16.862	69.72	0.04	12.96
05-17-2011 13:47:27	0.743	17.095	77.11	0.12	11.68
05-17-2011 13:48:28	0.672	17.149	104.21*	0.11	10.81
05-17-2011 13:49:26	0.891	17.019	56.36	0.09	14.49
05-17-2011 13:50:27	0.851	17.062	59.60	0.05	14.09
05-17-2011 13:51:27	0.860	17.085	52.74	0.02	14.23
05-17-2011 13:52:27	0.811	17.087	60.44	0.06	13.14
05-17-2011 13:53:28	0.766	17.161	68.48	0.03	12.41
05-17-2011 13:54:26	0.709	17.193	78.68*	0.08	11.24
05-17-2011 13:55:27	0.478	17.391	110.69*	0.12	7.05
05-17-2011 13:56:27	0.506	17.401	110.68*	0.07	7.53
05-17-2011 13:57:28	0.660	17.274	110.69*	0.09	9.20
05-17-2011 13:58:28	0.503	17.325	110.69*	0.07	7.45
05-17-2011 13:59:26	0.598	17.282	81.72*	0.09	9.07
05-17-2011 14:00:27	0.690	17.232	102.55*	0.05	9.91
05-17-2011 14:01:28	0.708	17.190	96.60*	0.04	10.63
05-17-2011 14:02:28	0.826	17.041	68.77	0.02	12.45
05-17-2011 14:03:26	0.875	17.013	57.99	0.07	13.62
05-17-2011 14:04:27	0.858	17.061	55.68	0.05	13.62
05-17-2011 14:05:27	0.777	17.087	66.72	0.10	12.20
05-17-2011 14:06:28	0.839	17.010	56.01	0.02	13.65
05-17-2011 14:07:26	0.719	17.090	86.44*	0.06	10.30
05-17-2011 14:08:27	0.690	17.094	100.60*	0.01	8.78
05-17-2011 14:09:28	0.926	16.955	70.81*	0.01	13.69
05-17-2011 14:10:26	0.873	16.934	58.86	0.07	13.49
05-17-2011 14:11:27	0.843	16.904	56.26	0.02	13.89
05-17-2011 14:12:27	0.965	16.831	46.36	0.04	16.96
05-17-2011 14:13:28	1.046	16.737	41.62	0.07	18.31
05-17-2011 14:14:27	0.872	16.878	48.10	0.04	15.79
05-17-2011 14:15:27	0.900	16.873	47.72	0.06	16.02
05-17-2011 14:16:28	0.969	16.843	44.34	0.04	17.37
05-17-2011 14:17:28	0.940	16.861	43.58	0.04	17.09
Pause					
End Pause					
05-17-2011 14:36:28	1.220	16.470	35.52	-0.09	16.31
05-17-2011 14:37:26	1.216	16.498	34.61	-0.12	16.61
05-17-2011 14:38:27	1.103	16.738	37.37	0.02	21.15
05-17-2011 14:39:28	1.172	16.818	35.17	0.02	21.02
05-17-2011 14:40:27	1.101	16.747	36.69	0.04	21.24
05-17-2011 14:41:28	1.105	16.626	38.57	-0.16	18.92
05-17-2011 14:42:27	1.142	16.616	36.13	-0.06	20.54
05-17-2011 14:43:28	0.985	16.764	60.36*	-0.09	14.48
05-17-2011 14:44:27	0.838	16.881	95.54*	-0.03	12.31
05-17-2011 14:45:27	1.075	16.718	55.43	-0.04	16.66
05-17-2011 14:46:26	1.113	16.634	45.74	-0.05	17.57
05-17-2011 14:47:27	1.045	16.587	46.61	-0.04	16.45
05-17-2011 14:48:26	1.068	16.585	42.40	-0.08	17.87
05-17-2011 14:49:27	1.175	16.545	35.62	0.01	22.40
05-17-2011 14:50:27	1.058	16.664	39.93	-0.03	19.63
05-17-2011 14:51:28	1.143	16.611	38.16	0.04	20.13
05-17-2011 14:52:27	1.166	16.578	36.07	-0.06	20.71
05-17-2011 14:53:27	1.019	16.629	41.22	-0.03	17.42
05-17-2011 14:54:26	0.882	16.699	49.66	0.03	16.19
05-17-2011 14:55:27	0.911	16.841	60.89*	0.01	13.75
05-17-2011 14:56:28	0.898	16.931	103.98*	0.04	12.17
05-17-2011 14:57:26	0.959	16.803	77.61	0.07	12.80
05-17-2011 14:58:26	0.871	16.893	60.18	0.04	13.52

05-17-2011 14:59:27	0.779	16.931	73.73	0.24	11.07
05-17-2011 15:00:27	0.922	16.838	70.04	-0.08	12.71
05-17-2011 15:01:28	0.787	16.804	73.80	-0.04	10.91
05-17-2011 15:02:26	0.815	16.819	75.81	-0.05	12.73
05-17-2011 15:03:27	0.669	16.781	59.87	-0.07	12.79
05-17-2011 15:04:27	0.744	16.830	82.54*	-0.08	10.15
05-17-2011 15:05:28	0.827	16.805	64.34	-0.04	12.32
05-17-2011 15:06:28	0.805	16.858	66.05	-0.03	12.14
05-17-2011 15:07:27	0.613	16.888	94.68*	-0.12	6.37
05-17-2011 15:08:28	0.501	17.025	69.78	-0.07	6.19
05-17-2011 15:09:27	0.547	16.992	29.11	0.02	7.73
05-17-2011 15:10:28	0.738	16.823	15.47	-0.09	9.11
05-17-2011 15:11:27	0.795	16.766	55.87	-0.09	9.90
05-17-2011 15:12:28	0.750	16.782	86.77*	-0.09	9.30
05-17-2011 15:13:26	0.666	16.873	110.75*	-0.05	9.02
05-17-2011 15:14:27	0.669	16.885	110.75*	-0.16	0.66
05-17-2011 15:15:28	0.681	16.868	110.74*	-0.21	8.31
05-17-2011 15:16:27	0.845	16.732	53.54*	-0.28	10.20
05-17-2011 15:17:28	0.896	16.676	64.68	-0.29	10.69
05-17-2011 15:18:27	0.776	16.725	101.91*	-0.37	8.49
05-17-2011 15:19:27	0.665	16.883	105.86*	-0.31	7.80
05-17-2011 15:20:28	0.615	16.972	56.63*	-0.26	7.66
05-17-2011 15:21:26	0.841	16.764	11.55	-0.20	10.01
05-17-2011 15:22:27	0.835	16.699	72.62*	-0.24	8.78
05-17-2011 15:23:27	0.839	16.664	82.03	-0.32	9.56
05-17-2011 15:24:28	0.834	16.696	89.24*	-0.31	10.08
05-17-2011 15:25:28	1.000	16.645	34.96	-0.25	13.02
05-17-2011 15:26:26	0.852	16.652	79.50	-0.29	10.07
05-17-2011 15:27:27	1.045	16.528	55.00	-0.35	11.88
05-17-2011 15:28:27	1.007	16.525	51.41	-0.34	11.51
05-17-2011 15:29:28	0.899	16.619	65.77	-0.33	11.39
05-17-2011 15:30:26	1.018	16.550	45.43	-0.31	13.19
05-17-2011 15:31:27	1.023	16.537	55.35*	-0.33	10.41

```

Test Run 1 STRATA Version 3
      O2      CO2      CO      SO2      NOx
      %      %      ppm      ppm      ppm
05-17-2011 15:32:28  0.793  16.714  110.75*  -0.31  7.50
05-17-2011 15:33:26  0.887  16.616  106.73*  -0.32  8.32
05-17-2011 15:34:27  1.041  16.491  66.64   -0.35  10.32
Run Averages      O2      CO2      CO      SO2      NOx
                  %      %      ppm      ppm      ppm
05-17-2011 15:34:56  0.866  16.871  65.77*  -0.03  13.11
Operator:      KC
Plant Name:    Citge
Location:      B-Cat
Test Run 1 End

```

Final System Bias Check, Run 1 RATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
O2 XC025088B  
CO C1711113  
CO C232622  
SO2 C216331  
POx C2101221

Date/Time	05-17-2011	16:46:01	PASSED		
Analyte	O2	CO2	CO	SO2	POx
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.00	0.00	0.00
Zero Cal	0.053	0.221	0.38	-0.21	0.09
Zero Avg	0.340	0.347	0.11	-0.52	0.42
Zero Bias%	1.1%	0.6%	0.3%	0.3%	0.4%
Zero Drift%	0.3%	0.6%	0.1%	-0.5%	0.4%
Span Ref Cyl	9.936	9.991	50.78	51.07	49.14
Span Cal	10.102	9.608	51.34	51.04	50.12
Span Avg	10.055	9.293	47.07	46.12	47.96
Span Bias%	0.2%	2.6%	4.3%	4.9%	2.2%
Span Drift%	0.2%	-0.3%	0.6%	0.0%	0.0%
Ini Zero Avg	0.256	0.226	0.05	-0.03	0.04
Ini Span Avg	10.090	9.348	46.46	46.16	47.95
Run Avg	0.846	16.871	65.77	-0.03	13.11
CO	0.248	0.286	0.08	-0.27	0.23
CO	10.028	9.321	46.76	46.14	47.95
Correct Avg	0.580	18.341	71.46	0.27	13.26

System Bias Check End



Test Run 2 STRATA Version 3.1

	O2 %	CO2 %	CO ppm	SO2 ppm	NOx ppm
Begin calculating run averages					
05-17-2011 16:51:30	1.424	15.928	27.47	0.65	18.61
05-17-2011 16:52:30	1.457	15.960	26.56	0.37	17.92
05-17-2011 16:53:29	1.344	15.985	25.79	0.22	15.15
05-17-2011 16:54:30	1.417	15.980	26.09	0.06	16.72
05-17-2011 16:55:29	1.490	15.936	26.72	-0.05	15.34
Pause					
End Pause					
05-17-2011 16:58:30	1.401	15.806	48.78	-0.31	9.97
05-17-2011 16:59:31	1.492	15.967	30.15	-0.22	15.80
05-17-2011 17:00:30	1.530	15.939	26.25	-0.21	16.06
05-17-2011 17:01:29	1.544	15.920	27.09	-0.26	16.86
05-17-2011 17:02:29	1.532	15.922	26.49	-0.24	16.38
05-17-2011 17:03:30	1.524	15.924	26.06	-0.27	16.41
05-17-2011 17:04:30	1.605	15.855	26.76	-0.27	16.65
05-17-2011 17:05:31	1.573	15.862	26.63	-0.30	17.13
05-17-2011 17:06:29	1.601	15.811	27.51	-0.28	16.25
05-17-2011 17:07:29	1.780	15.589	29.64	-0.31	14.00
05-17-2011 17:08:30	2.534	14.453	58.34	0.34	6.34
05-17-2011 17:09:30	3.404	14.194	41.98	-0.37	5.00
05-17-2011 17:10:29	3.732	13.946	31.71	-0.42	12.41
05-17-2011 17:11:30	3.649	14.000	21.01	-0.34	12.00
05-17-2011 17:12:29	3.582	14.047	21.64	-0.37	13.05
05-17-2011 17:13:30	3.724	13.954	26.08	-0.36	14.32
05-17-2011 17:14:29	3.848	13.850	24.89	-0.36	14.93
05-17-2011 17:15:30	4.121	13.623	23.61	-0.38	15.51
05-17-2011 17:16:29	4.529	13.334	22.29	-0.40	15.78
05-17-2011 17:17:30	4.885	13.063	21.54	-0.39	14.43
05-17-2011 17:18:29	4.857	13.090	22.93	-0.40	14.07
05-17-2011 17:19:30	4.995	12.909	21.22	-0.36	13.74
05-17-2011 17:20:31	4.754	13.140	45.33	-0.44	6.76
05-17-2011 17:21:29	4.771	13.115	44.54	-0.48	7.92
05-17-2011 17:22:29	4.911	13.054	29.27	-0.41	11.10
05-17-2011 17:23:30	5.112	12.898	24.44	-0.44	12.71
05-17-2011 17:24:30	5.478	12.636	22.78	-0.42	13.79
05-17-2011 17:25:31	5.951	12.233	21.55	-0.42	13.70
05-17-2011 17:26:29	5.915	12.266	22.05	-0.44	12.50
Pause					
End Pause					
05-17-2011 17:36:29	3.245	14.286	26.75	-0.43	13.97
Pause					
End Pause					
05-17-2011 18:11:29	2.034	15.762	37.63	-0.42	13.06
05-17-2011 18:12:30	2.076	15.730	30.92	-0.42	14.20
05-17-2011 18:13:30	2.118	15.670	30.63	-0.42	14.39
05-17-2011 18:14:31	2.051	15.714	32.85	-0.44	13.46
05-17-2011 18:15:29	2.075	15.699	30.68	-0.45	13.74
05-17-2011 18:16:29	1.546	16.027	31.65	-0.46	11.12
05-17-2011 18:17:30	1.589	16.066	32.01	-0.41	14.13
05-17-2011 18:18:30	1.498	16.070	30.39	-0.49	14.72
05-17-2011 18:19:29	1.321	16.237	31.47	-0.42	12.80
05-17-2011 18:20:30	1.166	16.346	68.67	-0.43	7.93
05-17-2011 18:21:29	1.222	16.254	79.60	-0.47	10.54
05-17-2011 18:22:30	1.203	16.304	48.74	-0.45	11.32
05-17-2011 18:23:30	1.286	16.242	43.26	-0.48	12.67
05-17-2011 18:24:31	1.259	16.274	36.90	-0.42	12.61
05-17-2011 18:25:29	1.309	16.020	35.38	-0.45	11.47
05-17-2011 18:26:30	1.413	16.136	34.41	-0.45	11.66
05-17-2011 18:27:30	1.235	16.224	33.39	-0.37	12.98
Pause					
End Pause					
05-17-2011 19:11:30	0.960	17.108	39.16	-0.22	13.00
05-17-2011 19:12:30	1.158	17.020	55.32	-0.30	24.21
05-17-2011 19:13:29	1.142	16.992	31.91	-0.35	24.58
05-17-2011 19:14:30	1.097	17.010	33.58	-0.34	23.24
05-17-2011 19:15:29	1.124	16.966	32.25	-0.32	24.61
05-17-2011 19:16:30	1.103	17.006	31.89	-0.34	24.35
05-17-2011 19:17:29	1.205	16.950	30.92	-0.36	27.28
05-17-2011 19:18:30	1.109	16.967	30.47	-0.32	25.60
05-17-2011 19:19:29	1.023	17.073	34.76	-0.33	20.96
05-17-2011 19:20:30	0.871	17.212	67.95	-0.40	14.17
05-17-2011 19:21:29	0.994	17.035	49.62	-0.34	16.93
05-17-2011 19:22:29	1.100	16.865	39.29	-0.26	20.91
05-17-2011 19:23:30	1.127	16.002	34.39	-0.19	22.68
05-17-2011 19:24:30	1.191	16.785	32.27	-0.28	25.34
05-17-2011 19:25:30	1.224	16.709	30.67	-0.27	26.69
05-17-2011 19:26:29	1.018	16.822	33.30	-0.24	22.11
05-17-2011 19:27:30	1.103	16.751	32.44	-0.28	24.74
05-17-2011 19:28:31	1.102	16.747	31.17	-0.27	25.15
05-17-2011 19:29:30	1.010	16.813	33.06	-0.23	22.54
05-17-2011 19:30:31	1.098	16.858	32.67	-0.25	24.48
05-17-2011 19:31:29	1.100	16.844	33.78	-0.31	21.88
05-17-2011 19:32:30	0.790	17.065	77.08	-0.28	12.69
05-17-2011 19:33:30	0.857	16.972	60.94	-0.26	14.54
05-17-2011 19:34:31	1.056	16.830	40.94	-0.28	19.71
05-17-2011 19:35:29	0.951	16.873	39.36	-0.23	18.68

05-17-2011 19:36:29	1.011	16.863	36.07	-0.27	20.79
05-17-2011 19:37:30	1.003	16.823	36.06	-0.28	20.84
05-17-2011 19:38:30	0.936	16.860	37.38	-0.29	19.50
05-17-2011 19:39:31	1.018	16.818	35.58	-0.29	21.31
05-17-2011 19:40:29	0.951	16.824	37.49	-0.28	20.09
05-17-2011 19:41:30	1.021	16.814	34.45	-0.24	22.19
05-17-2011 19:42:29	0.964	16.865	34.93	-0.29	21.07
05-17-2011 19:43:30	0.889	16.940	40.32	-0.28	17.72
05-17-2011 19:44:31	0.604	17.173	105.71*	-0.31	10.47
05-17-2011 19:45:30	0.907	16.939	58.09	-0.27	15.89
05-17-2011 19:46:31	0.931	16.883	42.46	-0.30	17.51
05-17-2011 19:47:30	1.074	16.808	37.02	-0.31	20.66
05-17-2011 19:48:31	0.939	16.850	39.69	-0.24	18.46
05-17-2011 19:49:29	0.975	16.826	38.19	-0.33	19.30
05-17-2011 19:50:30	0.892	16.852	41.66	-0.33	17.80
05-17-2011 19:51:29	0.976	16.821	37.79	-0.33	19.02
05-17-2011 19:52:31	1.044	16.759	35.65	-0.32	21.15
05-17-2011 19:53:29	0.960	16.803	37.05	-0.29	19.59
05-17-2011 19:54:30	0.984	16.814	37.49	-0.31	20.46
05-17-2011 19:55:29	0.909	16.862	41.02	-0.36	17.23
05-17-2011 19:56:30	0.713	17.076	103.73*	-0.35	11.16
05-17-2011 19:57:31	0.755	17.020	72.65	-0.33	12.40
05-17-2011 19:58:29	0.954	16.874	50.97	-0.26	17.23
05-17-2011 19:59:29	0.953	16.830	40.66	-0.22	17.98
05-17-2011 20:00:30	0.931	16.824	42.77	-0.31	18.52
05-17-2011 20:01:29	1.028	16.770	36.15	-0.30	21.17
05-17-2011 20:02:30	0.941	16.770	37.38	-0.37	19.41
05-17-2011 20:03:31	0.968	16.737	37.13	-0.35	20.64
05-17-2011 20:04:29	0.981	16.709	35.55	-0.34	21.03
05-17-2011 20:05:31	0.894	16.688	35.68	-0.39	21.29
05-17-2011 20:06:29	1.011	16.603	35.69	-0.39	20.94
05-17-2011 20:07:29	0.825	16.705	46.76	-0.41	15.14
05-17-2011 20:08:30	0.725	16.832	96.35*	-0.42	11.27

```

Test Run 2 STRATA Version 3
      O2      CO2      CO      SO2      NOx
      %      %      ppm      ppm      ppm
05-17-2011 20:09:31 0.861 16.704 62.45 -0.44 14.85
05-17-2011 20:10:29 1.042 16.573 40.96 -0.42 13.59
05-17-2011 20:11:29 0.964 16.542 35.46 -0.38 17.95
05-17-2011 20:12:30 0.927 16.581 42.34 -0.42 18.57
05-17-2011 20:13:30 1.066 16.481 36.67 -0.41 21.40
05-17-2011 20:14:31 1.000 16.451 37.25 -0.43 20.10
05-17-2011 20:15:29 0.933 16.501 35.16 -0.39 18.80
05-17-2011 20:16:29 1.042 16.430 35.94 -0.44 22.19
05-17-2011 20:17:30 1.034 16.392 35.29 -0.39 21.99
Run Averages      O2      CO2      CO      SO2      NOx
                  %      %      ppm      ppm      ppm
05-17-2011 20:17:45 1.729 16.005 36.05* -0.32 17.21
Operator:          EC
Plant Name:        Citgo
Location:          B-Cat
Test Run 2 End

```

Final System Bias Check, Run VTRATA Version 3.01

Operator: KC  
 Plant Name: CILCO  
 Location: B-Cat  
 Reference Cylinder Numbers  
 Zero Span  
 O2 XC025C88B  
 CO2 CC1711113  
 CO CC232222  
 SO2 CC216331  
 NOW CC281221

Date/Time	05-17-2011	20:47:22	PASSED		
Analyte	O2	CO2	CO	SO2	NOW
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.00	0.00	0.00
Zero Cal	0.053	0.221	0.38	-0.21	0.09
Zero Avg	0.100	0.304	0.15	-0.47	0.11
Zero Bias	0.2%	0.4%	0.2%	0.3%	0.1%
Zero Drift	-1.0%	-0.2%	0.0%	0.1%	-0.3%
Span Ref Cyl	9.936	9.991	50.78	51.07	49.14
Span Cal	10.103	9.808	51.34	51.04	50.12
Span Avg	10.010	9.413	47.90	46.22	49.58
Span Bias	0.4%	2.0%	3.4%	4.6%	0.5%
Span Drift	-0.2%	0.2%	0.8%	0.1%	1.6%
Ini Zero Avg	0.340	0.347	0.11	-0.52	0.42
Ini Span Avg	10.055	9.253	47.07	46.12	47.96
Run Avg	1.729	16.005	38.05	-0.32	17.21
Co	0.220	0.325	0.13	-0.49	0.26
Co	10.033	9.353	47.48	46.17	48.77
Correct Avg	1.528	17.353	40.67	0.19	17.17

System Bias Check End

Calibration Error Test, Run TRATA Version 3.01

Operator: KC  
 Plant Name: Citgo  
 Location: B-Cst  
 Reference Cylinder Numbers  
 Zero Low-range Mid-range High-range  
 THC H2 CC19643 CC79433 SS9163323BAL

Date/Time 05-17-2011 09:40:40 PASSED  
 Analyte TEC  
 Units ppm  
 Zero Ref Cyl 0.00  
 Zero Avg -0.04  
 Zero Error% 0.08  
 Low Ref Cyl 25.03  
 Low Avg 25.09  
 Low Error% 0.18  
 Mid Ref Cyl 49.39  
 Mid Avg 49.91  
 Mid Error% 0.58  
 High Ref Cyl 95.56  
 High Avg 95.70  
 High Error% 0.18  
 Calibration Error Test End

THC

Initial System Bias Check, R STRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat  
Reference Cylinder Numbers  
Zero Span  
N2 CC79433

THC Date/Time 05-17-2011 09:48:27 PASSED

Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal -0.04  
Zero Avg -0.03  
Zero Bias% 0.0%  
Zero Drift%  
Span Ref Cyl 49.39  
Span Cal 49.91  
Span Avg 50.47  
Span Bias% 0.6%  
Span Drift%  
System Bias Check End

THC

Test Run 1 STRATA Version 3

```

THC
ppm
Begin calculating run averages
05-17-2011 13:17:05 8.01
05-17-2011 13:18:06 8.49
05-17-2011 13:19:04 8.48
05-17-2011 13:20:05 7.38
05-17-2011 13:21:06 6.98
05-17-2011 13:22:05 6.48
05-17-2011 13:23:05 5.07
05-17-2011 13:24:06 5.37
05-17-2011 13:25:05 5.28
05-17-2011 13:26:05 5.24
05-17-2011 13:27:06 5.33
05-17-2011 13:28:05 5.37
05-17-2011 13:29:05 5.43
05-17-2011 13:30:06 5.58
05-17-2011 13:31:05 5.98
05-17-2011 13:32:05 5.85
05-17-2011 13:33:06 5.85
05-17-2011 13:34:05 5.86
05-17-2011 13:35:06 5.80
05-17-2011 13:36:06 4.79
05-17-2011 13:37:05 5.59
05-17-2011 13:38:06 6.25
05-17-2011 13:39:06 6.67
05-17-2011 13:40:05 6.10
05-17-2011 13:41:06 5.45
05-17-2011 13:42:04 5.41
05-17-2011 13:43:05 5.80
05-17-2011 13:44:06 5.74
05-17-2011 13:45:05 5.35
05-17-2011 13:46:05 4.49
05-17-2011 13:47:06 4.40
05-17-2011 13:48:05 4.41
05-17-2011 13:49:05 4.38
05-17-2011 13:50:06 4.35
05-17-2011 13:51:05 4.31
05-17-2011 13:52:05 4.31
05-17-2011 13:53:06 4.27
05-17-2011 13:54:05 4.42
05-17-2011 13:55:05 4.93
05-17-2011 13:56:06 4.06
05-17-2011 13:57:05 4.85
05-17-2011 13:58:06 4.88
05-17-2011 13:59:06 4.73
05-17-2011 14:00:05 4.61
05-17-2011 14:01:06 4.43
05-17-2011 14:02:06 4.36
05-17-2011 14:03:05 4.22
05-17-2011 14:04:06 4.18
05-17-2011 14:05:04 4.13
05-17-2011 14:06:05 3.97
05-17-2011 14:07:06 4.14
05-17-2011 14:08:05 4.23
05-17-2011 14:09:05 4.02
05-17-2011 14:10:06 3.88
05-17-2011 14:11:05 3.84
05-17-2011 14:12:05 3.79
05-17-2011 14:13:06 3.68
05-17-2011 14:14:05 3.67
05-17-2011 14:15:06 3.58
05-17-2011 14:16:06 3.42
Pause
End Pause
05-17-2011 14:36:06 -1.30
05-17-2011 14:37:05 1.95
05-17-2011 14:38:05 5.90
05-17-2011 14:39:06 5.62
05-17-2011 14:40:05 5.91
05-17-2011 14:41:05 6.20
05-17-2011 14:42:06 6.18
05-17-2011 14:43:06 6.24
05-17-2011 14:44:05 6.26
05-17-2011 14:45:06 6.13
05-17-2011 14:46:05 5.61
05-17-2011 14:47:05 6.13
05-17-2011 14:48:06 5.86
05-17-2011 14:49:05 5.81
05-17-2011 14:50:06 5.59
05-17-2011 14:51:06 5.18
05-17-2011 14:52:05 5.65
05-17-2011 14:53:06 5.35
05-17-2011 14:54:06 4.68
05-17-2011 14:55:05 4.87
05-17-2011 14:56:06 5.19
05-17-2011 14:57:04 5.37
05-17-2011 14:58:05 5.12

```

THC

05-17-2011 14:59:06	5.14
05-17-2011 15:00:05	5.17
05-17-2011 15:01:05	5.56
05-17-2011 15:02:06	5.71
05-17-2011 15:03:05	5.28
05-17-2011 15:04:05	5.61
05-17-2011 15:05:06	5.84
05-17-2011 15:06:05	5.43
05-17-2011 15:07:05	5.67
05-17-2011 15:08:06	6.30
05-17-2011 15:09:05	5.57
05-17-2011 15:10:06	5.27
05-17-2011 15:11:06	5.00
05-17-2011 15:12:05	5.43
05-17-2011 15:13:06	5.37
05-17-2011 15:14:06	5.04
05-17-2011 15:15:05	5.15
05-17-2011 15:16:06	5.07
05-17-2011 15:17:04	4.51
05-17-2011 15:18:05	4.55
05-17-2011 15:19:06	4.42
05-17-2011 15:20:04	4.69
05-17-2011 15:21:05	4.61
05-17-2011 15:22:06	4.38
05-17-2011 15:23:05	4.78
05-17-2011 15:24:05	4.20
05-17-2011 15:25:06	4.17
05-17-2011 15:26:05	3.87
05-17-2011 15:27:05	3.65
05-17-2011 15:28:06	3.92
05-17-2011 15:29:05	3.46
05-17-2011 15:30:06	2.60
05-17-2011 15:31:06	2.99

T HC



Test Run 1 STRATA Version 3  
THC  
ppm  
05-17-2011 15:32:05 3.28  
05-17-2011 15:33:06 -0.30  
05-17-2011 15:34:05 3.32  
Run Averages THC  
ppm  
05-17-2011 15:34:31 4.96  
Operator: KC  
Plant Name: Citgo  
Location: B-Cat  
Test Run 1 End

THC

Final System Bias Check, Run 1 DATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
N2 CC79433

THC Date/Time 05-17-2011 16:06:01 PASSED

Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal -0.04  
Zero Avg -0.16  
Zero Bias% 0.2%  
Zero Drift% -0.2%  
Span Ref Cyl 49.39  
Span Cal 49.91  
Span Avg 49.41  
Span Bias% 2.3%  
Span Drift% -2.9%

Ini Zero Avg -0.05  
Ini Span Avg 50.47  
Run Avg 4.96  
Co -0.16  
Cm 49.04  
Correct Avg 5.14  
System Bias Check End

THC

Test Run 2 STRATA version 3.

THC  
ppm

Begin calculating run averages

05-17-2011 16:51:03	4.08
05-17-2011 16:52:04	4.01
05-17-2011 16:53:02	4.09
05-17-2011 16:54:03	4.30
05-17-2011 16:55:04	4.41

Pause

End Pause

05-17-2011 16:56:04	4.60
05-17-2011 16:59:03	4.73
05-17-2011 17:00:03	4.93
05-17-2011 17:01:04	4.49
05-17-2011 17:02:03	4.43
05-17-2011 17:03:03	4.32
05-17-2011 17:04:04	4.08
05-17-2011 17:05:03	4.04
05-17-2011 17:06:03	3.87
05-17-2011 17:07:04	3.51
05-17-2011 17:08:03	2.96
05-17-2011 17:09:04	2.69
05-17-2011 17:10:04	2.20
05-17-2011 17:11:03	1.69
05-17-2011 17:12:04	-1.23
05-17-2011 17:13:04	-1.37
05-17-2011 17:14:03	-1.38
05-17-2011 17:15:04	-1.38
05-17-2011 17:16:02	-1.41
05-17-2011 17:17:03	-1.29
05-17-2011 17:18:04	-0.96
05-17-2011 17:19:02	-0.69
05-17-2011 17:20:03	-0.66
05-17-2011 17:21:04	-0.59
05-17-2011 17:22:03	-0.90
05-17-2011 17:23:03	-1.42
05-17-2011 17:24:04	-1.46
05-17-2011 17:25:03	-1.46
05-17-2011 17:26:03	-1.45

Pause

End Pause

05-17-2011 17:36:04	-0.01
---------------------	-------

Pause

End Pause

05-17-2011 18:11:03	-1.47
05-17-2011 18:12:03	-1.48
05-17-2011 18:13:04	-1.48
05-17-2011 18:14:03	-1.48
05-17-2011 18:15:03	-1.44
05-17-2011 18:16:04	-1.41
05-17-2011 18:17:03	-1.47
05-17-2011 18:18:03	-1.29
05-17-2011 18:19:04	-1.37
05-17-2011 18:20:03	-1.27
05-17-2011 18:21:04	-1.14
05-17-2011 18:22:04	0.68
05-17-2011 18:23:03	1.19
05-17-2011 18:24:04	1.42
05-17-2011 18:25:02	1.34
05-17-2011 18:26:03	0.86
05-17-2011 18:27:04	1.66

Pause

End Pause

05-17-2011 19:10:04	7.68
05-17-2011 19:11:03	7.98
05-17-2011 19:12:03	7.74
05-17-2011 19:13:04	7.37
05-17-2011 19:14:03	7.21
05-17-2011 19:15:04	7.03
05-17-2011 19:16:02	7.21
05-17-2011 19:17:03	7.01
05-17-2011 19:18:04	6.86
05-17-2011 19:19:02	7.08
05-17-2011 19:20:03	7.25
05-17-2011 19:21:04	7.95
05-17-2011 19:22:03	7.25
05-17-2011 19:23:03	6.89
05-17-2011 19:24:04	6.86
05-17-2011 19:25:03	6.74
05-17-2011 19:26:03	6.74
05-17-2011 19:27:04	6.82
05-17-2011 19:28:03	6.80
05-17-2011 19:29:03	7.28
05-17-2011 19:30:04	7.11
05-17-2011 19:31:03	7.03
05-17-2011 19:32:04	7.41
05-17-2011 19:33:04	7.67
05-17-2011 19:34:03	7.59

THC

05-17-2011 19:35:04	7.48
05-17-2011 19:36:02	7.32
05-17-2011 19:37:03	7.22
05-17-2011 19:38:04	7.17
05-17-2011 19:39:03	7.18
05-17-2011 19:40:03	7.21
05-17-2011 19:41:04	7.43
05-17-2011 19:42:03	7.22
05-17-2011 19:43:03	7.20
05-17-2011 19:44:04	7.82
05-17-2011 19:45:03	7.99
05-17-2011 19:46:03	7.80
05-17-2011 19:47:04	7.74
05-17-2011 19:48:03	7.80
05-17-2011 19:49:04	7.61
05-17-2011 19:50:04	7.67
05-17-2011 19:51:03	8.09
05-17-2011 19:52:04	7.62
05-17-2011 19:53:02	7.50
05-17-2011 19:54:03	7.51
05-17-2011 19:55:04	7.53
05-17-2011 19:56:03	8.04
05-17-2011 19:57:03	8.27
05-17-2011 19:58:04	8.11
05-17-2011 19:59:03	8.50
05-17-2011 20:00:03	8.05
05-17-2011 20:01:04	7.75
05-17-2011 20:02:03	7.70
05-17-2011 20:03:03	7.98
05-17-2011 20:04:04	7.84
05-17-2011 20:05:03	7.60
05-17-2011 20:06:04	7.52
05-17-2011 20:07:04	7.53

THC

Test Run 2 STRATA Version 3

	THC
	ppm
05-17-2011 20:08:03	8.40
05-17-2011 20:09:04	8.21
05-17-2011 20:10:03	7.98
05-17-2011 20:11:03	8.09
05-17-2011 20:12:04	7.83
05-17-2011 20:13:03	7.62
05-17-2011 20:14:03	7.49
05-17-2011 20:15:04	7.50
05-17-2011 20:16:03	7.42
05-17-2011 20:17:03	7.39
Run Averages	THC
	ppm
05-17-2011 20:17:18	4.61
Operator:	KC
Plant Name:	Citgc
Location:	Refar
Test Run 2 End	

THC

Final System Bias Check, Run 3TRATA Version 3.01

Operator: RC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
THC N2 CC79433

Date/Time 05-17-2011 20:29:04 PASSED

Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal -0.04  
Zero Avg 1.28  
Zero Bias% 1.38  
Zero Drift% 1.58  
Span Ref Cyl 49.39  
Span Cal 49.91  
Span Avg 50.37  
Span Bias% 0.58  
Span Drift% 2.8%

Ini Zero Avg -0.26  
Ini Span Avg 47.61  
Run Avg 4.61  
O2 0.51  
O2 48.59  
Correct Avg 4.18  
System Bias Check End

THC

Calibration Error Test, Run - MTRATA Version 3.01

Operator: KC

Plant Name: Citgo

Location: B-Cat

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2			KC025088B	Ambiert Air
CO2			CC171113	CC221405
CO			CC22068	SG9134842
SO2			CC216331	CC33499
NOx			CC281221	CC56129

Date/Time	05-18-2011	10:11:08	PASSED
Analyte	O2	CO2	CO
Units	%	%	ppm
Zero Ref Cyl	0.010	0.000	0.0
Zero Avg	0.021	0.281	0.9
Zero Error%	0.1%	1.4%	0.1%
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	9.936	9.991	493.7
Mid Avg	10.050	9.828	499.5
Mid Error%	0.5%	0.3%	0.6%
High Ref Cyl	20.900	18.930	998.8
High Avg	20.900	18.981	999.8
High Error%	0.0%	0.3%	1.6%

Calibration Error Test End

## Initial System Bias Check, F STRATA Version 3.01

Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat

Reference Cylinder Numbers  
 Zero Span

O2 XC025088B  
 CO2 CC171113  
 CO CC22068  
 SO2 CC216131  
 NOx CC261221

Date/Time	05-18-2011		10:57:19		FASSEL
Analyte	O2	CO2	CO	SO2	NOx
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.0	0.00	0.00
Zero Cal	0.021	0.241	0.9	-0.34	0.04
Zero Avg	0.036	0.384	0.7	-0.23	0.12
Zero Bias%	0.3%	0.5%	0.6%	0.1%	0.1%
Zero Drift%					
Span Ref Cyl	9.936	9.991	493.7	51.07	49.14
Span Cal	10.050	9.818	499.9	50.47	49.54
Span Avg	9.977	9.601	485.1	46.12	48.51
Span Bias%	0.3%	1.1%	1.4%	4.5%	1.0%
Span Drift%					
System Bias Check End					



```

Test Run 1 STRATA Version 3
      O2      CO2      CO      SO2      NOx
      %       %       ppm      ppm      ppm
Begin calculating run averages
05-18-2011 12:51:32    0.784    16.883    63.9    -0.46    11.91
05-18-2011 12:52:33    0.807    16.864    53.4    -0.39    12.93
05-18-2011 12:53:32    0.830    16.826    45.4    -0.43    13.76
05-18-2011 12:54:33    0.787    16.889    50.6    -0.46    12.73
05-18-2011 12:55:31    0.821    16.869    47.4    -0.46    13.88
Pause
End Pause
05-18-2011 13:45:33    0.591    16.974    99.8    -0.49    8.82
05-18-2011 13:46:32    0.680    16.932    87.0    -0.54    10.52
05-18-2011 13:47:32    0.708    16.868    60.1    -0.53    10.79
05-18-2011 13:48:31    0.594    16.953    99.4    -0.51    8.76
05-18-2011 13:49:32    0.498    17.056    258.0    -0.55    7.06
05-18-2011 13:50:33    0.592    16.927    147.9    -0.56    8.37
05-18-2011 13:51:32    0.739    16.810    71.0    -0.54    10.42
05-18-2011 13:52:33    0.675    16.942    75.0    -0.51    9.86
05-18-2011 13:53:32    0.816    16.758    56.4    -0.51    12.69
05-18-2011 13:54:33    0.819    16.712    44.3    -0.52    12.86
05-18-2011 13:55:31    0.792    16.744    58.8    -0.48    11.73
05-18-2011 13:56:32    0.730    16.778    50.7    -0.51    11.90
05-18-2011 13:57:33    0.746    16.753    49.6    -0.51    12.12
05-18-2011 13:58:32    0.704    16.786    59.6    -0.50    11.28
05-18-2011 13:59:33    0.773    16.737    47.1    -0.48    12.80
05-18-2011 14:00:32    0.792    16.670    46.0    -0.47    12.55
05-18-2011 14:01:33    0.542    16.887    176.1    -0.53    7.72
05-18-2011 14:02:31    0.747    16.704    132.2    -0.48    10.15
05-18-2011 14:03:32    0.854    16.553    55.2    -0.49    12.04
05-18-2011 14:04:33    0.890    16.532    46.2    -0.50    13.64
05-18-2011 14:05:32    0.903    16.518    39.6    -0.52    14.35
05-18-2011 14:06:33    0.850    16.517    45.2    -0.53    13.76
05-18-2011 14:07:32    1.024    16.384    33.5    -0.51    18.06
05-18-2011 14:08:33    0.927    16.462    32.7    -0.46    17.09
05-18-2011 14:09:31    1.052    16.367    29.6    -0.50    19.88
05-18-2011 14:10:32    0.962    16.383    30.5    -0.46    18.17
05-18-2011 14:11:33    0.901    16.444    33.1    -0.54    16.74
05-18-2011 14:12:32    0.945    16.399    33.3    -0.51    17.22
05-18-2011 14:13:33    0.709    16.642    87.1    -0.55    9.93
05-18-2011 14:14:32    0.848    16.516    68.1    -0.51    22.37
05-18-2011 14:15:33    0.974    16.399    38.1    -0.53    15.80
05-18-2011 14:16:31    0.987    16.373    32.8    -0.48    17.58
05-18-2011 14:17:32    1.056    16.307    29.7    -0.51    19.46
05-18-2011 14:18:33    0.984    16.340    31.2    -0.51    18.02
05-18-2011 14:19:32    0.918    16.412    34.8    -0.46    16.22
05-18-2011 14:20:33    0.904    16.419    34.5    -0.50    16.29
05-18-2011 14:21:32    1.025    16.346    31.2    -0.47    19.53
05-18-2011 14:22:33    1.020    16.311    29.2    -0.49    19.50
05-18-2011 14:23:31    0.921    16.367    33.1    -0.42    17.32
05-18-2011 14:24:32    0.901    16.396    34.9    -0.52    16.22
05-18-2011 14:25:33    0.757    16.570    77.2    -0.53    20.54
05-18-2011 14:26:32    0.842    16.472    55.6    -0.49    12.47
05-18-2011 14:27:33    0.798    16.464    48.9    -0.47    12.76
05-18-2011 14:28:32    0.786    16.464    47.4    -0.46    13.04
05-18-2011 14:29:33    0.762    16.500    48.3    -0.52    13.16
05-18-2011 14:30:31    0.869    16.436    38.2    -0.50    15.55
05-18-2011 14:31:32    0.879    16.405    35.4    -0.47    15.87
05-18-2011 14:32:33    0.812    16.443    42.4    -0.51    14.18
05-18-2011 14:33:32    0.742    16.517    48.5    -0.49    12.80
05-18-2011 14:34:33    0.799    16.483    44.3    -0.49    14.17
05-18-2011 14:35:32    0.829    16.440    38.3    -0.48    14.86
05-18-2011 14:36:33    0.728    16.529    47.7    -0.54    12.24
05-18-2011 14:37:31    0.556    16.708    139.9    -0.51    8.18
05-18-2011 14:38:32    0.704    16.582    83.2    -0.53    10.40
05-18-2011 14:39:31    0.714    16.553    62.4    -0.51    11.22
05-18-2011 14:40:32    0.787    16.504    48.3    -0.51    13.07
05-18-2011 14:41:33    0.809    16.463    44.8    -0.50    13.70
05-18-2011 14:42:32    0.756    16.518    45.4    -0.49    12.99
05-18-2011 14:43:33    0.817    16.475    42.3    -0.56    14.36
05-18-2011 14:44:31    0.815    16.470    40.5    -0.52    14.57
05-18-2011 14:45:32    0.863    16.456    36.3    -0.55    15.97
05-18-2011 14:46:31    0.880    16.439    33.2    -0.44    16.71
05-18-2011 14:47:33    0.836    16.440    38.6    -0.48    15.50
05-18-2011 14:48:33    0.774    16.486    40.9    -0.50    13.80
Pause
End Pause
05-18-2011 17:12:33    0.681    16.920    71.6    -0.48    11.50
05-18-2011 17:13:31    0.685    16.979    102.1    -0.50    9.66
05-18-2011 17:14:32    0.667    16.941    117.3    -0.51    9.58
05-18-2011 17:15:31    0.796    16.843    79.9    -0.50    12.21
05-18-2011 17:16:32    0.831    16.797    53.9    -0.47    13.19
05-18-2011 17:17:33    0.977    16.707    43.6    -0.44    15.76
05-18-2011 17:18:32    1.005    16.661    35.7    -0.42    18.24
05-18-2011 17:19:33    1.016    16.621    35.5    -0.47    18.69
05-18-2011 17:20:32    0.941    16.680    30.7    -0.44    15.66
05-18-2011 17:21:32    0.972    16.644    37.9    -0.52    17.79
05-18-2011 17:22:33    1.020    16.581    36.0    -0.47    19.36
05-18-2011 17:23:33    1.054    16.523    32.7    -0.45    20.47

```

05-18-2011 17:21:31	1.025	16.536	33.5	-0.48	15.82
05-18-2011 17:23:32	0.743	16.781	04.1	0.52	11.06
05-18-2011 17:25:32	0.757	16.787	111.6	-0.54	11.20
05-18-2011 17:27:33	0.994	16.601	45.5	-0.43	14.24
05-18-2011 17:29:33	1.009	16.574	48.7	-0.48	11.67
05-18-2011 17:29:31	1.047	16.552	35.2	-0.46	15.04
05-18-2011 17:30:32	1.051	16.543	34.9	-0.42	15.72
05-18-2011 17:31:32	1.232	16.431	29.8	-0.45	24.50
05-18-2011 17:32:33	1.107	16.471	29.3	-0.47	22.30
05-18-2011 17:33:33	0.885	16.625	37.8	-0.45	17.58
05-18-2011 17:34:31	1.128	16.520	30.5	-0.47	22.83
05-18-2011 17:35:32	1.054	16.561	32.4	-0.45	21.08
05-18-2011 17:36:32	1.126	16.505	30.4	0.40	22.63
05-18-2011 17:37:33	0.823	16.767	48.4	-0.50	12.36
05-18-2011 17:38:33	0.924	16.694	74.7	-0.52	13.74
05-18-2011 17:39:32	1.044	16.587	41.3	-0.50	11.36
05-18-2011 17:40:32	1.119	16.491	34.5	-0.48	20.33
05-18-2011 17:41:32	1.076	16.508	33.5	-0.46	20.17
05-18-2011 17:42:33	1.063	16.545	33.9	-0.46	20.28
05-18-2011 17:43:33	1.109	16.489	32.1	-0.51	21.52
05-18-2011 17:44:31	1.057	16.509	33.0	-0.48	20.50
05-18-2011 17:45:32	0.988	16.555	36.2	-0.52	14.81
05-18-2011 17:46:32	1.047	16.530	34.3	-0.45	20.50
05-18-2011 17:47:33	1.097	16.486	31.7	-0.46	21.91
05-18-2011 17:48:33	1.067	16.504	31.6	-0.48	21.36
05-18-2011 17:49:31	0.894	16.665	52.6	-0.47	14.11
05-18-2011 17:50:32	0.874	16.688	79.1	-0.48	12.43
05-18-2011 17:51:32	0.907	16.604	61.2	-0.48	14.20
05-18-2011 17:52:33	1.118	16.449	37.5	-0.49	19.50
05-18-2011 17:53:33	1.023	16.489	35.7	-0.51	18.98
05-18-2011 17:54:31	1.036	16.485	37.1	-0.48	19.63
05-18-2011 17:55:32	1.149	16.413	31.4	-0.52	22.56
05-18-2011 17:55:32	0.975	16.527	36.7	-0.50	18.75

```

Test Run 1 STRATA Version 3
      O2      CO2      CO      SO2      NOx
      %      %      ppm      ppm      ppm
05-18-2011 17:57:33    1.032    16.504    34.2    -0.47    20.60
05-18-2011 17:58:31    1.065    16.452    32.3    -0.47    21.43
05-18-2011 17:59:32    1.036    16.490    34.8    -0.51    20.96
05-18-2011 18:00:32    1.058    16.451    32.2    -0.55    21.33
05-18-2011 18:01:33    0.937    16.675    62.7    -0.48    19.00
05-18-2011 18:02:33    0.930    16.613    65.0    -0.62    13.81
Run Averages      O2      CO2      CO      SO2      NOx
                  %      %      ppm      ppm      ppm
05-18-2011 18:02:37    0.886    16.590    52.5    -0.49    15.44
Operator:      KC
Plant Name:    Citgo
Location:      B-Cat
Test Run 1 End

```

Final System Bias Check, Run 15-18-2011, Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
O2 ICC25088B  
CO2 CC171113  
CO CC22048  
SO2 CC216331  
POx CC201221

Date/Time	05-18-2011	19:38:07	PASSED		
Analyte	O2	CO2	CO	SO2	POx
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.0	0.00	0.00
Zero Cal	0.021	0.241	0.9	-0.24	0.04
Zero Avg	0.181	0.473	1.0	-0.25	0.34
Zero Bias%	0.3%	1.0%	0.0%	0.2%	0.3%
Zero Drift%	0.3%	0.4%	0.0%	-0.3%	0.2%
Span Ref Cyl	9.936	9.991	493.7	31.07	49.10
Span Cal	10.050	9.828	499.5	30.07	49.84
Span Avg	10.038	9.401	485.6	48.18	49.60
Span Bias%	0.1%	2.1%	1.4%	2.0%	0.1%
Span Drift%	0.2%	-1.0%	0.0%	2.4%	1.1%
Ini Zero Avg	0.036	0.384	0.7	-0.23	0.12
Ini Span Avg	9.977	9.601	485.1	46.52	48.51
Run Avg	0.836	16.590	52.5	-0.49	15.44
Co	0.138	0.429	0.8	-0.39	0.23
Ca	10.008	9.501	485.3	47.70	49.06
Correct Avg	0.753	17.797	52.6	-0.11	15.30

System Bias Check End

Test Run 2 STRMIA Version 3

	O <sub>3</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NOx ppm
Begin calculating run averages					
05-18-2011 19:15:33	0.785	16.402	51.8	-0.42	14.56
05-18-2011 19:21:33	0.880	16.393	49.9	-0.47	16.80
05-18-2011 19:21:34	0.954	16.312	39.1	-0.49	18.35
05-18-2011 19:22:34	0.745	16.449	52.8	-0.48	14.51
05-18-2011 19:23:33	0.829	16.422	43.2	-0.53	16.58
05-18-2011 19:24:33	0.844	16.418	42.0	-0.51	17.06
05-18-2011 19:25:33	0.761	16.519	73.7	-0.47	12.64
05-18-2011 19:26:34	0.707	16.544	102.2	-0.54	11.17
05-18-2011 19:27:34	0.723	16.522	82.7	-0.50	12.76
05-18-2011 19:28:33	0.925	16.354	43.7	-0.54	17.88
05-18-2011 19:29:33	0.871	16.379	43.6	-0.55	17.05
05-18-2011 19:30:33	0.894	16.347	40.8	-0.50	17.96
05-18-2011 19:31:34	0.884	16.344	42.2	-0.51	17.49
05-18-2011 19:32:34	0.893	16.363	41.1	-0.53	18.50
05-18-2011 19:33:33	0.928	16.297	38.3	-0.50	18.68
05-18-2011 19:34:33	0.859	16.334	40.9	-0.52	17.56
05-18-2011 19:35:33	0.872	16.337	41.5	-0.54	18.05
05-18-2011 19:36:34	0.947	16.283	36.6	-0.50	19.46
05-18-2011 19:37:34	0.695	16.486	100.6	-0.52	11.47
05-18-2011 19:38:33	0.728	16.459	130.0	-0.54	11.48
05-18-2011 19:39:33	0.900	16.305	54.4	-0.51	15.67
05-18-2011 19:40:33	0.924	16.239	43.2	-0.46	17.53
05-18-2011 19:41:34	0.957	16.202	37.9	-0.51	19.10
05-18-2011 19:42:34	1.023	16.154	34.6	-0.52	20.71
05-18-2011 19:43:33	0.863	16.261	45.9	-0.57	17.47
05-18-2011 19:44:33	1.117	16.141	32.0	-0.53	24.20
05-18-2011 19:45:33	0.915	16.210	37.0	-0.56	18.87
05-18-2011 19:46:34	0.998	16.173	36.9	-0.54	21.56
05-18-2011 19:47:34	1.118	16.090	30.8	-0.56	24.53
05-18-2011 19:48:33	1.011	16.119	32.2	-0.57	22.36
05-18-2011 19:49:33	0.803	16.279	63.5	-0.57	13.98
05-18-2011 19:50:33	0.767	16.332	95.2	-0.59	12.23
05-18-2011 19:51:34	0.840	16.265	58.4	-0.61	14.72
05-18-2011 19:52:34	0.895	16.208	44.7	-0.57	16.87
05-18-2011 19:53:33	0.950	16.170	40.2	-0.58	15.14
05-18-2011 19:54:33	0.979	16.134	37.5	-0.61	15.90
05-18-2011 19:55:33	0.990	16.141	38.9	-0.57	20.86
05-18-2011 19:56:34	0.990	16.145	34.6	-0.50	21.02
05-18-2011 19:57:34	1.057	16.106	33.3	-0.60	22.84
05-18-2011 19:58:33	1.014	16.123	33.0	-0.64	21.47
05-18-2011 19:59:33	0.969	16.163	37.4	-0.66	20.48
05-18-2011 20:00:33	1.068	16.102	33.4	-0.59	22.77
05-18-2011 20:01:34	0.852	16.255	59.6	-0.61	14.62
05-18-2011 20:02:34	0.938	16.231	71.2	-0.62	14.51
05-18-2011 20:03:33	0.915	16.180	51.4	-0.66	15.71
05-18-2011 20:04:33	0.987	16.169	43.1	-0.63	18.80
05-18-2011 20:05:33	1.186	16.048	32.4	-0.63	24.08
05-18-2011 20:06:34	0.910	16.165	39.9	-0.68	18.88
05-18-2011 20:07:34	1.193	16.059	32.1	-0.62	26.44
05-18-2011 20:08:33	1.291	15.944	28.6	-0.62	28.87
05-18-2011 20:09:33	1.125	16.011	30.9	-0.57	25.27
05-18-2011 20:10:33	1.039	16.072	32.4	-0.62	22.70
05-18-2011 20:11:34	1.093	16.075	32.4	-0.57	25.42
05-18-2011 20:12:34	1.166	15.998	29.4	-0.59	26.67
05-18-2011 20:13:33	0.867	16.194	57.0	-0.64	15.69
05-18-2011 20:14:33	0.748	16.337	121.2	-0.63	12.58
05-18-2011 20:15:33	0.961	16.155	47.3	-0.64	17.44
05-18-2011 20:16:34	0.983	16.110	39.2	-0.63	19.64
05-18-2011 20:17:34	1.016	16.009	35.4	-0.67	21.19
05-18-2011 20:18:33	1.020	16.084	34.2	-0.65	21.61
05-18-2011 20:19:33	0.960	16.102	35.9	-0.72	20.55
05-18-2011 20:20:33	0.916	16.178	38.9	-0.66	18.90
05-18-2011 20:21:34	1.011	16.028	36.3	-0.66	18.55
05-18-2011 20:22:34	1.080	15.913	31.1	-0.73	18.18
Pause					
End Pause					
05-18-2011 20:31:34	0.930	16.205	36.8	-0.64	19.13
05-18-2011 20:32:34	0.942	16.200	37.9	-0.66	19.50
05-18-2011 20:33:33	0.970	16.187	34.6	-0.63	20.22
05-18-2011 20:34:33	0.859	16.244	34.6	-0.65	17.33
05-18-2011 20:35:33	0.925	16.220	36.8	-0.63	19.01
05-18-2011 20:36:34	0.894	16.247	30.6	-0.64	18.36
05-18-2011 20:37:34	0.794	16.350	53.3	-0.63	13.41
05-18-2011 20:38:33	0.677	16.467	124.9	-0.69	10.84
05-18-2011 20:39:33	0.909	16.261	36.2	-0.65	15.53
05-18-2011 20:40:33	0.948	16.201	41.3	-0.67	17.39
05-18-2011 20:41:34	0.920	16.207	40.1	-0.69	17.43
05-18-2011 20:42:34	0.898	16.216	42.6	-0.63	17.49
05-18-2011 20:43:33	1.072	16.142	33.9	-0.67	21.72
05-18-2011 20:44:33	0.901	16.222	38.5	-0.64	17.85
05-18-2011 20:45:33	0.997	16.192	35.1	-0.66	20.50
05-18-2011 20:46:34	0.930	16.216	36.1	-0.69	18.97
05-18-2011 20:47:34	0.964	16.196	37.0	-0.63	20.19
05-18-2011 20:48:33	0.997	16.170	34.4	-0.66	20.05
05-18-2011 20:49:33	0.925	16.223	45.2	-0.63	16.19

05-18-2011 20:50:34	0.684	16.402	117.3	-0.60	10.81
05-18-2011 20:51:34	0.852	16.267	62.1	-0.65	14.41
05-18-2011 20:52:34	0.92	16.200	45.4	-0.69	16.89
05-18-2011 20:53:33	0.91	16.169	41.5	-0.68	17.56
05-18-2011 20:54:33	1.017	16.122	34.9	-0.67	20.49
05-18-2011 20:55:34	0.991	16.104	34.6	-0.63	20.47
05-18-2011 20:56:34	0.910	16.142	36.8	-0.64	18.91
05-18-2011 20:57:34	0.940	16.146	36.7	-0.64	19.79
05-18-2011 20:58:33	1.017	16.113	33.4	-0.60	22.01
05-18-2011 20:59:30	1.013	16.101	33.1	-0.65	22.05
05-18-2011 21:00:34	1.018	16.089	33.0	-0.65	21.88
05-18-2011 21:01:34	0.832	16.217	56.8	-0.63	14.00
05-18-2011 21:02:34	0.735	16.312	100.2	-0.66	11.64
05-18-2011 21:03:33	1.008	16.128	47.2	-0.65	17.77
05-18-2011 21:04:33	0.977	16.115	39.0	-0.66	17.92
05-18-2011 21:05:34	0.909	16.169	43.2	-0.64	17.48
05-18-2011 21:06:34	1.127	16.064	33.2	-0.64	23.18
05-18-2011 21:07:34	1.137	16.035	31.0	-0.57	23.63
05-18-2011 21:08:33	1.036	16.091	33.1	-0.58	21.51
05-18-2011 21:09:33	0.953	16.151	36.6	-0.62	19.69
05-18-2011 21:10:34	1.066	16.118	33.1	-0.64	22.36
05-18-2011 21:11:34	1.004	16.143	33.5	-0.63	20.73
05-18-2011 21:12:34	0.953	16.180	36.3	-0.63	19.65
05-18-2011 21:13:33	0.865	16.260	51.6	-0.69	14.51
05-18-2011 21:14:33	0.741	16.408	107.4	-0.67	11.14
05-18-2011 21:15:34	0.897	16.229	58.0	-0.66	14.41
05-18-2011 21:16:34	0.985	16.171	44.7	-0.65	17.86
05-18-2011 21:17:34	1.031	16.135	37.8	-0.68	18.99
05-18-2011 21:18:33	0.951	16.174	40.3	-0.64	17.92
05-18-2011 21:19:33	1.031	16.122	34.9	-0.66	15.88
05-18-2011 21:20:34	0.951	16.165	37.6	-0.65	18.41
05-18-2011 21:21:34	0.975	16.146	36.2	-0.68	15.29
05-18-2011 21:22:34	1.061	16.095	33.2	-0.65	21.88

Test Run 2 STRATA Version 3

	O <sub>2</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NOx ppm
05-18-2011 21:23:33	0.991	16.112	34.2	-0.65	19.97
05-18-2011 21:24:33	0.840	16.217	43.7	-0.57	16.22
05-18-2011 21:25:34	0.858	16.252	48.7	-0.64	14.72
05-18-2011 21:26:34	0.749	16.316	52.1	-0.61	11.14
Run Averages	O <sub>2</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NOx ppm
05-18-2011 21:27:16	0.937	16.209	47.0	-0.61	18.36
operator:	KC				
Plant Name:	Citgc				
Location:	B-Cat				
Test Run 2	End				

Final System Bias Check, Run STRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
C2 XC025088B  
CO2 CC171113  
CO CC22068  
SO2 CC216331  
NOx CC281221

Date/Time	05-18-2011	21:44:25	PASSED
Analyte	CO2	CO	NOx
Units	%	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.00
Zero Cal	0.021	0.281	0.9
Zero Avg	0.164	0.414	1.0
Zero Bias%	0.6%	0.7%	0.4%
Zero Drift%	0.0%	-0.3%	0.0%
Span Ref Cyl	9.936	9.991	493.7
Span Cal	10.060	9.828	499.5
Span Avg	10.010	9.487	484.8
Span Bias%	0.2%	1.7%	1.5%
Span Drift%	-0.1%	0.4%	-0.1%
Ini Zero Avg	0.161	0.473	1.0
Ini Span Avg	10.038	9.401	485.6
Run Avg	0.937	16.209	47.0
CO	0.162	0.444	1.0
CO	10.024	9.444	485.2
Correct Avg	0.762	17.501	46.9
System Bias Check End			0.02



Calibration Error Test, Run : TRATA Version 3.01  
 Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat

	Reference Cylinder Numbers	
	Zero	Low-range
C2		
CO2		
CO		
SO2		
NOx		

Run 3

Date/Time	05-19-2011	08:29:07			PASSED
Analyte	CO2	CO2	CO	SO2	NOx
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.0	0.00	0.00
Zero Avg	0.072	0.114	0.5	-0.47	0.02
Zero Error%	0.3%	0.6%	0.1%	0.5%	0.0%
Low Ref Cyl					
Low Avg					
Low Error%					
Mid Ref Cyl	9.936	9.991	493.7	51.07	49.14
Mid Avg	10.070	9.717	498.9	50.22	49.75
Mid Error%	0.5%	1.4%	0.5%	0.8%	0.6%
High Ref Cyl	20.900	18.930	998.8	101.53	95.75
High Avg	20.875	18.858	1004.4	99.62	96.27
High Error%	0.1%	0.4%	0.6%	1.9%	0.5%

Calibration Error Test End

Initial System Bias Check, R STRATA Version 3.01  
 Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat

Reference Cylinder Numbers  
 Zero Span  
 C2 XC025088B  
 CO2 CC171113  
 CO CC22068  
 SO2 CC216331  
 SOX CC281221

Date/Time	05-19-2011	08:47:19	PASSED		
Analyte	C2	CO2	CO	SOX	SOX
Units	%	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.000	0.0	0.03	0.03
Zero Cal	0.072	0.114	0.5	-0.47	0.02
Zero Avg	0.108	0.194	0.4	-0.46	0.18
Zero Bias%	0.1%	0.4%	0.0%	0.0%	0.2%
Zero Drift%					
Span Ref Cyl	9.936	9.981	493.7	51.07	49.14
Span Cal	10.010	9.717	496.9	50.22	49.75
Span Avg	9.915	9.442	485.1	49.33	49.17
Span Bias%	0.6%	1.4%	1.4%	0.9%	0.6%
Span Drift%					

System Bias Check End

Test Run 1 STRATA Version 3

	O2 %	CO2 %	CO ppm	SO2 ppm	NOx ppm
Begin calculating run averages					
05-19-2011 09:47:33	1.145	16.659	28.4	-0.45	31.36
05-19-2011 09:48:33	1.351	16.539	25.5	-0.37	37.60
05-19-2011 09:49:34	1.273	16.528	25.8	-0.41	36.54
05-19-2011 09:50:34	1.071	16.649	27.3	-0.40	31.48
05-19-2011 09:51:32	1.184	16.610	25.8	-0.44	34.93
05-19-2011 09:52:33	1.387	16.653	27.2	-0.39	32.23
05-19-2011 09:53:33	1.294	16.554	25.2	-0.37	30.77
05-19-2011 09:54:34	1.156	16.607	25.1	-0.42	34.23
05-19-2011 09:55:34	0.893	16.876	42.3	-0.50	19.60
05-19-2011 09:56:32	1.041	16.739	40.6	-0.46	22.75
05-19-2011 09:57:33	1.040	16.712	33.3	-0.48	25.90
05-19-2011 09:58:33	0.980	16.736	31.6	-0.51	26.26
05-19-2011 09:59:34	0.979	16.759	31.4	-0.47	27.01
05-19-2011 10:00:34	0.870	16.850	31.8	-0.48	24.42
05-19-2011 10:01:32	0.969	16.819	31.2	-0.48	27.28
05-19-2011 10:02:33	0.844	16.866	33.0	-0.46	23.05
05-19-2011 10:03:33	0.727	16.969	40.2	-0.47	19.43
05-19-2011 10:04:34	0.780	16.951	39.1	-0.47	20.91
05-19-2011 10:05:34	0.772	16.926	36.0	-0.49	20.92
05-19-2011 10:06:32	0.615	17.056	52.7	-0.46	15.92
05-19-2011 10:07:33	0.501	17.211	96.6	-0.44	11.50
05-19-2011 10:08:33	0.500	17.222	160.5	-0.49	10.82
05-19-2011 10:09:34	0.584	17.140	77.7	-0.46	12.94
05-19-2011 10:10:34	0.690	17.051	54.7	-0.41	16.07
05-19-2011 10:11:32	0.662	17.045	50.0	-0.45	15.68
05-19-2011 10:12:33	0.724	17.023	47.4	-0.39	17.91
05-19-2011 10:13:33	0.638	17.058	50.2	-0.42	15.37
05-19-2011 10:14:34	0.581	17.115	69.4	-0.45	13.89
05-19-2011 10:15:34	0.661	17.098	53.4	-0.42	15.67
05-19-2011 10:16:32	0.586	17.128	60.2	-0.43	13.84
05-19-2011 10:17:33	0.565	17.155	69.9	-0.41	13.41
05-19-2011 10:18:33	0.561	17.184	74.9	-0.44	12.99
05-19-2011 10:19:34	0.498	17.293	126.9	-0.46	10.13
05-19-2011 10:20:34	0.400	17.274	192.0	-0.44	9.02
05-19-2011 10:21:33	0.510	17.199	110.4	-0.44	11.16
05-19-2011 10:22:33	0.650	17.101	67.2	-0.45	14.63
05-19-2011 10:23:33	0.590	17.102	69.4	-0.46	13.14
05-19-2011 10:24:34	0.635	17.069	74.6	-0.45	14.62
05-19-2011 10:25:34	0.639	17.030	59.5	-0.45	14.18
05-19-2011 10:26:33	0.584	17.074	65.7	-0.45	13.62
05-19-2011 10:27:33	0.623	17.040	54.7	-0.45	14.93
05-19-2011 10:28:33	0.648	17.016	51.8	-0.46	15.62
05-19-2011 10:29:34	0.704	16.983	44.3	-0.46	16.98
05-19-2011 10:30:34	0.667	16.958	49.5	-0.47	16.02
05-19-2011 10:31:33	0.444	17.178	161.0	-0.51	9.53
05-19-2011 10:32:33	0.437	17.147	248.4	-0.44	9.48
05-19-2011 10:33:33	0.564	17.002	53.0	-0.49	11.88
05-19-2011 10:34:34	0.643	16.929	61.0	-0.50	13.96
05-19-2011 10:35:34	0.547	17.006	77.9	-0.54	12.55
05-19-2011 10:36:33	0.860	16.803	46.1	-0.54	20.36
05-19-2011 10:37:33	0.876	16.722	35.8	-0.52	20.06
05-19-2011 10:38:33	0.792	16.777	40.2	-0.44	15.32
05-19-2011 10:39:34	0.795	16.774	37.6	-0.51	15.56
05-19-2011 10:40:34	0.786	16.766	40.0	-0.55	15.54
05-19-2011 10:41:33	0.852	16.725	36.3	-0.52	20.98
05-19-2011 10:42:33	0.744	16.782	59.8	-0.54	17.62
05-19-2011 10:43:33	0.454	17.042	186.1	-0.50	9.38
05-19-2011 10:44:34	0.571	16.999	127.4	-0.56	11.72
05-19-2011 10:45:34	0.567	16.955	75.2	-0.63	11.93
05-19-2011 10:46:33	0.565	16.963	71.1	-0.56	12.48
05-19-2011 10:47:33	0.627	16.918	57.0	-0.49	13.90
05-19-2011 10:48:34	0.736	16.877	64.0	-0.51	16.77
05-19-2011 10:49:34	0.636	16.893	56.7	-0.50	13.13
05-19-2011 10:50:32	0.578	16.974	71.1	-0.49	12.76
05-19-2011 10:51:33	0.687	16.901	49.5	-0.57	14.66
05-19-2011 10:52:33	0.782	16.805	42.1	-0.49	14.93
05-19-2011 10:53:34	0.727	16.827	47.3	-0.57	15.30
05-19-2011 10:54:34	0.791	16.787	41.0	-0.50	16.93
05-19-2011 10:55:33	0.607	16.935	102.8	-0.53	10.55
05-19-2011 10:56:33	0.579	16.961	153.8	-0.62	10.26
05-19-2011 10:57:33	0.665	16.872	74.6	-0.55	12.46
05-19-2011 10:58:34	0.756	16.791	47.1	-0.51	14.89
05-19-2011 10:59:34	0.710	16.804	47.8	-0.50	14.52
05-19-2011 11:00:33	0.712	16.813	45.9	-0.50	15.41
Pause					
End Pause					
05-19-2011 11:06:33	0.694	16.755	44.3	-0.54	14.91
05-19-2011 11:07:33	0.552	16.898	88.2	-0.52	10.46
05-19-2011 11:08:34	0.462	16.986	179.8	-0.49	8.38
05-19-2011 11:09:34	0.566	16.887	102.5	-0.53	10.57
05-19-2011 11:10:33	0.711	16.757	55.7	-0.49	13.90
05-19-2011 11:11:33	0.626	16.772	51.6	-0.55	12.35
05-19-2011 11:12:33	0.762	16.513	16.7	-0.55	10.61
05-19-2011 11:13:34	0.531	16.618	37.5	-0.59	7.30
05-19-2011 11:14:34	0.671	16.550	59.0	-0.56	9.57

05-19-2011 11:15:33	0.659	16.662	45.7	-0.55	10.81
05-19-2011 11:16:33	0.651	16.805	51.7	-0.51	13.83
05-19-2011 11:17:34	0.64	16.841	53.0	-0.55	13.16
05-19-2011 11:18:34	0.682	16.819	51.8	-0.60	14.16
05-19-2011 11:18:33	0.511	16.963	149.0	-0.56	8.96
05-19-2011 11:21:33	0.471	16.996	247.8	-0.53	8.79
05-19-2011 11:21:34	0.605	16.872	89.7	-0.54	10.72
05-19-2011 11:22:34	0.610	16.892	77.7	-0.49	12.05
05-19-2011 11:23:34	0.708	16.813	51.0	-0.49	13.88
05-19-2011 11:24:33	0.693	16.082	43.7	-0.62	13.91
05-19-2011 11:25:33	0.663	16.020	53.1	-0.56	12.74
05-19-2011 11:26:34	0.623	16.850	66.8	-0.53	12.29
05-19-2011 11:27:34	0.656	16.844	52.9	-0.55	13.07
05-19-2011 11:28:33	0.761	16.772	42.3	-0.54	15.63
05-19-2011 11:28:33	0.643	16.819	50.2	-0.53	12.69
05-19-2011 11:30:34	0.700	16.795	50.8	-0.50	13.69
05-19-2011 11:31:34	0.678	16.848	72.3	-0.54	11.10
05-19-2011 11:32:33	0.354	17.051	374.4	-0.52	6.11
05-19-2011 11:33:33	0.545	16.929	186.8	-0.55	9.85
05-19-2011 11:34:33	0.636	16.844	64.6	-0.53	11.26
05-19-2011 11:35:34	0.705	16.791	53.2	-0.61	13.67
05-19-2011 11:36:34	0.680	16.788	52.6	-0.53	12.45
05-19-2011 11:37:33	0.642	16.841	58.2	-0.51	12.70
05-19-2011 11:38:33	0.733	16.757	44.4	-0.52	13.96
05-19-2011 11:39:33	0.654	16.799	54.0	-0.49	12.44
05-19-2011 11:40:34	0.641	16.836	66.5	-0.53	13.27
05-19-2011 11:41:34	0.734	16.737	43.0	-0.51	14.29
05-19-2011 11:42:33	0.613	16.814	66.1	-0.53	12.67
05-19-2011 11:43:33	0.702	16.798	49.8	-0.49	11.51
05-19-2011 11:44:33	0.472	16.965	231.4	-0.51	8.39
05-19-2011 11:45:34	0.602	16.800	65.3	-0.49	11.85
05-19-2011 11:46:34	0.697	16.740	54.7	0.54	12.76
05-19-2011 11:47:33	0.686	16.750	49.8	-0.53	13.14

Test Run  $\sqrt{}$  STRATA Version 3

	O <sub>2</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NOx ppm
05-19-2011 11:48:33	0.553	16.804	68.1	-0.56	11.02
05-19-2011 11:49:34	0.789	16.705	44.7	-0.54	16.66
05-19-2011 11:50:34	0.662	16.757	48.3	-0.54	12.96
05-19-2011 11:51:32	0.686	16.790	52.4	-0.56	14.78
Run Averages	O <sub>2</sub> %	CO <sub>2</sub> %	CO ppm	SO <sub>2</sub> ppm	NOx ppm
05-19-2011 11:52:04	0.701	16.880	70.3	-0.50	15.70

Operator: KC  
Plant Name: Citgo  
Location: B-Cat  
Test Run 1 End

Final System Bias Check, Run STRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span

C2 XC025088B  
CO2 CC171113  
CO CC22068  
SO2 CC216331  
NOx CC281221

Date/Time	05-19-2011	12:17:10	PASSED
Analyte	O2	CO2	CO
Units	%	%	ppm
Zero Ref Cyl	0.000	0.000	0.0
Zero Cal	0.072	0.114	0.5
Zero Avg	0.052	0.391	0.5
Zero Bias%	0.1%	1.4%	0.0%
Zero Drift%	-0.2%	1.0%	0.0%
Span Ref Cyl	9.956	9.991	493.7
Span Cal	10.070	9.717	498.9
Span Avg	9.913	9.470	482.8
Span Bias%	0.6%	1.2%	1.1%
Span Drift%	0.6%	0.1%	-0.2%
Ini Zero Avg	0.108	0.154	0.4
Ini Span Avg	9.915	9.442	485.1
Run Avg	0.701	16.880	70.3
CO	0.080	0.252	0.4
CO	9.914	9.456	483.9
Correct Avg	0.627	18.064	71.3
System Bias Check End			

Calibration Error Test, Run TRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-C&T

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
THC	32	CC19643	CC79433	SS913323BAL

Date/Time 05-18-2011 09:20:22  
Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Avg 0.25  
Zero Error% 0.3%  
Low Ref Cyl 25.43  
Low Avg 25.45  
Low Error% 0.4%  
Mid Ref Cyl 49.39  
Mid Avg 49.17  
Mid Error% 0.0%  
High Ref Cyl 95.56  
High Avg 95.52  
High Error% 0.0%  
Calibration Error Test End

THC

Initial System Bias Check, P STRATA Version 3.01  
Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
r2 OC79433

THC  
Date/Time 05-18-2011 09:26:36 PASSED  
Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal 0.15  
Zero Avg -0.05  
Zero Bias 0.3%  
Zero Drift  
Span Ref Cyl 49.39  
Span Cal 49.37  
Span Avg 49.11  
Span Bias 2.3%  
Span Drift  
System Bias Check End

THC



Test Run 1 STRATA Version 3/

THC  
ppm

Begin calculating run averages

05-18-2011 12:51:04	1.83
05-18-2011 12:52:03	1.84
05-18-2011 12:53:04	1.84
05-18-2011 12:54:03	1.83
05-18-2011 12:55:04	1.83

Pause

End Pause

05-18-2011 13:45:03	2.32
05-18-2011 13:46:04	2.40
05-18-2011 13:47:03	2.22
05-18-2011 13:48:04	2.18
05-18-2011 13:49:03	2.03
05-18-2011 13:50:04	2.07
05-18-2011 13:51:05	2.19
05-18-2011 13:52:03	2.22
05-18-2011 13:53:04	2.23
05-18-2011 13:54:03	2.25
05-18-2011 13:55:04	2.24
05-18-2011 13:56:03	2.25
05-18-2011 13:57:04	2.27
05-18-2011 13:58:03	2.28
05-18-2011 13:59:04	2.28
05-18-2011 14:00:03	2.29
05-18-2011 14:01:04	2.30
05-18-2011 14:02:03	2.31
05-18-2011 14:03:04	2.30
05-18-2011 14:04:05	2.30
05-18-2011 14:05:03	2.30
05-18-2011 14:06:04	2.32
05-18-2011 14:07:03	2.34
05-18-2011 14:08:04	2.34
05-18-2011 14:09:03	2.37
05-18-2011 14:10:04	2.40
05-18-2011 14:11:03	2.41
05-18-2011 14:12:04	2.42
05-18-2011 14:13:03	2.43
05-18-2011 14:14:04	2.42
05-18-2011 14:15:03	2.42
05-18-2011 14:16:04	2.42
05-18-2011 14:17:05	2.43
05-18-2011 14:18:03	2.41
05-18-2011 14:19:04	2.38
05-18-2011 14:20:03	2.38
05-18-2011 14:21:04	2.37
05-18-2011 14:22:03	2.35
05-18-2011 14:23:04	2.37
05-18-2011 14:24:03	2.36
05-18-2011 14:25:04	2.37
05-18-2011 14:26:03	2.36
05-18-2011 14:27:04	2.36
05-18-2011 14:28:03	2.38
05-18-2011 14:29:04	2.41
05-18-2011 14:30:05	2.37
05-18-2011 14:31:03	2.35
05-18-2011 14:32:04	2.37
05-18-2011 14:33:03	2.34
05-18-2011 14:34:04	2.35
05-18-2011 14:35:03	2.36
05-18-2011 14:36:04	2.34
05-18-2011 14:37:03	2.34
05-18-2011 14:38:04	2.33
05-18-2011 14:39:03	2.33
05-18-2011 14:40:04	2.31
05-18-2011 14:41:03	2.33
05-18-2011 14:42:04	2.33
05-18-2011 14:43:05	2.35
05-18-2011 14:44:03	2.35
05-18-2011 14:45:04	2.35
05-18-2011 14:46:03	2.35
05-18-2011 14:47:04	2.37
05-18-2011 14:48:03	2.37

Pause

End Pause

05-18-2011 17:11:04	6.92
05-18-2011 17:12:03	6.82
05-18-2011 17:13:04	7.09
05-18-2011 17:14:03	7.28
05-18-2011 17:15:04	7.25
05-18-2011 17:16:03	7.24
05-18-2011 17:17:04	7.93
05-18-2011 17:18:03	6.80
05-18-2011 17:19:04	6.56
05-18-2011 17:20:03	6.63
05-18-2011 17:21:04	6.49
05-18-2011 17:22:03	6.32

THC

05-18-2011 17:23:04	6.31
05-18-2011 17:24:04	6.22
05-18-2011 17:25:05	6.62
05-18-2011 17:26:04	7.02
05-18-2011 17:27:03	7.75
05-18-2011 17:28:04	7.22
05-18-2011 17:29:03	6.61
05-18-2011 17:30:04	6.37
05-18-2011 17:31:03	6.52
05-18-2011 17:32:04	6.23
05-18-2011 17:33:03	6.12
05-18-2011 17:34:04	6.14
05-18-2011 17:35:03	6.07
05-18-2011 17:36:04	5.98
05-18-2011 17:37:03	6.37
05-18-2011 17:38:04	7.21
05-18-2011 17:39:03	7.34
05-18-2011 17:40:04	6.67
05-18-2011 17:41:03	6.32
05-18-2011 17:42:04	6.22
05-18-2011 17:43:03	6.27
05-18-2011 17:44:04	6.17
05-18-2011 17:45:03	6.18
05-18-2011 17:46:04	6.19
05-18-2011 17:47:03	6.08
05-18-2011 17:48:04	6.66
05-18-2011 17:49:03	6.69
05-18-2011 17:50:04	6.91
05-18-2011 17:51:03	6.95
05-18-2011 17:52:04	6.66
05-18-2011 17:53:03	6.55
05-18-2011 17:54:04	6.07
05-18-2011 17:55:03	6.63

The

Test Run 1 STRATA Version 3.  
 THC  
 ppm  
 05-18-2011 17:56:03 6.41  
 05-18-2011 17:57:04 6.40  
 05-18-2011 17:58:03 6.19  
 05-18-2011 17:59:04 6.22  
 05-18-2011 18:00:03 6.14  
 05-18-2011 18:01:04 6.20  
 05-18-2011 18:02:03 6.78  
 Run Averages THC  
 ppm  
 05-18-2011 18:02:07 4.12  
 Operator: KC  
 Plant Name: Citgo  
 Location: R-Cat  
 Test Run 1 End

THC

Final System Bias Check, Run: MTRATA Version 3.01  
Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
E2 CC79433

THC Date/Time 05-18-2011 19:15:48 PASSED

Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal 0.25  
Zero Avg 0.41  
Zero Bias% 0.2%  
Zero Drift% 0.5%  
Span Ref Cyl 49.39  
Span Cal 49.37  
Span Avg 50.21  
Span Bias% 0.7%  
Span Drift% 3.0%

Ini Zero Avg -0.05  
Ini Span Avg 47.11  
Run Avg 4.12  
Co 0.18  
Cm 48.61  
Correct Avg 4.02  
System Bias Check End

THC

Test Run 2 STATA Version 3.

	THC ppm
Begin calculating run averages	
05-18-2011 19:19:04	6.81
05-18-2011 19:20:04	6.81
05-18-2011 19:21:03	6.86
05-18-2011 19:22:04	6.92
05-18-2011 19:23:05	6.79
05-18-2011 19:24:03	6.68
05-18-2011 19:25:04	6.84
05-18-2011 19:26:05	7.19
05-18-2011 19:27:03	7.23
05-18-2011 19:28:04	7.24
05-18-2011 19:29:05	6.98
05-18-2011 19:30:03	6.76
05-18-2011 19:31:04	6.90
05-18-2011 19:32:05	6.65
05-18-2011 19:33:03	6.53
05-18-2011 19:34:04	6.59
05-18-2011 19:35:05	6.51
05-18-2011 19:36:04	6.42
05-18-2011 19:37:04	6.73
05-18-2011 19:38:05	7.08
05-18-2011 19:39:04	7.07
05-18-2011 19:40:04	7.16
05-18-2011 19:41:05	6.79
05-18-2011 19:42:04	6.67
05-18-2011 19:43:04	7.37
05-18-2011 19:44:03	6.91
05-18-2011 19:45:04	6.56
05-18-2011 19:46:05	6.63
05-18-2011 19:47:03	6.96
05-18-2011 19:48:04	7.47
05-18-2011 19:49:05	6.72
05-18-2011 19:50:03	6.97
05-18-2011 19:51:04	5.88
05-18-2011 19:52:05	5.66
05-18-2011 19:53:03	7.12
05-18-2011 19:54:04	6.81
05-18-2011 19:55:05	5.47
05-18-2011 19:56:03	5.35
05-18-2011 19:57:04	5.47
05-18-2011 19:58:05	5.26
05-18-2011 19:59:04	6.64
05-18-2011 20:00:04	6.81
05-18-2011 20:01:05	6.55
05-18-2011 20:02:04	6.77
05-18-2011 20:03:04	6.75
05-18-2011 20:04:05	6.73
05-18-2011 20:05:04	6.63
05-18-2011 20:06:04	6.60
05-18-2011 20:07:03	7.58
05-18-2011 20:08:04	6.60
05-18-2011 20:09:04	6.23
05-18-2011 20:10:03	6.27
05-18-2011 20:11:04	6.07
05-18-2011 20:12:05	5.93
05-18-2011 20:13:03	6.11
05-18-2011 20:14:04	6.58
05-18-2011 20:15:05	6.61
05-18-2011 20:16:03	6.82
05-18-2011 20:17:04	6.55
05-18-2011 20:18:05	6.53
05-18-2011 20:19:03	6.64
05-18-2011 20:20:04	6.39
05-18-2011 20:21:05	6.37
05-18-2011 20:22:04	6.41
Pause	
End Pause	
05-18-2011 20:31:04	6.46
05-18-2011 20:32:05	6.28
05-18-2011 20:33:03	6.37
05-18-2011 20:34:04	6.27
05-18-2011 20:35:05	6.76
05-18-2011 20:36:03	6.43
05-18-2011 20:37:04	6.58
05-18-2011 20:38:05	6.91
05-18-2011 20:39:03	6.89
05-18-2011 20:40:04	6.75
05-18-2011 20:41:05	6.80
05-18-2011 20:42:03	6.56
05-18-2011 20:43:04	6.77
05-18-2011 20:44:05	6.93
05-18-2011 20:45:04	6.55
05-18-2011 20:46:04	6.57
05-18-2011 20:47:05	6.40
05-18-2011 20:48:04	6.33
05-18-2011 20:49:04	6.44

THC

05-18-2011 20:50:05	6.82
05-18-2011 20:51:04	6.89
05-18-2011 20:52:04	6.82
05-18-2011 20:53:03	6.81
05-18-2011 20:54:04	6.96
05-18-2011 20:55:05	6.61
05-18-2011 20:56:03	6.59
05-18-2011 20:57:04	6.61
05-18-2011 20:58:05	7.04
05-18-2011 20:59:03	6.52
05-18-2011 21:00:04	6.41
05-18-2011 21:01:05	6.24
05-18-2011 21:02:03	6.66
05-18-2011 21:03:04	7.01
05-18-2011 21:04:05	6.67
05-18-2011 21:05:03	6.51
05-18-2011 21:06:04	6.53
05-18-2011 21:07:05	6.40
05-18-2011 21:08:04	6.30
05-18-2011 21:09:04	6.27
05-18-2011 21:10:05	6.58
05-18-2011 21:11:04	6.17
05-18-2011 21:12:04	6.61
05-18-2011 21:13:05	6.28
05-18-2011 21:14:04	6.73
05-18-2011 21:15:04	6.72
05-18-2011 21:16:03	6.63
05-18-2011 21:17:04	6.65
05-18-2011 21:18:05	6.75
05-18-2011 21:19:03	7.30
05-18-2011 21:20:04	6.69
05-18-2011 21:21:05	6.63
05-18-2011 21:22:03	6.37

THC

Test Run 2 STRATA Version 3:  
 THC  
 ppm  
 05-18-2011 21:23:04 6.40  
 05-18-2011 21:24:05 6.30  
 05-18-2011 21:25:04 6.39  
 05-18-2011 21:26:04 6.65  
 Run Average: THC  
 ppm  
 05-18-2011 21:26:49 6.68  
 Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat  
 Test Run 2 End

THC

Final System Bias Check, Run STRATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
N2 OC79433

THC Date/Time 05-18-2011 21:50:10 PASSED

Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal 0.25  
Zero Avg 1.42  
Zero Bias% 1.68  
Zero Drift% 1.44  
Span Ref Cyl 49.39  
Span Cal 49.37  
Span Avg 50.27  
Span Bias% 0.98  
Span Drift% 0.2%

Ini Zero Avg 0.41  
Ini Span Avg 50.11  
Run Avg 6.48  
Co 1.11  
Cm 50.76  
Correct Avg 5.60  
System Bias Check End

THC



Calibration Error Test, Run    TRATA Version 3.01  
Operator:                    KC  
Plant Name:                Citgo  
Location:                  B-Cat

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
THC	N2	CC19643	CC79433	999163323BBL

Date/Time        05-19-2011            09:08:47            PASSED

Analyte            THC

Units              ppm

Zero Ref Cyl       0.00

Zero Avg           -0.16

Zero Error%       0.2%

Low Ref Cyl       25.33

Low Avg            25.30

Low Error%        0.3%

Mid Ref Cyl        49.39

Mid Avg            49.23

Mid Error%        0.2%

High Ref Cyl       95.56

High Avg           95.95

High Error%       0.4%

Calibration Error Test End

Run 2

THC

Initial System Bias Check, R STRATA Version 3.01  
Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
N2 CC79433

THC Date/Time 05-19-2011 09:15:26 PASSED

Analyte TEC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal -0.16  
Zero Avg -0.22  
Zero Bias% 0.1%  
Zero Drift%  
Span Ref Cyl 49.39  
Span Cal 49.23  
Span Avg 49.94  
Span Bias% 0.2%  
Span Drift%  
System Bias Check End

THC

Test Run *x* STRATA Version 3

	THC ppm
Begin calculating run averages	
05-19-2011 09:47:04	5.86
05-19-2011 09:48:05	5.69
05-19-2011 09:49:04	5.59
05-19-2011 09:50:04	5.62
05-19-2011 09:51:05	5.65
05-19-2011 09:52:04	5.58
05-19-2011 09:53:05	5.65
05-19-2011 09:54:05	5.60
05-19-2011 09:55:04	5.65
05-19-2011 09:56:05	6.40
05-19-2011 09:57:05	7.48
05-19-2011 09:58:04	6.33
05-19-2011 09:59:05	5.72
05-19-2011 10:00:05	5.60
05-19-2011 10:01:04	5.56
05-19-2011 10:02:05	5.74
05-19-2011 10:03:05	5.82
05-19-2011 10:04:04	5.91
05-19-2011 10:05:05	6.44
05-19-2011 10:06:06	6.15
05-19-2011 10:07:04	6.23
05-19-2011 10:08:05	6.76
05-19-2011 10:09:06	6.90
05-19-2011 10:10:04	6.83
05-19-2011 10:11:05	7.24
05-19-2011 10:12:04	7.12
05-19-2011 10:13:04	6.47
05-19-2011 10:14:05	6.47
05-19-2011 10:15:04	6.54
05-19-2011 10:16:04	7.41
05-19-2011 10:17:05	6.77
05-19-2011 10:18:04	6.63
05-19-2011 10:19:05	6.69
05-19-2011 10:20:06	7.05
05-19-2011 10:21:04	7.28
05-19-2011 10:22:05	7.20
05-19-2011 10:23:05	7.61
05-19-2011 10:24:04	7.89
05-19-2011 10:25:05	7.38
05-19-2011 10:26:05	5.75
05-19-2011 10:27:04	5.71
05-19-2011 10:28:05	6.80
05-19-2011 10:29:06	6.68
05-19-2011 10:30:04	6.87
05-19-2011 10:31:05	5.78
05-19-2011 10:32:06	7.19
05-19-2011 10:33:04	7.69
05-19-2011 10:34:05	3.19
05-19-2011 10:35:04	7.17
05-19-2011 10:36:04	6.98
05-19-2011 10:37:05	6.66
05-19-2011 10:38:04	6.80
05-19-2011 10:39:05	6.43
05-19-2011 10:40:05	6.40
05-19-2011 10:41:04	6.34
05-19-2011 10:42:05	7.18
05-19-2011 10:43:05	6.43
05-19-2011 10:44:04	6.93
05-19-2011 10:45:05	6.98
05-19-2011 10:46:05	6.89
05-19-2011 10:47:04	6.85
05-19-2011 10:48:05	6.98
05-19-2011 10:49:06	7.35
05-19-2011 10:50:04	7.07
05-19-2011 10:51:05	6.77
05-19-2011 10:52:06	6.61
05-19-2011 10:53:04	6.80
05-19-2011 10:54:05	6.54
05-19-2011 10:55:04	7.98
05-19-2011 10:56:04	7.09
05-19-2011 10:57:05	6.71
05-19-2011 10:58:04	6.68
05-19-2011 10:59:04	6.49
05-19-2011 11:00:05	6.58
Pause	
End Pause	
05-19-2011 11:06:05	6.26
05-19-2011 11:07:04	6.26
05-19-2011 11:08:05	7.30
05-19-2011 11:09:05	7.07
05-19-2011 11:10:04	6.78
05-19-2011 11:11:05	6.72
05-19-2011 11:12:06	6.68
05-19-2011 11:13:04	6.92
05-19-2011 11:14:05	6.92

THC

05-19-2011 11:15:04	6.62
05-19-2011 11:16:04	6.40
05-19-2011 11:17:05	6.3
05-19-2011 11:18:04	6.45
05-19-2011 11:19:04	6.71
05-19-2011 11:20:05	7.12
05-19-2011 11:21:04	7.03
05-19-2011 11:22:05	7.02
05-19-2011 11:23:05	6.88
05-19-2011 11:24:04	6.74
05-19-2011 11:25:05	7.73
05-19-2011 11:26:05	6.73
05-19-2011 11:27:04	6.54
05-19-2011 11:28:05	6.33
05-19-2011 11:29:05	6.40
05-19-2011 11:30:04	6.38
05-19-2011 11:31:05	6.39
05-19-2011 11:32:05	6.80
05-19-2011 11:33:04	7.19
05-19-2011 11:34:05	6.94
05-19-2011 11:35:06	6.95
05-19-2011 11:36:04	7.31
05-19-2011 11:37:05	7.16
05-19-2011 11:38:06	6.68
05-19-2011 11:39:04	6.38
05-19-2011 11:40:05	6.43
05-19-2011 11:41:04	6.51
05-19-2011 11:42:04	6.51
05-19-2011 11:43:05	7.00
05-19-2011 11:44:04	5.77
05-19-2011 11:45:05	5.92
05-19-2011 11:46:05	7.11
05-19-2011 11:47:04	5.88

THC

Test Run / STRATA Version 3

	THC
	ppm
05-19-2011 11:48:05	7.28
05-19-2011 11:49:06	7.67
05-19-2011 11:50:04	6.44
05-19-2011 11:51:05	6.22
Run Averages	THC
	ppm
05-19-2011 11:51:37	6.70
Operator:	EC
Plant Name:	Citgc
Location:	B-Cat
Test Run 1 End	

THC

Final System Bias Check, Run : STRATA Version 3.01  
Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
F2 CC79433

Date/Time 05-19-2011 12:23:52 PASSED

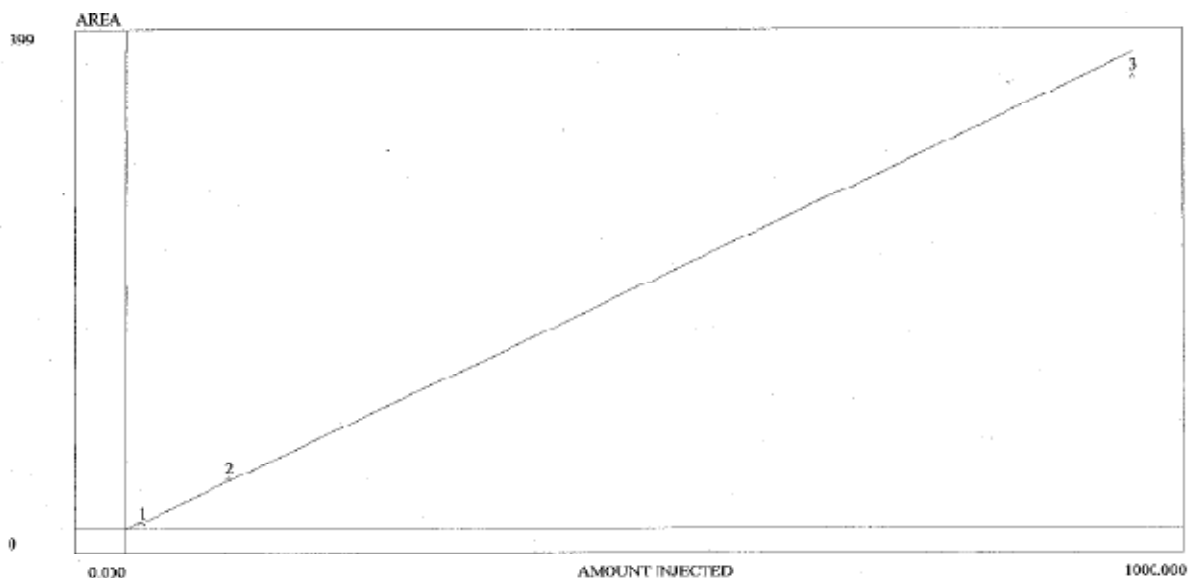
Analyte THC  
Units ppm  
Zero Ref Cyl 0.00  
Zero Cal -0.16  
Zero Avg 0.45  
Zero Bias% 0.4%  
Zero Drift% 0.7%  
Span Ref Cyl 49.39  
Span Cal 49.23  
Span Avg 47.26  
Span Bias% 2.0%  
Span Drift% -1.0%

Ini Zero Avg -0.22  
Ini Span Avg 49.04  
Run Avg 6.70  
Co 0.12  
Cm 48.15  
Correct Avg 6.77  
System Bias Check End

THC

Calibration file: methane.CAL

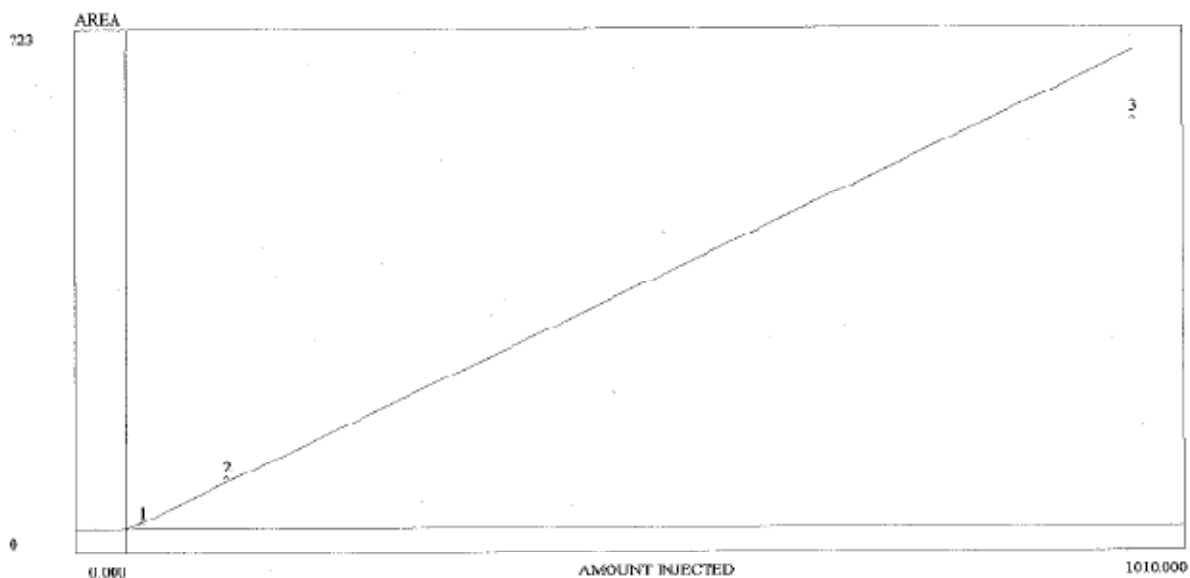
Run 18 Methane @ 4th



Avg slope of curve: 0.40  
Y-axis intercept: 0.00  
Linearity: 1.00  
Number of levels: 3  
SD/rel SD of CP's: 0.0/6.0  
 $Y=0.3993X$   
 $r^2: 0.9999$   
Last calibrated: Tue May 17 16:33:45 2011

Lvl	Area/bt	Amount	CF	Current	Previous #1	Previous #2
1	5.881	15.000	0.392	5.881	N/A	N/A
2	43.018	43.018	0.426	43.018	N/A	N/A
3	380.055	380.055	0.380	380.055	N/A	N/A

Calibration file: C:\peak372\GC Projects\CITGO - 3 WGS C1 and C2\ethane.cal



Avg slope of curve: 0.72

Y-axis intercept: 0.00

Linearity: 1.00

Number of levels: 3

SD/rel SD of CP's: 0.112.7

$r=0.7159X$

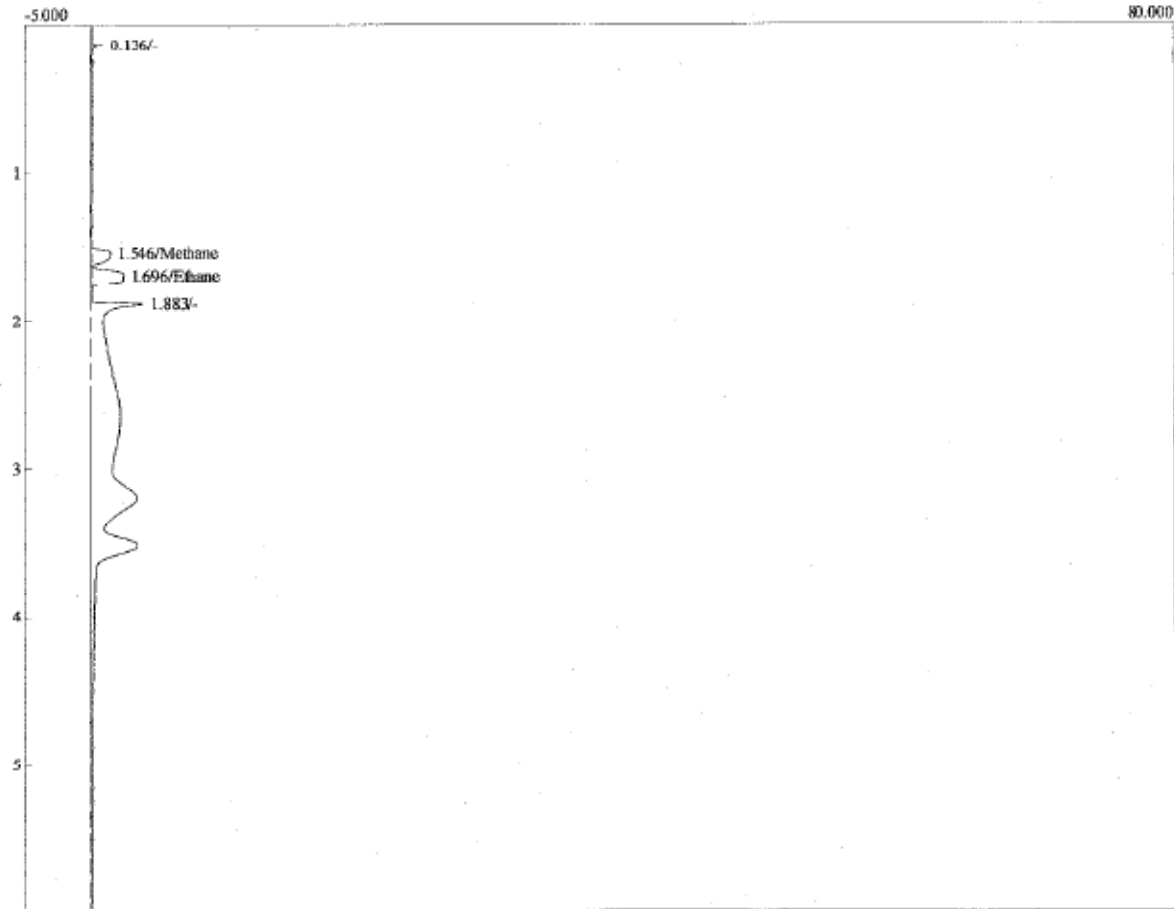
$r^2: 0.9994$

Last calibrated: Tue May 17 16:34:08 2011

Lvl	Area/ht	Amount	CS	Current	Previous #1	Previous #2
1	11.070	15.000	0.738	11.070	N/A	N/A
2	79.380	100.000	0.794	79.380	N/A	N/A
3	622.110	1010.000	0.516	622.110	N/A	N/A

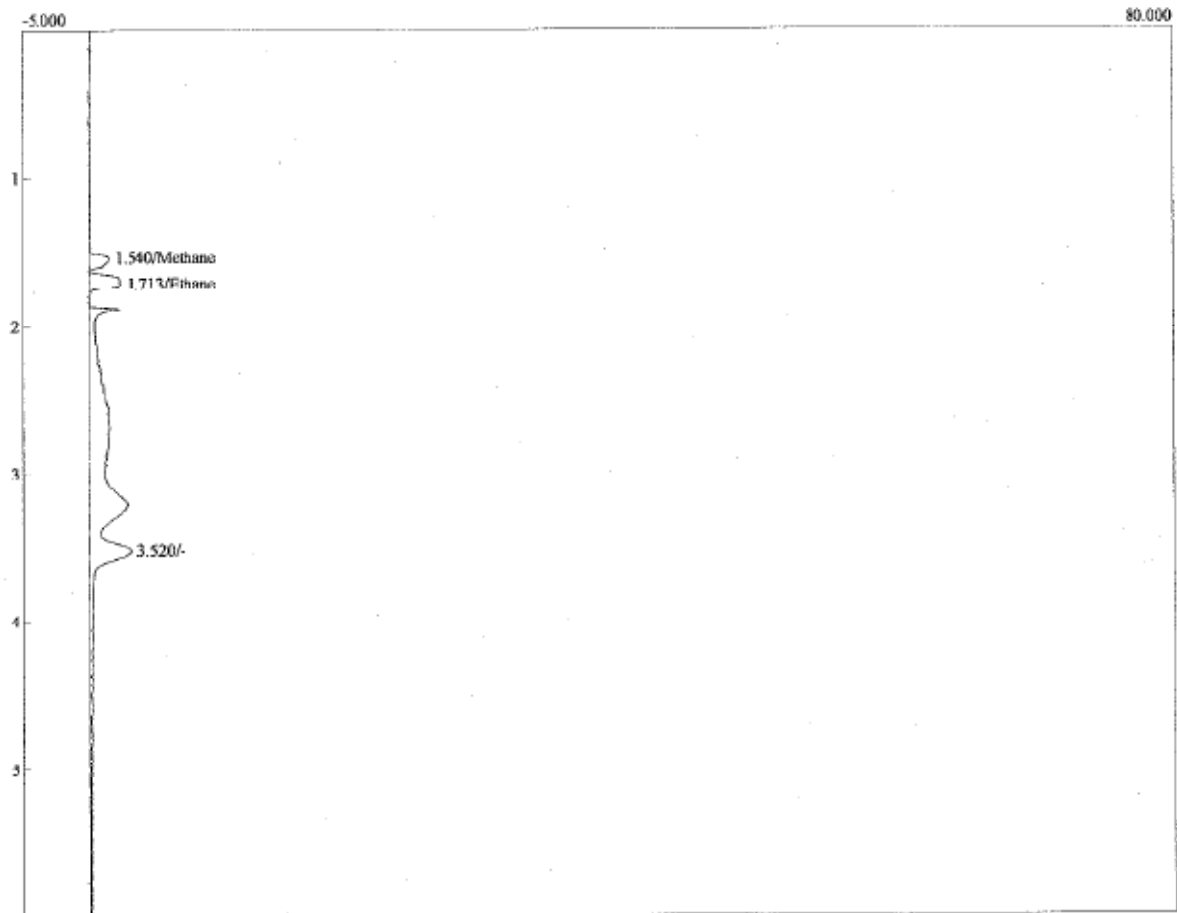


Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 13:17:48  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat 3 WGS C1 and C07 ()  
 Operator: RI



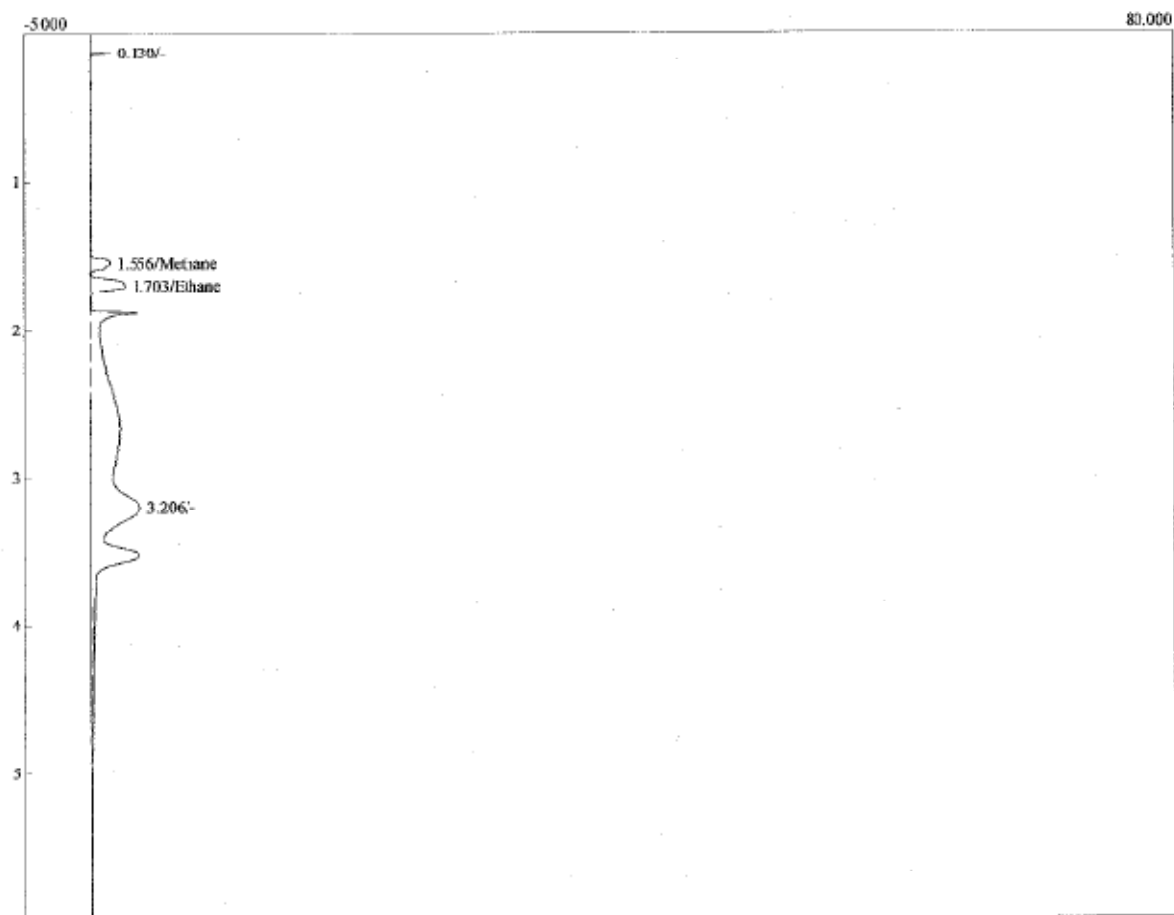
Component	Retention	Area	External	Units
Methane	1.546	6.66	15.0000	ppmv
Ethane	1.696	12.54	15.0000	ppmv
		19.20	30.0000	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 13:30:54  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C08 ()  
 Operator: RI



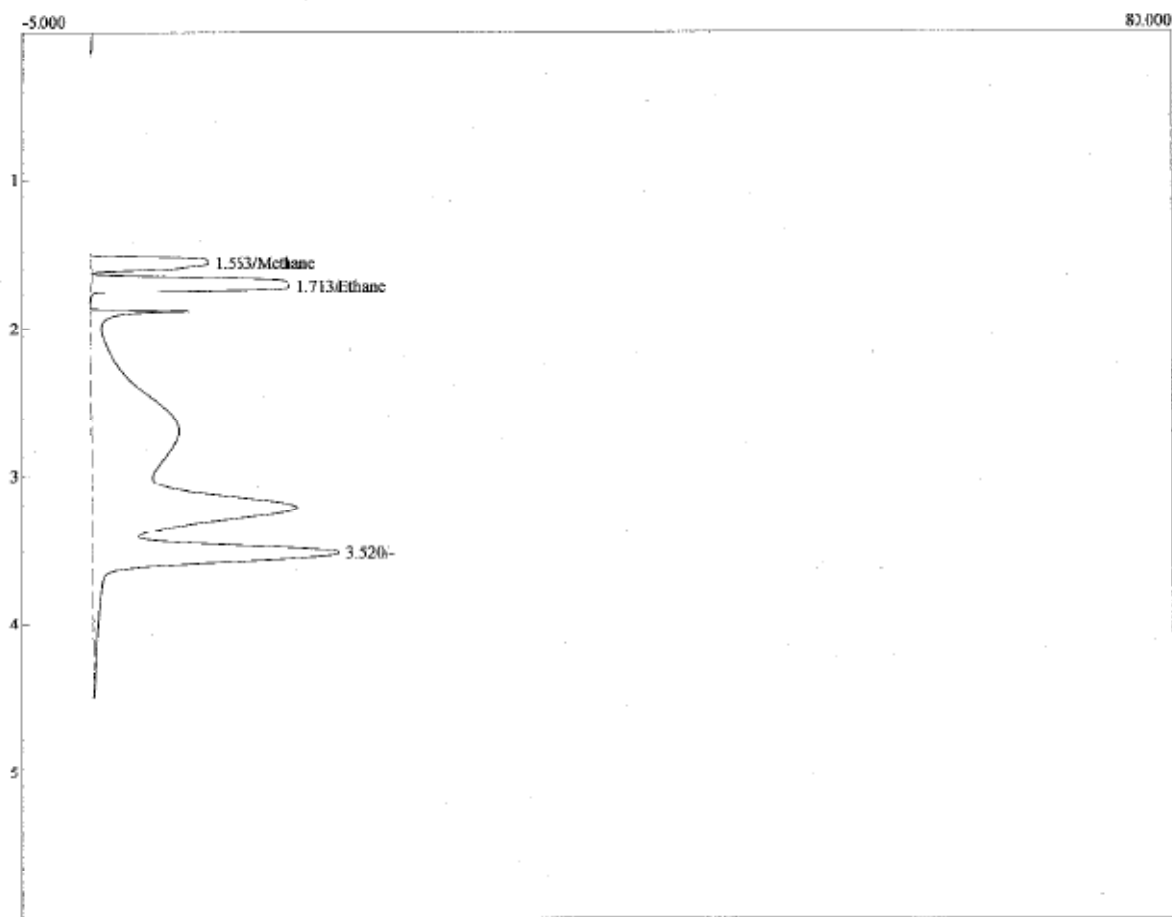
Component	Retention	Area	External	Units
Methane	1.540	6.31	15.0000	ppmv
Ethane	1.713	11.48	15.0000	ppmv
		17.79	30.0000	

Lab name: Shaw Environmental  
 Client: CFTGO LCNC  
 Client ID: B Cat WGS  
 Analysis date: 05/11/2011 12:56:03  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CFTGO Cat B WGS C1 and C06 ()  
 Operator: RI



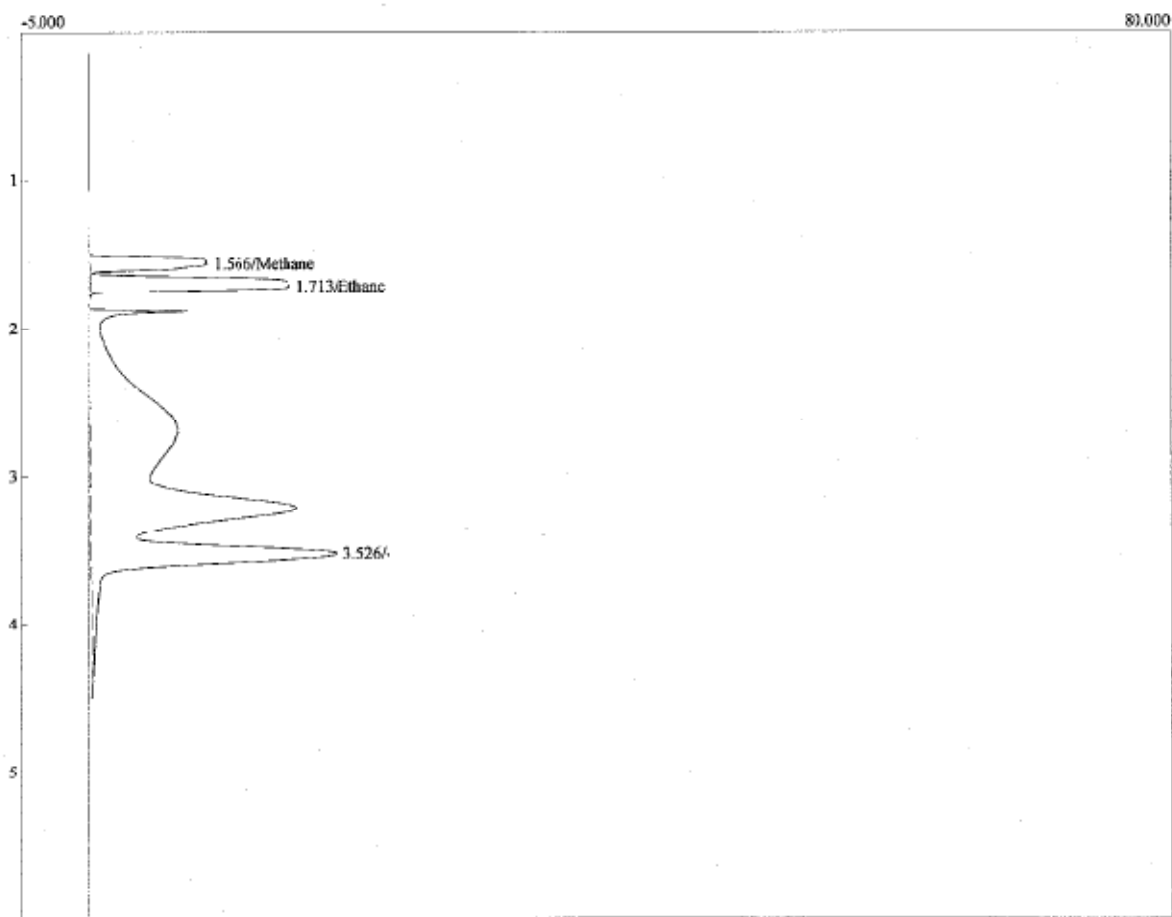
Component	Retention	Area	External	Units
Methane	1.556	5.88	15.0000	ppmv
Ethane	1.703	11.07	15.0000	ppmv
		16.95	30.0000	

Lab name: Shaw Environmental  
 Client: CITCO LCNC  
 Client ID: B Ca WGS  
 Analysis date: 05/13/2011 15:44:52  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITCO Cat B WGS C1 and C12. ()  
 Operator: RI



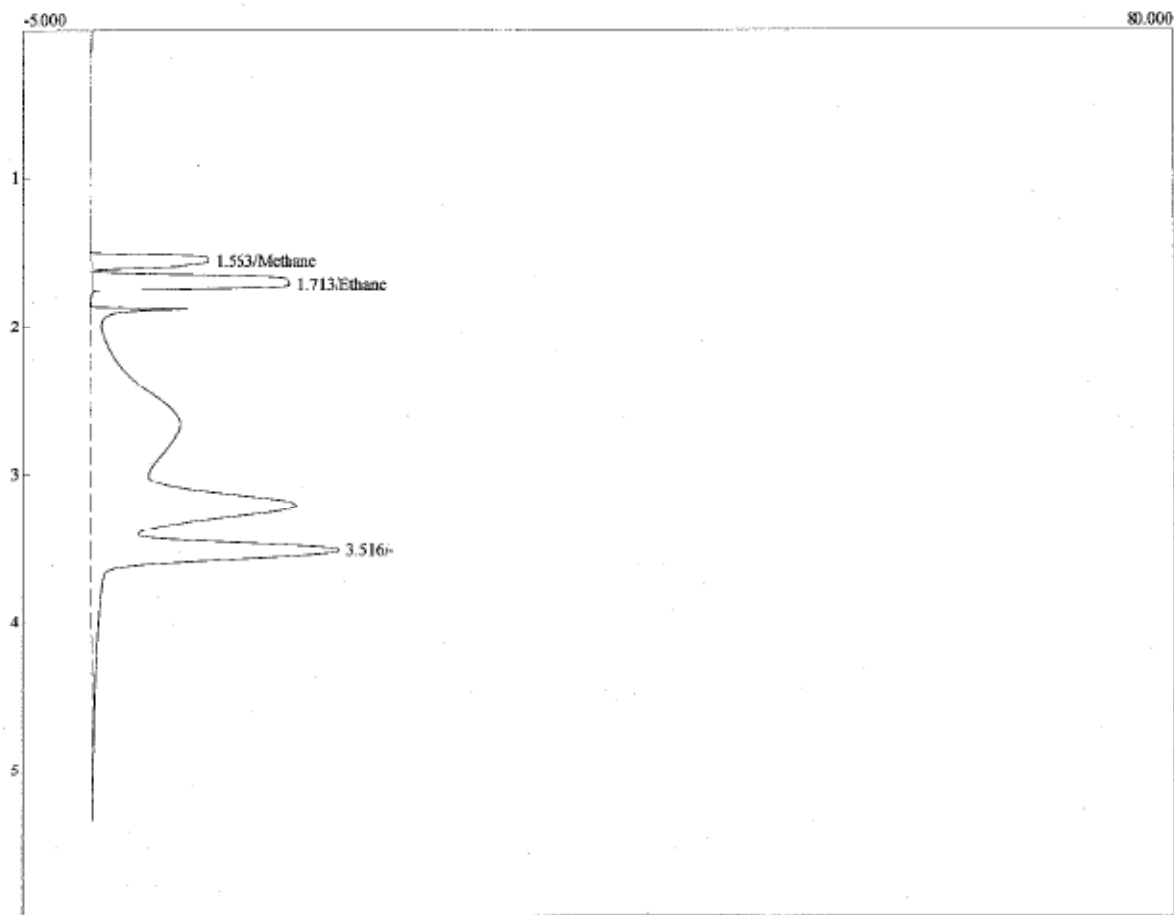
Component	Retention	Area	External	Units
Methane	1.563	42.60	104.6934	ppmv
Ethane	1.713	78.74	103.2369	ppmv
		121.35	207.9304	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/13/2011 15:53:00  
 Description: Det 2- FID  
 Column: RFXTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C13.ASC ()  
 Operator: RI



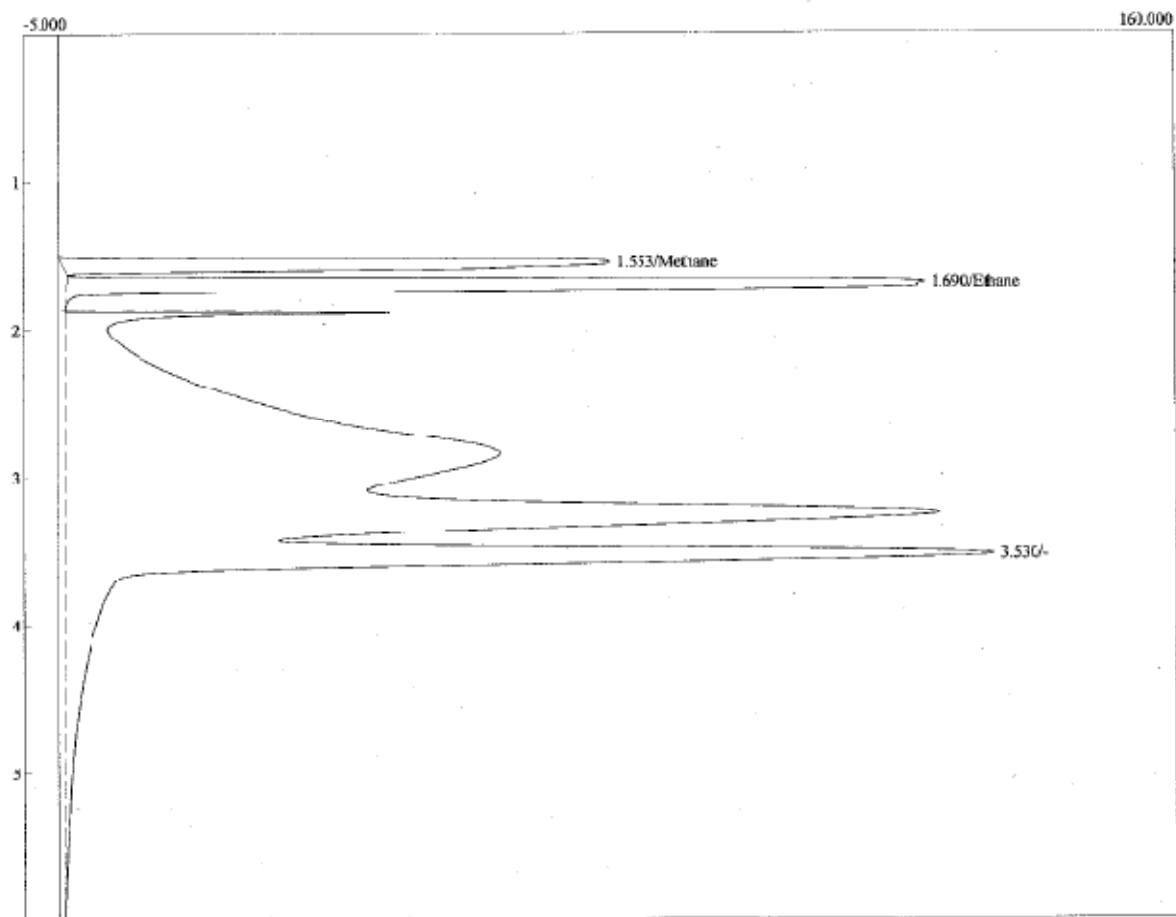
Component	Retention	Area	External	Units
Methane	1.566	42.85	104.9798	ppmv
Ethane	1.713	79.25	103.5577	ppmv
		122.10	308.5374	

Lab name: Shaw Environmental  
 Client: CITCO LCMC  
 Client ID: B Ca. WGS  
 Analysis date: 05/17/2011 13:58:50  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITCO Cat B WGS C1 and C14.ASC ()  
 Operator: RI



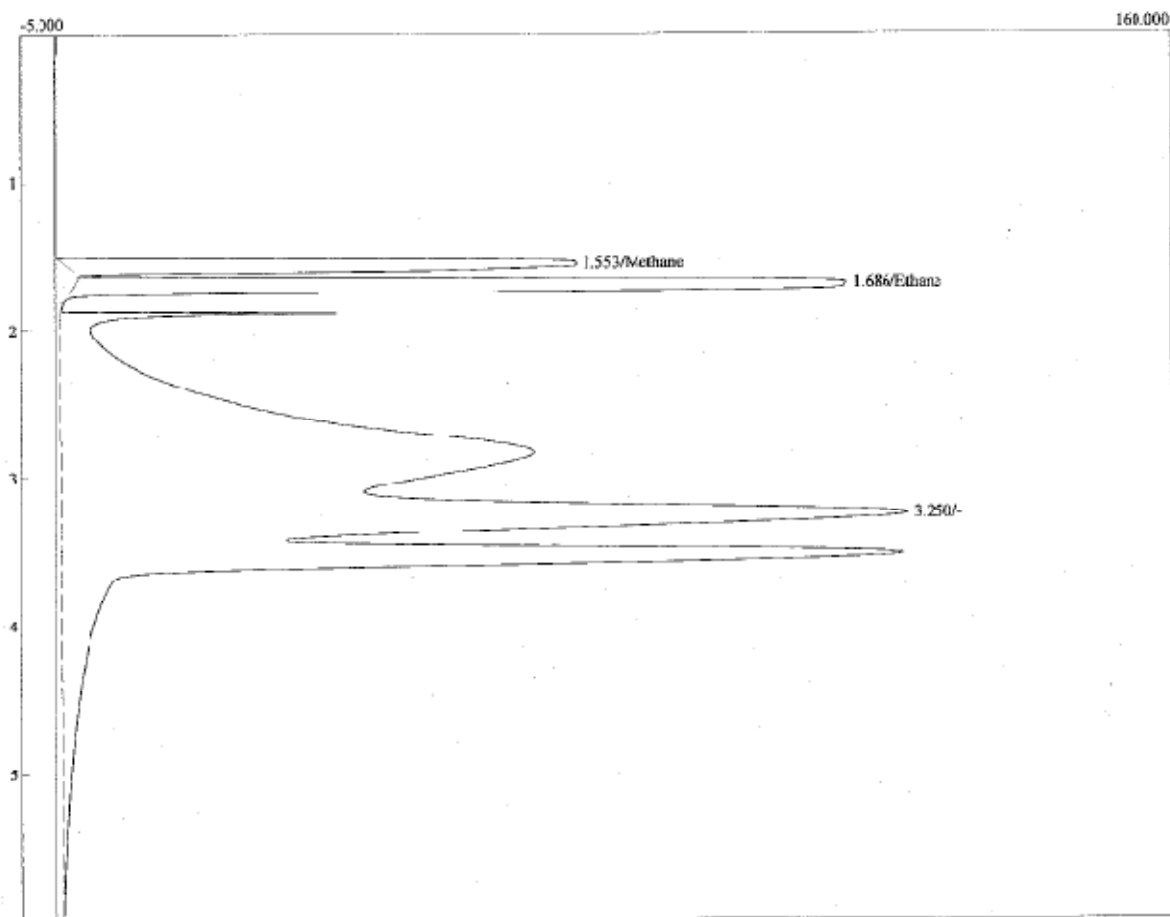
Component	Retention	Area	External	Units
Methane	1.563	43.02	105.1806	ppmv
Ethane	1.713	79.38	103.6464	ppmv
		122.40	208.8210	

Lab name: Shaw Environmental  
 Client: CITGO LCM/C  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 10:07:38  
 Description: Det 2: FID  
 Column: RESTEK 60METER MOXT-1  
 Carrier: HELIUM AT 17 PS  
 Data file: CITGO Cat B WGS C1 and C15.ASC ()  
 Operator: RJ



Component	Retention	Area	External	Units
Methane	1.553	363.21	388.0479	ppmv
Ethane	1.690	621.98	312.0750	ppmv
985.19 1700.1250				

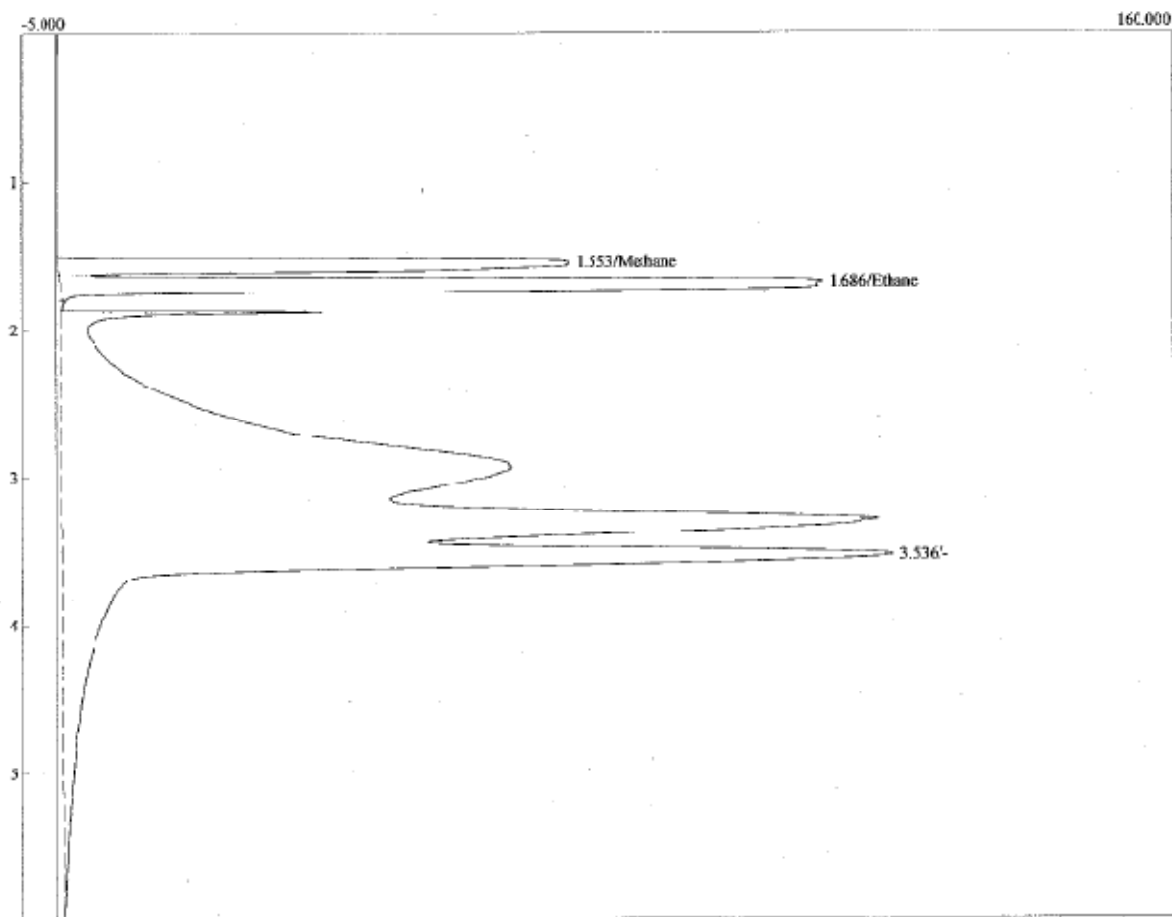
Test name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 16:16:31  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C16.ASC ()  
 Operator: RJ



Component	Retention	Area	External	Units
Methane	1.553	373.56	948.7722	ppmv
Ethane	1.686	619.68	809.0763	ppmv
		993.25	1757.8485	



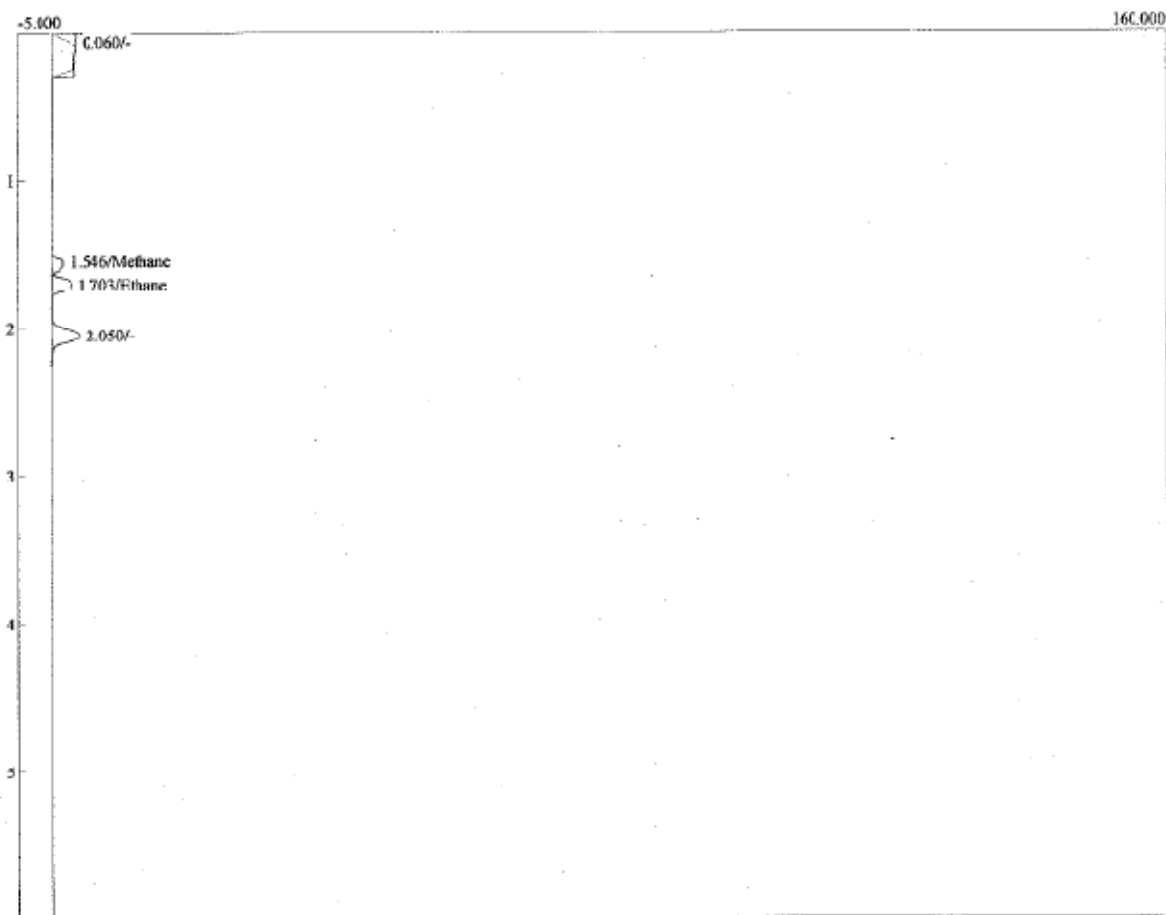
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 16:23:34  
 Description: Det 2-FID  
 Column: RESTEK 60METER MXT-  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C17.ASC ()  
 Operator: RJ



Component	Retention	Area	External	Units
Methane	1.553	340.05	956.8705	ppmv
Ethane	1.686	622.11	869.9301	ppmv
		1062.16	1826.8007	

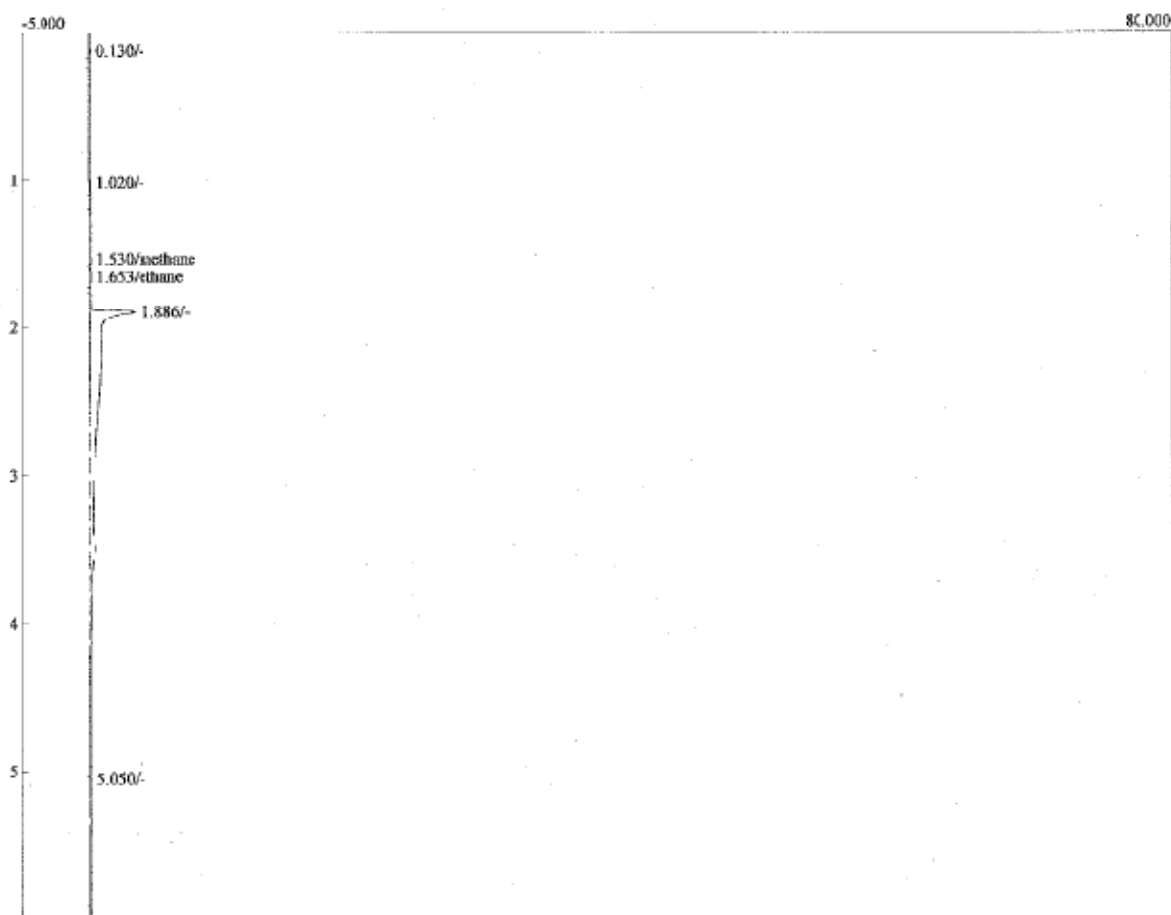
Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:25:57  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 .ASC ()  
 Operator: RJ

15 18 - leak



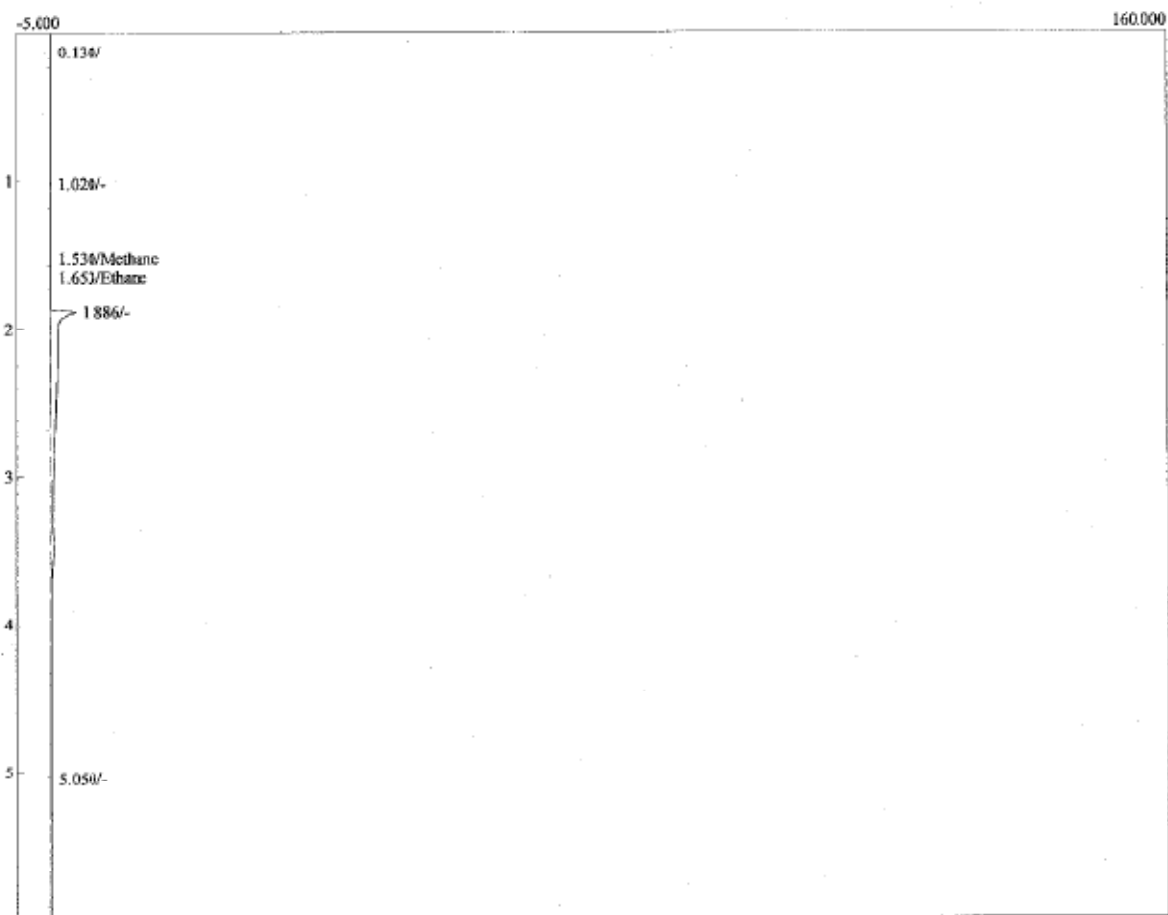
Component	Retention	Area	External	Units
Methane	1.546	6.87	0.0	ppmv
Ethane	1.703	13.57	0.0	ppmv
		20.45	0.0	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:01:53  
 Description: Det 2-FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C18.ASC ()  
 Sample: Test Run 1  
 Operator: RI



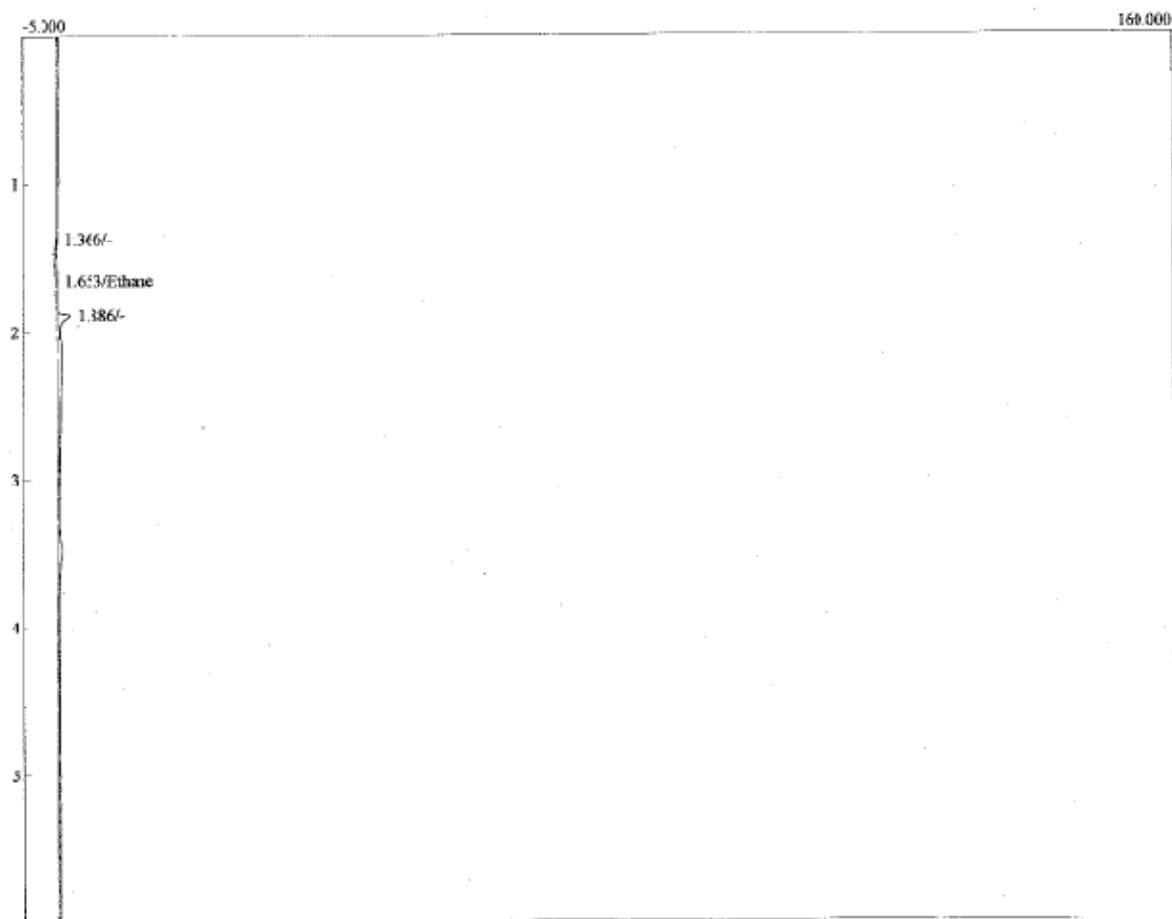
Component	Retention	Area	External	Units
methane	1.530	0.14	0.3611	ppmv
ethane	1.653	0.22	0.3106	ppmv
		0.37	0.6717	

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:01:53  
 Description: Det 2-FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C18.ASC ()  
 Operator: RJ



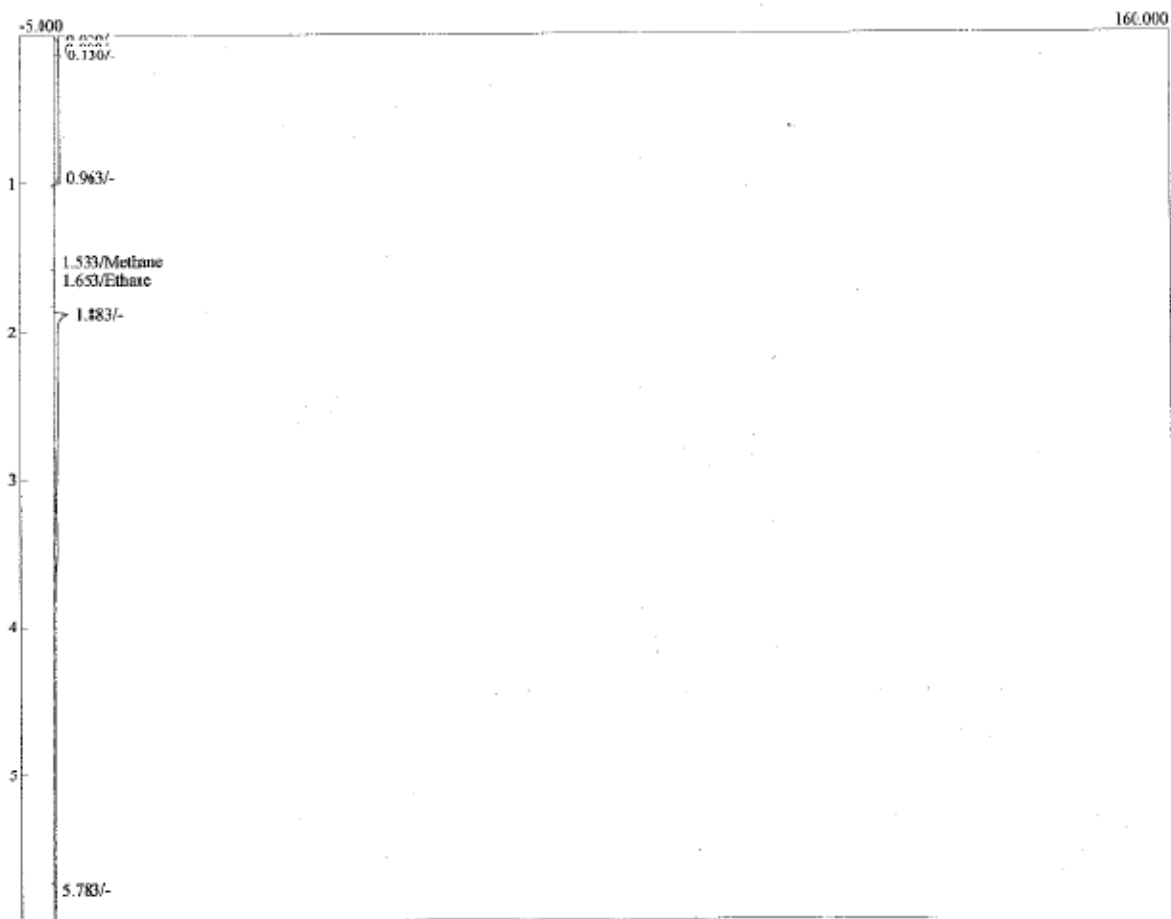
Component	Retention	Area	External Units
Methane	1.530	0.14	0.4 ppmv
Ethane	1.653	0.22	0.3 ppmv
		0.37	0.7

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysts date: 05/17/2011 17:10:02  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat B WGS C1 and C19.ASC ()  
 Operator: RJ



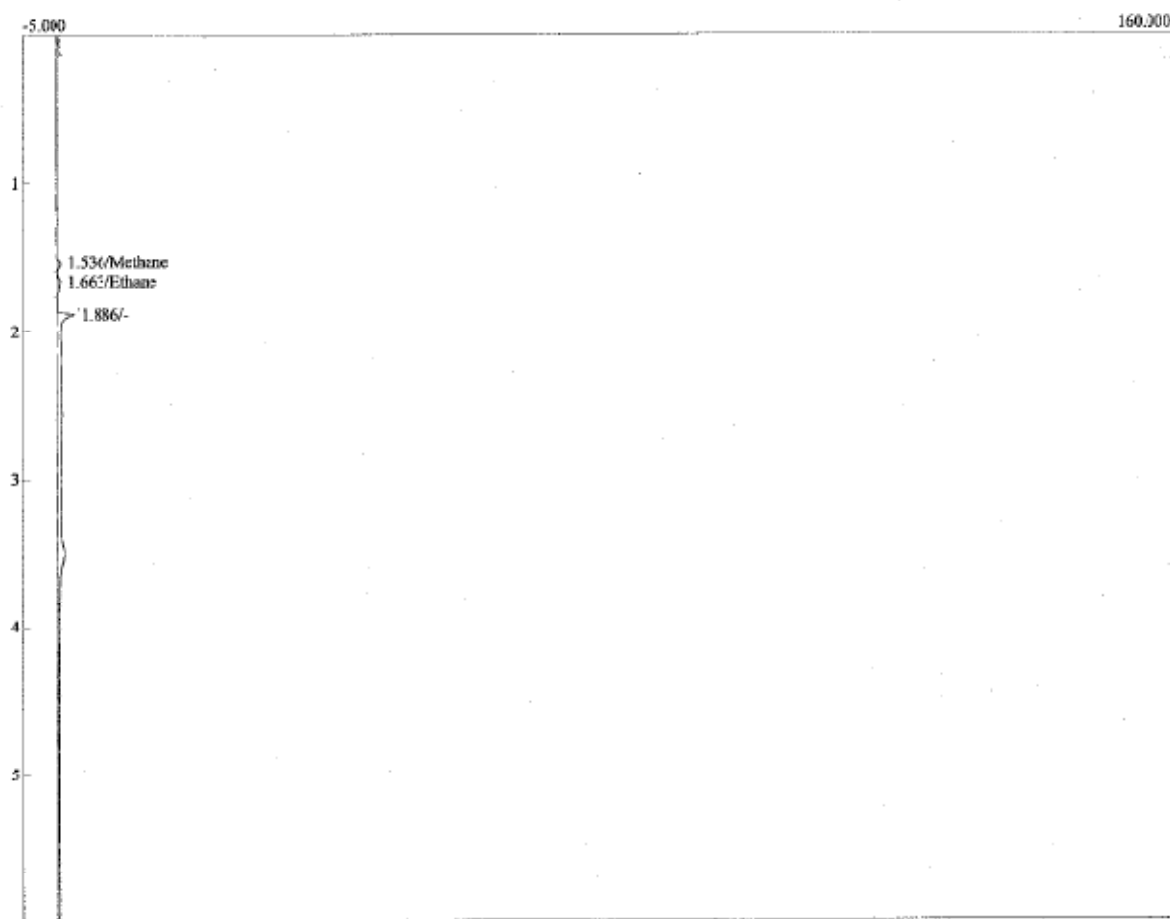
Component	Retention	Area	External Units
Ethane	1.653	1.33	19 ppmv
		1.33	19

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/17/2011 17:19:44  
 Description: Det 2-FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: CITGO Cat E WGS C1 and C20.ASC ()  
 Operator: R1



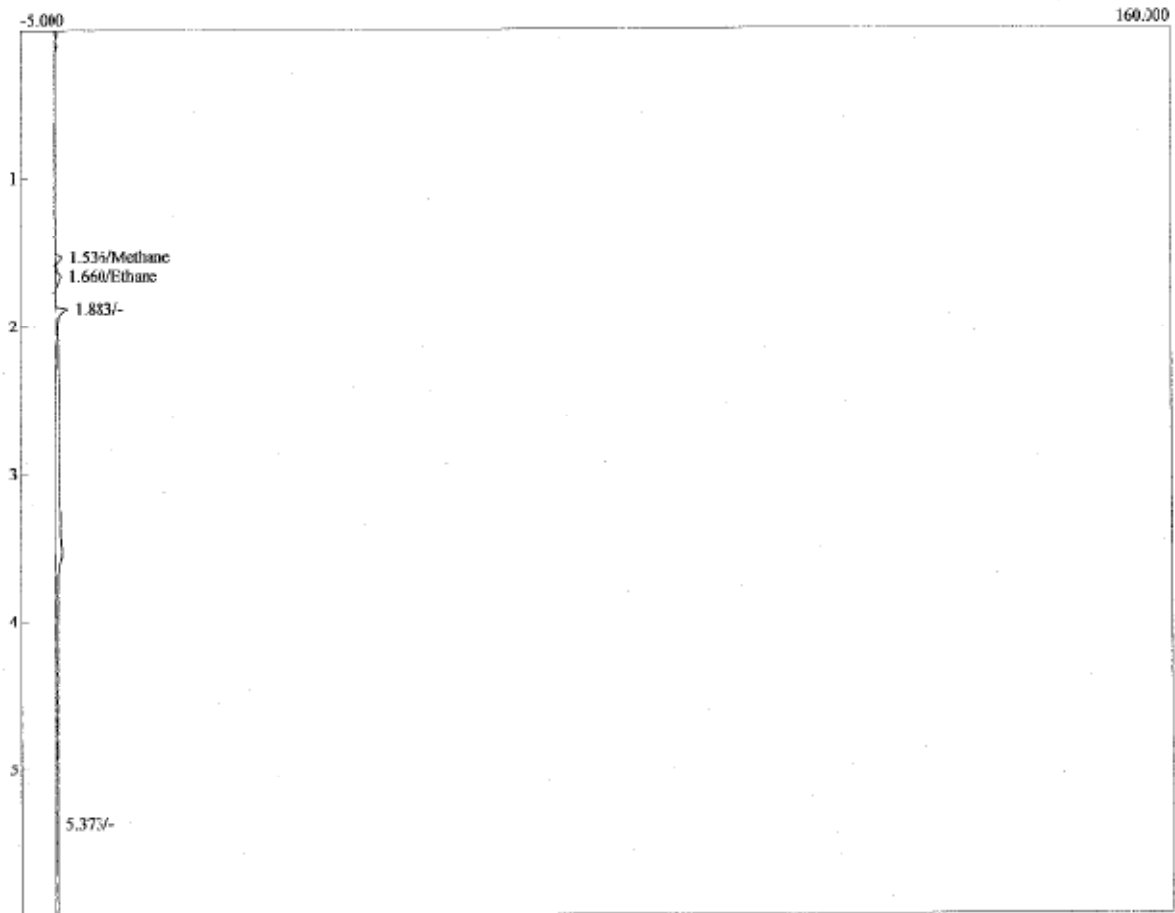
Component	Retention	Area	External Units
Methane	1.533	0.17	0.4 ppmv
Ethane	1.653	0.44	0.6 ppmv
		0.61	1.0

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:37:17  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 01.ASC ()  
 Operator: RI



Component	Retention	Area	External Units
Methane	1.536	1.25	3.1 ppmv
Ethane	1.663	1.81	2.6 ppmv
		3.09	5.7

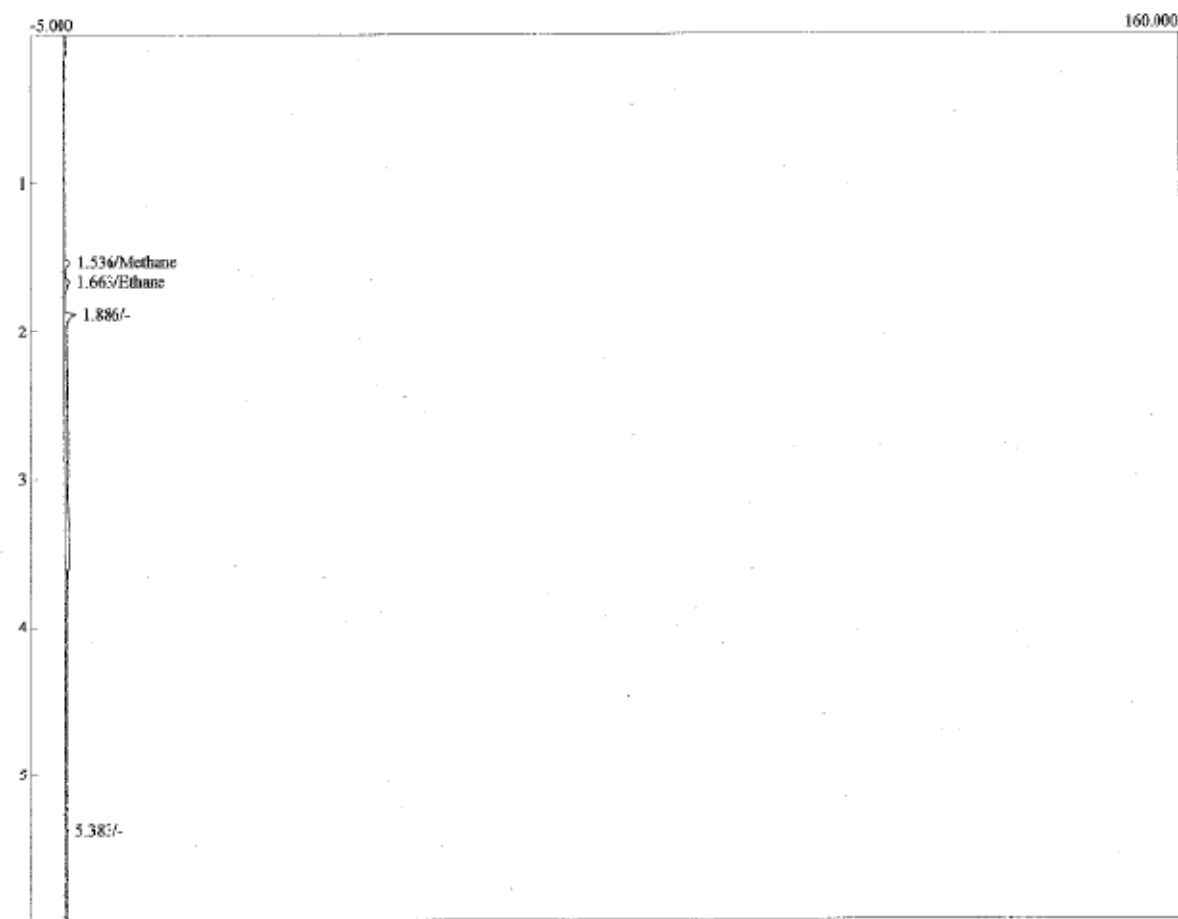
Jobname: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:45:29  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 02.ASC ()  
 Operator: RI



Component	Retention	Area	External Units
Methane	1.536	1.98	5.0 ppmv
Ethane	1.660	2.97	4.1 ppmv
		4.95	9.1

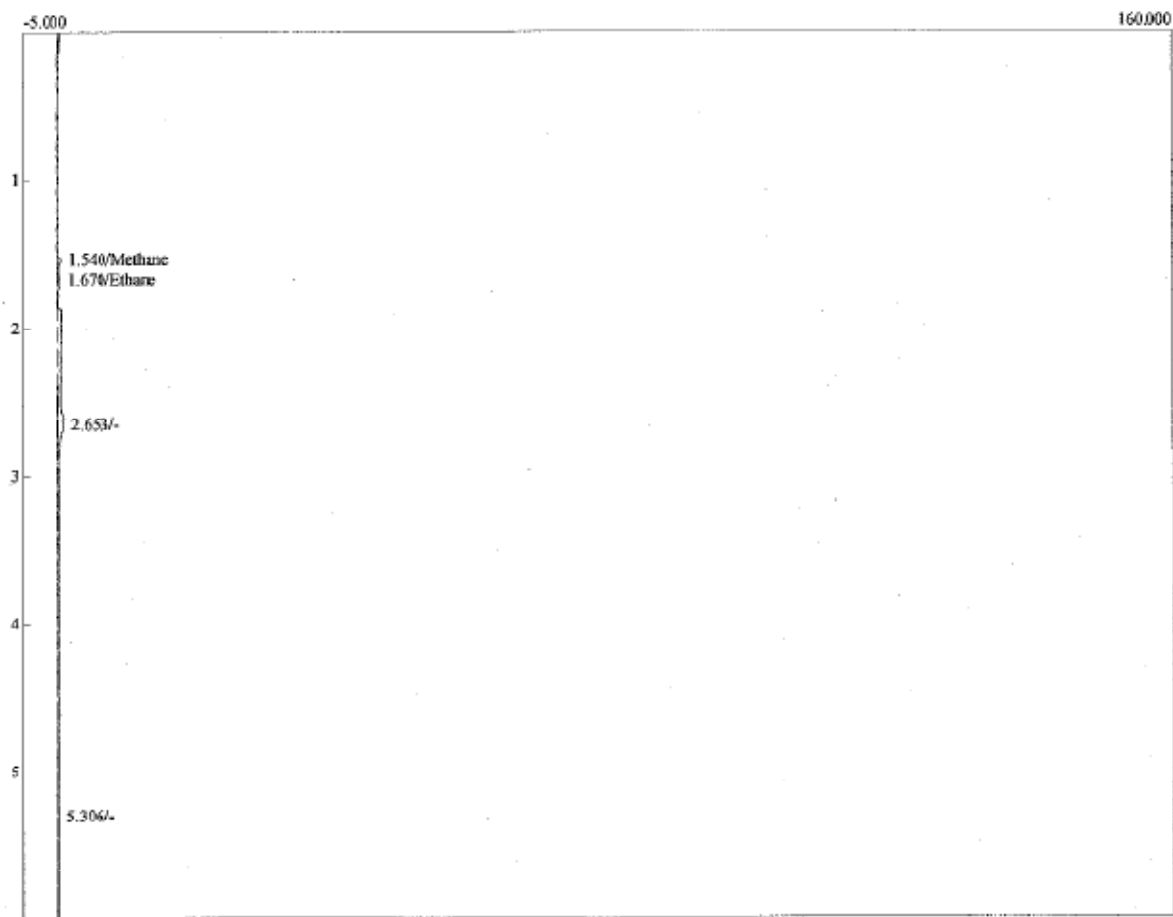


Labname: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 11:54:44  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 2 CITGO Cat B WGS C1 and C2 03.ASC ()  
 Operator: RI



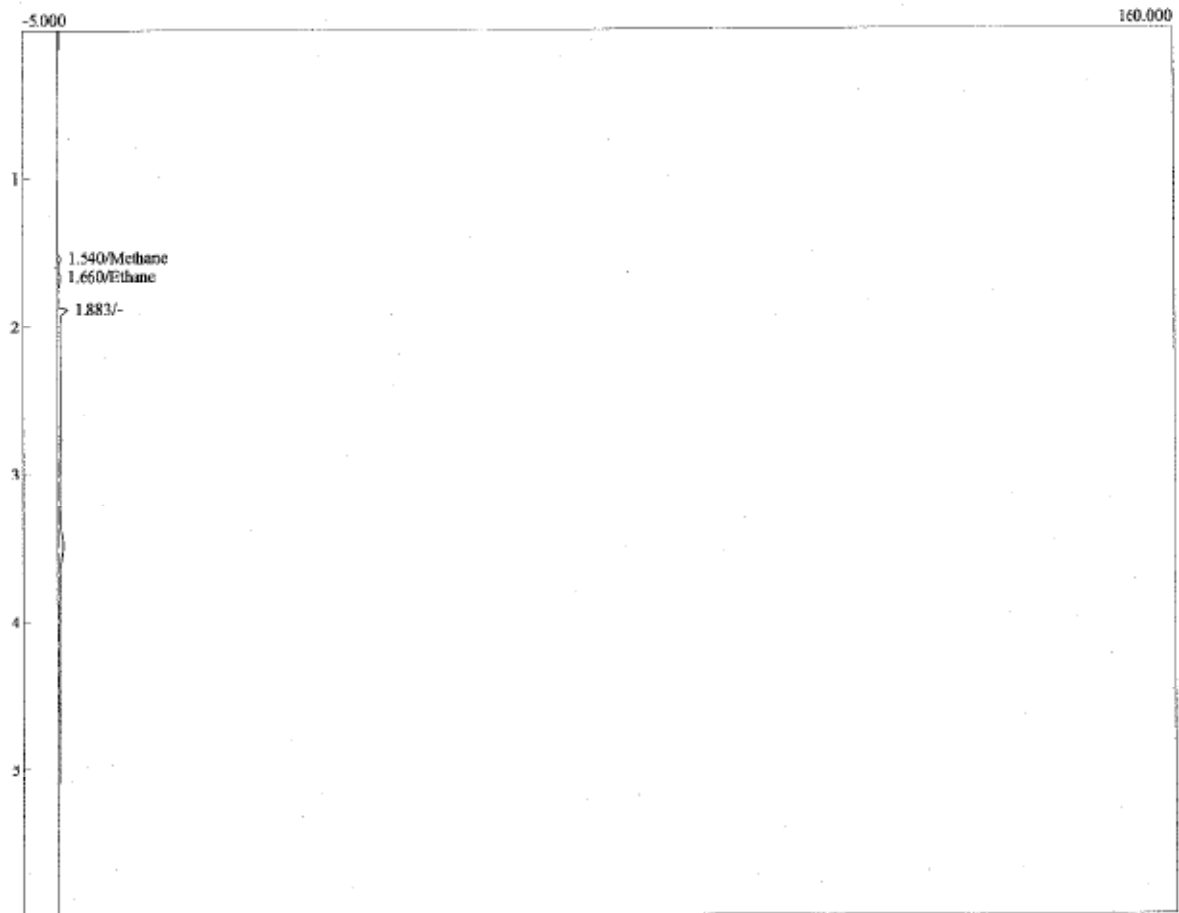
Component	Retention	Area	External Units
Methane	1.536	1.69	4.2 ppmv
Ethane	1.663	2.33	3.3 ppmv
		4.02	7.5

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:13:57  
 Description: Det 2-FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO-Cat B WGS C1 and C17.ASC ()  
 Operator: RI



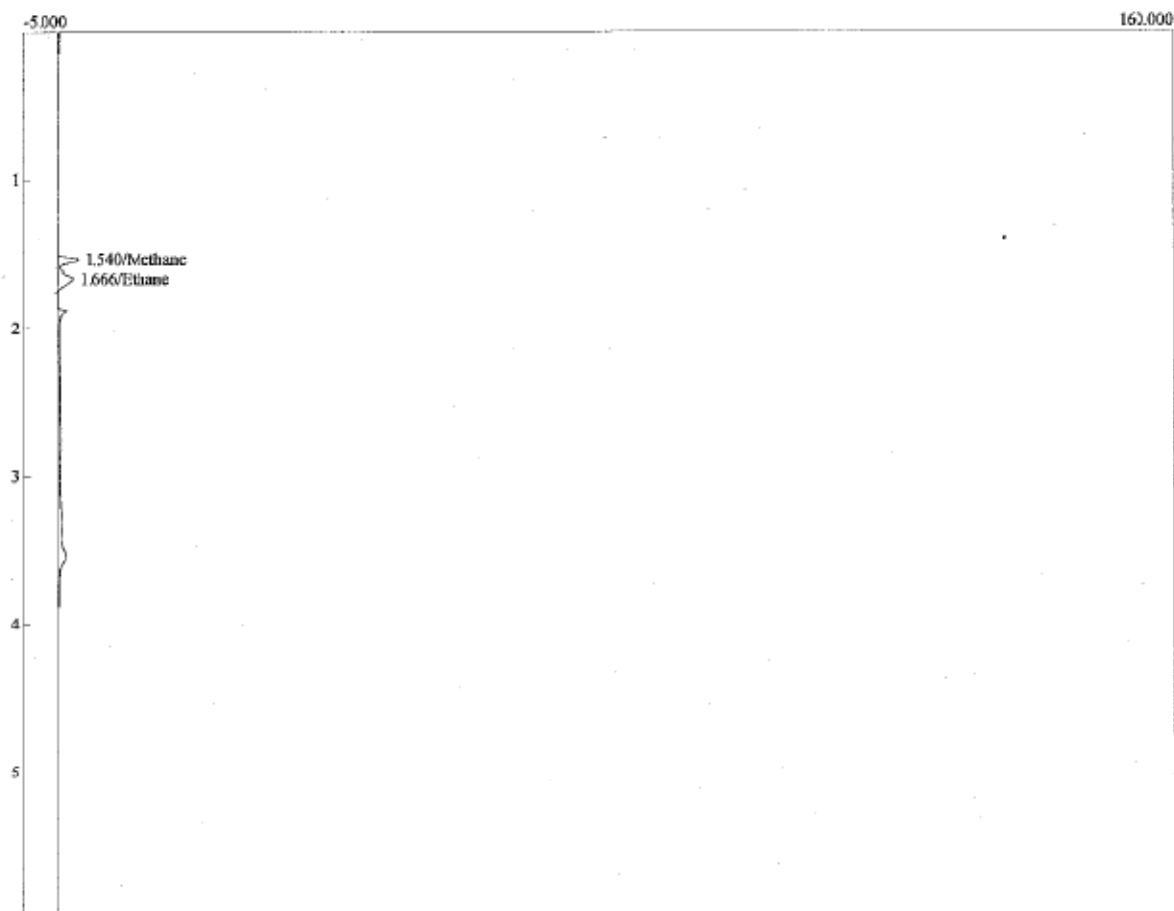
Component	Retention	Area	External Units
Methane	1.540	1.18	3.0 ppmv
Ethane	1.670	1.56	2.2 ppmv
		2.74	5.1

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:23:13  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO Cat B WGS C1 and C18.ASC ()  
 Operator: RI



Component	Retention	Area	External Units
Methane	1.540	0.88	2.2 ppbv
Ethane	1.660	1.20	1.7 ppbv
		2.08	3.9

Lab name: Shaw Environmental  
 Client: CITGO LCMC  
 Client ID: B Cat WGS  
 Analysis date: 05/19/2011 12:28:46  
 Description: Det 2- FID  
 Column: RESTEK 60METER MXT-1  
 Carrier: HELIUM AT 17 PSI  
 Data file: Run 3 CITGO Cat B WGS C1 and C19.ASC ()  
 Operator: KI



Component	Retention	Area	External Units
Methane	1.540	5.89	14.7 ppmv
Ethane	1.666	8.36	11.7 ppmv
		14.24	26.4

Calibration Error Test, Run 1 STF Version 3.01

Operator: KC  
Plant Name: Citiq  
Location: B-Cat

	Reference Cylinder Numbers		Mid-range	High-range
	Zero	Low-range		
O2			XC025C88B	Ambient Air
CO2			CC171113	C1221405

Date/time	05-20-2011		07:33:13	PASSED
Analyte	O2	CO2		
Units	%	%		
Zero Ref Cyl	0.000	0.000		
Zero Avg	0.083	0.179		
Zero Error%	0.3%	0.9%		
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl	9.936	9.951		
Mid Avg	10.064	9.736		
Mid Error%	0.5%	1.3%		
High Ref Cyl	20.990	19.930		
High Avg	20.892	18.871		
High Error%	0.0%	0.3%		

Calibration Error Test End

Initial System Bias Check, Run 1 37A Version 3.01

Operator: KC  
Plant Name: CITQD  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
CO2 XZ025098B  
CO2 CM171113

Date/Time	05-20-2011	07:45:45	PASSED
Analyte	CO2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.083	0.179	
Zero Avg	0.188	0.217	
Zero Bias%	0.4%	0.2%	
Zero Drift%			
Span Ref Cyl	9.936	9.991	
Span Cal	10.066	9.735	
Span Avg	9.948	9.298	
Span Bias%	0.5%	2.2%	
Span Drift%			
System Bias Check End			

Test Run 1 STRATA Version 3.01

	O2	CO2
%	%	%
Begin calculating run averages		
05-20-2011 11:41:20	3.616	14.542
05-20-2011 11:42:19	3.514	14.727
05-20-2011 11:43:21	3.566	14.752
05-20-2011 11:44:20	3.483	14.826
05-20-2011 11:45:19	3.480	14.878
05-20-2011 11:46:20	3.404	14.919
05-20-2011 11:47:20	3.357	14.929
05-20-2011 11:48:21	3.498	14.798
05-20-2011 11:49:20	3.434	14.868
05-20-2011 11:50:19	3.557	14.781
05-20-2011 11:51:20	3.633	14.564
05-20-2011 11:52:20	3.526	14.684
05-20-2011 11:53:21	3.692	14.357
05-20-2011 11:54:20	3.630	14.541
05-20-2011 11:55:19	3.601	14.563
05-20-2011 11:56:20	3.786	14.345
05-20-2011 11:57:20	3.690	14.577
05-20-2011 11:58:21	3.737	14.543
05-20-2011 11:59:20	3.452	14.791
05-20-2011 12:00:19	3.703	14.561
05-20-2011 12:01:20	3.880	14.539
05-20-2011 12:02:20	3.772	14.455
05-20-2011 12:03:21	3.808	14.408
05-20-2011 12:04:20	3.769	14.440
05-20-2011 12:05:19	3.798	14.367
05-20-2011 12:06:20	3.742	14.649
05-20-2011 12:07:19	3.695	14.500
05-20-2011 12:08:21	3.647	14.553
05-20-2011 12:09:20	3.507	14.594
05-20-2011 12:10:19	3.554	14.655
05-20-2011 12:11:20	3.397	14.770
05-20-2011 12:12:20	3.801	14.431
05-20-2011 12:13:21	3.633	14.540
05-20-2011 12:14:20	3.836	14.348
05-20-2011 12:15:19	3.577	14.547
05-20-2011 12:16:21	3.755	14.441
05-20-2011 12:17:20	3.884	14.112
05-20-2011 12:18:21	3.794	14.397
05-20-2011 12:19:20	3.644	14.508
05-20-2011 12:20:19	3.568	14.788
05-20-2011 12:21:20	3.579	14.831
05-20-2011 12:22:20	3.240	14.963
05-20-2011 12:23:21	3.180	15.058
05-20-2011 12:24:20	3.438	14.937
05-20-2011 12:25:19	3.519	14.837
05-20-2011 12:26:20	3.488	14.866
05-20-2011 12:27:20	3.584	14.735
05-20-2011 12:28:21	3.488	14.803
05-20-2011 12:29:20	3.572	14.796
05-20-2011 12:30:19	3.591	14.761
05-20-2011 12:31:21	3.459	14.898
05-20-2011 12:32:20	3.614	14.712
05-20-2011 12:33:21	3.364	14.877
05-20-2011 12:34:20	3.228	15.079
05-20-2011 12:35:19	3.348	15.006
05-20-2011 12:36:20	3.328	14.948
05-20-2011 12:37:20	3.492	14.786
05-20-2011 12:38:21	3.443	14.830
05-20-2011 12:39:20	3.405	14.900
05-20-2011 12:40:21	3.528	14.810
Run Averages	O2	CO2
	%	%
05-20-2011 12:40:21	3.570	14.694
Operator:	KC	
Plant Name:	UIGC	
Location:	B-Cat	
Test Run 1 End		

5/20/11  
1140 - 1457

Bad Data  
System Leak

got O2/CO2  
from OITGO census

Final System Bias Check, Run 1 S\* A Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
C2 XC025088B  
CO2 m171113

Date/Time	C5-20-2011	13:44:38	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.003	0.179	
Zero Avg	0.809	0.324	
Zero Bias%	2.5%	0.7%	
Zero Drift%	2.5%	0.5%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.064	9.736	
Span Avg	9.526	9.544	
Span Bias%	2.2%	1.0%	
Span Drift%	-1.5%	1.2%	
Ini Zero Avg	0.188	0.217	
Ini Span Avg	9.948	9.298	
Run Avg	3.570	14.694	
Co	0.459	0.270	
Om	9.757	9.421	
Correct Avg	3.303	15.748	
System Bias Check End			



Test Run 2 STRATA Version 3.01

	O2	CO2
	%	%
Begin calculating run averages		
05-20-2011 14:12:28	0.754	17.110
05-20-2011 14:13:28	0.829	17.034
05-20-2011 14:14:29	0.767	16.994
05-20-2011 14:15:28	0.827	17.018
05-20-2011 14:16:27	0.806	17.023
05-20-2011 14:17:28	0.891	16.987
05-20-2011 14:18:28	0.863	17.038
05-20-2011 14:19:29	0.598	17.300
05-20-2011 14:20:28	0.685	17.176
05-20-2011 14:21:27	0.799	17.056
05-20-2011 14:22:29	0.855	16.950
05-20-2011 14:23:28	0.842	16.956
05-20-2011 14:24:29	0.857	16.931
05-20-2011 14:25:28	1.120	16.740
05-20-2011 14:26:27	0.857	16.912
05-20-2011 14:27:29	1.030	16.848
05-20-2011 14:28:28	1.006	16.787
05-20-2011 14:29:27	1.010	16.773
05-20-2011 14:30:28	0.958	16.853
05-20-2011 14:31:28	0.850	17.000
05-20-2011 14:32:29	0.996	16.819
05-20-2011 14:33:28	0.907	16.860
05-20-2011 14:34:27	0.998	16.780
05-20-2011 14:35:28	1.020	16.813
05-20-2011 14:36:28	0.991	16.818
05-20-2011 14:37:29	0.988	16.853
05-20-2011 14:38:28	0.943	16.879
05-20-2011 14:39:27	1.023	16.851
05-20-2011 14:40:29	0.944	16.890
05-20-2011 14:41:28	0.942	16.904
05-20-2011 14:42:29	0.845	16.982
05-20-2011 14:43:28	0.672	17.218
05-20-2011 14:44:27	0.877	17.016
05-20-2011 14:45:29	0.868	16.932
05-20-2011 14:46:28	0.879	16.942
05-20-2011 14:47:27	0.935	16.883
05-20-2011 14:48:28	0.802	16.986
05-20-2011 14:49:28	0.905	16.910
05-20-2011 14:50:29	0.894	16.907
05-20-2011 14:51:28	0.855	16.951
05-20-2011 14:52:27	0.991	16.856
05-20-2011 14:53:28	0.891	16.882
05-20-2011 14:54:28	0.807	16.940
05-20-2011 14:55:29	0.644	17.132
05-20-2011 14:56:28	0.881	16.916
05-20-2011 14:57:27	0.900	16.848
05-20-2011 14:58:29	0.697	17.013
05-20-2011 14:59:28	0.869	16.968
05-20-2011 15:00:29	0.812	16.993
05-20-2011 15:01:28	0.888	16.879
05-20-2011 15:02:27	0.796	16.983
05-20-2011 15:03:29	0.765	17.290
05-20-2011 15:04:28	0.916	17.271
05-20-2011 15:05:27	0.782	17.409
05-20-2011 15:06:28	0.919	17.341
05-20-2011 15:07:28	0.591	17.608
05-20-2011 15:08:29	0.668	17.534
05-20-2011 15:09:28	0.844	17.313
05-20-2011 15:10:27	0.891	17.244
05-20-2011 15:11:28	0.869	17.333
Run Averages	O2	CO2
	%	%
05-20-2011 15:11:29	0.865	17.006
Operator:	KC	
Pilot Name:	Wtgc	
Location:	B-Cat	
Test Run 2 End		

Final System Bias Check, Run 2 S' A Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
C2 X0250888  
C02 C171113

Date/Time	05-20-2011	15:21:21	PASSED
Analyte	C2	C02	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.083	0.179	
Zero Avg	0.186	0.423	
Zero Bias%	0.4%	1.2%	
Zero Drift%	-2.5%	0.3%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.066	9.736	
Span Avg	9.908	9.765	
Span Bias%	0.6%	0.1%	
Span Drift%	1.3%	1.1%	
Ini Zero Avg	0.809	0.324	
Ini Span Avg	9.526	9.544	
Run Avg	0.865	17.006	
Cn	0.498	0.374	
Cm	9.717	9.655	
Correct Avg	0.396	17.904	
System Bias Check End			

Test Run 3 STRATA Version 3.01

	O2 %	CO2 %
Begin calculating run averages		
05-20-2011 15:41:07	0.756	17.487
05-20-2011 15:42:06	0.778	17.459
05-20-2011 15:43:08	0.799	17.501
05-20-2011 15:44:07	0.546	17.689
05-20-2011 15:45:06	0.582	17.607
05-20-2011 15:46:07	0.731	17.510
05-20-2011 15:47:07	0.793	17.445
05-20-2011 15:48:08	0.792	17.550
05-20-2011 15:49:07	0.813	17.564
05-20-2011 15:50:06	0.809	17.544
05-20-2011 15:51:07	0.632	17.683
05-20-2011 15:52:07	0.602	17.721
05-20-2011 15:53:08	0.731	17.689
05-20-2011 15:54:07	0.787	17.684
05-20-2011 15:55:06	0.547	17.823
05-20-2011 15:56:08	0.336	17.936
05-20-2011 15:57:07	0.514	17.860
05-20-2011 15:58:06	0.649	17.750
05-20-2011 15:59:07	0.625	17.720
05-20-2011 16:00:06	0.645	17.730
05-20-2011 16:01:08	0.570	17.760
05-20-2011 16:02:07	0.581	17.804
05-20-2011 16:03:06	0.623	17.767
05-20-2011 16:04:07	0.613	17.694
05-20-2011 16:05:07	0.587	17.713
05-20-2011 16:06:08	0.694	17.668
05-20-2011 16:07:07	0.396	17.368
05-20-2011 16:08:06	0.530	17.833
05-20-2011 16:09:08	0.645	17.547
05-20-2011 16:10:07	0.654	17.544
05-20-2011 16:11:08	0.625	17.593
05-20-2011 16:12:07	0.731	17.608
05-20-2011 16:13:06	0.789	17.568
05-20-2011 16:14:08	0.668	17.663
05-20-2011 16:15:07	0.710	17.635
05-20-2011 16:16:06	0.648	17.694
05-20-2011 16:17:07	0.714	17.635
05-20-2011 16:18:07	0.728	17.621
05-20-2011 16:19:08	0.599	17.798
05-20-2011 16:20:07	0.547	17.824
05-20-2011 16:21:06	0.556	17.803
05-20-2011 16:22:07	0.627	17.687
05-20-2011 16:23:07	0.682	17.634
05-20-2011 16:24:08	0.617	17.749
05-20-2011 16:25:07	0.810	17.595
05-20-2011 16:26:06	0.685	17.686
05-20-2011 16:27:08	0.772	17.646
05-20-2011 16:28:07	0.715	17.629
05-20-2011 16:29:08	0.834	17.346
05-20-2011 16:30:07	0.729	17.529
05-20-2011 16:31:06	0.702	17.708
05-20-2011 16:32:08	0.484	17.861
05-20-2011 16:33:07	0.767	17.658
05-20-2011 16:34:06	0.786	17.598
05-20-2011 16:35:07	0.889	17.531
05-20-2011 16:36:06	0.763	17.603
05-20-2011 16:37:08	0.776	17.573
05-20-2011 16:38:07	0.699	17.609
05-20-2011 16:39:06	0.714	17.649
05-20-2011 16:40:07	0.705	17.569
Run Averages	O2 %	CO2 %
05-20-2011 16:40:07	0.676	17.662
Operator:	KC	
Plant Name:	Catgc	
Location:	B-Cat	
Test Run 3 End		

Final System Bias Check, Run 3 S A Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
C2 X0025008B  
C02 0171113

Date/Time	05-20-2011	16:49:54	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.003	0.179	
Zero Avg	0.149	0.450	
Zero Bias%	0.3%	1.4%	
Zero Drift%	-0.1%	0.1%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.064	9.736	
Span Avg	9.918	9.864	
Span Bias%	0.6%	0.6%	
Span Drift%	0.6%	0.5%	
Ini Zero Avg	0.166	0.423	
Ini Span Avg	9.908	9.765	
Run Avg	0.676	17.662	
Co	0.168	0.437	
Om	9.913	9.815	
Correct Avg	0.519	18.351	
System Bias Check End			

Speciated VOHAPs/Aldehydes

	O2 (WGS CEMS) (% by vol, dry) 317AI107	CO2 (WGS CEMS) (% by vol, dry) 317AI'09
<b>Run 1</b>		
20-May-11 11:40:00	0.62	17.41
20-May-11 11:41:00	0.63	17.38
20-May-11 11:42:00	0.67	17.41
20-May-11 11:43:00	0.62	17.39
20-May-11 11:44:00	0.76	17.36
20-May-11 11:45:00	0.72	17.36
20-May-11 11:46:00	0.60	17.40
20-May-11 11:47:00	0.62	17.60
20-May-11 11:48:00	0.61	17.49
20-May-11 11:49:00	0.70	17.39
20-May-11 11:50:00	0.70	17.36
20-May-11 11:51:00	0.76	17.30
20-May-11 11:52:00	0.81	17.31
20-May-11 11:53:00	0.74	17.35
20-May-11 11:54:00	0.72	17.33
20-May-11 11:55:00	0.73	17.32
20-May-11 11:56:00	0.78	17.33
20-May-11 11:57:00	0.80	17.31
20-May-11 11:58:00	0.87	17.35
20-May-11 11:59:00	0.72	17.44
20-May-11 12:00:00	0.62	17.61
20-May-11 12:01:00	0.55	17.42
20-May-11 12:02:00	0.64	17.36
20-May-11 12:03:00	0.75	17.32
20-May-11 12:04:00	0.70	17.31
20-May-11 12:05:00	0.73	17.31
20-May-11 12:06:00	0.64	17.36
20-May-11 12:07:00	0.73	17.33
20-May-11 12:08:00	0.83	17.32
20-May-11 12:09:00	0.76	17.37
20-May-11 12:10:00	0.64	17.44
20-May-11 12:11:00	0.47	17.54
20-May-11 12:12:00	0.47	17.55
20-May-11 12:13:00	0.67	17.42
20-May-11 12:14:00	0.73	17.39
20-May-11 12:15:00	0.72	17.41
20-May-11 12:16:00	0.66	17.39
20-May-11 12:17:00	0.61	17.38
20-May-11 12:18:00	0.66	17.36

Citgo  
CEMS

Data  
Used for All Runs  
that day

20-May-11 12:19:00	0.75	17.35
20-May-11 12:20:00	0.65	17.41
20-May-11 12:21:00	0.59	17.39
20-May-11 12:22:00	0.70	17.40
20-May-11 12:23:00	0.57	17.53
20-May-11 12:24:00	0.48	17.53
20-May-11 12:25:00	0.65	17.43
20-May-11 12:25:00	0.83	17.37
20-May-11 12:27:00	0.70	17.37
20-May-11 12:28:00	0.70	17.33
20-May-11 12:29:00	0.61	17.39
20-May-11 12:30:00	0.64	17.35
20-May-11 12:31:00	0.77	17.35
20-May-11 12:32:00	0.77	17.33
20-May-11 12:33:00	0.64	17.40
20-May-11 12:34:00	0.65	17.45
20-May-11 12:35:00	0.44	17.59
20-May-11 12:36:00	0.39	17.59
20-May-11 12:37:00	0.50	17.50
20-May-11 12:38:00	0.53	17.43
20-May-11 12:39:00	0.61	17.45
20-May-11 12:40:00	0.58	17.44
20-May-11 12:41:00	0.60	17.42
20-May-11 12:42:00	0.60	17.42
20-May-11 12:43:00	0.56	17.41
20-May-11 12:44:00	0.59	17.43
20-May-11 12:45:00	0.62	17.42
20-May-11 12:46:00	0.60	17.44
20-May-11 12:47:00	0.56	17.57
20-May-11 12:48:00	0.40	17.60
20-May-11 12:49:00	0.44	17.51
20-May-11 12:50:00	0.54	17.43
20-May-11 12:51:00	0.54	17.47
20-May-11 12:52:00	0.60	17.46
20-May-11 12:53:00	0.83	17.45
Average	0.64	17.41

**Speciated VOHAPs/Aldehydes**

	O2 (WGS CEMS) (% by vol. dry) 317AH107	CO2 (WGS CEMS) (% by vol. dry) 317AH109
<b>Run 2</b>		
20-May-11 13:50:00	0.52	17.47
20-May-11 13:51:00	0.56	17.44
20-May-11 13:52:00	0.59	17.44
20-May-11 13:53:00	0.53	17.41
20-May-11 13:54:00	0.56	17.42
20-May-11 13:55:00	0.67	17.39
20-May-11 13:56:00	0.71	17.41
20-May-11 13:57:00	0.54	17.42
20-May-11 13:58:00	0.61	17.34
20-May-11 13:59:00	0.64	17.44
20-May-11 14:00:00	0.47	17.53
20-May-11 14:01:00	0.53	17.42
20-May-11 14:02:00	0.58	17.37
20-May-11 14:03:00	0.67	17.39
20-May-11 14:04:00	0.71	17.38
20-May-11 14:05:00	0.81	17.33
20-May-11 14:06:00	0.80	17.33
20-May-11 14:07:00	0.59	17.38
20-May-11 14:08:00	0.63	17.35
20-May-11 14:09:00	0.75	17.32
20-May-11 14:10:00	0.66	17.34
20-May-11 14:11:00	0.62	17.35
20-May-11 14:12:00	0.69	17.34
20-May-11 14:13:00	0.58	17.38
20-May-11 14:14:00	0.62	17.37
20-May-11 14:15:00	0.69	17.36
20-May-11 14:16:00	0.67	17.35
20-May-11 14:17:00	0.68	17.33
20-May-11 14:18:00	0.71	17.33
20-May-11 14:19:00	0.78	17.33
20-May-11 14:20:00	0.71	17.44
20-May-11 14:21:00	0.55	17.46
20-May-11 14:22:00	0.61	17.37
20-May-11 14:23:00	0.63	17.33
20-May-11 14:24:00	0.66	17.30
20-May-11 14:25:00	0.72	17.28
20-May-11 14:26:00	0.78	17.22
20-May-11 14:27:00	0.83	17.20
20-May-11 14:28:00	0.75	17.22

20-May-11 14:29:00	0.87	17.18
20-May-11 14:30:00	0.83	17.17
20-May-11 14:31:00	0.84	17.22
20-May-11 14:32:00	0.81	17.29
20-May-11 14:33:00	0.74	17.25
20-May-11 14:34:00	0.79	17.21
20-May-11 14:35:00	0.75	17.20
20-May-11 14:36:00	0.79	17.19
20-May-11 14:37:00	0.85	17.19
20-May-11 14:38:00	0.85	17.22
20-May-11 14:39:00	0.75	17.21
20-May-11 14:40:00	0.77	17.22
20-May-11 14:41:00	0.80	17.20
20-May-11 14:42:00	0.79	17.24
20-May-11 14:43:00	0.72	17.31
20-May-11 14:44:00	0.57	17.42
20-May-11 14:45:00	0.50	17.37
20-May-11 14:46:00	0.64	17.27
20-May-11 14:47:00	0.74	17.26
20-May-11 14:48:00	0.79	17.26
20-May-11 14:49:00	0.75	17.28
20-May-11 14:50:00	0.57	17.28
20-May-11 14:51:00	0.68	17.27
20-May-11 14:52:00	0.64	17.28
20-May-11 14:53:00	0.66	17.24
20-May-11 14:54:00	0.80	17.24
20-May-11 14:55:00	0.77	17.33
20-May-11 14:56:00	0.54	17.39
Average	0.69	17.32



**Speciated VOHAPs/Aldehydes**

	O2 (WGS CEMS) (% by vol, dry) 317AI107	CO2 (WGS CEMS) (% by vol, dry) 317AI109
<b>Run 3</b>		
20-May-11 15:40:00	0.66	17.27
20-May-11 15:41:00	0.65	17.33
20-May-11 15:42:00	0.64	17.34
20-May-11 15:43:00	0.72	17.35
20-May-11 15:44:00	0.59	17.40
20-May-11 15:45:00	0.45	17.48
20-May-11 15:46:00	0.47	17.40
20-May-11 15:47:00	0.59	17.36
20-May-11 15:48:00	0.60	17.35
20-May-11 15:49:00	0.67	17.31
20-May-11 15:50:00	0.63	17.32
20-May-11 15:51:00	0.68	17.34
20-May-11 15:52:00	0.48	17.43
20-May-11 15:53:00	0.43	17.45
20-May-11 15:54:00	0.50	17.40
20-May-11 15:55:00	0.63	17.40
20-May-11 15:56:00	0.52	17.51
20-May-11 15:57:00	0.26	17.58
20-May-11 15:58:00	0.26	17.52
20-May-11 15:59:00	0.37	17.47
20-May-11 16:00:00	0.46	17.45
20-May-11 16:01:00	0.48	17.45
20-May-11 16:02:00	0.49	17.47
20-May-11 16:03:00	0.41	17.48
20-May-11 16:04:00	0.40	17.45
20-May-11 16:05:00	0.41	17.47
20-May-11 16:06:00	0.40	17.47
20-May-11 16:07:00	0.52	17.47
20-May-11 16:08:00	0.40	17.58
20-May-11 16:09:00	0.25	17.56
20-May-11 16:10:00	0.44	17.46
20-May-11 16:11:00	0.43	17.44
20-May-11 16:12:00	0.50	17.42
20-May-11 16:13:00	0.62	17.37
20-May-11 16:14:00	0.62	17.35
20-May-11 16:15:00	0.59	17.41
20-May-11 16:16:00	0.57	17.41
20-May-11 16:17:00	0.48	17.42
20-May-11 16:18:00	0.51	17.41

20-May-11 16:19:00	0.56	17.41
20-May-11 16:20:00	0.50	17.49
20-May-11 16:21:00	0.34	17.51
20-May-11 16:22:00	0.35	17.48
20-May-11 16:23:00	0.35	17.46
20-May-11 16:24:00	0.49	17.42
20-May-11 16:25:00	0.49	17.43
20-May-11 16:26:00	0.51	17.35
20-May-11 16:27:00	0.48	17.37
20-May-11 16:28:00	0.54	17.37
20-May-11 16:29:00	0.56	17.37
20-May-11 16:30:00	0.63	17.35
20-May-11 16:31:00	0.58	17.38
20-May-11 16:32:00	0.45	17.45
20-May-11 16:33:00	0.40	17.51
20-May-11 16:34:00	0.52	17.38
20-May-11 16:35:00	0.56	17.32
20-May-11 16:36:00	0.58	17.28
20-May-11 16:37:00	0.60	17.31
20-May-11 16:38:00	0.56	17.34
20-May-11 16:39:00	0.52	17.38
20-May-11 16:40:00	0.51	17.38
20-May-11 16:41:00	0.56	17.37
20-May-11 16:42:00	0.63	17.38
20-May-11 16:43:00	0.61	17.39
20-May-11 16:44:00	0.48	17.53
20-May-11 16:45:00	0.31	17.58
20-May-11 16:46:00	0.32	17.49
20-May-11 16:47:00	0.40	17.43
Average	0.50	17.42

Calibration Error Test, Run 1 ST Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

	Reference Cylinder Numbers		Mid-range	High-range
	Zero	Low-range		
c2			XD0250388	Ambient Air
co2			CT171113	CT221485

Date/Time	05-23-2011		08:24:50	PASSED
Analyte	c2	co2		
Units	%	%		
Zero Ref Cyl	0.000	0.000		
Zero Avg	0.005	0.100		
Zero Error%	0.3%	0.8%		
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl	9.936	9.961		
Mid Avg	10.100	9.862		
Mid Error%	0.7%	0.6%		
High Ref Cyl	20.900	18.930		
High Avg	20.958	19.088		
High Error%	0.4%	0.8%		

Calibration Error Test End

Initial System Bias Check, Run 1 DATA Version 3.01

Operator: KC  
Plant Name: CILCO  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
CO2 XC025098B  
CO2 CC171113

Date/Time	05-23-2011	09:34:29	PASSED
Analyte	CO	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.000	0.100	
Zero Avg	0.248	0.147	
Zero Bias%	0.7%	0.1%	
Zero Drift%			
Span Ref Cyl	9.936	9.991	
Span Cal	10.100	9.862	
Span Avg	9.995	9.511	
Span Bias%	0.4%	1.8%	
Span Drift%			
System Bias Check End			

Test Run 1 STRATA Version 3.01

	O2 %	CO2 %
Begin calculating run averages		
05-23-2011 10:26:03	1.013	17.034
05-23-2011 10:27:04	1.118	16.848
05-23-2011 10:28:03	0.960	16.877
05-23-2011 10:29:04	1.057	16.837
05-23-2011 10:30:02	0.756	17.086
05-23-2011 10:31:03	0.788	17.044
05-23-2011 10:32:02	0.934	17.013
05-23-2011 10:33:03	0.904	16.967
05-23-2011 10:34:02	1.030	16.853
05-23-2011 10:35:03	0.953	16.880
05-23-2011 10:36:02	0.848	16.930
05-23-2011 10:37:03	0.851	16.972
05-23-2011 10:38:04	1.013	16.967
05-23-2011 10:39:03	0.843	16.934
05-23-2011 10:40:04	1.104	16.786
05-23-2011 10:41:03	0.976	16.814
05-23-2011 10:42:04	0.695	17.075
05-23-2011 10:43:02	0.779	17.174
05-23-2011 10:44:03	0.795	17.320
05-23-2011 10:45:02	1.124	17.108
05-23-2011 10:46:03	1.054	17.092
05-23-2011 10:47:02	0.867	17.193
05-23-2011 10:48:03	1.029	17.145
05-23-2011 10:49:02	1.046	17.136
05-23-2011 10:50:03	1.069	17.394
05-23-2011 10:51:04	1.043	17.117
05-23-2011 10:52:03	1.015	17.118
05-23-2011 10:53:04	0.973	17.138
05-23-2011 10:54:03	0.847	17.207
05-23-2011 10:55:04	0.794	17.351
05-23-2011 10:56:02	0.898	17.203
05-23-2011 10:57:03	0.965	17.102
05-23-2011 10:58:02	0.945	17.391
05-23-2011 10:59:03	1.082	17.015
05-23-2011 11:00:02	0.957	17.328
05-23-2011 11:01:03	1.110	16.786
05-23-2011 11:02:02	1.151	16.744
05-23-2011 11:03:03	1.015	16.952
05-23-2011 11:04:04	1.208	16.755
05-23-2011 11:05:03	1.110	16.905
05-23-2011 11:06:04	1.119	16.867
05-23-2011 11:07:03	0.868	17.172
05-23-2011 11:08:04	1.141	16.982
05-23-2011 11:09:02	1.201	16.893
05-23-2011 11:10:03	1.163	16.832
05-23-2011 11:11:02	1.226	16.760
05-23-2011 11:12:03	1.110	16.960
05-23-2011 11:13:02	1.194	16.843
05-23-2011 11:14:03	1.160	16.837
05-23-2011 11:15:02	1.140	16.891
05-23-2011 11:16:03	1.081	16.913
05-23-2011 11:17:04	1.039	16.982
05-23-2011 11:18:03	0.968	17.387
05-23-2011 11:19:04	0.846	17.241
05-23-2011 11:20:03	0.917	17.132
05-23-2011 11:21:04	0.998	17.312
05-23-2011 11:22:02	1.144	16.892
05-23-2011 11:23:03	1.043	16.933
05-23-2011 11:24:02	0.982	16.870
05-23-2011 11:25:03	0.992	16.987
Run Averages	O2 %	CO2 %
05-23-2011 11:25:03	1.000	16.993
Operator:	KC	
Plant Name:	Clitgo	
Location:	B-Cat	
Test Run 1 End		

Final System Bias Check, Run 1 S A Version 3.01

Operator: KC  
 Plant Name: Citgo  
 Location: B-Cat  
 Reference Cylinder Numbers  
 Zero Span  
 C2 XC025098B  
 CO2 M171333

Date/Time	05-23-2011	11:36:14	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.045	0.166	
Zero Avg	0.341	0.653	
Zero Bias%	1.1%	2.4%	
Zero Drift%	0.4%	2.5%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.100	9.862	
Span Avg	9.941	9.454	
Span Bias%	0.6%	2.0%	
Span Drift%	-0.2%	-0.3%	
Ini Zero Avg	0.248	0.147	
Ini Span Avg	9.955	9.511	
Run Avg	1.000	16.993	
Co	0.254	0.400	
cm	9.968	9.482	
Correct Avg	0.725	18.252	
System Bias Check End			

Calibration Error Test, Run 1 ST Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

	Reference Cylinder Numbers		Mid-range	High-range
	Zero	Low-range		
O2			XC025088B	Ambient Air
CO2			CC1711113	CC221405

Date/Time	05-23-2011		11:46:07	PASSED
Analyte	O2	CO2		
Units	%	%		
Zero Ref Cyl	0.003	0.000		
Zero Avg	0.010	0.200		
Zero Error%	0.0%	1.0%		
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl	9.936	9.991		
Mid Avg	10.084	9.873		
Mid Error%	0.6%	0.6%		
High Ref Cyl	20.900	19.930		
High Avg	20.944	19.082		
High Error%	0.2%	0.8%		
Calibration Error Test End				

Initial System Bias Check, Run 1 DATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
02 X0025088B  
003 C0171113

Date/Time	05-23-2011	11:53:38	PASSED
Analyte	CO	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.000	0.200	
Zero Avg	0.169	0.374	
Zero Bias%	0.6%	0.9%	
Zero Drift%			
Span Ref Cyl	9.936	9.991	
Span Cal	10.084	9.873	
Span Avg	9.974	9.607	
Span Bias%	0.4%	1.3%	
Span Drift%			
System Bias Check End			



Test Run 1 STRATA Version 3.01

	O2 %	CO2 %
Begin calculating run averages		
05-23-2011 11:55:43	0.886	17.012
05-23-2011 11:56:44	0.988	16.983
05-23-2011 11:57:42	0.891	17.028
05-23-2011 11:58:43	0.882	17.061
05-23-2011 11:59:42	0.995	16.982
05-23-2011 12:00:43	0.881	17.138
05-23-2011 12:01:42	0.935	17.037
05-23-2011 12:02:43	0.909	16.996
05-23-2011 12:03:42	0.927	16.983
05-23-2011 12:04:43	0.892	17.046
05-23-2011 12:05:42	0.718	17.210
05-23-2011 12:06:43	0.670	17.189
05-23-2011 12:07:44	0.751	17.228
05-23-2011 12:08:43	0.850	17.144
05-23-2011 12:09:44	0.910	17.087
05-23-2011 12:10:42	0.759	17.224
05-23-2011 12:11:43	0.935	17.158
05-23-2011 12:12:42	0.890	17.126
05-23-2011 12:13:43	0.869	17.134
05-23-2011 12:14:42	0.782	17.193
05-23-2011 12:15:43	0.838	17.159
05-23-2011 12:16:42	0.773	17.222
05-23-2011 12:17:43	0.557	17.483
05-23-2011 12:18:42	0.678	17.371
05-23-2011 12:19:43	0.828	17.223
05-23-2011 12:20:44	0.778	17.162
05-23-2011 12:21:43	0.823	17.156
05-23-2011 12:22:44	0.913	17.103
05-23-2011 12:23:42	0.793	17.190
05-23-2011 12:24:43	0.931	17.102
05-23-2011 12:25:42	0.904	17.096
05-23-2011 12:26:43	0.890	17.114
05-23-2011 12:27:42	0.944	17.075
05-23-2011 12:28:43	0.890	17.086
05-23-2011 12:29:42	0.661	17.310
05-23-2011 12:30:43	0.761	17.138
05-23-2011 12:31:42	0.794	17.130
05-23-2011 12:32:43	1.038	17.029
05-23-2011 12:33:44	0.968	17.036
05-23-2011 12:34:43	1.079	16.920
05-23-2011 12:35:44	0.995	16.958
05-23-2011 12:36:42	1.084	16.922
05-23-2011 12:37:43	1.151	16.829
05-23-2011 12:38:42	0.904	16.997
05-23-2011 12:39:43	0.867	17.054
05-23-2011 12:40:42	1.043	16.963
05-23-2011 12:41:43	0.654	17.308
05-23-2011 12:42:42	0.738	17.186
05-23-2011 12:43:43	0.813	17.099
05-23-2011 12:44:42	0.863	17.105
05-23-2011 12:45:43	0.907	17.017
05-23-2011 12:46:44	0.876	17.054
05-23-2011 12:47:43	0.898	17.052
05-23-2011 12:48:44	0.824	17.140
05-23-2011 12:49:42	0.841	17.125
05-23-2011 12:50:43	0.807	17.104
05-23-2011 12:51:42	0.788	17.133
05-23-2011 12:52:43	0.756	17.185
05-23-2011 12:53:42	0.396	17.511
05-23-2011 12:54:43	0.604	17.352
05-23-2011 12:55:42	0.726	17.246
05-23-2011 12:56:43	0.727	17.167
05-23-2011 12:57:42	0.703	17.200
05-23-2011 12:58:43	0.683	17.239
05-23-2011 12:59:44	0.749	17.214
05-23-2011 13:00:43	0.711	17.203
05-23-2011 13:01:44	0.699	17.227
05-23-2011 13:02:42	0.740	17.211
05-23-2011 13:03:43	0.799	17.181
05-23-2011 13:04:42	0.848	17.136
05-23-2011 13:05:43	0.533	17.386
05-23-2011 13:06:42	0.600	17.324
05-23-2011 13:07:43	0.792	17.167
05-23-2011 13:08:42	0.749	17.131
05-23-2011 13:09:43	0.728	17.191
05-23-2011 13:10:42	0.820	17.125
05-23-2011 13:11:43	0.877	17.026
05-23-2011 13:12:44	0.849	17.072
05-23-2011 13:13:43	0.953	17.019
05-23-2011 13:14:44	0.826	17.044
05-23-2011 13:15:42	0.806	17.057
05-23-2011 13:16:43	0.851	17.094
05-23-2011 13:17:42	0.730	17.290
05-23-2011 13:18:43	0.805	17.121
05-23-2011 13:19:42	0.875	16.994

05-23-2011 13:20:43	0.824	17.054
05-23-2011 13:21:42	0.740	17.135
05-23-2011 13:22:43	0.795	17.07
05-23-2011 13:23:42	0.737	17.165
05-23-2011 13:24:43	0.787	17.149
05-23-2011 13:25:44	0.817	17.133
05-23-2011 13:26:43	0.740	17.150
05-23-2011 13:27:44	0.758	17.118
05-23-2011 13:28:42	0.694	17.184
05-23-2011 13:29:43	0.466	17.159
05-23-2011 13:30:42	0.669	17.297
05-23-2011 13:31:43	0.588	17.236
05-23-2011 13:32:42	0.720	17.196
05-23-2011 13:33:43	0.734	17.195
05-23-2011 13:34:42	0.767	17.156
05-23-2011 13:35:43	0.795	17.164
05-23-2011 13:36:42	0.768	17.326
05-23-2011 13:37:43	0.783	17.366
05-23-2011 13:38:44	0.874	17.352
05-23-2011 13:39:43	0.781	17.370
05-23-2011 13:40:44	0.686	17.157
05-23-2011 13:41:42	0.531	17.392
05-23-2011 13:42:43	0.750	17.186
05-23-2011 13:43:42	0.764	17.126
05-23-2011 13:44:43	0.851	17.344
05-23-2011 13:45:42	0.677	17.119
05-23-2011 13:46:43	0.710	17.177
05-23-2011 13:47:42	0.717	17.187
05-23-2011 13:48:43	0.785	17.136
05-23-2011 13:49:42	0.792	17.151
05-23-2011 13:50:43	0.664	17.236
05-23-2011 13:51:44	0.736	17.215
05-23-2011 13:52:43	0.734	17.206

Test Run 1 STRATA Version 3.01

	02	202
	%	%
05-23-2011 13:53:42	0.396	17.465
05-23-2011 13:54:43	0.540	17.361
05-23-2011 13:55:44	0.674	17.243
05-23-2011 13:56:42	0.659	17.238
05-23-2011 13:57:43	0.744	17.188
05-23-2011 13:58:42	0.698	17.216
05-23-2011 13:59:43	0.740	17.204
05-23-2011 14:00:42	0.709	17.311
05-23-2011 14:01:43	0.795	17.143
05-23-2011 14:02:42	0.815	17.108
05-23-2011 14:03:43	0.808	17.111
05-23-2011 14:04:42	0.824	17.080
05-23-2011 14:05:43	0.557	17.318
05-23-2011 14:06:42	0.520	17.339
05-23-2011 14:07:43	0.680	17.236
05-23-2011 14:08:44	0.806	17.141
05-23-2011 14:09:42	0.681	17.179
05-23-2011 14:10:43	0.740	17.181
05-23-2011 14:11:42	0.704	17.200
05-23-2011 14:12:43	0.716	17.201
05-23-2011 14:13:42	0.713	17.201
05-23-2011 14:14:43	0.817	17.144
05-23-2011 14:15:42	0.748	17.166
05-23-2011 14:16:43	0.690	17.193
05-23-2011 14:17:42	0.494	17.427
05-23-2011 14:18:43	0.600	17.265
05-23-2011 14:19:42	0.652	17.210
05-23-2011 14:20:43	0.708	17.186
05-23-2011 14:21:44	0.716	17.155
05-23-2011 14:22:42	0.721	17.162
05-23-2011 14:23:43	0.934	17.035
05-23-2011 14:24:42	0.769	17.107
05-23-2011 14:25:43	0.755	17.128
05-23-2011 14:26:42	0.720	17.182
05-23-2011 14:27:43	0.904	17.054
05-23-2011 14:28:42	0.658	17.193
05-23-2011 14:29:43	0.522	17.386
05-23-2011 14:30:42	0.682	17.215
05-23-2011 14:31:43	0.683	17.176
05-23-2011 14:32:42	0.935	17.005
05-23-2011 14:33:43	0.940	16.907
05-23-2011 14:34:44	0.910	16.930
05-23-2011 14:35:42	0.823	16.967
05-23-2011 14:36:43	0.919	16.937
05-23-2011 14:37:42	0.717	17.040
05-23-2011 14:38:43	0.812	16.988
05-23-2011 14:39:42	0.931	16.909
05-23-2011 14:40:43	0.749	17.062
05-23-2011 14:41:42	0.881	17.339
05-23-2011 14:42:43	0.579	17.249
05-23-2011 14:43:42	0.745	17.142
05-23-2011 14:44:43	0.786	17.075
05-23-2011 14:45:42	0.763	17.090
05-23-2011 14:46:43	0.868	17.009
05-23-2011 14:47:44	0.830	17.013
05-23-2011 14:48:42	0.700	17.113
05-23-2011 14:49:43	0.695	17.142
05-23-2011 14:50:42	0.698	17.184
05-23-2011 14:51:43	0.759	17.113
05-23-2011 14:52:42	0.735	17.116
05-23-2011 14:53:43	0.428	17.415
05-23-2011 14:54:42	0.562	17.298
Run Averaged	02	202
	%	%
05-23-2011 14:54:42	0.773	17.147
Operator:	KU	
Plant Name:	Citgc	
Location:	B-Cat	
Test Run 1 End		

Final System Bias Check, Run 1 S A Version 3.01

Operator: KC  
Plant Name: C179D  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
CO2 XC0250988  
CO2 CC171113

Date/Time	05-23-2011	15:02:46	PASSED
Analyte	CO2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.010	0.200	
Zero Avg	0.136	0.356	
Zero Bias%	0.5%	0.8%	
Zero Drift%	-0.1%	-0.1%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.084	9.873	
Span Avg	9.925	9.579	
Span Bias%	0.6%	1.5%	
Span Drift%	-0.2%	-0.1%	
Ini Zero Avg	0.169	0.374	
Ini Span Avg	9.974	9.607	
Run Avg	0.773	17.147	
CO	0.153	0.365	
CA	9.950	9.593	
Correct Avg	0.629	18.170	
System Bias Check End			

Calibration Error Test, Run 1 ST : Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
C2			XC025036B	Ambient Air
CO2			CP171113	CC221405

Date/Time	05-23-2011	15:15:07	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Avg	-0.003	0.232	
Zero Error%	0.0%	1.0%	
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	0.026	9.991	
Mid Avg	10.053	9.862	
Mid Error%	0.5%	0.6%	
High Ref Cyl	20.900	19.930	
High Avg	20.895	19.111	
High Error%	0.0%	0.9%	

Calibration Error Test End

Initial System Bias Check, Run 2 : ATA Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
CO2 X-025098B  
CO2 C-171113

Date/Time	05-23-2011	15:37:23	PASSED
Analyte	CO2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	-0.003	0.202	
Zero Avg	0.120	0.332	
Zero Bias%	0.5%	0.7%	
Zero Drift%			
Span Ref Cyl	9.936	9.991	
Span Cal	10.051	9.862	
Span Avg	9.930	9.593	
Span Bias%	0.5%	1.3%	
Span Diff%			
System Bias Check End			

V

```

Test Run 2  STRATA Version 3.01
      02      02
      %      %
Begin calculating run averages
05-23-2011 16:29:01 0.621 17.379
05-23-2011 16:30:02 0.454 17.273
05-23-2011 16:31:01 0.515 17.183
05-23-2011 16:32:02 0.694 17.360
05-23-2011 16:33:01 0.770 16.999
05-23-2011 16:34:02 0.771 16.942
05-23-2011 16:35:01 0.865 16.935
05-23-2011 16:36:02 0.814 17.030
05-23-2011 16:37:01 0.827 17.112
05-23-2011 16:38:02 0.847 17.327
05-23-2011 16:39:01 0.894 17.307
05-23-2011 16:40:02 0.879 17.338
05-23-2011 16:41:03 0.844 17.325
05-23-2011 16:42:01 0.587 17.199
05-23-2011 16:43:02 0.690 17.378
05-23-2011 16:44:01 0.794 17.321
05-23-2011 16:45:02 0.961 16.942
05-23-2011 16:46:01 0.956 16.940
05-23-2011 16:47:02 0.866 17.315
05-23-2011 16:48:01 0.989 16.958
05-23-2011 16:49:02 1.035 16.913
05-23-2011 16:50:01 1.009 16.923
05-23-2011 16:51:02 1.000 16.929
05-23-2011 16:52:01 0.994 16.940
05-23-2011 16:53:02 1.033 16.903
05-23-2011 16:54:03 0.748 17.169
05-23-2011 16:55:01 0.826 17.361
05-23-2011 16:56:02 0.861 17.302
05-23-2011 16:57:01 0.951 16.937
05-23-2011 16:58:02 0.923 16.907
05-23-2011 16:59:01 0.848 16.973
05-23-2011 17:00:02 0.965 16.935
05-23-2011 17:01:01 1.089 16.846
05-23-2011 17:02:02 0.848 16.993
05-23-2011 17:03:01 0.831 17.307
05-23-2011 17:04:02 0.997 16.903
05-23-2011 17:05:01 0.991 16.987
05-23-2011 17:06:02 0.637 17.194
05-23-2011 17:07:03 0.651 17.168
05-23-2011 17:08:01 0.870 17.300
05-23-2011 17:09:02 0.662 16.971
05-23-2011 17:10:01 0.843 16.996
05-23-2011 17:11:02 0.862 16.956
05-23-2011 17:12:01 0.928 16.930
05-23-2011 17:13:02 0.905 16.932
05-23-2011 17:14:01 0.926 16.991
05-23-2011 17:15:02 0.977 16.962
05-23-2011 17:16:01 0.927 16.991
05-23-2011 17:17:02 0.884 16.928
05-23-2011 17:18:01 0.638 17.218
05-23-2011 17:19:02 0.789 17.083
05-23-2011 17:20:03 0.863 16.980
05-23-2011 17:21:01 1.002 16.980
05-23-2011 17:22:02 1.098 16.789
05-23-2011 17:23:01 0.898 16.974
05-23-2011 17:24:02 0.869 16.928
05-23-2011 17:25:01 1.115 16.803
05-23-2011 17:26:02 1.093 16.783
05-23-2011 17:27:01 0.857 16.945
05-23-2011 17:28:02 0.860 16.980
05-23-2011 17:29:01 0.802 17.324
05-23-2011 17:30:02 0.634 17.276
05-23-2011 17:31:01 0.767 17.123
05-23-2011 17:32:02 0.890 16.988
05-23-2011 17:33:03 0.976 16.866
05-23-2011 17:34:01 1.025 16.860
05-23-2011 17:35:02 0.790 16.994
05-23-2011 17:36:01 0.868 16.991
05-23-2011 17:37:02 0.841 17.333
05-23-2011 17:38:01 0.851 17.325
05-23-2011 17:39:02 0.892 16.989
05-23-2011 17:40:01 0.892 16.971
05-23-2011 17:41:02 0.979 16.949
05-23-2011 17:42:01 0.503 17.227
05-23-2011 17:43:02 0.760 17.111
05-23-2011 17:44:01 0.824 17.067
05-23-2011 17:45:02 0.907 16.986
05-23-2011 17:46:03 0.839 16.996
05-23-2011 17:47:01 0.794 17.355
05-23-2011 17:48:02 0.873 17.312
05-23-2011 17:49:01 0.912 16.987
05-23-2011 17:50:02 0.939 16.950
05-23-2011 17:51:01 0.943 16.927
05-23-2011 17:52:02 0.942 16.944
05-23-2011 17:53:01 0.901 16.971

```

05-23-2011 17:54:02	0.631	17.254
05-23-2011 17:55:01	0.776	17.120
05-23-2011 17:56:02	0.824	17.44
05-23-2011 17:57:01	0.874	17.0
05-23-2011 17:58:02	1.001	16.914
05-23-2011 17:59:01	1.009	16.904
05-23-2011 18:00:02	0.956	16.923
05-23-2011 18:01:01	0.923	16.919
05-23-2011 18:02:02	0.940	16.916
05-23-2011 18:03:02	0.877	16.970
05-23-2011 18:04:01	0.917	16.943
05-23-2011 18:05:02	0.965	16.941
05-23-2011 18:06:01	0.725	17.194
05-23-2011 18:07:02	0.779	17.101
05-23-2011 18:08:01	0.941	16.946
05-23-2011 18:09:02	0.910	16.953
05-23-2011 18:10:01	1.036	16.895
05-23-2011 18:11:02	1.021	16.870
05-23-2011 18:12:01	1.104	16.826
05-23-2011 18:13:02	1.042	16.842
05-23-2011 18:14:01	1.063	16.857
05-23-2011 18:15:02	1.067	16.857
05-23-2011 18:16:02	1.079	16.800
05-23-2011 18:17:01	1.029	16.859
05-23-2011 18:18:02	0.889	17.050
05-23-2011 18:19:01	0.833	17.029
05-23-2011 18:20:02	1.017	16.888
05-23-2011 18:21:01	1.009	16.876
05-23-2011 18:22:02	1.039	16.869
05-23-2011 18:23:01	1.010	16.851
05-23-2011 18:24:02	1.118	16.767
05-23-2011 18:25:01	1.080	16.794
05-23-2011 18:26:02	1.075	16.795



```

Test Run 2 STRATA Version 3.01
      Q2      JO2
      %      %
05-23-2011 18:27:01      1.194      16.164
05-23-2011 18:28:02      1.139      16.724
Pause
End Pause
05-23-2011 18:37:02      0.394      16.937
05-23-2011 18:38:01      1.379      16.666
05-23-2011 18:39:02      1.077      16.818
05-23-2011 18:40:01      1.103      16.806
05-23-2011 18:41:02      1.077      16.790
05-23-2011 18:42:01      0.595      17.142
05-23-2011 18:43:02      0.361      17.010
05-23-2011 18:44:01      0.382      16.960
05-23-2011 18:45:02      1.004      16.907
05-23-2011 18:46:01      0.386      16.956
05-23-2011 18:47:02      0.367      16.929
05-23-2011 18:48:01      0.374      16.936
05-23-2011 18:49:02      1.373      16.854
05-23-2011 18:50:01      0.391      16.952
05-23-2011 18:51:02      0.320      16.978
05-23-2011 18:52:01      1.007      16.099
05-23-2011 18:53:02      0.382      16.988
05-23-2011 18:54:01      0.584      17.188
05-23-2011 18:55:02      0.764      17.128
05-23-2011 18:56:01      0.387      17.000
05-23-2011 18:57:02      0.372      16.971
05-23-2011 18:58:01      0.389      16.983
05-23-2011 18:59:02      0.338      16.964
05-23-2011 19:00:01      0.367      16.925
05-23-2011 19:01:02      0.362      16.910
05-23-2011 19:02:01      0.348      16.917
05-23-2011 19:03:02      0.360      16.920
05-23-2011 19:04:01      0.393      16.945
05-23-2011 19:05:02      0.393      16.883
05-23-2011 19:06:01      0.320      17.080
05-23-2011 19:07:02      0.755      17.100
05-23-2011 19:08:01      0.305      16.966
05-23-2011 19:09:02      1.000      16.886
05-23-2011 19:10:01      0.392      16.872
05-23-2011 19:11:02      1.164      16.843
05-23-2011 19:12:01      1.033      16.839
05-23-2011 19:13:02      0.366      16.879
05-23-2011 19:14:01      1.066      16.823
05-23-2011 19:15:02      1.093      16.819
05-23-2011 19:16:01      1.001      16.883
05-23-2011 19:17:02      0.303      16.858
05-23-2011 19:18:01      0.385      17.083
05-23-2011 19:19:02      0.304      17.003
05-23-2011 19:20:01      1.000      16.884
05-23-2011 19:21:02      1.139      16.783
05-23-2011 19:22:01      1.069      16.802
05-23-2011 19:23:02      1.054      16.809
05-23-2011 19:24:01      1.162      16.754
05-23-2011 19:25:02      1.144      16.740
05-23-2011 19:26:01      0.369      16.843
05-23-2011 19:27:02      1.021      16.871
05-23-2011 19:28:01      1.039      16.876
05-23-2011 19:29:02      1.005      16.897
05-23-2011 19:30:01      0.720      17.169
05-23-2011 19:31:02      0.785      17.115
05-23-2011 19:32:01      0.308      16.981
05-23-2011 19:33:02      1.035      16.873
05-23-2011 19:34:01      1.035      16.837
05-23-2011 19:35:02      1.036      16.874
05-23-2011 19:36:01      1.134      16.009
05-23-2011 19:37:02      1.060      16.816
05-23-2011 19:38:01      1.052      16.850
05-23-2011 19:39:02      1.162      16.786
05-23-2011 19:40:01      1.087      16.801
05-23-2011 19:41:02      1.122      16.765
05-23-2011 19:42:01      0.797      17.058
05-23-2011 19:43:02      0.331      16.972
05-23-2011 19:44:01      1.017      16.815
05-23-2011 19:45:02      1.102      16.767
05-23-2011 19:46:01      1.140      16.756
05-23-2011 19:47:02      1.181      16.718
05-23-2011 19:48:01      1.162      16.723
05-23-2011 19:49:02      1.175      16.707
05-23-2011 19:50:01      1.169      16.710
05-23-2011 19:51:02      1.223      16.576
05-23-2011 19:52:01      1.236      16.557
05-23-2011 19:53:02      1.124      16.723
05-23-2011 19:54:01      0.980      16.926
05-23-2011 19:55:02      1.036      16.845
05-23-2011 19:56:01      1.046      16.807
05-23-2011 19:57:02      1.113      16.748
05-23-2011 19:58:01      1.102      16.729

```

05-23-2011 19:59:02	1.103	16.759
05-23-2011 20:00:01	1.177	16.705
05-23-2011 20:01:02	1.317	16.729
05-23-2011 20:02:03	1.238	16.773
05-23-2011 20:03:01	1.200	16.711
05-23-2011 20:04:02	1.240	16.877
05-23-2011 20:05:01	1.261	16.545
05-23-2011 20:06:02	1.015	16.884
05-23-2011 20:07:01	0.995	16.889
05-23-2011 20:08:02	1.207	16.715
05-23-2011 20:09:01	1.234	16.566
05-23-2011 20:10:02	1.249	16.692
05-23-2011 20:11:01	1.287	16.666
05-23-2011 20:12:02	1.254	16.655
05-23-2011 20:13:01	1.236	16.678
05-23-2011 20:14:02	1.380	16.649
05-23-2011 20:15:03	1.296	16.597
05-23-2011 20:16:01	1.337	16.597
05-23-2011 20:17:02	1.254	16.735
05-23-2011 20:18:01	0.932	17.063
05-23-2011 20:19:02	1.173	16.886
05-23-2011 20:20:01	1.136	16.830
05-23-2011 20:21:02	1.179	16.303
05-23-2011 20:22:01	1.227	16.769
05-23-2011 20:23:02	1.146	16.706
05-23-2011 20:24:01	1.159	16.597
05-23-2011 20:25:02	1.105	16.712
05-23-2011 20:26:01	1.326	16.776
05-23-2011 20:27:02	1.129	16.760
05-23-2011 20:28:03	1.092	16.787
05-23-2011 20:29:01	1.134	16.739
05-23-2011 20:30:02	0.978	16.920
05-23-2011 20:31:01	0.879	16.872

```

Test Run 2 STRATA Version 3.01
      O2      CO2
      %      %
05-23-2011 20:32:02  0.883  16.909
05-23-2011 20:33:01  1.065  16.375
05-23-2011 20:34:02  1.085  16.317
05-23-2011 20:35:01  0.988  16.356
05-23-2011 20:36:02  0.861  16.364
Run Averaged      CO2      CO2
      %      %
05-23-2011 20:36:02  0.969  16.311
Operator:      KC
Plant Name:    Citgo
Location:      B-Cat
Test Run 2 End

```

Final System Bias Check, Run 2 S A Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-Cat

Reference Cylinder Numbers  
Zero Span  
CO2 XE025088B  
CO2 CI171113

Date/Time 05-23-2011 20:44:04 PASSED

Analyte	CO2	CO2
Units	%	%
Zero Ref Cyl	0.000	0.000
Zero Cal	-0.003	0.202
Zero Avg	0.253	0.500
Zero Bias%	1.0%	1.5%
Zero Drift%	0.5%	0.8%
Span Ref Cyl	9.936	9.991
Span Cal	10.053	9.862
Span Avg	10.015	9.405
Span Bias%	0.1%	1.9%
Span Drift%	0.3%	-0.6%

Ini Zero Avg	0.120	0.332
Ini Span Avg	9.930	9.599
Run Avg	0.969	16.911
Co	0.187	0.416
On	9.473	9.542
Correct Avg	0.794	18.050
System Bias Check End		

Calibration Error Test, Run 3 CT Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: B-LSC

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
O2			XC0250888	Ambient Air
CO2			CC171113	CC221405

Date/Time (5-24-2011 07:50:00 PASSED

Analyte	O2	CO2
Units	%	%
Zero Ref Cyl	0.000	0.000
Zero Avg	0.056	0.166
Zero Error%	0.4%	0.8%
Low Ref Cyl		
Low Avg		
Low Error%		
Mid Ref Cyl	9.936	9.991
Mid Avg	10.081	9.740
Mid Error%	0.6%	1.3%
High Ref Cyl	20.900	18.930
High Avg	20.914	18.000
High Error%	0.3%	0.2%

Calibration Error Test End

Initial System Bias Check, Run 3    ATA Version 3.01  
 Operator:            KC  
 Plant Name:          Citgo  
 Location:            B-Lat

Reference Cylinder Numbers  
 Zero                            Span  
 Q2                              XC0250882  
 Q02                             CC171113

Date/Time	05-24-2011	07:59:42	PASSED
Analyte	Q2	CC2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.056	0.166	
Zero Avg	0.313	0.187	
Zero Bias%	0.9%	0.1%	
Zero Drift%			
Span Ref Cyl	9.916	9.991	
Span Cal	10.081	9.740	
Span Avg	10.000	9.492	
Span Bias%	0.3%	1.2%	
Span Drift%			

System Bias Check End

TEST RUN 3 STRATA Version 3.01

	02	002
	%	%
Begin calculating run averages		
05-24-2011 08:36:03	1.067	16.547
05-24-2011 08:37:02	1.011	16.587
05-24-2011 08:38:04	1.036	16.607
05-24-2011 08:39:03	1.055	16.627
05-24-2011 08:40:02	1.013	16.593
05-24-2011 08:41:03	0.890	16.706
05-24-2011 08:42:02	0.535	17.009
05-24-2011 08:43:04	0.769	16.842
05-24-2011 08:44:03	0.951	16.716
05-24-2011 08:45:02	0.924	16.700
05-24-2011 08:46:03	0.969	16.665
05-24-2011 08:47:03	0.902	16.704
05-24-2011 08:48:04	0.817	16.761
05-24-2011 08:49:03	0.881	16.751
05-24-2011 08:50:02	0.855	16.735
05-24-2011 08:51:03	0.930	16.721
05-24-2011 08:52:03	1.013	16.638
05-24-2011 08:53:02	0.725	16.865
05-24-2011 08:54:03	0.627	17.018
05-24-2011 08:55:02	0.819	16.777
05-24-2011 08:56:04	0.850	16.744
05-24-2011 08:57:03	0.815	16.769
05-24-2011 08:58:02	0.794	16.784
05-24-2011 08:59:03	0.919	16.718
05-24-2011 09:00:02	0.689	16.834
05-24-2011 09:01:04	0.817	16.786
05-24-2011 09:02:03	0.746	16.951
05-24-2011 09:03:02	0.885	16.731
05-24-2011 09:04:03	0.865	16.737
05-24-2011 09:05:03	0.788	16.733
05-24-2011 09:06:04	0.477	17.073
05-24-2011 09:07:03	0.638	16.948
05-24-2011 09:08:02	0.695	16.879
05-24-2011 09:09:03	1.010	16.657
05-24-2011 09:10:03	0.834	16.699
05-24-2011 09:11:02	0.665	16.842
05-24-2011 09:12:03	0.850	16.740
05-24-2011 09:13:02	0.754	16.786
05-24-2011 09:14:04	0.771	16.788
05-24-2011 09:15:03	0.805	16.765
05-24-2011 09:16:02	0.731	16.807
05-24-2011 09:17:03	0.726	16.851
05-24-2011 09:18:02	0.487	17.078
05-24-2011 09:19:04	0.634	16.918
05-24-2011 09:20:03	0.625	16.896
05-24-2011 09:21:02	0.637	16.903
05-24-2011 09:22:03	0.672	16.870
05-24-2011 09:23:03	0.663	16.862
05-24-2011 09:24:04	0.665	16.875
05-24-2011 09:25:03	0.684	16.865
05-24-2011 09:26:02	0.692	16.843
05-24-2011 09:27:04	0.802	16.794
05-24-2011 09:28:03	0.679	16.858
05-24-2011 09:29:02	0.713	16.871
05-24-2011 09:30:03	0.472	17.099
05-24-2011 09:31:02	0.606	16.939
05-24-2011 09:32:04	0.664	16.884
05-24-2011 09:33:03	0.684	16.845
05-24-2011 09:34:02	0.678	16.862
05-24-2011 09:35:03	0.662	16.974
05-24-2011 09:36:03	0.765	16.821
05-24-2011 09:37:04	0.727	16.828
05-24-2011 09:38:03	0.705	16.833
05-24-2011 09:39:02	0.764	16.777
05-24-2011 09:40:03	0.791	16.738
05-24-2011 09:41:03	0.657	16.840
05-24-2011 09:42:02	0.460	17.108
05-24-2011 09:43:03	0.643	16.906
05-24-2011 09:44:02	0.683	16.838
05-24-2011 09:45:04	0.690	16.796
05-24-2011 09:46:03	0.746	16.759
05-24-2011 09:47:02	0.793	16.734
05-24-2011 09:48:03	0.741	16.756
05-24-2011 09:49:02	0.761	16.755
05-24-2011 09:50:04	0.888	16.651
05-24-2011 09:51:03	0.935	16.593
05-24-2011 09:52:02	0.895	16.613
05-24-2011 09:53:03	0.808	16.674
05-24-2011 09:54:03	0.566	16.929
05-24-2011 09:55:04	0.785	16.736
05-24-2011 09:56:03	0.846	16.648
05-24-2011 09:57:02	0.796	16.664
05-24-2011 09:58:03	1.042	16.512
05-24-2011 09:59:03	0.904	16.561
05-24-2011 10:00:02	0.918	16.561

05-24-2011 10:01:03	0.824	16.546
05-24-2011 10:02:02	0.777	16.596
05-24-2011 10:03:04	0.760	16.529
05-24-2011 10:04:03	0.846	16.549
05-24-2011 10:05:02	0.882	16.533
05-24-2011 10:06:03	0.580	16.524
05-24-2011 10:07:02	0.541	16.505
05-24-2011 10:08:04	0.823	16.508
05-24-2011 10:09:03	0.840	16.552
05-24-2011 10:10:02	0.819	16.577
05-24-2011 10:11:03	0.969	16.560
05-24-2011 10:12:02	0.821	16.549
05-24-2011 10:13:04	0.827	16.676
05-24-2011 10:14:03	0.969	16.551
05-24-2011 10:15:02	0.774	16.670
05-24-2011 10:16:04	0.821	16.693
05-24-2011 10:17:03	0.740	16.766
05-24-2011 10:18:02	0.457	17.023
05-24-2011 10:19:03	0.747	16.779
05-24-2011 10:20:02	0.603	16.820
05-24-2011 10:21:04	0.710	16.779
05-24-2011 10:22:03	0.791	16.728
05-24-2011 10:23:02	0.635	16.826
05-24-2011 10:24:03	0.699	16.811
05-24-2011 10:25:03	0.761	16.760
05-24-2011 10:26:04	0.645	16.805
05-24-2011 10:27:03	0.555	16.884
05-24-2011 10:28:02	0.691	16.816
05-24-2011 10:29:03	0.611	16.897
05-24-2011 10:30:03	0.366	17.124
05-24-2011 10:31:02	0.532	16.974
05-24-2011 10:32:03	0.657	16.867
05-24-2011 10:33:03	0.658	16.858



Test Run 3 STRATA Version 3.01

	Q2	J02
05-24-2011 10:34:04	0.830	16.743
05-24-2011 10:35:03	0.713	16.769
*****		
End Pause		
05-24-2011 10:40:03	0.511	16.947
05-24-2011 10:41:03	0.679	16.897
05-24-2011 10:42:02	0.369	17.120
05-24-2011 10:43:03	0.504	16.973
05-24-2011 10:44:02	0.544	16.853
05-24-2011 10:45:04	0.630	16.888
05-24-2011 10:46:03	0.637	16.859
05-24-2011 10:47:02	0.586	16.877
05-24-2011 10:48:03	0.677	16.844
05-24-2011 10:49:02	0.787	16.754
05-24-2011 10:50:04	0.535	16.906
05-24-2011 10:51:03	0.697	16.832
05-24-2011 10:52:02	0.808	16.749
05-24-2011 10:53:03	0.792	16.771
05-24-2011 10:54:03	0.464	17.027
05-24-2011 10:55:04	0.694	16.837
05-24-2011 10:56:03	0.678	16.810
05-24-2011 10:57:02	0.889	16.685
05-24-2011 10:58:04	0.675	16.781
05-24-2011 10:59:03	0.793	16.741
05-24-2011 11:00:02	0.727	16.768
05-24-2011 11:01:03	0.766	16.772
05-24-2011 11:02:02	0.806	16.731
05-24-2011 11:03:04	0.828	16.716
05-24-2011 11:04:03	0.772	16.742
05-24-2011 11:05:02	0.882	16.706
05-24-2011 11:06:03	0.461	17.095
05-24-2011 11:07:03	0.563	16.993
05-24-2011 11:08:04	0.734	16.787
05-24-2011 11:09:03	0.679	16.806
05-24-2011 11:10:02	0.716	16.825
05-24-2011 11:11:03	0.840	16.742
05-24-2011 11:12:03	0.835	16.751
05-24-2011 11:13:02	0.790	16.771
05-24-2011 11:14:03	0.747	16.793
05-24-2011 11:15:02	0.734	16.833
05-24-2011 11:16:04	0.714	16.838
05-24-2011 11:17:03	0.659	16.882
05-24-2011 11:18:02	0.457	17.109
05-24-2011 11:19:03	0.644	16.950
05-24-2011 11:20:02	0.643	16.903
05-24-2011 11:21:04	0.649	16.889
05-24-2011 11:22:03	0.609	16.918
05-24-2011 11:23:02	0.691	16.864
05-24-2011 11:24:03	0.657	16.904
05-24-2011 11:25:03	0.731	16.843
05-24-2011 11:26:04	0.602	16.933
05-24-2011 11:27:03	0.714	16.855
05-24-2011 11:28:02	0.633	16.877
05-24-2011 11:29:03	0.756	16.814
05-24-2011 11:30:03	0.432	17.093
05-24-2011 11:31:02	0.675	16.898
05-24-2011 11:32:03	0.719	16.816
05-24-2011 11:33:02	0.781	16.775
05-24-2011 11:34:03	0.737	16.771
05-24-2011 11:35:02	0.777	16.728
05-24-2011 11:36:03	0.652	16.843
05-24-2011 11:37:04	0.643	16.854
05-24-2011 11:38:03	0.685	16.865
05-24-2011 11:39:04	0.659	16.884
05-24-2011 11:40:03	0.679	16.843
05-24-2011 11:41:03	0.588	16.903
05-24-2011 11:42:02	0.332	17.154
05-24-2011 11:43:03	0.439	17.036
05-24-2011 11:44:02	0.496	16.980
05-24-2011 11:45:03	0.607	16.934
05-24-2011 11:46:02	0.640	16.914
05-24-2011 11:47:03	0.634	16.892
05-24-2011 11:48:02	0.716	16.838
05-24-2011 11:49:03	0.540	16.946
05-24-2011 11:50:04	0.643	16.889
05-24-2011 11:51:03	0.673	16.847
05-24-2011 11:52:04	0.572	16.921
05-24-2011 11:53:03	0.547	16.980
05-24-2011 11:54:03	0.460	17.118
05-24-2011 11:55:02	0.465	17.029
05-24-2011 11:56:03	0.493	17.001
05-24-2011 11:57:02	0.645	16.892
05-24-2011 11:58:03	0.581	16.930
05-24-2011 11:59:02	0.568	16.948
05-24-2011 12:00:03	0.605	16.846
05-24-2011 12:01:02	0.677	16.870

05-24-2011 12:02:03	0.631	16.892
05-24-2011 12:03:04	0.677	16.854
05-24-2011 12:04:03	0.578	16.809
05-24-2011 12:05:04	0.712	16.855
05-24-2011 12:06:03	0.450	17.080
05-24-2011 12:07:03	0.530	17.046
05-24-2011 12:08:02	0.569	16.954
05-24-2011 12:09:03	0.508	16.811
05-24-2011 12:10:02	0.635	16.898
05-24-2011 12:11:03	0.618	16.893
05-24-2011 12:12:02	0.613	16.914
05-24-2011 12:13:03	0.622	16.810
05-24-2011 12:14:02	0.684	16.879
05-24-2011 12:15:03	0.758	16.826
05-24-2011 12:16:04	0.717	16.840
05-24-2011 12:17:03	0.544	16.834
05-24-2011 12:18:04	0.415	17.163
05-24-2011 12:19:03	0.493	17.038
05-24-2011 12:20:03	0.580	16.980
05-24-2011 12:21:02	0.658	16.890
05-24-2011 12:22:03	0.641	16.897
05-24-2011 12:23:02	0.678	16.952
05-24-2011 12:24:03	0.687	16.861
05-24-2011 12:25:02	0.602	16.834
05-24-2011 12:26:03	0.705	16.874
05-24-2011 12:27:02	0.715	16.831
05-24-2011 12:28:03	0.607	16.890
05-24-2011 12:29:04	0.733	16.852
05-24-2011 12:30:03	0.377	17.138
05-24-2011 12:31:04	0.418	17.068
05-24-2011 12:32:03	0.541	16.999
05-24-2011 12:33:03	0.718	16.879
05-24-2011 12:34:02	0.592	16.947

```

Test Run 3  STRATA Version 3.01
          O2      CO2
          %      %
05-24-2011 12:35:04    0.741    16.843
05-24-2011 12:36:02    0.765    16.807
05-24-2011 12:37:03    0.640    16.856
05-24-2011 12:38:02    0.509    16.939
Run Averages          O2      CO2
          %      %
05-24-2011 12:38:49    0.700    16.837
Operator:              EC
Plant Name:            Citgo
Location:              B-Cat
Test Run 3  End

```

Final System Bias Check, Run 3 3' A Version 3.01  
 Operator: KC  
 Plant Name: Citgo  
 Location: 3002

Reference Cylinder Numbers  
 Zero Span  
 C2 XC025088B  
 C02 C0171113

Date/Time	(5-24-2011	12:46:14	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.056	0.166	
Zero Avg	0.099	0.370	
Zero Bias%	0.0%	1.0%	
Zero Drift%	-0.6%	0.9%	
Span Ref Cyl	9.956	9.991	
Span Cal	10.081	9.740	
Span Avg	9.856	9.366	
Span Bias%	0.5%	1.7%	
Span Drift%	-0.6%	-0.5%	
Ini Zero Avg	0.313	0.187	
Ini Span Avg	10.009	9.452	
Run Avg	0.700	16.837	
Co	0.206	0.278	
Om	9.933	9.444	
Correct Avg	0.504	18.049	
System Bias Check End			

Calibration Error Test, Run 1 ST, Version 3.01

Operator: KC  
Plant Name: Citgo  
Location: ReCat

	Reference Cylinder Numbers		Mid-range	High-range
	Zero	Low-range		
O2			XC0250888	Ambient Air
CO2			CC177113	CC221485

Date/Time	05-25-2011	08:26:03	PASSED
Analyte	O2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Avg	0.000	0.000	
Zero Error%	0.3%	0.7%	
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	9.936	9.601	
Mid Avg	10.070	9.674	
Mid Error%	0.5%	1.6%	
High Ref Cyl	20.900	18.900	
High Avg	20.860	18.767	
High Error%	0.2%	0.8%	
Calibration Error Test End			

Initial System Bias Check, Run 1      ATA Version 3.31

Operator:            KC  
Plant Name:        Catco  
Location:          B-Cat

Reference Cylinder Numbers  
Zero                Span  
O2                    GC025088B  
CO2                   GC171113

Date/Time	05-25-2011	08:34:09	PASSED
Analyte	O2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.000	0.136	
Zero Avg	0.296	0.151	
Zero Bias%	0.9%	0.3%	
Zero Drift%			
Span Ref Cyl	9.936	9.991	
Span Cal	10.000	9.674	
Span Avg	9.976	9.388	
Span Bias%	0.4%	1.4%	
Span Drift%			
System Bias Check End			

Test Run 1 STRATA Version 3.01

	O2	CO2
	%	%
Begin calculating run averages		
05-25-2011 11:11:01	0.917	16.654
05-25-2011 11:12:02	0.930	16.649
05-25-2011 11:13:01	0.906	16.638
05-25-2011 11:14:02	0.730	16.806
05-25-2011 11:15:01	0.682	16.854
05-25-2011 11:16:02	0.805	16.729
05-25-2011 11:17:01	0.809	16.710
05-25-2011 11:18:02	0.861	16.689
05-25-2011 11:19:01	0.939	16.634
05-25-2011 11:20:01	0.945	16.623
05-25-2011 11:21:00	0.897	16.641
05-25-2011 11:22:01	0.859	16.680
05-25-2011 11:23:02	0.960	16.624
05-25-2011 11:24:01	0.925	16.638
05-25-2011 11:25:02	0.917	16.635
05-25-2011 11:26:01	0.764	16.806
05-25-2011 11:27:02	0.773	16.808
05-25-2011 11:28:01	0.865	16.668
05-25-2011 11:29:02	0.905	16.650
05-25-2011 11:30:01	0.924	16.637
05-25-2011 11:31:02	0.955	16.613
05-25-2011 11:32:01	1.018	16.577
05-25-2011 11:33:01	0.912	16.641
05-25-2011 11:34:00	1.013	16.580
05-25-2011 11:35:01	1.018	16.576
05-25-2011 11:36:02	0.961	16.614
05-25-2011 11:37:01	0.979	16.588
05-25-2011 11:38:02	0.899	16.686
05-25-2011 11:39:01	0.756	16.810
05-25-2011 11:40:02	0.917	16.639
05-25-2011 11:41:01	0.934	16.646
05-25-2011 11:42:02	1.028	16.587
05-25-2011 11:43:01	0.955	16.614
05-25-2011 11:44:02	1.056	16.570
05-25-2011 11:45:01	1.038	16.559
05-25-2011 11:46:01	0.949	16.605
05-25-2011 11:47:00	0.913	16.640
05-25-2011 11:48:01	1.000	16.603
05-25-2011 11:49:02	0.906	16.652
05-25-2011 11:50:01	0.774	16.773
05-25-2011 11:51:02	0.756	16.859
05-25-2011 11:52:01	0.777	16.771
05-25-2011 11:53:02	0.977	16.621
05-25-2011 11:54:01	0.895	16.645
05-25-2011 11:55:02	0.822	16.717
05-25-2011 11:56:01	0.880	16.679
05-25-2011 11:57:02	0.807	16.729
05-25-2011 11:58:01	0.858	16.703
05-25-2011 11:59:01	0.788	16.746
05-25-2011 12:00:00	0.832	16.728
05-25-2011 12:01:01	0.819	16.729
05-25-2011 12:02:02	0.657	16.893
05-25-2011 12:03:01	0.624	16.934
05-25-2011 12:04:02	0.669	16.843
05-25-2011 12:05:01	0.921	16.681
05-25-2011 12:06:02	0.795	16.720
05-25-2011 12:07:01	0.771	16.765
05-25-2011 12:08:02	0.842	16.732
05-25-2011 12:09:01	0.847	16.704
05-25-2011 12:10:02	0.805	16.731
05-25-2011 12:11:01	0.871	16.708
05-25-2011 12:12:01	0.863	16.696
05-25-2011 12:13:00	0.807	16.737
05-25-2011 12:14:01	0.711	16.849
05-25-2011 12:15:02	0.612	16.968
05-25-2011 12:16:01	0.772	16.791
05-25-2011 12:17:02	0.816	16.736
05-25-2011 12:18:01	0.810	16.723
05-25-2011 12:19:02	0.827	16.715
05-25-2011 12:20:01	0.824	16.740
05-25-2011 12:21:02	0.856	16.707
05-25-2011 12:22:01	0.839	16.727
05-25-2011 12:23:02	0.861	16.680
05-25-2011 12:24:01	0.827	16.712
05-25-2011 12:25:02	0.869	16.698
05-25-2011 12:26:00	0.744	16.805
05-25-2011 12:27:01	0.563	16.964
05-25-2011 12:28:00	0.799	16.771
05-25-2011 12:29:01	0.867	16.690
05-25-2011 12:30:02	0.862	16.686
05-25-2011 12:31:01	0.804	16.710
05-25-2011 12:32:02	0.933	16.672
05-25-2011 12:33:01	0.943	16.644
05-25-2011 12:34:02	0.823	16.694
05-25-2011 12:35:01	0.838	16.701

05-25-2011 12:36:02	0.854	16.703
05-25-2011 12:37:01	0.935	16.650
05-25-2011 12:38:02	0.725	16.625
End Pause		
05-25-2011 12:52:01	0.770	16.797
05-25-2011 12:53:02	0.939	16.653
05-25-2011 12:54:00	0.866	16.666
05-25-2011 12:55:01	1.038	16.582
05-25-2011 12:56:00	0.943	16.597
05-25-2011 12:57:01	0.944	16.632
05-25-2011 12:58:00	1.022	16.551
05-25-2011 12:59:01	1.002	16.568
05-25-2011 13:00:02	0.917	16.612
05-25-2011 13:01:01	0.846	16.669
05-25-2011 13:02:02	0.807	16.688
05-25-2011 13:03:01	0.709	16.823
05-25-2011 13:04:02	0.678	16.809
05-25-2011 13:05:01	0.914	16.662
05-25-2011 13:06:02	0.890	16.636
05-25-2011 13:07:01	0.920	16.691
05-25-2011 13:08:02	0.855	16.688
05-25-2011 13:09:00	0.911	16.675
05-25-2011 13:10:01	0.815	16.856
05-25-2011 13:11:00	0.805	16.703
05-25-2011 13:12:01	0.812	16.703
05-25-2011 13:13:02	0.693	16.794
05-25-2011 13:14:01	0.666	16.876
05-25-2011 13:15:02	0.487	17.027
05-25-2011 13:16:01	0.700	16.861
05-25-2011 13:17:02	0.636	16.871
05-25-2011 13:18:01	0.671	16.840
05-25-2011 13:19:02	0.679	16.828

Page 3



```

Test Run 1 STRATA Version 3.01
      O2      CO2
      %      %
05-25-2011 13:20:01 0.774 16.200
05-25-2011 13:21:02 0.646 16.345
05-25-2011 13:22:01 0.730 16.329
05-25-2011 13:23:02 0.703 16.337
05-25-2011 13:24:00 0.636 16.372
05-25-2011 13:25:01 0.647 16.382
05-25-2011 13:26:00 0.586 16.915
05-25-2011 13:27:01 0.340 17.095
05-25-2011 13:28:02 0.516 17.100
05-25-2011 13:29:01 0.540 16.967
05-25-2011 13:30:02 0.575 16.927
05-25-2011 13:31:01 0.567 16.939
05-25-2011 13:32:02 0.550 16.914
05-25-2011 13:33:01 0.589 16.920
05-25-2011 13:34:02 0.568 16.924
05-25-2011 13:35:01 0.570 16.957
05-25-2011 13:36:02 0.610 16.912
05-25-2011 13:37:00 0.672 16.854
05-25-2011 13:38:01 0.534 16.965
05-25-2011 13:39:00 0.527 17.021
05-25-2011 13:40:01 0.660 16.936
05-25-2011 13:41:00 0.660* 16.864*
05-25-2011 13:42:01 0.674 16.851
05-25-2011 13:43:02 0.712 16.807
05-25-2011 13:44:01 0.662 16.837
05-25-2011 13:45:02 0.672 16.835
05-25-2011 13:46:01 0.697 16.831
05-25-2011 13:47:02 0.879 16.706
05-25-2011 13:48:01 0.743 16.764
05-25-2011 13:49:02 0.790 16.745
05-25-2011 13:50:01 0.715 16.808
05-25-2011 13:51:02 0.518 16.989
05-25-2011 13:52:01 0.709 16.914
05-25-2011 13:53:01 0.666 16.825
05-25-2011 13:54:00 0.846 16.712
05-25-2011 13:55:01 0.779 16.713
05-25-2011 13:56:02 0.772 16.729
05-25-2011 13:57:01 0.840 16.679
05-25-2011 13:58:02 0.744 16.729
05-25-2011 13:59:01 0.797 16.714
05-25-2011 14:00:02 0.785 16.727
05-25-2011 14:01:01 0.772 16.716
05-25-2011 14:02:02 0.774 16.740
05-25-2011 14:03:01 0.998 16.919
05-25-2011 14:04:02 0.696 16.909
05-25-2011 14:05:01 0.818 16.696
05-25-2011 14:06:01 0.812 16.696
05-25-2011 14:07:00 0.861 16.661
05-25-2011 14:08:01 0.802 16.682
05-25-2011 14:09:02 0.779 16.707
05-25-2011 14:10:01 0.855 16.666
05-25-2011 14:11:02 0.814 16.670
05-25-2011 14:12:01 0.824 16.656
05-25-2011 14:13:02 0.715 16.757
05-25-2011 14:14:01 0.779 16.748
05-25-2011 14:15:02 0.557 16.922
05-25-2011 14:16:01 0.709 16.795
05-25-2011 14:17:02 0.871 16.640
05-25-2011 14:18:01 0.759 16.707
05-25-2011 14:19:01 0.832 16.667
Run Averages      O2      CO2
                  %      %
05-25-2011 14:19:04 0.756* 16.744*
Operator:          KC
Plant Name:        Citgo
Location:          B-Cat
Test Run 1 End

```

Final System Bias Check, Run 1 S A Version 3.01

Operator: KC  
Plant Name: C1190  
Location: 2000

Reference Cylinder Numbers  
Zero Span

02 XC025088B  
00171112

Date/Time	05-25-2011	14:31:42	PASSED
Analyte	02	002	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.000	0.136	
Zero Avg	0.163	0.359	
Zero Bias%	0.4%	1.1%	
Span Ref Cyl	9.956	9.951	
Span Cal	10.000	9.674	
Span Avg	9.959	9.526	
Span Bias%	0.5%	0.7%	
Span Drift%	-0.1%	0.7%	
Ini Zero Avg	0.296	0.191	
Ini Span Avg	9.976	9.388	
Run Avg	0.796	16.744	
Co	0.229	0.275	
Cm	9.958	9.457	
Correct Avg	0.579	17.920	
System Bias Check End			

Test Run 2 STRATA Version 3.01

	02	02
	%	%
Eccin calculation for averages		
05-25-2011 16:07:03	0.548	16.975
05-25-2011 16:08:03	0.648	16.896
05-25-2011 16:09:04	0.582	16.944
05-25-2011 16:10:03	0.500	16.857
05-25-2011 16:11:02	0.570	16.979
05-25-2011 16:12:03	0.515	17.003
05-25-2011 16:13:03	0.401	17.039
05-25-2011 16:14:04	0.510	17.040
05-25-2011 16:15:03	0.374	17.172
05-25-2011 16:16:02	0.465	17.064
05-25-2011 16:17:04	0.614	16.952
05-25-2011 16:18:03	0.576	16.944
05-25-2011 16:19:04	0.565	16.942
05-25-2011 16:20:03	0.570	16.962
05-25-2011 16:21:02	0.601	16.945
05-25-2011 16:22:04	0.640	16.924
05-25-2011 16:23:03	0.682	16.890
05-25-2011 16:24:02	0.580	16.922
05-25-2011 16:25:03	0.654	16.888
05-25-2011 16:26:02	0.667	16.870
05-25-2011 16:27:04	0.357	17.107
05-25-2011 16:28:03	0.546	16.978
05-25-2011 16:29:02	0.636	16.898
05-25-2011 16:30:03	0.735	16.790
05-25-2011 16:31:03	0.614	16.843
05-25-2011 16:32:04	0.639	16.844
05-25-2011 16:33:03	0.678	16.841
05-25-2011 16:34:02	0.766	16.796
05-25-2011 16:35:04	0.712	16.810
05-25-2011 16:36:03	0.712	16.829
05-25-2011 16:37:04	0.798	16.762
05-25-2011 16:38:03	0.721	16.824
05-25-2011 16:39:02	0.431	17.072
05-25-2011 16:40:04	0.689	16.880
05-25-2011 16:41:03	0.719	16.837
05-25-2011 16:42:02	0.760	16.833
05-25-2011 16:43:03	0.763	16.806
05-25-2011 16:44:03	0.775	16.815
05-25-2011 16:45:04	0.795	16.813
05-25-2011 16:46:03	0.813	16.793
05-25-2011 16:47:02	0.823	16.777
05-25-2011 16:48:04	0.825	16.767
05-25-2011 16:49:03	0.863	16.739
05-25-2011 16:50:04	0.822	16.761
05-25-2011 16:51:03	0.574	16.995
05-25-2011 16:52:02	0.687	16.868
05-25-2011 16:53:04	0.749	16.801
05-25-2011 16:54:03	0.840	16.796
05-25-2011 16:55:04	0.859	16.717
05-25-2011 16:56:03	0.813	16.723
05-25-2011 16:57:03	0.818	16.724
05-25-2011 16:58:04	0.854	16.690
05-25-2011 16:59:03	0.834	16.702
05-25-2011 17:00:02	0.938	16.656
05-25-2011 17:01:03	0.813	16.722
05-25-2011 17:02:03	0.849	16.725
05-25-2011 17:03:04	0.489	16.989
05-25-2011 17:04:03	0.727	16.825
05-25-2011 17:05:02	0.804	16.770
05-25-2011 17:06:04	0.764	16.740
05-25-2011 17:07:03	0.797	16.740
05-25-2011 17:08:04	0.839	16.735
05-25-2011 17:09:03	0.867	16.710
05-25-2011 17:10:02	0.952	16.637
05-25-2011 17:11:04	0.871	16.647
05-25-2011 17:12:03	0.848	16.683
05-25-2011 17:13:04	0.883	16.664
05-25-2011 17:14:03	0.770	16.702
05-25-2011 17:15:02	0.648	16.965
05-25-2011 17:16:04	0.687	16.882
05-25-2011 17:17:03	0.882	16.729
05-25-2011 17:18:02	0.887	16.730
05-25-2011 17:19:03	0.857	16.721
05-25-2011 17:20:03	0.884	16.701
05-25-2011 17:21:04	0.866	16.718
05-25-2011 17:22:03	0.985	16.688
05-25-2011 17:23:02	0.803	16.750
05-25-2011 17:24:04	0.840	16.750
05-25-2011 17:25:03	0.839	16.757
05-25-2011 17:26:04	0.782	16.796
05-25-2011 17:27:03	0.640	16.941
05-25-2011 17:28:02	0.769	16.816
05-25-2011 17:29:04	0.792	16.792
05-25-2011 17:30:02	0.909	16.694
05-25-2011 17:31:04	0.834	16.718

05-25-2011 17:32:03	0.819	16.719
05-25-2011 17:33:02	0.077	16.671
05-25-2011 17:34:04	0.857	16.85
05-25-2011 17:35:03	0.020	16.659
Pause		
End Pause		
05-25-2011 17:48:02	0.952	16.656
05-25-2011 17:49:03	0.813	16.729
05-25-2011 17:50:04	0.077	16.659
05-25-2011 17:51:03	0.737	16.857
05-25-2011 17:52:04	0.767	16.758
05-25-2011 17:53:03	0.880	16.683
05-25-2011 17:54:04	0.000	16.650
05-25-2011 17:55:03	0.963	16.623
05-25-2011 17:56:04	0.965	16.633
05-25-2011 17:57:02	0.982	16.541
05-25-2011 17:58:03	0.047	16.674
05-25-2011 17:59:02	0.996	16.618
05-25-2011 18:00:03	1.036	16.570
05-25-2011 18:01:02	1.019	16.571
05-25-2011 18:02:03	0.077	16.650
05-25-2011 18:03:04	0.733	16.840
05-25-2011 18:04:03	0.860	16.714
05-25-2011 18:05:04	1.009	16.599
05-25-2011 18:06:03	0.047	16.610
05-25-2011 18:07:04	1.046	16.563
05-25-2011 18:08:03	1.044	16.547
05-25-2011 18:09:04	0.919	16.636
05-25-2011 18:10:03	1.060	16.670
05-25-2011 18:11:04	1.049	16.550
05-25-2011 18:12:02	0.956	16.601
05-25-2011 18:13:03	1.005	16.584
05-25-2011 18:14:02	0.020	16.630

Page 1

```

Test Run 2 STRATA Version 3.01
      O2      CO2
      %      %
05-25-2011 18:16:02 0.720 16.071
05-25-2011 18:16:02 0.918 16.685
05-25-2011 18:17:03 0.911 16.664
05-25-2011 18:18:02 0.968 16.624
05-25-2011 18:19:03 0.921 16.630
05-25-2011 18:20:04 0.988 16.611
05-25-2011 18:21:03 1.040 16.571
05-25-2011 18:22:04 0.966 16.609
05-25-2011 18:23:04 0.970 16.679
05-25-2011 18:24:04 0.941 16.652
05-25-2011 18:25:03 1.024 16.593
05-25-2011 18:26:04 0.888 16.673
05-25-2011 18:27:04 0.867 16.607
05-25-2011 18:28:03 0.898 16.705
05-25-2011 18:29:02 0.903 16.674
05-25-2011 18:30:03 0.960 16.642
05-25-2011 18:31:03 0.863 16.624
05-25-2011 18:32:03 1.003 16.604
05-25-2011 18:33:04 0.909 16.661
05-25-2011 18:34:03 0.926 16.662
05-25-2011 18:35:04 0.887 16.630
05-25-2011 18:36:03 0.924 16.673
05-25-2011 18:37:04 0.991 16.637
05-25-2011 18:38:03 1.003 16.624
05-25-2011 18:39:04 0.862 16.593
05-25-2011 18:40:02 0.871 16.734
05-25-2011 18:41:03 1.019 16.616
05-25-2011 18:42:02 0.938 16.632
05-25-2011 18:43:03 1.029 16.602
05-25-2011 18:44:02 0.976 16.620
05-25-2011 18:45:03 1.031 16.582
05-25-2011 18:46:04 1.041 16.578
05-25-2011 18:47:03 1.026 16.579
05-25-2011 18:48:04 0.999 16.588
05-25-2011 18:49:03 0.967 16.620
05-25-2011 18:50:04 1.001 16.609
05-25-2011 18:51:03 0.721 16.569
05-25-2011 18:52:04 0.785 16.776
05-25-2011 18:53:02 0.963 16.637
05-25-2011 18:54:03 0.892 16.680
05-25-2011 18:55:02 0.883 16.559
05-25-2011 18:56:03 0.902 16.670
05-25-2011 18:57:02 1.011 16.630
05-25-2011 18:58:03 0.966 16.624
05-25-2011 18:59:04 0.821 16.654
05-25-2011 19:00:03 1.038 16.582
05-25-2011 19:01:04 1.003 16.588
05-25-2011 19:02:03 1.056 16.569
05-25-2011 19:03:04 0.745 16.612
05-25-2011 19:04:03 0.849 16.735
05-25-2011 19:05:04 0.983 16.635
05-25-2011 19:06:02 0.970 16.611
05-25-2011 19:07:03 1.038 16.577
05-25-2011 19:08:02 0.986 16.609
05-25-2011 19:09:03 0.966 16.623
05-25-2011 19:10:02 1.002 16.611
05-25-2011 19:11:03 1.028 16.590
05-25-2011 19:12:04 0.980 16.617
05-25-2011 19:13:03 0.974 16.613
Run Average      O2      CO2
                  %      %
05-25-2011 19:13:50 0.836 16.736
Operator:          NC
Plant Name:        Citgo
Location:          B-Cat
Test Run 2 End

```

Final System Bias Check, Run 2 S A Version 3.01

Operator: KC  
Plant Name: Citgo  
Reference Cylinder Numbers

02  
000  
Sero Span  
XC025088B  
C0171152

Date/Time	05-25-2011	19:20:49	PASSED
Analyte	O2	CO2	
Units	%	%	
Sero Ref Cyl	0.000	0.000	
Sero Cal	0.064	0.126	
Sero Avg	0.204	0.435	
Sero Bias%	0.6%	1.7%	
Span Ref Cyl	9.956	9.951	
Span Cal	10.050	9.674	
Span Avg	9.916	9.388	
Span Bias%	0.6%	1.6%	
Span Drift%	-0.1%	-0.8%	
Ini Zero Avg	0.163	0.359	
Ini Span Avg	9.939	9.526	
Run Avg	0.856	16.756	
Co	0.184	0.437	
Om	9.928	9.442	
Correct Avg	0.666	18.087	
System Bias Check End			

Calibration Error Test, Run 3 ST Version 3.01

Operator: JP  
Plant Name: CUGD  
Location: Ref

	Reference Cylinder Numbers		Mid-range	High-range
	Zero	Low-range		
C2			XC025038B	Ambient Air
C22			CC121112	CC221112

Date/Time	05-26-2011	07:47:46	PASSED
Analyte	CO	CO	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Avg	0.113	0.180	
Zero Error%	0.5%	0.9%	
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	9.936	9.941	
Mid Avg	10.095	9.796	
Mid Error%	0.6%	1.0%	
High Ref Cyl	20.900	18.930	
High Avg	20.911	18.949	
High Error%	0.0%	0.1%	

## Initial System Bias Check, Run 3 ATA Version 3.01

Operator: JP  
Plant Name: GILGO  
Location: 0-1-1

## Reference Cylinder Numbers

02 Sero Span  
000 MC025088B  
000 00171113

Date/Time 05-26-2011 07:57:18 PASSED  
Analyze 02 CC2  
Units % %  
Sero Ref Cyl 0.060 0.060  
Sero Cal 0.113 0.160  
Sero Avg 0.317 0.252  
Sero Bias% 0.8% 0.4%  
Span Ref Cyl 9.936 9.951  
Span Cal 10.005 9.766  
Span Avg 9.976 9.414  
Span Bias% 0.5% 1.4%  
Span Delta  
System Bias Check End



Test Run 3 STRATA Versior 3.01

	O2	J02
	%	%
Begin calculations for averages		
05-26-2011 08:46:02	1.271	15.658
05-26-2011 08:47:03	1.223	15.655
05-26-2011 08:48:02	1.178	15.700
05-26-2011 08:49:02	1.231	15.672
05-26-2011 08:50:01	1.197	15.732
05-26-2011 08:51:02	1.000	16.298
05-26-2011 08:52:01	0.935	16.665
05-26-2011 08:53:02	0.971	16.624
05-26-2011 08:54:01	0.979	17.271
05-26-2011 08:55:02	0.963	17.415
05-26-2011 08:56:01	0.970	17.426
05-26-2011 08:57:02	1.014	17.345
05-26-2011 08:58:03	0.990	17.336
05-26-2011 08:59:02	0.903	17.354
05-26-2011 09:00:03	0.991	17.292
05-26-2011 09:01:02	0.955	17.293
05-26-2011 09:02:02	0.952	17.275
05-26-2011 09:03:01	0.714	17.490
05-26-2011 09:04:02	0.863	17.362
05-26-2011 09:05:01	0.936	17.019
05-26-2011 09:06:02	0.985	16.557
05-26-2011 09:07:01	1.055	16.564
05-26-2011 09:08:02	0.963	16.683
05-26-2011 09:09:01	0.953	16.774
05-26-2011 09:10:02	0.964	16.840
05-26-2011 09:11:03	0.949	16.857
05-26-2011 09:12:02	0.933	16.927
05-26-2011 09:13:03	0.992	16.997
05-26-2011 09:14:02	0.860	16.045
05-26-2011 09:15:02	0.675	17.064
05-26-2011 09:16:01	0.795	16.865
05-26-2011 09:17:02	0.847	16.944
05-26-2011 09:18:01	0.953	16.708
05-26-2011 09:19:02	0.917	16.726
05-26-2011 09:20:01	0.891	16.778
05-26-2011 09:21:02	0.953	16.549
05-26-2011 09:22:01	0.864	16.716
05-26-2011 09:23:02	0.936	16.728
05-26-2011 09:24:03	0.947	16.752
05-26-2011 09:25:02	0.864	16.703
05-26-2011 09:26:03	0.900	16.800
05-26-2011 09:27:02	0.736	16.946
05-26-2011 09:28:02	0.741	16.953
05-26-2011 09:29:01	0.875	16.791
05-26-2011 09:30:02	0.879	16.791
05-26-2011 09:31:01	0.988	16.725
05-26-2011 09:32:02	0.942	16.750
05-26-2011 09:33:01	0.896	16.814
05-26-2011 09:34:02	0.935	16.800
05-26-2011 09:35:01	0.979	16.789
05-26-2011 09:36:02	0.947	16.836
05-26-2011 09:37:03	1.014	16.765
05-26-2011 09:38:02	1.028	16.631
05-26-2011 09:39:03	0.809	16.791
05-26-2011 09:40:02	0.826	16.720
05-26-2011 09:41:02	0.972	16.549
05-26-2011 09:42:01	0.915	16.595
05-26-2011 09:43:02	1.010	17.225
05-26-2011 09:44:01	0.877	17.227
05-26-2011 09:45:02	0.894	17.471
05-26-2011 09:46:01	0.940	17.314
05-26-2011 09:47:02	0.842	17.439
05-26-2011 09:48:01	0.877	17.439
05-26-2011 09:49:02	0.933	17.400
05-26-2011 09:50:03	0.859	17.390
05-26-2011 09:51:02	0.680	17.399
05-26-2011 09:52:03	0.799	17.327
05-26-2011 09:53:02	0.810	17.337
05-26-2011 09:54:02	0.925	17.134
05-26-2011 09:55:01	0.937	17.168
05-26-2011 09:56:02	0.878	17.251
05-26-2011 09:57:01	0.897	17.207
05-26-2011 09:58:02	0.966	17.088
05-26-2011 09:59:01	0.995	17.054
05-26-2011 10:00:02	0.896	17.066
05-26-2011 10:01:03	0.942	17.332
05-26-2011 10:02:02	0.905	17.183
05-26-2011 10:03:03	0.722	17.378
05-26-2011 10:04:02	0.878	17.199
05-26-2011 10:05:03	0.841	17.191
05-26-2011 10:06:02	0.907	17.130
05-26-2011 10:07:02	0.942	17.081
05-26-2011 10:08:01	0.941	17.161
05-26-2011 10:09:02	0.886	17.191
05-26-2011 10:10:01	0.961	17.095

05-26-2011 10:11:02	0.992	17.362
05-26-2011 10:12:01	0.940	17.118
05-26-2011 10:13:02	0.948	17.27
End Pause		
05-26-2011 10:31:03	1.000	17.118
05-26-2011 10:32:02	1.009	17.082
05-26-2011 10:33:02	0.989	17.047
05-26-2011 10:34:01	1.041	17.075
05-26-2011 10:35:03	0.966	17.078
05-26-2011 10:36:01	1.055	17.026
05-26-2011 10:37:02	0.969	17.119
05-26-2011 10:38:01	0.953	17.115
05-26-2011 10:39:02	0.773	17.285
05-26-2011 10:40:01	0.952	17.118
05-26-2011 10:41:02	0.971	17.047
05-26-2011 10:42:03	1.003	17.041
05-26-2011 10:43:02	1.089	16.925
05-26-2011 10:44:03	1.077	16.986
05-26-2011 10:45:02	1.022	17.070
05-26-2011 10:46:02	1.054	17.099
05-26-2011 10:47:01	1.101	17.101
05-26-2011 10:48:02	1.157	16.906
05-26-2011 10:49:03	1.090	16.848
05-26-2011 10:50:02	0.980	17.058
05-26-2011 10:51:01	0.817	17.341
05-26-2011 10:52:02	0.985	17.199
05-26-2011 10:53:01	0.969	17.140
05-26-2011 10:54:02	1.128	17.021
05-26-2011 10:55:03	1.079	16.857
05-26-2011 10:56:02	1.046	16.952
05-26-2011 10:57:02	1.099	16.893
05-26-2011 10:58:02	1.119	17.019

```

Test Run 3 STRATA Version 3.01
      O2      CO2
      %      %
05-26-2011 11:00:02 1.098 16.962
05-26-2011 11:01:03 1.073 16.789
05-26-2011 11:02:01 1.018 16.899
05-26-2011 11:03:02 0.905 17.030
05-26-2011 11:04:01 1.005 17.118
05-26-2011 11:05:02 0.904 17.187
05-26-2011 11:06:01 0.942 16.916
05-26-2011 11:07:02 0.954 17.000
05-26-2011 11:08:01 0.985 17.057
05-26-2011 11:09:02 1.008 17.068
05-26-2011 11:10:01 1.000 17.105
05-26-2011 11:11:02 0.924 17.201
05-26-2011 11:12:03 0.885 17.237
05-26-2011 11:13:02 0.941 17.213
05-26-2011 11:14:03 0.956 17.029
05-26-2011 11:15:01 0.709 17.160
05-26-2011 11:16:02 0.805 17.176
05-26-2011 11:17:01 0.852 17.163
05-26-2011 11:18:02 0.928 17.082
05-26-2011 11:19:01 0.929 17.061
05-26-2011 11:20:02 0.940 17.052
05-26-2011 11:21:01 0.965 17.035
05-26-2011 11:22:02 0.899 17.062
05-26-2011 11:23:01 0.864 17.128
05-26-2011 11:24:02 0.870 17.095
05-26-2011 11:25:03 0.879 17.121
05-26-2011 11:26:02 0.835 17.202
05-26-2011 11:27:02 0.876 17.248
05-26-2011 11:28:01 0.707 17.256
05-26-2011 11:29:02 0.780 17.245
05-26-2011 11:30:01 0.896 17.073
05-26-2011 11:31:02 0.934 17.095
05-26-2011 11:32:01 0.901 17.123
05-26-2011 11:33:02 0.898 17.162
05-26-2011 11:34:01 0.939 17.066
05-26-2011 11:35:02 0.937 17.184
05-26-2011 11:36:01 0.906 17.202
05-26-2011 11:37:02 0.964 17.038
05-26-2011 11:38:03 0.852 17.162
05-26-2011 11:39:02 0.806 17.428
05-26-2011 11:40:03 0.709 17.316
05-26-2011 11:41:01 0.809 17.260
05-26-2011 11:42:02 0.892 17.200
05-26-2011 11:43:01 0.832 17.240
05-26-2011 11:44:02 0.847 17.256
05-26-2011 11:45:01 0.842 17.216
05-26-2011 11:46:02 0.880 17.200
05-26-2011 11:47:01 0.864 17.287
05-26-2011 11:48:02 0.849 17.108
05-26-2011 11:49:01 0.898 17.096
05-26-2011 11:50:02 0.792 17.213
05-26-2011 11:51:03 0.545 17.484
05-26-2011 11:52:02 0.673 17.373
05-26-2011 11:53:03 0.726 17.346
05-26-2011 11:54:01 0.846 17.243
05-26-2011 11:55:02 0.884 17.542
05-26-2011 11:56:01 0.699 17.217
05-26-2011 11:57:02 0.711 17.299
Run Averages      O2      CO2
                  %      %
05-26-2011 11:57:51 0.922 17.029
Operator:          JF
Plant Name:        Citgo
Location:          B-Cat
Test Run 3 End

```

Final System Bias Check, Run 3 S A Version 3.01

Operator: JP  
 Plant Name: Catgo  
 Location: E-Cat  
 Reference Cylinder Numbers  
 Zero Span  
 C2 MC0250888  
 CO2 MC021112

Date/Time	C5-26-2011	12:08:09	PASSED
Analyte	C2	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.123	0.180	
Zero Avg	0.207	0.409	
Zero Bias%	0.4%	1.1%	
Zero Drift%	-0.4%	0.6%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.005	9.796	
Span Avg	10.024	9.825	
Span Bias%	0.1%	0.1%	
Span Drift%	0.2%	2.1%	
Ini Zero Avg	0.317	0.292	
Ini Span Avg	9.916	9.414	
Run Avg	0.922	17.029	
Co	0.262	0.351	
On	10.000	9.619	
Correct Ave	0.674	17.978	
System Bias Check End			

Initial System Bias Check, Run 1     DATA Version 3.31

Operator:            JP  
Plant Name:          CITGO  
Function:            B-10-1

Reference Cylinder Numbers

	Zero	Span
02		XC025088B
002		00177112

Date/Time        05-26-2011        12:20:06        PASSED

Analyte	02	002
Units	%	%
Zero Ref Cyl	0.000	0.000
Zero Cal	0.113	0.180
Zero Avg	0.162	0.419
Zero Bias%	0.2%	1.2%
Span Ref Cyl	9.916	9.991
Span Cal	10.065	9.786
Span Avg	9.942	9.743
Span Bias%	0.6%	0.3%
System Bias Check End		

Test Run 1 STRATA Version 3.01

	O2	CO2
	%	%
Facin calculation for aspartates		
05-26-2011 16:16:02	0.501	17.923
05-26-2011 16:17:03	0.613	17.816
05-26-2011 16:18:02	0.747	17.693
05-26-2011 16:19:03	0.677	17.706
05-26-2011 16:20:02	0.631	17.771
05-26-2011 16:21:03	0.604	17.823
05-26-2011 16:22:02	0.613	17.793
05-26-2011 16:23:03	0.600	17.760
05-26-2011 16:24:02	0.693	17.754
05-26-2011 16:25:02	0.621	17.796
05-26-2011 16:26:01	0.593	17.842
05-26-2011 16:27:03	0.457	18.012
05-26-2011 16:28:03	0.538	17.941
05-26-2011 16:29:02	0.603	17.865
05-26-2011 16:30:03	0.643	17.817
05-26-2011 16:31:02	0.691	17.800
05-26-2011 16:32:03	0.668	17.807
05-26-2011 16:33:02	0.691	17.821
05-26-2011 16:34:03	0.630	17.867
05-26-2011 16:35:02	0.647	17.800
05-26-2011 16:36:03	0.666	17.774
05-26-2011 16:37:02	0.636	17.805
05-26-2011 16:38:02	0.616	17.801
05-26-2011 16:39:01	0.470	17.836
05-26-2011 16:40:02	0.368	17.952
05-26-2011 16:41:03	0.526	17.841
05-26-2011 16:42:02	0.629	17.800
05-26-2011 16:43:03	0.623	17.802
05-26-2011 16:44:02	0.636	17.779
05-26-2011 16:45:03	0.584	17.841
05-26-2011 16:46:02	0.654	17.784
05-26-2011 16:47:03	0.477	17.730
05-26-2011 16:48:02	0.626	17.809
05-26-2011 16:49:03	0.657	17.805
05-26-2011 16:50:02	0.539	17.855
05-26-2011 16:51:02	0.609	17.960
05-26-2011 16:52:01	0.455	17.948
05-26-2011 16:53:02	0.511	17.898
05-26-2011 16:54:03	0.514	17.869
05-26-2011 16:55:02	0.608	17.822
05-26-2011 16:56:03	0.589	17.849
05-26-2011 16:57:02	0.589	17.863
05-26-2011 16:58:03	0.607	17.875
05-26-2011 16:59:02	0.614	17.925
05-26-2011 17:00:03	0.595	17.852
05-26-2011 17:01:02	0.576	17.832
05-26-2011 17:02:03	0.450	17.824
05-26-2011 17:03:02	0.570	17.875
05-26-2011 17:04:02	0.430	18.019
05-26-2011 17:05:01	0.550	17.908
05-26-2011 17:06:02	0.590	17.836
05-26-2011 17:07:03	0.661	17.759
05-26-2011 17:08:02	0.614	17.771
05-26-2011 17:09:03	0.601	17.821
05-26-2011 17:10:02	0.617	17.812
05-26-2011 17:11:03	0.581	17.932
05-26-2011 17:12:02	0.511	17.871
05-26-2011 17:13:03	0.496	17.913
05-26-2011 17:14:02	0.541	17.924
05-26-2011 17:15:03	0.455	17.991
05-26-2011 17:16:02	0.341	18.011
05-26-2011 17:17:02	0.410	17.984
05-26-2011 17:18:01	0.547	17.931
05-26-2011 17:19:02	0.602	17.891
05-26-2011 17:20:03	0.556	17.849
05-26-2011 17:21:02	0.537	17.820
05-26-2011 17:22:03	0.602	17.803
05-26-2011 17:23:02	0.593	17.812
05-26-2011 17:24:03	0.566	17.827
05-26-2011 17:25:02	0.578	17.853
05-26-2011 17:26:03	0.626	17.839
05-26-2011 17:27:02	0.506	17.973
05-26-2011 17:28:03	0.474	17.930
05-26-2011 17:29:02	0.552	17.887
05-26-2011 17:30:02	0.653	17.830
05-26-2011 17:31:01	0.572	17.817
05-26-2011 17:32:02	0.706	17.764
05-26-2011 17:33:03	0.655	17.795
05-26-2011 17:34:02	0.579	17.835
05-26-2011 17:35:03	0.663	17.782
05-26-2011 17:36:02	0.701	17.767
05-26-2011 17:37:03	0.700	17.730
05-26-2011 17:38:02	0.692	17.768
05-26-2011 17:39:03	0.502	17.900
05-26-2011 17:40:02	0.547	17.908

05-26-2011 17:41:03	0.607	17.851
05-26-2011 17:42:02	0.751	17.737
05-26-2011 17:43:02	0.768	17.95
05-26-2011 17:44:02	0.655	17.88
05-26-2011 17:45:02	0.780	17.675
05-26-2011 17:46:03	0.649	17.756
05-26-2011 17:47:02	0.766	17.720
05-26-2011 17:48:02	0.702	17.785
05-26-2011 17:49:02	0.759	17.763
05-26-2011 17:50:03	0.723	17.742
05-26-2011 17:51:02	0.609	17.866
End Pause		
05-26-2011 18:03:03	0.561	17.913
05-26-2011 18:04:02	0.488	17.989
05-26-2011 18:05:02	0.645	17.855
05-26-2011 18:06:02	0.795	17.716
05-26-2011 18:07:03	0.743	17.720
05-26-2011 18:08:02	0.685	17.741
05-26-2011 18:09:02	0.602	17.788
05-26-2011 18:10:02	0.702	17.739
05-26-2011 18:11:02	0.739	17.767
05-26-2011 18:12:01	0.714	17.770
05-26-2011 18:13:02	0.704	17.788
05-26-2011 18:14:03	0.707	17.743
05-26-2011 18:15:02	0.576	17.883
05-26-2011 18:16:03	0.534	17.889
05-26-2011 18:17:02	0.675	17.878
05-26-2011 18:18:03	0.697	17.785
05-26-2011 18:19:02	0.741	17.762
05-26-2011 18:20:03	0.807	17.721
05-26-2011 18:21:02	0.760	17.741
05-26-2011 18:22:02	0.722	17.780

```

Test Run 1 STRATA Version 3.01
      02      002
      %      %
05-26-2011 18:24:03 0.750 17.740
05-26-2011 18:25:02 0.835 17.688
05-26-2011 18:26:02 0.742 17.743
05-26-2011 18:27:01 0.682 17.681
05-26-2011 18:28:02 0.513 17.918
05-26-2011 18:29:01 0.666 17.790
05-26-2011 18:30:02 0.720 17.716
05-26-2011 18:31:02 0.602 17.732
05-26-2011 18:32:02 0.716 17.722
05-26-2011 18:33:03 0.705 17.746
05-26-2011 18:34:02 0.817 17.703
05-26-2011 18:35:03 0.626 17.680
05-26-2011 18:36:02 0.769 17.697
05-26-2011 18:37:03 0.814 17.682
05-26-2011 18:38:02 0.745 17.703
05-26-2011 18:39:03 0.626 17.640
05-26-2011 18:40:01 0.629 17.882
05-26-2011 18:41:02 0.693 17.829
05-26-2011 18:42:01 0.700 17.792
05-26-2011 18:43:02 0.700 17.726
05-26-2011 18:44:03 0.754 17.727
05-26-2011 18:45:02 0.748 17.726
05-26-2011 18:46:03 0.772 17.705
05-26-2011 18:47:02 0.794 17.704
05-26-2011 18:48:03 0.802 17.719
05-26-2011 18:49:02 0.802 17.714
05-26-2011 18:50:03 0.862 17.662
05-26-2011 18:51:02 0.728 17.762
05-26-2011 18:52:02 0.568 17.001
05-26-2011 18:53:01 0.693 17.745
05-26-2011 18:54:02 0.786 17.705
05-26-2011 18:55:01 0.727 17.681
05-26-2011 18:56:02 0.866 17.601
05-26-2011 18:57:03 0.847 17.631
05-26-2011 18:58:02 0.856 17.651
05-26-2011 18:59:02 0.800 17.661
05-26-2011 19:00:02 0.851 17.671
05-26-2011 19:01:03 0.953 17.558
05-26-2011 19:02:02 0.839 17.664
05-26-2011 19:03:02 0.702 17.822
05-26-2011 19:04:02 0.592 17.921
05-26-2011 19:05:02 0.835 17.690
05-26-2011 19:06:01 0.805 17.675
05-26-2011 19:07:02 0.804 17.880
05-26-2011 19:08:01 0.881 17.616
05-26-2011 19:09:02 0.850 17.619
05-26-2011 19:10:03 0.850 17.613
05-26-2011 19:11:02 0.894 17.632
05-26-2011 19:12:03 0.850 17.640
05-26-2011 19:13:02 0.847 17.649
05-26-2011 19:14:03 0.094 17.596
05-26-2011 19:15:02 0.778 17.718
05-26-2011 19:16:03 0.653 17.824
05-26-2011 19:17:02 0.842 17.690
05-26-2011 19:18:02 0.837 17.674
05-26-2011 19:19:01 0.992 17.641
05-26-2011 19:20:02 1.010 17.571
05-26-2011 19:21:01 0.955 17.573
Run Averages      02      002
      %      %
05-26-2011 19:21:24 0.712 17.753
Operator:          JS
Plant Name:        Citgo
Location:          West
Test Run 1 End

```

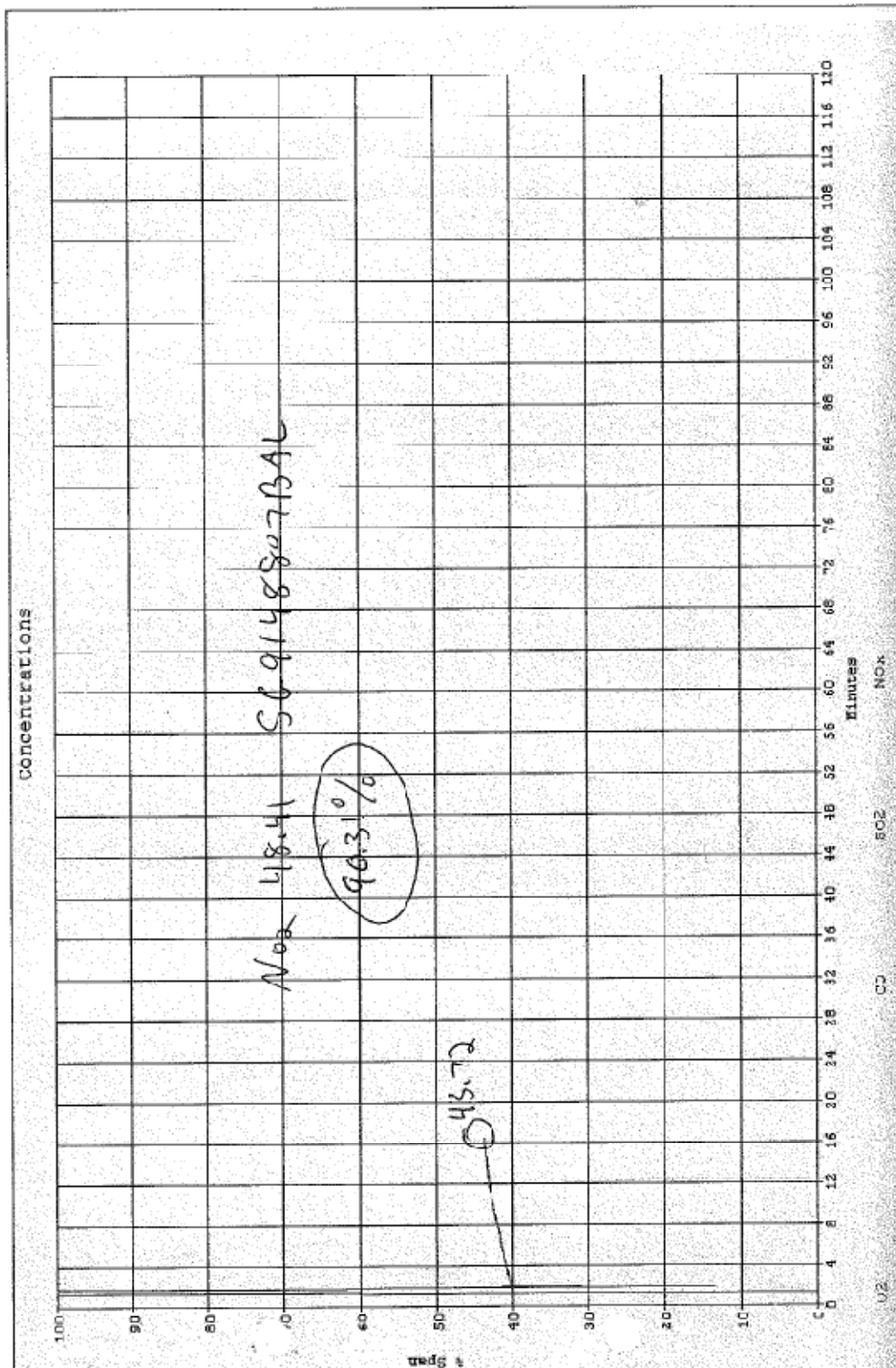


Final System Bias Check, Run 1 S 'A Version 3.01

Operator: JP  
Plant Name: Citgo

Reference Cylinder Numbers  
Zero Span  
Q2 XC025088B  
Q02 00000000

Date/Time	(5-26-2011	19:29:01	PASSED
Analyte	CO	CO2	
Units	%	%	
Zero Ref Cyl	0.000	0.000	
Zero Cal	0.113	0.180	
Zero Avg	0.272	0.526	
Zero Bias	0.6%	1.7%	
Zero Drift	0.7%	0.5%	
Span Ref Cyl	9.936	9.991	
Span Cal	10.004	9.766	
Span Avg	10.026	9.915	
Span Bias	0.1%	0.6%	
Span Drift	0.3%	0.5%	
Ini Zero Avg	0.162	0.419	
Ini Span Avg	9.842	9.744	
Run Avg	0.712	17.783	
Co	0.217	0.472	
CO2	9.984	9.829	
Correct Avg	0.503	18.452	
System Bias Check End			



Calibration Error Test, Run 1 STI Version 3.01

Operator: JP  
Plant Name: Citgo

Reference Cylinder Numbers  
Zero Low-range Mid-range High-range  
C2 KC025088B Ambient Air  
00000000 00000000

Date/Time 05-27-2011 08:17:45 PASSED

Analyte	C2	CC2
Units	%	%
Zero Ref Cyl	0.000	0.000
Zero Avg	0.065	0.230
Zero Error%	0.3%	1.2%
Low Ref Cyl		
Low Avg		
Low Error%		
Mid Ref Cyl	9.936	9.901
Mid Avg	10.116	9.824
Mid Error%	0.1%	0.0%
High Ref Cyl	20.900	18.930
High Avg	21.008	18.904
High Error%	0.4%	0.1%

Initial System Bias Check, Run 2, VTA Version 3.01

Operator: JP  
Plant Name: Citgo

Reference Cylinder Numbers

02 Zero Span  
X025088B  
00000000

Date/Time 05-27-2011 08:25:24 PASSED

Analyte	02	CO2
Units	%	%
Zero Ref Cyl	0.000	0.000
Zero Cal	0.005	0.250
Zero Avg	0.202	0.313
Zero Bias%	0.5%	0.7%
Span Ref Cyl	9.936	9.951
Span Cal	10.116	9.624
Span Avg	9.990	9.450
Span Bias%	0.1%	1.1%
Span DRILL%		
System Bias Check End		

Test Run STRATA Version 3.01

02

002

Basic calculation run averages

05-27-2011 12:09:08	0.844	17.087
05-27-2011 12:10:09	0.843	17.109
05-27-2011 12:11:08	0.914	17.076
05-27-2011 12:12:08	0.747	17.100
05-27-2011 12:13:08	1.010	17.022
05-27-2011 12:14:09	0.817	17.133
05-27-2011 12:15:08	0.517	17.372
05-27-2011 12:16:08	0.713	17.100
05-27-2011 12:17:08	0.752	17.159
05-27-2011 12:18:09	0.906	17.067
05-27-2011 12:19:08	0.674	17.056
05-27-2011 12:20:08	0.680	17.010
05-27-2011 12:21:09	0.867	17.005
05-27-2011 12:22:08	0.814	17.063
05-27-2011 12:23:09	0.005	17.031
05-27-2011 12:24:08	0.799	17.155
05-27-2011 12:25:09	0.837	17.127
05-27-2011 12:26:08	0.674	17.246
05-27-2011 12:27:09	0.554	17.335
05-27-2011 12:28:08	0.750	17.104
05-27-2011 12:29:09	0.865	17.074
05-27-2011 12:30:08	0.859	17.048
05-27-2011 12:31:09	0.801	17.098
05-27-2011 12:32:08	0.752	17.145
05-27-2011 12:33:09	0.788	17.125
05-27-2011 12:34:09	0.831	17.093
05-27-2011 12:35:08	0.803	17.071
05-27-2011 12:36:08	0.770	17.002
05-27-2011 12:37:08	0.742	17.126
05-27-2011 12:38:09	0.585	17.275
05-27-2011 12:39:08	0.602	17.310
05-27-2011 12:40:08	0.540	17.322
05-27-2011 12:41:08	0.767	17.119
05-27-2011 12:42:09	0.772	17.094
05-27-2011 12:43:08	0.802	17.083
05-27-2011 12:44:08	0.855	17.075
05-27-2011 12:45:08	0.912	17.014
05-27-2011 12:46:09	0.897	17.011
05-27-2011 12:47:09	0.870	17.034
05-27-2011 12:48:08	0.880	16.944
05-27-2011 12:49:09	0.944	16.976
05-27-2011 12:50:08	0.808	17.090
05-27-2011 12:51:09	0.630	17.234
05-27-2011 12:52:08	0.878	17.025
05-27-2011 12:53:09	0.798	17.045
05-27-2011 12:54:08	0.852	17.041
05-27-2011 12:55:09	0.944	16.968
05-27-2011 12:56:08	0.802	16.900
05-27-2011 12:57:09	0.862	17.022
05-27-2011 12:58:08	0.799	17.067
05-27-2011 12:59:09	0.826	17.060
05-27-2011 13:00:08	0.824	17.048
05-27-2011 13:01:08	0.712	17.104
05-27-2011 13:02:09	0.578	17.262
05-27-2011 13:03:08	0.691	17.331
05-27-2011 13:04:08	0.577	17.228
05-27-2011 13:05:08	0.700	17.158
05-27-2011 13:06:09	0.720	17.130
05-27-2011 13:07:08	0.751	17.133
05-27-2011 13:08:08	0.747	17.145
05-27-2011 13:09:08	0.831	17.060
05-27-2011 13:10:09	0.753	17.090
05-27-2011 13:11:08	0.826	17.050
05-27-2011 13:12:09	0.541	17.109
05-27-2011 13:13:09	0.679	17.174
05-27-2011 13:14:08	0.507	17.285
05-27-2011 13:15:09	0.329	17.458
05-27-2011 13:16:08	0.701	17.222
05-27-2011 13:17:09	0.578	17.228
05-27-2011 13:18:08	0.634	17.214
05-27-2011 13:19:09	0.589	17.249
05-27-2011 13:20:08	0.654	17.192
05-27-2011 13:21:09	0.705	17.155
05-27-2011 13:22:08	0.592	17.226
05-27-2011 13:23:09	0.620	17.230
05-27-2011 13:24:08	0.627	17.228
05-27-2011 13:25:09	0.533	17.268
05-27-2011 13:26:08	0.440	17.350
05-27-2011 13:27:08	0.212	17.460
05-27-2011 13:28:08	0.508	17.242
05-27-2011 13:29:08	0.513	17.328
05-27-2011 13:30:09	0.461	17.316
05-27-2011 13:31:08	0.532	17.303
05-27-2011 13:32:08	0.414	17.242
05-27-2011 13:33:08	0.580	17.282

05-27-2011 13:34:09	0.594	17.265
05-27-2011 13:35:00	0.492	17.321
05-27-2011 13:36:09	0.566	17.77
05-27-2011 13:37:00	0.500	17.00
05-27-2011 13:38:09	0.499	17.326
05-27-2011 13:39:09	0.418	17.403
05-27-2011 13:40:08	0.664	17.221
05-27-2011 13:41:00	0.661	17.160
05-27-2011 13:42:08	0.710	17.156
05-27-2011 13:43:09	0.730	17.113
05-27-2011 13:44:08	0.731	17.129
05-27-2011 13:45:00	0.906	17.150
05-27-2011 13:46:08	0.798	17.071
05-27-2011 13:47:09	0.725	17.115
05-27-2011 13:48:08	0.683	17.162
05-27-2011 13:49:00	0.600	17.000
05-27-2011 13:50:08	0.539	17.276
05-27-2011 13:51:09	0.501	17.356
05-27-2011 13:52:09	0.713	17.158
05-27-2011 13:53:00	0.701	17.000
05-27-2011 13:54:09	0.672	17.013
05-27-2011 13:55:08	0.794	17.060
05-27-2011 13:56:09	0.856	17.024
05-27-2011 13:57:00	0.883	17.000
05-27-2011 13:58:09	0.978	16.942
05-27-2011 13:59:08	0.922	16.950
05-27-2011 14:00:09	0.347	16.946
05-27-2011 14:01:00	1.000	16.000
05-27-2011 14:02:09	0.904	17.001
05-27-2011 14:03:08	0.676	17.173
05-27-2011 14:04:09	0.902	16.986
05-27-2011 14:05:00	1.000	16.000
05-27-2011 14:06:09	1.000	16.000

Page 1

```

Test Run 1 STRATA Version 3.01
      02      02
      %      %
05-27-2011 14:05:00 0.957 16.830
05-27-2011 14:06:00 0.984 16.806
05-27-2011 14:09:09 1.125 16.817
05-27-2011 14:10:00 1.107 16.761
05-27-2011 14:11:00 1.111 16.800
05-27-2011 14:12:00 1.153 16.755
05-27-2011 14:13:09 1.072 16.808
05-27-2011 14:14:00 1.062 16.860
05-27-2011 14:15:00 0.996 16.878
05-27-2011 14:16:00 1.030 16.862
05-27-2011 14:17:09 1.036 16.822
05-27-2011 14:18:00 1.142 16.727
05-27-2011 14:19:00 0.992 16.874
05-27-2011 14:20:00 1.099 16.775
05-27-2011 14:21:00 1.059 16.806
05-27-2011 14:22:00 1.109 16.794
05-27-2011 14:23:00 1.100 16.768
05-27-2011 14:24:09 1.175 16.705
05-27-2011 14:25:00 1.095 16.755
05-27-2011 14:26:09 1.005 16.876
05-27-2011 14:27:00 0.967 16.844
05-27-2011 14:28:09 1.011 16.896
05-27-2011 14:29:00 1.141 16.718
05-27-2011 14:30:00 0.947 16.846
05-27-2011 14:31:00 0.978 16.803
05-27-2011 14:32:09 0.990 16.835
05-27-2011 14:33:00 0.952 16.888
05-27-2011 14:34:00 1.011 16.861
05-27-2011 14:35:00 0.987 16.890
05-27-2011 14:36:00 1.016 16.858
05-27-2011 14:37:09 0.878 16.941
05-27-2011 14:38:00 0.827 17.064
05-27-2011 14:39:00 0.662 17.175
05-27-2011 14:40:00 0.768 17.047
05-27-2011 14:41:09 0.912 16.965
05-27-2011 14:42:00 0.888 16.940
05-27-2011 14:43:00 0.817 16.997
05-27-2011 14:44:00 0.871 16.976
05-27-2011 14:45:09 0.981 16.865
05-27-2011 14:46:00 0.883 16.913
05-27-2011 14:47:00 0.879 16.956
05-27-2011 14:48:09 0.884 16.971
05-27-2011 14:49:00 0.876 16.971
Run Averages      02      02
      %      %
05-27-2011 14:49:31 0.801 17.069
Operator:      JP
Plant Name:    Citgo
Location:      B-Coff
Test Run 1 End

```

Final System Bias Check, Run 37 Version 3.01  
 Operator: JP  
 Plant Name: Citgo

Reference Cylinder Numbers  
 Zero Span  
 C2 XC0250088

Date/Time 05-27-2011 14:56:36 PASSED  
 Analyte C2 C02  
 Units % %  
 Zero Def Cyl 0.000 0.000  
 Zero Cal 0.085 0.230  
 Zero Avg 0.105 0.372  
 Zero Bias% 0.1% 0.7%  
 Span Def Cyl 9.936 9.991  
 Span Cal 10.116 9.024  
 Span Avg 9.900 9.586  
 Span Bias% -0.4% 0.5%  
 Tri Zero Avg 0.202 0.373  
 Tri Span Avg 9.460 9.490  
 Run Avg 0.801 17.069  
 Co 0.152 0.373  
 Cn 9.945 9.543  
 Correct Run 0.450 18.101  
 System Bias Check Pass



Test Run 3 STRATA Version 3.01  
 02

Run	Calculation	Run	Average
05-27-2011	14:59:04	0.853	16.943
05-27-2011	15:00:05	0.900	16.924
05-27-2011	15:01:04	0.609	16.994
05-27-2011	15:02:05	0.634	16.984
05-27-2011	15:03:04	0.550	17.146
05-27-2011	15:04:05	0.755	16.986
05-27-2011	15:05:04	0.709	16.905
05-27-2011	15:06:05	0.775	16.915
05-27-2011	15:07:04	0.700	16.907
05-27-2011	15:08:05	0.718	16.916
05-27-2011	15:09:03	0.651	16.947
05-27-2011	15:10:04	0.674	16.941
05-27-2011	15:11:05	0.734	16.911
05-27-2011	15:12:04	0.650	16.946
05-27-2011	15:13:05	0.695	16.923
05-27-2011	15:14:04	0.687	16.947
05-27-2011	15:15:05	0.377	17.205
05-27-2011	15:16:04	0.575	17.050
05-27-2011	15:17:05	0.604	16.994
05-27-2011	15:18:04	0.640	17.001
05-27-2011	15:19:05	0.571	17.006
05-27-2011	15:20:04	0.534	17.040
05-27-2011	15:21:05	0.623	17.018
05-27-2011	15:22:04	0.632	16.966
05-27-2011	15:23:05	0.453	17.083
05-27-2011	15:24:04	0.580	17.031
05-27-2011	15:25:05	0.582	17.027
05-27-2011	15:26:04	0.444	17.102
05-27-2011	15:27:05	0.331	17.220
05-27-2011	15:28:04	0.450	17.139
05-27-2011	15:29:05	0.474	17.088
05-27-2011	15:30:04	0.593	17.030
05-27-2011	15:31:05	0.567	17.026
05-27-2011	15:32:04	0.494	17.037
05-27-2011	15:33:05	0.476	17.088
05-27-2011	15:34:04	0.580	17.067
05-27-2011	15:35:05	0.541	17.072
05-27-2011	15:36:04	0.509	17.076
05-27-2011	15:37:05	0.491	17.089
05-27-2011	15:38:04	0.517	17.102
05-27-2011	15:39:05	0.298	17.241
05-27-2011	15:40:04	0.420	17.129
05-27-2011	15:41:05	0.488	17.101
05-27-2011	15:42:04	0.617	17.012
05-27-2011	15:43:05	0.563	17.025
05-27-2011	15:44:04	0.486	17.062
05-27-2011	15:45:05	0.499	17.083
05-27-2011	15:46:04	0.515	17.011
05-27-2011	15:47:05	0.663	16.958
05-27-2011	15:48:04	0.711	16.928
05-27-2011	15:49:05	0.743	16.906
05-27-2011	15:50:04	0.592	16.985
05-27-2011	15:51:05	0.396	17.168
05-27-2011	15:52:04	0.559	17.053
05-27-2011	15:53:05	0.685	16.959
05-27-2011	15:54:04	0.640	16.962
05-27-2011	15:55:05	0.661	16.961
05-27-2011	15:56:04	0.652	16.966
05-27-2011	15:57:05	0.856	16.040
05-27-2011	15:58:04	0.572	16.922
05-27-2011	15:59:05	0.632	16.982
05-27-2011	16:00:04	0.713	16.926
05-27-2011	16:01:05	0.704	16.789
05-27-2011	16:02:04	0.627	16.822
05-27-2011	16:03:05	0.425	17.058
05-27-2011	16:04:04	0.531	17.016
05-27-2011	16:05:05	0.586	17.005
05-27-2011	16:06:04	0.522	17.022
05-27-2011	16:07:05	0.646	16.972
05-27-2011	16:08:04	0.670	16.993
05-27-2011	16:09:05	0.730	16.962
05-27-2011	16:10:04	0.642	17.010
05-27-2011	16:11:05	0.741	16.938
05-27-2011	16:12:04	0.614	16.996
05-27-2011	16:13:05	0.809	16.893
05-27-2011	16:14:04	0.685	16.962
05-27-2011	16:15:05	0.407	17.172
05-27-2011	16:16:04	0.606	17.034
05-27-2011	16:17:05	0.846	16.863
05-27-2011	16:18:04	0.952	16.812
05-27-2011	16:19:05	0.743	16.003
05-27-2011	16:20:04	0.751	16.890
05-27-2011	16:21:05	0.873	16.835
05-27-2011	16:22:04	0.912	16.888
05-27-2011	16:23:05	0.924	16.853

05-27-2011 16:24:05	0.770	16.886
05-27-2011 16:25:04	0.857	16.850
05-27-2011 16:26:05	0.735	16.819
End Pause		
05-27-2011 16:32:04	0.886	16.819
05-27-2011 16:33:05	0.786	16.856
05-27-2011 16:34:05	0.887	16.782
05-27-2011 16:35:05	0.958	16.759
05-27-2011 16:36:04	0.843	16.834
05-27-2011 16:37:05	0.961	16.752
05-27-2011 16:38:05	0.887	16.786
05-27-2011 16:39:05	0.699	16.875
05-27-2011 16:40:03	0.865	16.832
05-27-2011 16:41:04	0.899	16.775
05-27-2011 16:42:05	0.886	16.819
05-27-2011 16:43:04	0.996	16.720
05-27-2011 16:44:05	0.962	16.728
05-27-2011 16:45:04	1.040	16.665
05-27-2011 16:46:05	0.853	16.730
05-27-2011 16:47:04	1.053	16.664
05-27-2011 16:48:05	1.022	16.687
05-27-2011 16:49:04	1.078	16.632
05-27-2011 16:50:05	1.000	16.673
05-27-2011 16:51:04	0.745	16.946
05-27-2011 16:52:05	0.923	16.771
05-27-2011 16:53:03	1.003	16.641
05-27-2011 16:54:04	1.000	16.681
05-27-2011 16:55:05	1.057	16.673
05-27-2011 16:56:04	1.078	16.698
05-27-2011 16:57:05	1.110	16.618
05-27-2011 16:58:05	1.055	16.640
05-27-2011 16:59:05	1.070	16.621

Date 7

```

Test Run 2 STRATA Version 3.01
02 02
%
05-27-2011 17:01:05 1.152 16.534
05-27-2011 17:02:04 1.022 16.633
05-27-2011 17:03:05 0.786 16.881
05-27-2011 17:04:05 0.988 16.647
05-27-2011 17:06:04 1.197 16.477
05-27-2011 17:07:05 0.886 16.535
05-27-2011 17:08:05 1.099 16.549
05-27-2011 17:10:03 1.002 16.623
05-27-2011 17:11:04 1.010 16.623
05-27-2011 17:13:04 0.934 16.658
05-27-2011 17:14:05 0.983 16.620
05-27-2011 17:15:04 0.505 16.954
05-27-2011 17:17:05 0.722 16.672
05-27-2011 17:17:04 0.782 16.792
05-27-2011 17:18:05 0.860 16.740
05-27-2011 17:19:04 0.803 16.796
05-27-2011 17:20:05 0.870 16.741
05-27-2011 17:21:03 0.821 16.791
05-27-2011 17:22:04 0.883 16.766
05-27-2011 17:23:03 0.834 16.783
05-27-2011 17:24:04 0.824 16.780
05-27-2011 17:25:05 0.812 16.757
05-27-2011 17:26:04 0.718 16.860
05-27-2011 17:27:05 0.531 17.042
05-27-2011 17:28:04 0.596 17.000
05-27-2011 17:29:05 0.735 16.881
05-27-2011 17:30:04 0.711 16.821
05-27-2011 17:31:05 0.746 16.742
05-27-2011 17:32:04 0.785 16.745
05-27-2011 17:33:05 0.692 16.815
05-27-2011 17:34:03 0.702 16.856
05-27-2011 17:35:04 0.783 16.800
05-27-2011 17:36:05 0.582 16.960
05-27-2011 17:37:04 0.717 16.004
05-27-2011 17:38:05 0.711 16.882
05-27-2011 17:39:04 0.392 17.085
05-27-2011 17:40:05 0.680 16.880
05-27-2011 17:41:04 0.703 16.889
05-27-2011 17:42:05 0.587 16.974
05-27-2011 17:43:04 0.735 16.925
05-27-2011 17:44:05 0.723 16.880
05-27-2011 17:45:04 0.622 16.898
05-27-2011 17:46:05 0.652 16.886
05-27-2011 17:47:03 0.709 16.852
05-27-2011 17:48:04 0.600 16.833
05-27-2011 17:49:03 0.711 16.856
05-27-2011 17:50:04 0.751 16.851
05-27-2011 17:51:05 0.443 17.068
05-27-2011 17:52:04 0.440 16.845
05-27-2011 17:53:05 0.686 16.858
05-27-2011 17:54:04 0.707 16.829
05-27-2011 17:55:05 0.691 16.831
05-27-2011 17:56:04 0.755 16.799
05-27-2011 17:57:05 0.675 16.808
05-27-2011 17:58:04 0.762 16.917
05-27-2011 17:59:05 0.817 17.084
Run Averages 02 002
%
05-27-2011 17:59:05 0.730 16.892
Operator: JP
Plant Name: C-100
Location: B-Cat
Test Run 2 End

```

Final System Bias Check, Run 2 ST Version 3.01  
 Operator: JP  
 Plant Name: Citgo

Reference Cylinder Numbers  
 Zero Span

Q2 NC025088B

Date/Time 05-27-2011 18:06:44 PASSED  
 Analyte Q2 CUZ  
 Units % %  
 Zero Ref Cyl 0.000 0.000  
 Zero Cal 0.005 0.230  
 Zero Avg 0.141 0.446  
 Zero Bias % 0.24 1.14  
 Span Ref Cyl 9.936 9.991  
 Span Cal 10.216 9.024  
 Span Avg 9.968 9.509  
 Span Bias % 0.22 1.44  
 Span Drift % 0.00 -0.43  
 Ini Zero Avg 0.105 0.372  
 Ini Span Avg 9.900 9.506  
 Run Avg 0.730 16.852  
 Co 0.123 0.409  
 Cm 9.904 9.552  
 Percent Low 0.616 18.011  
 SYSTEM BIAS CHECK END

## *Appendix C*

### *Laboratory Reports*

***Enthalpy:***  
***Analytical Report 0411-77***

# **Shaw Environmental, Inc.**

Air Measurements Division - 4171 Essen Lane  
Baton Rouge, LA 70809

**CITGO ICR Testing**  
Project # 142733

**Analytical Report**  
(0411-77)

***EPA CTM 027***  
Ammonia

***EPA Method 8***  
Sulfur Dioxide

***EPA Method 5***  
Particulate Matter

***EPA Method 5B Type***  
Non-Sulfate Particulate Matter

***EPA Method 202***  
Condensable Particulate Matter

***ASTM D5907-90 Type***  
Particulate Matter for Total Dissolved Solids



**Enthalpy Analytical, Inc.**

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

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

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 80 pages.

*Valgena Respass*

QA Review Performed by – Valgena Respass

Report Issued:06/23/2011



EA# 0411-77 Page 2 of 80



# Summary of Results



EA# 0411-77 Page 3 of 80

Company	Shaw Environmental, Inc
Analyst	EO
Parameters	EPA CTM-027

Client #	142733
Job #	0411-77
# Samples	3 Runs

Compound	Sample ID / Catch Weight (ug)		
Ammonia	<i>CTM027-1</i> 4,088	<i>CTM027-2</i> 5,577	<i>CTM027-3</i> 5,390

Company	Shaw Environmental
Analyst	EO
Parameters	EPA Method 8

Client #	142733
Job #	0411-77
# Samples	3 Runs

Compound	Sample ID / Catch Weight (mg)		
	<i>F2 Fuel Gas R1</i>	<i>F2 Fuel Gas R2</i>	<i>F2 Fuel Gas R3</i>
Sulfur Dioxide	1.93	1.95	4.05

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 5

Client #	142733
Job #	0411-77
# Samples	3 Runs, Blanks

Compound	Sample ID / Particulate Matter (PM) Weight (mg)		
	<b>052611-5-1</b>	<b>052711-5-2</b>	<b>052711-5-3</b>
	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>
Net Filter Catch	19.5	28.6	26.2
Net Front Rinse	8.6	5.9	6.1
Total Particulate	28.1	34.5	32.3
	<b>052711-5-BL</b>		
	<b>Reagent Blank</b>		
Net Filter Catch	1.5		

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 5B Type

Client #	142733
Job #	0411-77
# Samples	3 Runs, Blanks

Compound	Sample ID / Non-sulfate Particulate Matter (PM) Weight (mg)		
	<b>052611-5-1</b>	<b>052711-5-2</b>	<b>052711-5-3</b>
	<i>Run 1</i>	<i>Run 2</i>	<i>Run 3</i>
Net Filter Catch	10.4	21.0	19.2
Net Front Rinse	8.5	5.4	5.6
Non-sulfate PM	18.9	26.4	24.8
	<b>052711-5-BL</b>		
	<i>Reagent Blank</i>		
Net Filter Catch	0.2		

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	142733
Job #	0411-77
# Samples	3 Runs, Blanks

Compound	Sample ID / Condensable Particulate Matter (CPM) Weight (mg)		
	<b>052611-202-1</b>	<b>052711-202-2</b>	<b>052711-202-3</b>
	<i>Run 1</i>	<i>Run 2</i>	<i>Run 3</i>
Net Organic Catch	4.6	4.0	7.5
Corrected Inorganic	20.5	14.0	13.5
TB Corrected CPM	23.1	16.0	19.0
	<b>052711-202-BL</b>		
	<i>Proof Blank</i>		
Net Organic Catch	2.5		
Corrected Inorganic	16.9		
Non-TB Corrected CPM	19.4		
	<b>052711-202-FTRB-BL</b>		
	<i>Train Blank</i>		
Organic Catch	2.3	If Train Blank Corrected CPM is >2.0 mg, then sample correction is 2.0 mg.	
Inorganic Catch	1.7		
CPM	4.1		

Company	Shaw Environmental
Analyst	KTH
Parameters	ASTM 5907

Client #	142733
Job #	0411-77
# Samples	3 Runs

Fraction	Sample ID / Particulate Catch Weight (mg)		
Net Particulate	<i>052611-SW-1</i> 10,551.4	<i>052711-SW-2</i> 10,391.4	<i>052711-SW-3</i> 10,860.4

# Results



EA# 0411-77 Page 10 of 80



Company	Shaw Environmental, Inc
Analyst	EO
Parameters	EPA CTM-027

Client #	142733
Job #	0411-77
# Samples	3 Runs

MDL 0.0118 (ug/mL) Lower Curve Limit 0.235 (ug/mL)  
 LOQ 0.235 (ug/mL) Upper Curve Limit 11.1 (ug/mL)  
 Compound Ammonia

Sample ID	Lab ID # 1	Lab ID # 2	Analysis Method	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
CTM027-1/2-1	050-1001.D	050-1002.D	HPLC59PG98.M	4.74	4.74	0.1	1.62	1.61	0.1	1.62	4	630	4,070	
CTM027-3-1	053-1301.D	053-1302.D	HPLC59PG98.M	4.71	4.72	0.2	0.133	0.137	1.6	0.135	1	132	17.8	J
													4,088	
CTM027-1/2-2	054-1401.D	054-1402.D	HPLC59PG98.M	4.74	4.73	0.1	1.88	1.88	0.1	1.88	4	730	5,483	
CTM027-3-2	055-1501.D	055-1502.D	HPLC59PG98.M	4.71	4.71	0.1	0.719	0.724	0.4	0.722	1	130	93.8	
													5,577	
CTM027-1/2-3	056-1601.D	056-1602.D	HPLC59PG98.M	4.74	4.74	0.0	1.85	1.86	0.1	1.85	4	725	5,377	
CTM027-3-3	057-1701.D	057-1702.D	HPLC59PG98.M	4.71	4.71	0.1	0.0989	0.101	0.9	0.100	1	130	13.0	J
													5,390	
0.04N H2SO4 RB	049-0901.D	049-0902.D	HPLC59PG98.M	4.72	4.73	0.3	0.0143	0.0141	0.7	0.0142	1	1.00	0.0142	J
MS CTM027-1/2-1	051-1101.D	051-1102.D	HPLC59PG98.M	4.74	4.73	0.2	4.95	4.96	0.1	4.95	1	0.800	3.96	
													Spike Amount (ug)	2.83
													Native Amount (ug)	1.24
													Spike Recovery (%)	96.0%
MSD CTM027-1/2-1	052-1201.D	052-1202.D	HPLC59PG98.M	4.75	4.74	0.2	4.95	5.00	0.6	4.98	1	0.800	3.98	
													Spike Amount (ug)	2.83
													Native Amount (ug)	1.24
													Spike Recovery (%)	96.7%
HPLC59pg98 #SS	040-0801.D	040-0802.D	HPLC59PG98.M	4.75	4.75	0.1	5.40	5.40	0.0	5.40	1	1.00	5.40	
													Spike Amount (ug)	5.55
													Spike Recovery (%)	97.2%

0411-77 res 27

EA# 0411-77 Page 11 of 80

6/23/2011

Company	Shaw Environmental
Analyst	EO
Parameters	EPA Method 8

Client #	142733
Job #	0411-77
# Samples	3 Runs

MDL 0.06  
Blank titrant amount (Vtb) 0.05  
BaCl<sub>2</sub> normality 0.00959

#### Sulfur Dioxide (SO<sub>2</sub>)

Sample ID.	Volume Received (mL)	Titration Aliquot Vol (mL)	1st Titration BaCl <sub>2</sub> Vol (mL)	2nd Titration BaCl <sub>2</sub> Vol (mL)	Average BaCl <sub>2</sub> Vol (mL)	% Difference	Aliquot Factor	Catch Weight SO <sub>2</sub> (mg)
H <sub>2</sub> O <sub>2</sub> Fractions								
F2 Fuel Gas R1	61	5	0.56	0.57	0.57	1.8	12.2	1.93
F2 Fuel Gas R2	63	5	0.56	0.55	0.56	1.8	12.6	1.95
F2 Fuel Gas R3	63	5	1.09	1.10	1.10	0.9	12.6	4.05

**EPA Method 5 - Particulate Determination - Data Analysis**

Company	Shaw Environmental	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	EPA Method 5	# Samples	3 Runs, Blanks

**Analysis of Particulate Recovery**

Sample ID	<i>Run 1</i>		<i>Run 2</i>		<i>Run 3</i>		<i>Reagent Blank</i>	
Filter ID	3630		3629		3633		3634	
Filter tare (g)	0.4635		0.4663		0.4355		0.4378	
Total tare (g)	0.4635	Dates	0.4663	Dates	0.4355	Dates	0.4378	Dates
Final wt. (g) 1st	0.4831	6/9/11	0.4950	6/9/11	0.4618	6/9/11	0.4393	6/9/11
Final wt. (g) 2nd	0.4830	6/13/11	0.4949	6/13/11	0.4617	6/13/11	0.4392	6/13/11
Net filter catch (mg)	19.5		28.6		26.2		1.5	
Beaker number	9765	Dates	9766	Dates	9767	Dates		
Final wt (g) 1st	2.2362	6/9/11	2.2440	6/9/11	2.2456	6/9/11		
Final wt (g) 2nd	2.2362	6/13/11	2.2436	6/13/11	2.2454	6/13/11		
Beaker tare (g)	2.2268		2.2372		2.2390			
Acetone blank (g)	0.0008		0.0006		0.0003			
Acetone vol (mL)	185		138		74			
Net front rinse (mg)	8.6		5.9		6.1			
Total particulate (mg)	28.1		34.5		32.3			

**Blank Acetone Analysis**

Blank beaker number	9768			Dates
Blank volume (mL)	156		Final wt (g) 1st	2.2416 6/9/11
Beaker tare (g)	2.2398		Final wt (g) 2nd	2.2405 6/13/11
Max acetone residue (g)	0.0012		Acetone residue (g)	0.0006

**In-House Blank Acetone Analysis**

Blank beaker number	9777			Dates
Blank volume (mL)	200		Final wt (g) 1st	2.2454 6/15/11 A
Beaker tare (g)	2.2450		Final wt (g) 2nd	2.2454 6/15/11 P
Max acetone residue (g)	0.0016		Acetone residue (g)	0.0004

**EPA Method 5B Type - Non-sulfate Particulate Determination - Data Analysis**

Company	Shaw Environmental	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	EPA Method 5B Type	# Samples	3 Runs, Blanks

**Analysis of Particulate Recovery**

Sample ID	Run 1		Run 2		Run 3		Reagent Blank	
Filter ID	3630		3629		3633		3634	
Filter tare (g)	0.4635		0.4663		0.4355		0.4378	
Total tare (g)	0.4635	Dates	0.4663	Dates	0.4355	Dates	0.4378	Dates
Final wt. (g) 1st	0.4740	6/9/11	0.4873	6/9/11	0.4547	6/9/11	0.4380	6/9/11
Final wt. (g) 2nd	0.4739	6/13/11	0.4873	6/13/11	0.4547	6/13/11	0.4379	6/13/11
Net filter catch (mg)	10.4		21.0		19.2		0.2	
Beaker number	9765	Dates	9766	Dates	9767	Dates		
Final wt (g) 1st	2.2359	6/9/11	2.2430	6/9/11	2.2448	6/9/11		
Final wt (g) 2nd	2.2358	6/13/11	2.2430	6/13/11	2.2447	6/13/11		
Beaker tare (g)	2.2268		2.2372		2.2390			
Acetone blank (g)	0.0005		0.0004		0.0002			
Acetone vol (mL)	185		138		74			
Net front rinse (mg)	8.5		5.4		5.6			
Non-sulfate particulate (mg)	18.9		26.4		24.8			

**Blank Acetone Analysis**

Blank beaker number	9763			Dates
Blank volume (mL)	156	Final wt (g) 1st	2.2403	6/9/11
Beaker tare (g)	2.2398	Final wt (g) 2nd	2.2402	6/13/11
Max acetone residue (g)	0.0012	Acetone residue (g)	0.0004	

**In-House Blank Acetone Analysis**

Blank beaker number	9777			Dates
Blank volume (mL)	200	Final wt (g) 1st	2.2454	6/15/11 A
Beaker tare (g)	2.2450	Final wt (g) 2nd	2.2454	6/15/11 P
Max acetone residue (g)	0.0016	Acetone residue (g)	0.0004	

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	142733
Job #	0411-77
# Samples	2 Runs, Blanks

#### Analysis of Condensible Particulate Recovery

Sample ID Number	Train Blank	Run 1	Run 2	Run 3
<b>Organic</b>				
Beaker Number	9772	9769	9770	9771
Initial Hexane/Acetone Volume, mL	64	134	98	88
Lab Hexane Volume, mL	165	165	165	165
Final Weight, g	2.2401	2.2397	2.2334	2.2523
Reweight, Final, g	2.2401	2.2396	2.2334	2.2523
Beaker Tare, g	2.2378	2.2350	2.2294	2.2445
Net Organic Catch, mg	2.3	4.6	4.0	7.5
<b>Inorganic</b>				
Beaker Number	9848	9845	9846	9847
Final Weight, g	2.2735	2.2364	2.2727	2.2610
Reweight, Final, g	2.2735	2.2363	2.2727	2.2610
Beaker Tare, g	2.2717	2.2157	2.2585	2.2473
Sample H <sub>2</sub> O volume, mL	120	460	510	465
Added H <sub>2</sub> O, Filter Extraction, mL	75	75	75	75
Removed Pre-aliquot, mL	0.5	0.5	0.5	0.5
Pre-aliquot CF	1.003	1.001	1.001	1.001
Resuspended Volume, mL	100.0	100.0	100.0	100.0
Removed Post-aliquot, mL	0.5	0.5	0.5	0.5
Post-aliquot CF	1.01	1.01	1.01	1.01
Net Inorganic, mg	1.9	20.7	14.3	13.8
Ammonium Correction, mg	0.1	0.3	0.2	0.3
Corrected Inorganic, mg	1.7	20.5	14.0	13.5
Condensible Particulate Matter, mg	4.1	25.1	18.0	21.0
TB Corrected CPM, mg		23.1	16.0	19.0

#### Client Blank Analyses

Type Blank	Hexane	Dates	Type Blank	H <sub>2</sub> O Blank	Dates	Type Blank	Acetone	Dates
Beaker Number	9774		Beaker Number	9849		Beaker Number	9773	
Tare weight, g	2.2154	6/7/11	Tare weight, g	2.2659	6/8/11	Tare weight, g	2.2145	6/7/11
Dry Residue Weight, g	2.2161	6/15/11 A	Dry Residue Weight, g	2.2680	6/15/11 A	Dry Residue Weight, g	2.2152	6/15/11 A
Reweight, Final, g	2.2169	6/15/11 P	Reweight, Final, g	2.2679	6/15/11 P	Reweight, Final, g	2.2152	6/15/11 P
Hexane Residue, g	0.0006		Water Residue, g	0.0021		Acetone Residue, g	0.0007	
Hexane Volume, mL	208		Water Volume, mL	210		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0020		Max. Water Residue, g	0.0021		Max. Acetone Residue, g	0.0016	

#### In-House Blank Analyses

Type Blank	Hexane	Dates	Type Blank	H <sub>2</sub> O Blank	Dates	Type Blank	Acetone	Dates
Beaker Number	9776		Beaker Number	9851		Beaker Number	9777	
Tare weight, g	2.2348	6/7/11	Tare weight, g	2.2585	6/8/11	Tare weight, g	2.2450	6/7/11
Dry Residue Weight, g	2.2352	6/15/11 A	Dry Residue Weight, g	2.2595	6/15/11 A	Dry Residue Weight, g	2.2454	6/15/11 A
Reweight, Final, g	2.2351	6/15/11 P	Reweight, Final, g	2.2595	6/15/11 P	Reweight, Final, g	2.2454	6/15/11 P
Hexane Residue, g	0.0003		Water Residue, g	0.0010		Acetone Residue, g	0.0004	
Hexane Volume, mL	225		Water Volume, mL	230		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0022		Max. Water Residue, g	0.0025		Max. Acetone Residue, g	0.0016	

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	142733
Job #	0411-77
# Samples	2 Runs, Blanks

#### Analysis of Condensible Particulate Recovery

Sample ID Number	Trans Blank	Proof Blank
<b>Organic</b>		
Beaker Number	9772	9775
Initial Hexane/Acetone Volume, mL	64	120
Lab Hexane Volume, mL	165	165
	Dates	Dates
Final Weight, g	2.2401 6/15/11 A	2.2614 6/15/11 A
Reweight, Final, g	2.2401 6/15/11 P	2.2613 6/15/11 P
Beaker Tare, g	2.2378 6/7/11	2.2588 6/7/11
Net Organic Catch, mg	2.3	2.5
<b>Inorganic</b>		
Beaker Number	9848	9859
Final Weight, g	2.2735 6/15/11 A	2.2753 6/15/11 A
Reweight, Final, g	2.2735 6/15/11 P	2.2752 6/15/11 P
Beaker Tare, g	2.2717 6/8/11	2.2585 6/8/11
Sample H <sub>2</sub> O volume, mL	120	80
Added H <sub>2</sub> O, Filter Extraction, mL	75	75
Removed Pre-aliquot, mL	0.5	0.5
Pre-aliquot CF	1.003	1.003
Resuspended Volume, mL	100.0	100.0
Removed Post-aliquot, mL	0.5	0.5
Post-aliquot CF	1.01	1.01
Net Inorganic, mg	1.9	16.9
Ammonium Correction, mg	0.1	0.0
Corrected Inorganic, mg	1.7	16.9
Condensible Particulate Matter, mg	4.1	19.4

#### Client Blank Analyses

Type Blank	Hexane	Dates	Type Blank	H <sub>2</sub> O Blank	Dates	Type Blank	Acetone	Dates
Beaker Number	9774		Beaker Number	9849		Beaker Number	9773	
Tare weight, g	2.2154 6/7/11		Tare weight, g	2.2659 6/8/11		Tare weight, g	2.2145 6/7/11	
Dry Residue Weight, g	2.2161 6/15/11 A		Dry Residue Weight, g	2.2689 6/15/11 A		Dry Residue Weight, g	2.2152 6/15/11 A	
Reweight, Final, g	2.2160 6/15/11 P		Reweight, Final, g	2.2679 6/15/11 P		Reweight, Final, g	2.2152 6/15/11 P	
Hexane Residue, g	0.00095		Water Residue, g	0.0021		Acetone Residue, g	0.0007	
Hexane Volume, mL	208		Water Volume, mL	210		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0020		Max. Water Residue, g	0.0021		Max. Acetone Residue, g	0.0018	

#### In-House Blank Analyses

Type Blank	Hexane	Dates	Type Blank	H <sub>2</sub> O Blank	Dates	Type Blank	Acetone	Dates
Beaker Number	9776		Beaker Number	9851		Beaker Number	9777	
Tare weight, g	2.2348 6/7/11		Tare weight, g	2.2585 6/8/11		Tare weight, g	2.2450 6/7/11	
Dry Residue Weight, g	2.2352 6/15/11 A		Dry Residue Weight, g	2.2595 6/15/11 A		Dry Residue Weight, g	2.2454 6/15/11 A	
Reweight, Final, g	2.2351 6/15/11 P		Reweight, Final, g	2.2595 6/15/11 P		Reweight, Final, g	2.2454 6/15/11 P	
Hexane Residue, g	0.0003		Water Residue, g	0.0010		Acetone Residue, g	0.0004	
Hexane Volume, mL	225		Water Volume, mL	250		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0012		Max. Water Residue, g	0.0020		Max. Acetone Residue, g	0.0018	

Company	Shaw Environmental
Analyst	KTH
Parameters	EPA Method 202

Client #	142733
Job #	0411-77
# Samples	3 Runs, Blanks

MDL 0.09 (mg Ammonium)

MDL 0.26 (mg Sulfate)

Blank titrant amount (V<sub>tb</sub>) 0.04

NH<sub>4</sub>OH normality 0.1

Lot # Sigma Aldrich 318620

Sample ID.	Volume Resuspended (mL)	Titration Aliquot Vol (mL)	NH <sub>4</sub> OH Titration Vol (mL)	Aliquot Factor (mL res'd/aliqu mL)	SO <sub>4</sub> Catch (mg)	Ammonium equivalent (mg)
Train Blank	100	99.5	0.11	1.01	0.34	0.12
Run 1	100	99.5	0.19	1.01	0.72	0.26
Run 2	100	99.5	0.18	1.01	0.68	0.24
Run 3	100	99.5	0.21	1.01	0.82	0.29
Proof Blank	100	99.5	0.06	1.01	0.26 ND	0.09 ND

Company	Shaw Environmental
Analyst	KTH
Parameters	ASTM 5907

Client #	142733
Job #	0411-77
# Samples	3 Runs

*Analysis of Particulate Recovery*

Sample ID Number	SW-1		SW-2		SW-3	
Beaker Number	9852	Dates	9853	Dates	9854	Dates
Final Weight, g	12.7916	6/15/11 A	12.6434	6/15/11 A	13.1032	6/15/11 A
Reweigh, Final, g	12.7915	6/15/11 P	12.6433	6/15/11 P	13.1031	6/15/11 P
Beaker Tare Weight, g	2.2401	6/8/11 A	2.2520	6/8/11 A	2.2429	6/8/11 A
Beaker Tare Reweigh, Initial, g	2.2401	6/8/11 P	2.2519	6/8/11 P	2.2428	6/8/11 P
Sample Final Volume, mL	500		470		490	
Net Particulate, mg	10,551.4		10,391.4		10,860.4	

*In-House Blank Analysis*

Sample ID Number	H2O Blank	
Beaker Number	9851	Dates
Final Weight, g	2.2595	6/15/11 A
Reweigh, Final, g	2.2595	6/15/11 P
Initial Beaker Tare Weight, g	2.2586	6/8/11 A
Reweigh Beaker Tare, Initial, g	2.2585	6/8/11 P
Water Residue, g	0.0010	
Water Volume, mL	250	
Max. Water Residue, g	0.0025	



# Narrative Summary



EA# 0411-77 Page 19 of 80

## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	EO	Job #	0411-77
Parameters	EPA CTM-027	# Samples	3 Runs

<b>Custody</b>	Heather Tarjeff received the samples on 6/2/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 5.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.
<b>Analysis</b>	<p>The samples were analyzed for ammonia using the analytical procedures in EPA Conditional Test Method 027, Procedure for Collection and Analysis of Ammonia in Stationary Sources.</p> <p>The Agilent Model 1100, High Performance Liquid Chromatograph ("Curly") was equipped with a Dionex CD20 Conductivity Detector and a Dionex Ion Pac CS12, 4 x 250 mm column (S/N 009567).</p>
<b>Calibration</b>	<p>The calibration curve is included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.</p> <p>For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.</p>
<b>Chromatographic Conditions</b>	The acquisition method Ammonia.M is included in the Calibration Curve Chromatograms section of this report.
<b>QC Notes</b>	<p>Ammonia was not detected at a concentration greater than the LOQ in the analyses of the laboratory reagent blank.</p> <p>A matrix spike and matrix spike duplicate were prepared using aliquots of the sample <i>CTM027-1/2-1</i>. The recovery values were 96.0% and 96.7%.</p> <p>A second source standard (#SS) prepared and analyzed with the samples was also used as a Laboratory Control Sample. The recovery value was 97.2%.</p> <p>All samples were analyzed within the two-week holding time specified in the method.</p>



## Enthalpy Analytical Narrative Summary (continued)

### Reporting Notes

These analyses met the requirements of the NELAC Standard. Any deviations from the requirements of the reference method or NELAC Standard have been previously noted in the report narrative. The results presented in this report are representative of the samples as provided to the laboratory.

Enthalpy Analytical, Inc. is nationally accredited to perform EPA CTM-027 for compliance purposes by the Louisiana Department of Environmental Quality's Louisiana Environmental Laboratory Accreditation Program (LELAP), certificate number 04010.



EA# 0411-77 Page 21 of 80

## Enthalpy Analytical Narrative Summary

<b>Company</b>	Shaw Environmental	<b>Client #</b>	142733
<b>Analyst</b>	EO	<b>Job #</b>	0411-77
<b>Parameters</b>	EPA Method 8	<b># Samples</b>	3 Runs

**Custody** Heather Tarjeff of Enthalpy Analytical, Inc. received the samples on 6/2/11 at 5.4 °C after being relinquished by Shaw Environmental, Inc. The samples were received in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for sulfur dioxide using the analytical procedures in EPA Method 8, Determination of Sulfuric Acid and Sulfur Dioxide Emissions from Stationary Sources (40 CFR Part 60, Appendix A).

The samples were titrated using a barium chloride solution prepared in the lab. The normality was determined according to the procedures described in the method. The samples were titrated to a pink endpoint using a thorin indicator.

**QC Notes** Replicate titrations were performed with the replicate titrant volumes within 0.2mL different. Results are reported in milligrams (mg) catch.

**Calculations** Sulfur dioxide (SO<sub>2</sub>) calculations

$$C_{SO_2} = (N)(V_t - V_b)(V_{sol}/V_a)(32.03)$$

Where:

$C_{SO_2}$	Catch weight as sulfur dioxide (mg)
$N$	Normality of the barium chloride titrant
$V_t$	Volume of the titrant used to achieve pink endpoint
$V_b$	Titrant volume to achieve pink endpoint w/Lab IPA
$V_{sol}$	Volume of the entire sample solution
$V_a$	Volume of the aliquot taken for the titration
32.03	Equivalent weight for sulfur dioxide.

**Reporting Notes** Samples are analyzed using a micro-burette to conserve sample and reduce waste. The burette is 1/10 the volume of that specified in EPA Method 6. Due to the size of the burette, 1% or 0.02 mL is used as the reproducibility criterion as 0.02 mL is 1/10th the 0.2 mL default volume in EPA Method 6.



## Enthalpy Analytical Narrative Summary (continued)

### Reporting Notes (continued)

These analyses met the requirements of the NELAC Standard. Any deviations from the requirements of the reference method and/or the NELAC Standard have been previously noted in this narrative. The results presented in this report are representative of the samples as provided to the laboratory.

Enthalpy Analytical, Inc. is nationally accredited to perform EPA Method 8 for compliance purposes by the Louisiana Department of Environmental Quality's Louisiana Environmental Laboratory Accreditation Program (LELAP), certificate number 04010.



EA# 0411-77 Page 23 of 80



## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	EPA Method 5	# Samples	3 Runs, Blanks

**Custody** Heather Tarjeff received the samples on 6/2/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 5.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for particulate matter using the analytical procedures in EPA Method 5, Determination of Particulate Matter Emissions from Stationary Sources (40 CFR Part 60, Appendix A).

Samples were weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

**QC Notes** A filter blank and acetone blank were received and analyzed with these samples.

The catch weights were adjusted by a corresponding reagent blank correction value. A mathematically determined (theoretical) maximum value was calculated and compared with the actual value measured for the blank. The lower of the two values was used as the blank correction value, which was then factored by the sample volume divided by the blank volume, and subtracted from the sample catch weight.

A constant weight, as specified in the method, was not achieved for the rinse blank fraction. The difference between consecutive weighs was 1.1mg. Further weighings were not performed because the fractions had been baked for the Method 5B determination when the error was observed.

**Reporting Notes** Gravimetric analyses are considered to be accurate to  $\pm 0.5$  mg. Therefore, negative catch weights between 0 and negative 0.5 mg are regarded as set to zero and no investigation is undertaken. Negative catch weights less than negative 0.5 mg are investigated. All catch weights were greater than zero.

These analyses met the requirements of the NELAC Standard. Any deviations from the requirements of the reference method or NELAC Standard have been previously noted in the report narrative. The results presented in this report are representative of the samples as provided to the laboratory.



## Enthalpy Analytical Narrative Summary (continued)

### Reporting Notes (continued)

Enthalpy Analytical, Inc. is nationally accredited to perform EPA Method 5 for compliance purposes by the Louisiana Department of Environmental Quality's Louisiana Environmental Laboratory Accreditation Program (LELAP), certificate number 04010.



EA# 0411-77 Page 25 of 80

## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	EPA Method 5B Type	# Samples	3 Runs, Blank

**Custody** Heather Tarjeff received the samples on 6/2/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 5.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for particulate matter using the general analytical procedures in EPA Method 5B, Determination Of Nonsulfuric Acid Particulate Matter Emissions From Stationary Sources.

The filter and rinse fractions used for the Method 5 determinations were baked and desiccated prior to being weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

**QC Notes** Gravimetric analyses are typically accurate to  $\pm 0.5$  mg. Therefore, negative catch weights between 0 and negative 0.5 mg are regarded as zero and no investigation is undertaken. Negative catch weights less than negative 0.5 mg are investigated. All catch weights were greater than zero.

**Reporting Notes** The results presented in this report are representative of the samples as provided to the laboratory.





## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	EPA Method 202	# Samples	3 Runs, Blanks

**Custody** Heather Tarjeff received the samples on 6/2/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 5.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for condensable particulate matter using the analytical procedures in EPA Method 202, Dry Impinger Method For Determining of Condensable Particulate Emissions from Stationary Sources (40 CFR Part 51, Appendix M).

Samples were weighed on Balance-8, a Sartorius Model ME 5-F balance (SN 23104965) certified by Security Scale Service, Inc. through July 15, 2011.

**QC Notes** A proof blank, recovery blank (train blank), filter blank, acetone blank, water blank, and hexane blank were received and analyzed with these samples.

The method specifies blank corrections are accomplished by subtracting the particulate mass determined in the 'Field Train Blank' or 2 mg (whichever is less) from the sample weight.

The inorganic results for the samples were corrected for the ammonium ions used to precipitate the sulfate, per the formula in the method.

When the pH of the samples was measured to be 7.0 or greater with the pH meter, no titrant was added.

Gravimetric analyses are typically accurate to  $\pm 0.5$  mg. Therefore, negative catch weights between 0 and negative 0.5 mg are regarded as zero and no investigation is undertaken. Negative catch weights less than negative 0.5 mg are investigated. All catch weights were greater than zero.

**Reporting Notes** These analyses met the requirements of the NELAC Standard. Any deviations from the requirements of the reference method or NELAC Standard have been previously noted in the report narrative. The results presented in this report are representative of the samples as provided to the laboratory.



## Enthalpy Analytical Narrative Summary (continued)

### Reporting Notes (continued)

Enthalpy Analytical, Inc. is nationally accredited to perform EPA Method 202 for compliance purposes by the Louisiana Department of Environmental Quality's Louisiana Environmental Laboratory Accreditation Program (LELAP), certificate number 04010.



EA# 0411-77 Page 28 of 80

## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KTH	Job #	0411-77
Parameters	ASTM D5907	# Samples	3

**Custody** Heather Tarjeff received the samples on 6/2/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 5.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for particulate for calculating total dissolved solids using the general analytical procedures in EPA Method 5, Determination of Particulate Matter Emissions from Stationary Sources (40 CFR Part 60, Appendix A) and ASTM D5907-09, Standard Test Method for Filterable and Nonfilterable Matter in Water.

All samples were weighed on Balance-2 (Mettler Model AB265-S, serial # 1125163272), certified by Security Scale Service, Inc. through July 15, 2011.

**QC Notes** No blank corrections were made to the results.

**Reporting Notes** Gravimetric analyses are considered to be accurate to  $\pm 0.5$  mg. Therefore, negative catch weights between 0 and negative 0.5 mg are regarded as zero and no investigation is undertaken. Negative catch weights less than negative 0.5 mg are investigated. All catch weights were greater than zero.

The results presented in this report are representative of the samples as provided to the laboratory.





## General Reporting Notes

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

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



## General Reporting Notes

(continued)

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



EA# 0411-77 Page 31 of 80

# Sample Custody



EA# 0411-77 Page 32 of 80

**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
 (COC/RFA)**

Date 5/27/11 Page 1 of 2

PROJECT INFORMATION					PRESERVATIVE							
Project Number: 142733												
Project Name: CITGO ICR Testing												
Delivered Via:												
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days					Contact: PRESENT 142733 225-241-9384							
COMMENTS												
Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	245 PA	245 B PA	202 CPM	202-027 NH <sub>3</sub>	202-027 NH <sub>3</sub>	202-027 NH <sub>3</sub>	202-027 NH <sub>3</sub>	202-027 NH <sub>3</sub>
142733-052711-202-6-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-7-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-8-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-9-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-10-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-FTRB-1-BL	5/27/11	16:40	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-FTRB-2-BL	5/27/11	16:40	Liquid	1 / 500 mL Amber			✓					
142733-052611-202-1-1	5/26/11	16:15	Liquid	1 / 1 L Amber			✓					
142733-052611-202-2-1	5/26/11	16:15	Liquid	1 / 500 mL Amber			✓					
142733-052611-202-3-1	5/26/11	16:15	Filter	1 / petri			✓					
142733-052711-202-1-2	5/27/11	10:42	Liquid	1 / 1 L Amber			✓					
142733-052711-202-2-2	5/27/11	10:42	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-3-2	5/27/11	10:42	Filter	1 / petri			✓					
142733-052711-202-1-3	5/27/11	14:58	Liquid	1 / 1 L Amber			✓					
142733-052711-202-2-3	5/27/11	14:58	Liquid	1 / 500 mL Amber			✓					
142733-052711-202-3-3	5/27/11	14:58	Filter	1 / petri			✓					
142733-052711-5-PW-BL	5/27/11	13:15	Liquid	1 / 500 mL Amber	✓	✓						
142733-052711-5-F3634-BL	5/27/11	13:15	Filter	1 / petri	✓	✓						
142733-052611-5-PW-1	5/26/11	16:15	Liquid	1 / 500 mL Amber	✓	✓						
142733-052611-5-F3630-1	5/26/11	13:15	Filter	1 / petri	✓	✓						
142733-052711-5-PW-2	5/27/11	10:42	Liquid	1 / 500 mL Amber	✓	✓						

EA# 04111-77 Page 33 of 80

**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
(COC/RFA)**

Date 5/27/11 Page 2 of 2

142733-052711-5-F3829-2	5/27/11	10:42	Filter	1 / petri	✓	✓						
142733-052711-5-PW-3	5/27/11	14:58	Liquid	1 / 500 mL Amber	✓	✓						
142733-052711-5-F3633-3	5/27/11	14:58	Filter	1 / petri	✓	✓						
142733-052611-CTM027-1/2-1	5/26/11	16:15	Liquid	1 / 1 L Amber					✓			
142733-052611-CTM027-3-1	5/26/11	16:15	Liquid	1 / 500 mL Amber					✓			
142733-052711-CTM027-1/2-2	5/27/11	10:42	Liquid	1 / 1 L Amber					✓			
142733-052711-CTM027-3-2	5/27/11	10:42	Liquid	1 / 500 mL Amber					✓			
142733-052711-CTM027-1/2-3	5/27/11	14:58	Liquid	1 / 1 L Amber					✓			
142733-052711-CTM027-3-3	5/27/11	14:58	Liquid	1 / 500 mL Amber					✓			
142733-052611-SW-1	05/26/11	17:00	Liquid	1 / 500 mL Amber					✓			
142733-052711-SW-2	05/27/11	11:45	Liquid	1 / 500 mL Amber					✓			
142733-052711-SW-3	05/27/11	16:45	Liquid	1 / 500 mL Amber					✓			
Received: P2 Fuel Gas R1 Impacts H2O2 " R2 Impacts H2O2 " R3 Impacts H2O2												

Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: Time: <i>[Signature]</i> 19:17 Printed Name: Date: Blaise Figue 5/27/11 Company: Shaw	Signature: Time: <i>[Signature]</i> Printed Name: Date: <i>[Signature]</i> Company:	Signature: Time: <i>[Signature]</i> Printed Name: Date: <i>[Signature]</i> Company:	Signature: Time: <i>[Signature]</i> Printed Name: Date: <i>[Signature]</i> Company:	Signature: Time: <i>[Signature]</i> Printed Name: Date: <i>[Signature]</i> Company:	Signature: Time: <i>[Signature]</i> 11:04am Printed Name: Date: Blaise Figue 6/2/11 Laboratory: Enthalpy

*Locked field  
Shop*

*Temp = 5.1°C  
Raylex gun #1*



**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
(COC/RFA)**

Date \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

PROJECT INFORMATION					PRESERVATIVE							
Project Number:												
Project Name: XOM/CHALMETTE ICR Distillation Feed Composite												
Delivered Via:												
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days												

COMMENTS									
Contact: Richard Ishikawa 225-241-9584									
Combine Triplicates of each sample and analyze.									
Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	Hold - At Lab	RMS - For Sulfate Only			
142733-051711-RM8-1	5/17/11		Liquid	1/500ml		X			
142733-051711-RM8-2	5/17/11		Liquid	1/500ml		X			
142733-051811-26A-1-1	05/18/11	18:15	Filter	1/500ml	X				
142733-051811-26A-1-2	05/18/11	21:35	Filter	1/500ml	X				
142733-051811-26A-1-3	05/18/11	12:10	Filter	1/500ml	X				
142733-051811-OTM29-2-1	05/18/11	18:15	Filter	1/500ml					
142733-051811-OTM29-2-2	05/18/11	21:35	Filter	1/500ml					
142733-051811-OTM29-2-3	05/18/11	12:10	Filter	1/500ml					
142733-052611-CTM027-Fil-1	05/26/11	16:15	Filter	1/500ml	X				
142733-052711-CTM027-Fil-2	05/27/11	10:42	Filter	1/500ml	X				
142733-052711-CTM027-Fil-3	05/27/11	14:58	Filter	1/500ml	X				

Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: <i>[Signature]</i> Time: 19:17	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: <i>[Signature]</i> Time: 1:04pm
Printed Name: Blake Taylor Date: 5/27/11	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <i>[Signature]</i> Date: 6/2/11
Company: Shaw	Company: _____	Company: _____	Company: _____	Company: _____	Laboratory: <i>[Signature]</i>

*Shawfield Shop*

EA# 0411-77 Page 35 of 80

*Time 5:40 Ray's gus*

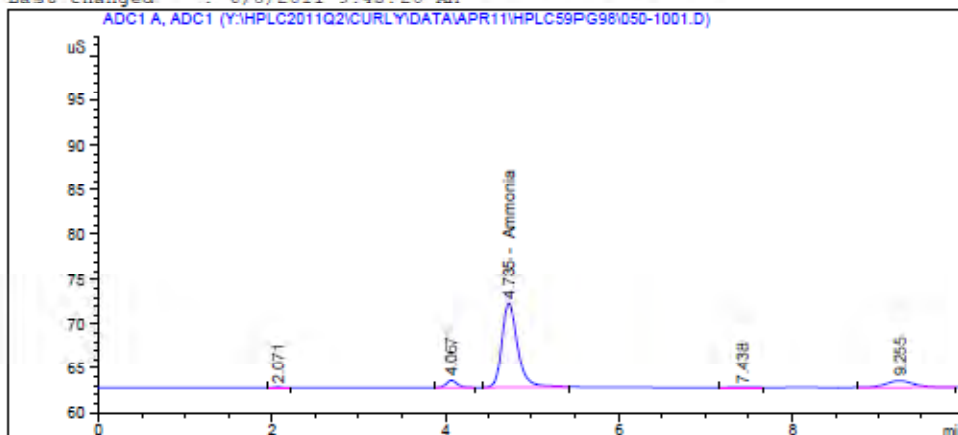
# Sample Chromatograms



EA# 0411-77 Page 36 of 80

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\050-1001.D  
Sample Name: 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 10
Acq. Instrument : Curly                   Location  : Vial 50
Injection Date  : 6/6/2011 6:54:30 PM      Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

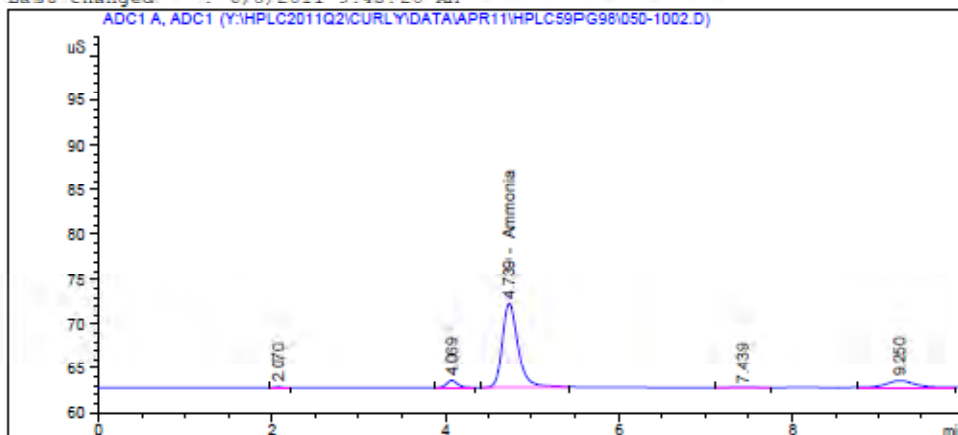
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.735	BB	122.06438	1.32418e-2	1.61635		Ammonia

Totals : 1.61635

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\050-1002.D  
Sample Name: 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 10
Acq. Instrument : Curly                  Location  : Vial 50
Injection Date  : 6/6/2011 7:06:22 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

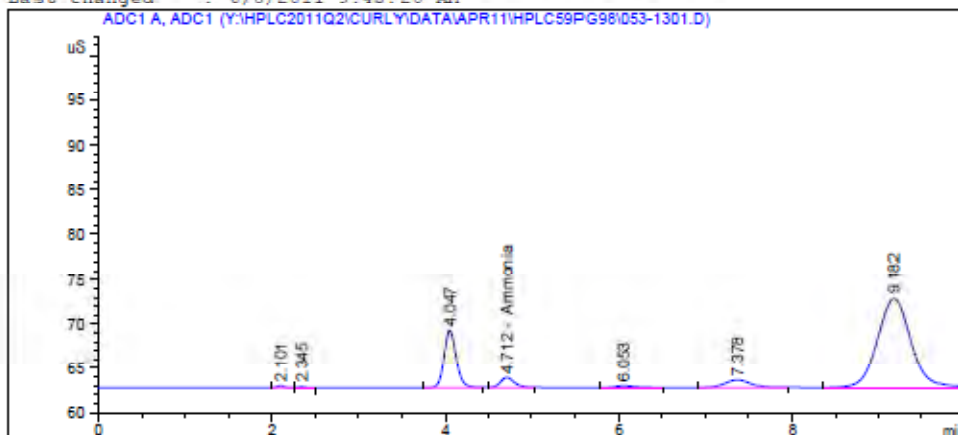
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.739	BB	121.89454	1.32400e-2	1.61389		Ammonia

Totals : 1.61389

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\053-1301.D  
Sample Name: 3-1 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line :   13
Acq. Instrument : Curly                   Location  : Vial 53
Injection Date  : 6/6/2011 8:05:46 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

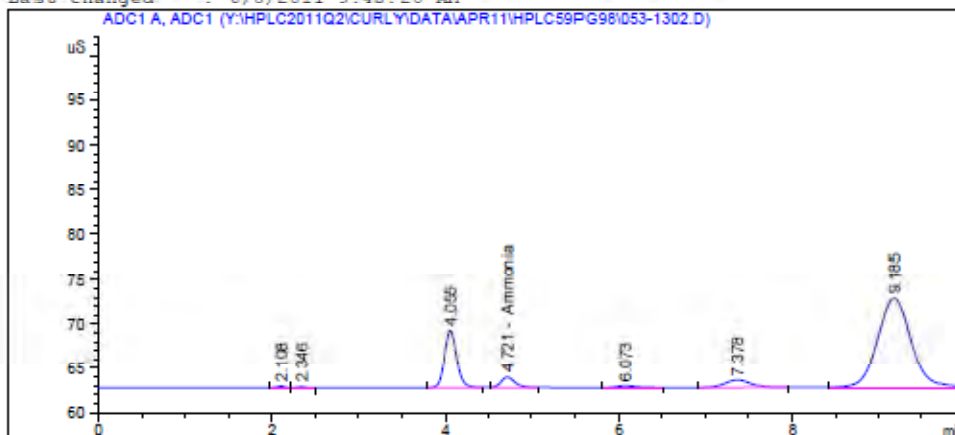
Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.712	BB	13.01556	1.02169e-2	1.32979e-1		Ammonia
Totals :				1.32979e-1		

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\053-1302.D  
Sample Name: 3-1 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line :   13
Acq. Instrument : Curly                  Location  : Vial 53
Injection Date  : 6/6/2011 8:17:42 PM    Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

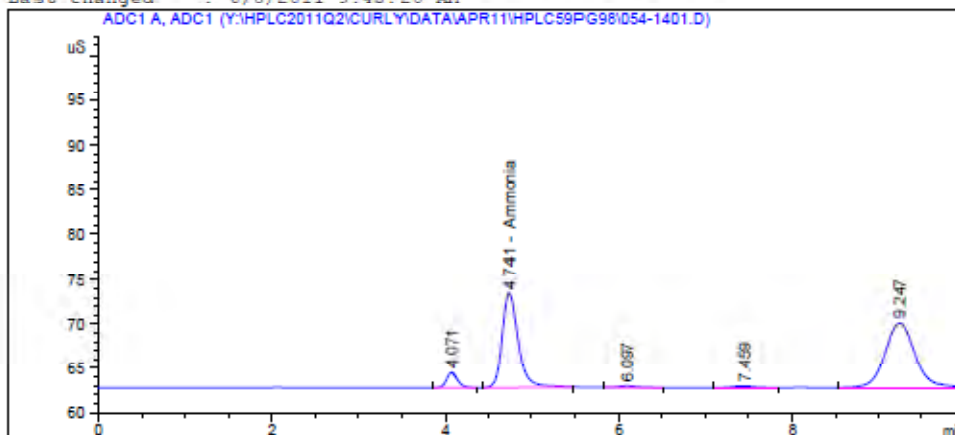
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.721	BB	13.44193	1.02169e-2	1.37335e-1		Ammonia

Totals : 1.37335e-1

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\054-1401.D  
Sample Name: 1/2-2 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line :   14
Acq. Instrument : Curly                   Location  : Vial 54
Injection Date  : 6/6/2011 8:29:38 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

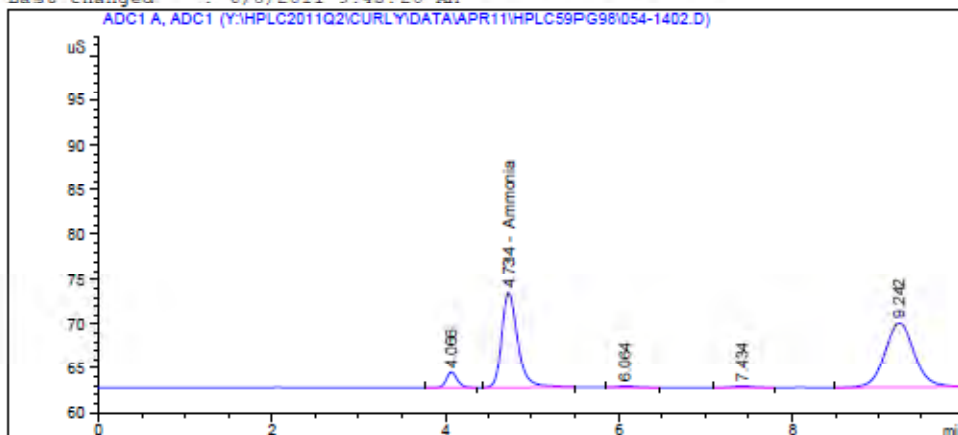
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.741	BB	139.80936	1.34125e-2	1.87519		Ammonia

Totals : 1.87519

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\054-1402.D  
Sample Name: 1/2-2 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 14
Acq. Instrument : Curly                   Location  : Vial 54
Injection Date  : 6/6/2011 8:41:35 PM      Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.734	BB	140.14198	1.34155e-2	1.88008		Ammonia

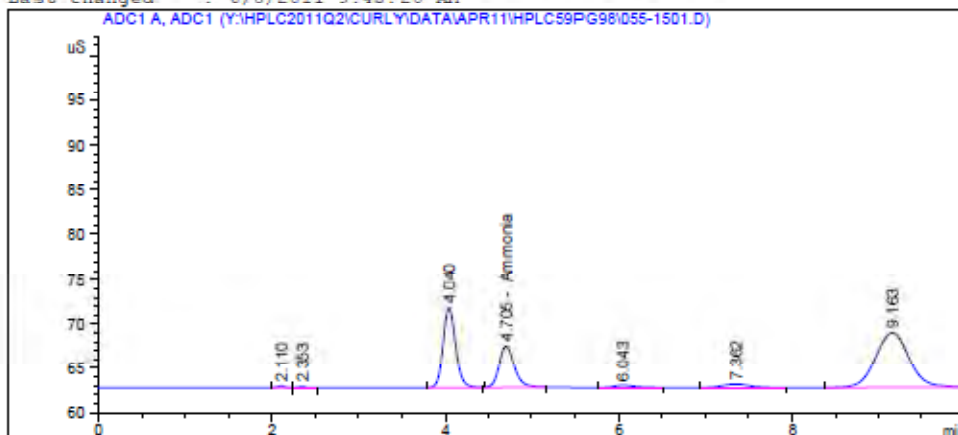
Totals : 1.88008

\*\*\* End of Report \*\*\*



Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\055-1501.D  
Sample Name: 3-2 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 15
Acq. Instrument : Curly                  Location  : Vial 55
Injection Date  : 6/6/2011 8:53:31 PM    Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

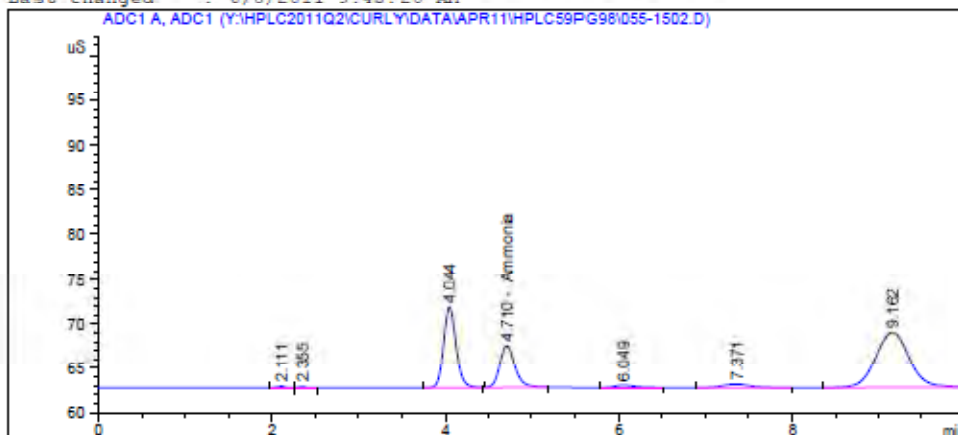
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.705	BB	58.55975	1.22809e-2	7.19164e-1		Ammonia

Totals : 7.19164e-1

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\055-1502.D  
Sample Name: 3-2 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line :   15
Acq. Instrument : Curly                   Location  : Vial 55
Injection Date  : 6/6/2011 9:05:26 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

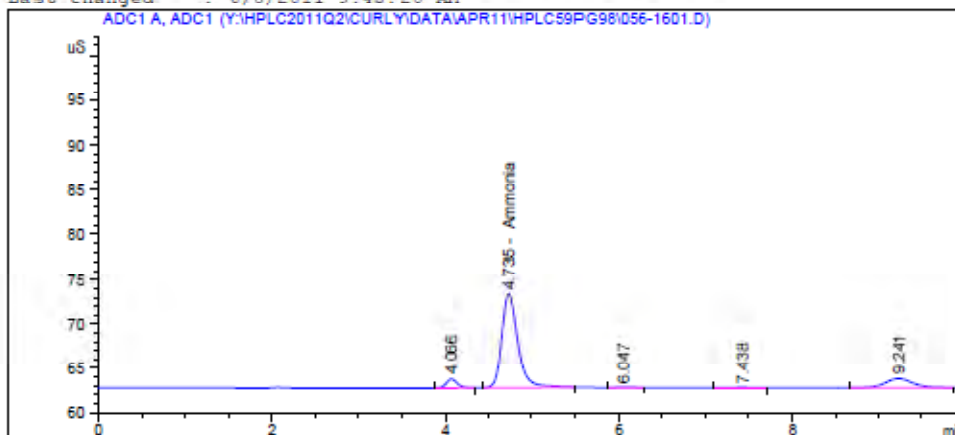
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.710	BB	58.94285	1.22907e-2	7.24448e-1		Ammonia

Totals : 7.24448e-1

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\056-1601.D  
Sample Name: 1/2-3 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 16
Acq. Instrument : Curly                   Location  : Vial 56
Injection Date  : 6/6/2011 9:17:23 PM      Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

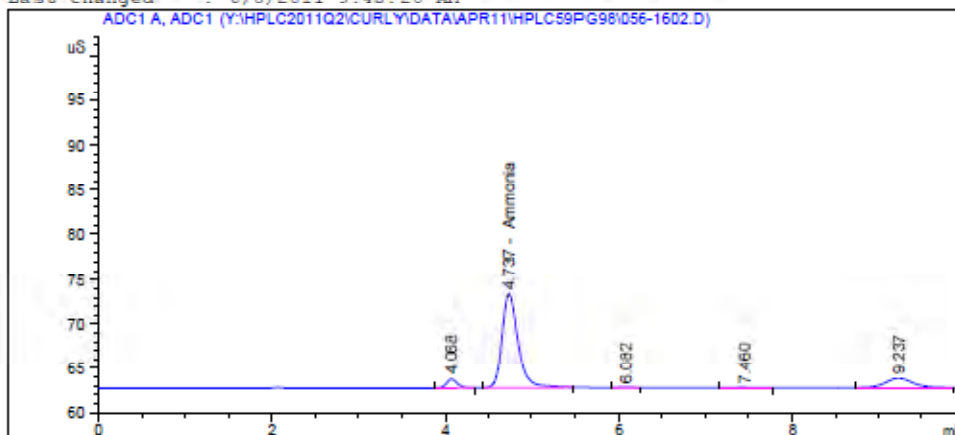
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.735	BB	138.24753	1.33981e-2	1.85225		Ammonia

Totals : 1.85225

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\056-1602.D  
Sample Name: 1/2-3 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 16
Acq. Instrument : Curly                  Location  : Vial 56
Injection Date  : 6/6/2011 9:29:19 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

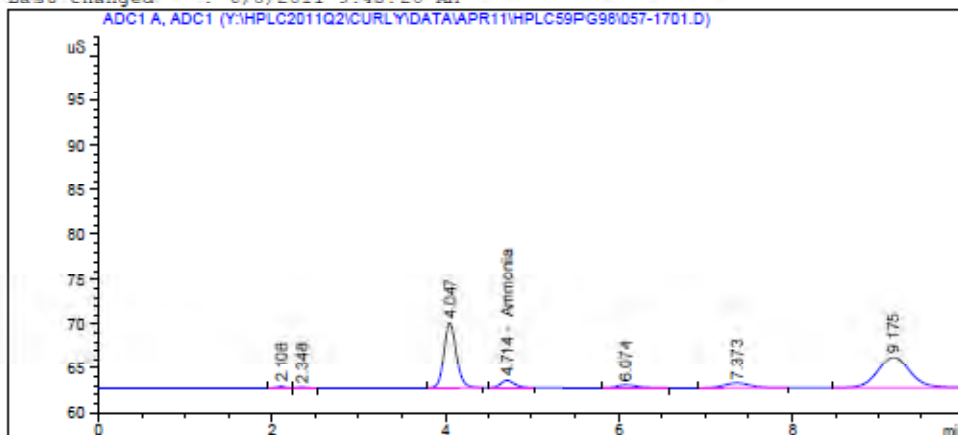
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.737	BB	138.49687	1.34004e-2	1.85591		Ammonia

Totals : 1.85591

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\057-1701.D  
Sample Name: 3-3 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 17
Acq. Instrument : Curly                  Location  : Vial 57
Injection Date  : 6/6/2011 9:41:14 PM    Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

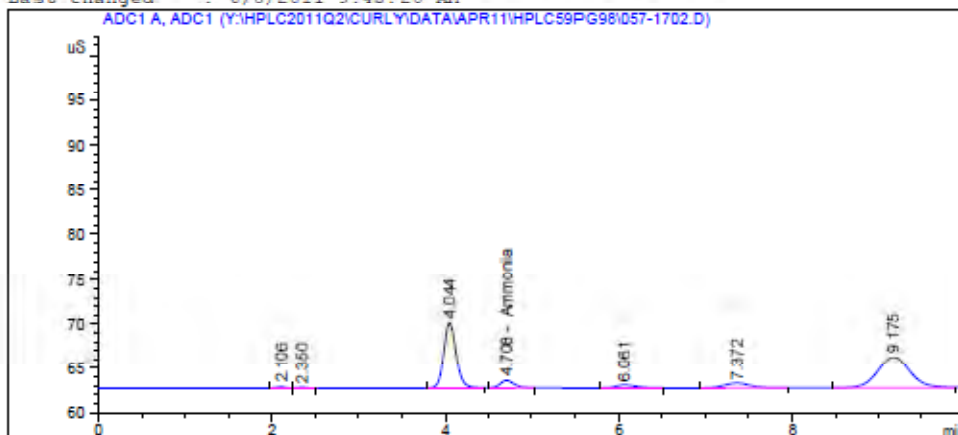
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.714	BB	9.67533	1.02169e-2	9.88523e-2		Ammonia

Totals : 9.88523e-2

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\057-1702.D  
Sample Name: 3-3 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 17
Acq. Instrument : Curly                  Location  : Vial 57
Injection Date  : 6/6/2011 9:53:13 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

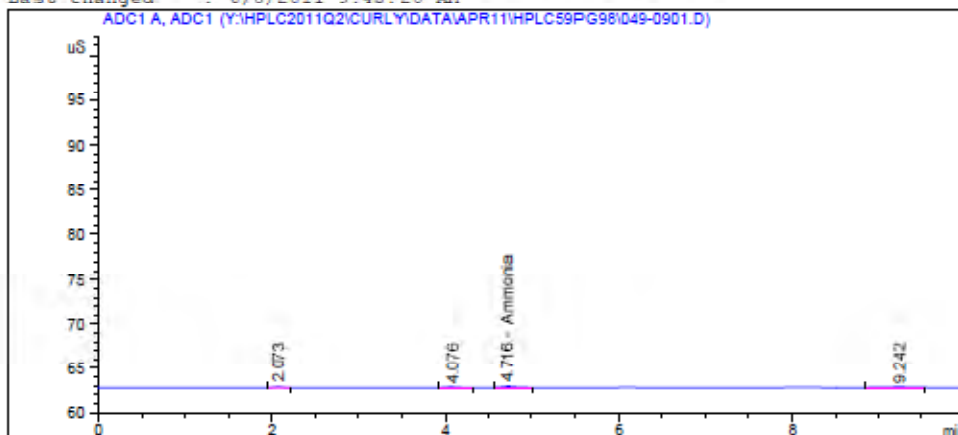
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.708	BB	9.84211	1.02169e-2	1.00556e-1		Ammonia

Totals : 1.00556e-1

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\049-0901.D  
Sample Name: 0.04N H2SO4 RB

```
=====
Acq. Operator   : EO                      Seq. Line :    9
Acq. Instrument : Curly                   Location  : Vial 49
Injection Date  : 6/6/2011 6:30:47 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      :      Signal
Calib. Data Modified :      Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

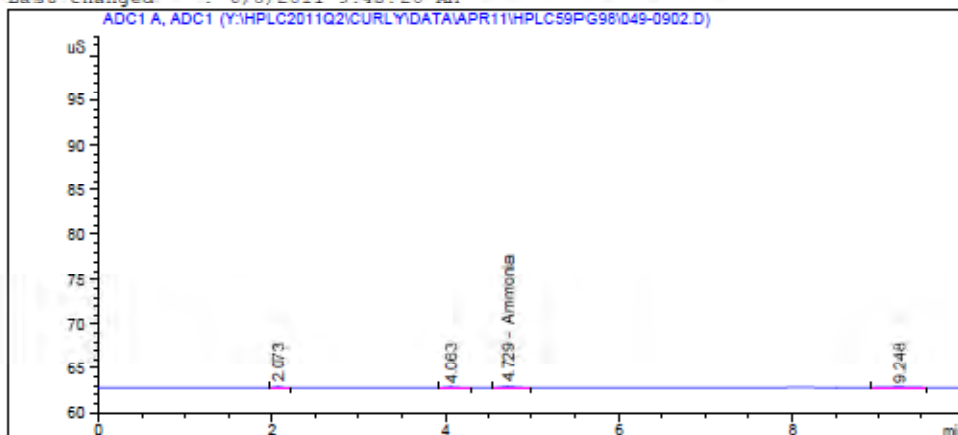
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.716	BB	1.39532	1.02169e-2	1.42559e-2		Ammonia

Totals : 1.42559e-2

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\049-0902.D  
Sample Name: 0.04N H2SO4 RB

```
=====
Acq. Operator   : EO                      Seq. Line :    9
Acq. Instrument : Curly                  Location  : Vial 49
Injection Date  : 6/6/2011 6:42:38 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.729	BB	1.37598	1.02169e-2	1.40583e-2		Ammonia

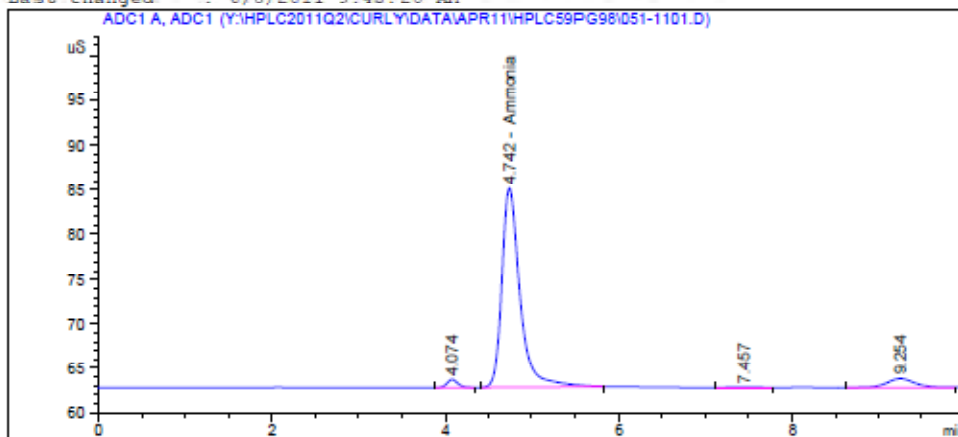
Totals : 1.40583e-2

\*\*\* End of Report \*\*\*



Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\051-1101.D  
Sample Name: MS 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 11
Acq. Instrument : Curly                   Location  : Vial 51
Injection Date  : 6/6/2011 7:18:12 PM      Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

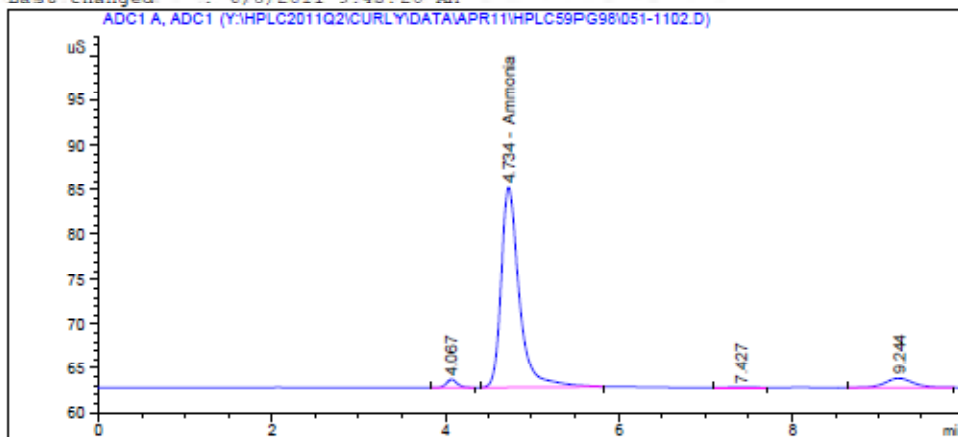
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.742	BB	330.63138	1.49593e-2	4.94601		Ammonia

Totals : 4.94601

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\051-1102.D  
Sample Name: MS 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 11
Acq. Instrument : Curly                  Location  : Vial 51
Injection Date  : 6/6/2011 7:30:03 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

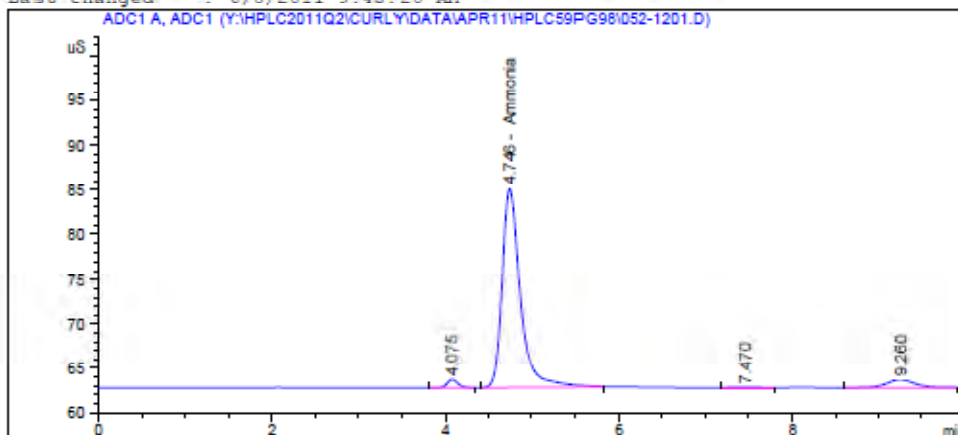
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.734	BB	331.28116	1.49648e-2	4.95757		Ammonia

Totals : 4.95757

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\052-1201.D  
Sample Name: MSD 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 12
Acq. Instrument : Curly                   Location  : Vial 52
Injection Date  : 6/6/2011 7:41:56 PM      Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

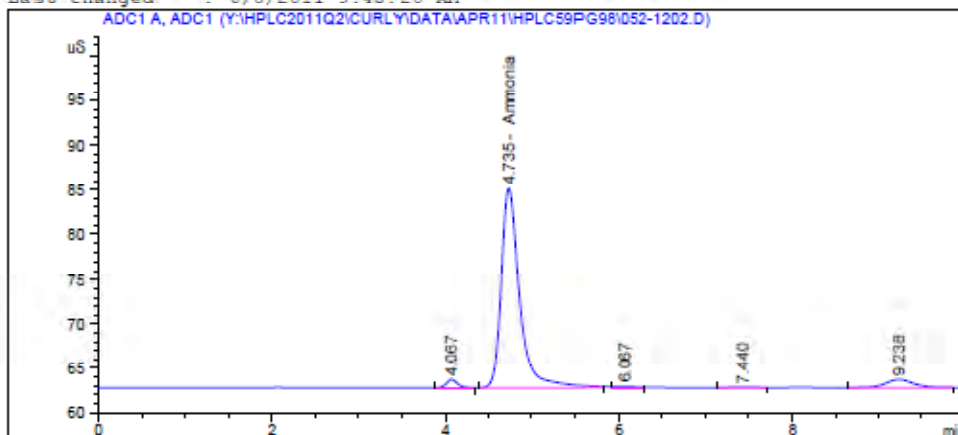
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.746	BB	330.79410	1.49607e-2	4.94890		Ammonia

Totals : 4.94890

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\052-1202.D  
Sample Name: MSD 1/2-1 \*4 0411-77

```
=====
Acq. Operator   : EO                      Seq. Line : 12
Acq. Instrument : Curly                  Location  : Vial 52
Injection Date  : 6/6/2011 7:53:48 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.735	BB	333.91217	1.49874e-2	5.00448		Ammonia

Totals : 5.00448

\*\*\* End of Report \*\*\*

# Calibration Curve Chromatograms



EA# 0411-77 Page 55 of 80

```

=====
                        Calibration Table
=====

```

Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM

Rel. Reference Window : 10.000 %  
 Abs. Reference Window : 0.000 min  
 Rel. Non-ref. Window : 10.000 %  
 Abs. Non-ref. Window : 0.000 min  
 Uncalibrated Peaks : not reported  
 Partial Calibration : Yes, identified peaks are recalibrated  
 Correct All Ret. Times: No, only for identified peaks

Curve Type : Quadratic  
 Origin : Connected  
 Weight : Linear (Resp)

Recalibration Settings:  
 Average Response : Average all calibrations  
 Average Retention Time: Floating Average New 75%

Calibration Report Options :  
 Printout of recalibrations within a sequence:  
     Calibration Table after Recalibration  
     Normal Report after Recalibration  
 If the sequence is done with bracketing:  
     Results of first cycle (ending previous bracket)

Signal 1: ADC1 A, ADC1

RetTime [min]	Lvl Sig	Amount [ug/mL]	Area	Amt/Area	Ref Grp Name
4.747	1	2.35000e-1	21.71125	1.08239e-2	Ammonia
	2	4.70000e-1	41.86491	1.12266e-2	
	3	1.85100	144.50889	1.28089e-2	
	4	4.49500	300.75676	1.49456e-2	
	5	6.58600	415.37263	1.58556e-2	
	6	8.58200	504.75948	1.70022e-2	
	7	11.10600	609.13412	1.82324e-2	

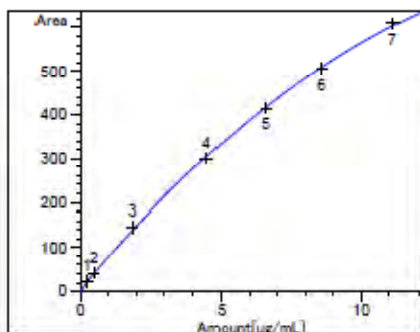
```

=====
                        Peak Sum Table
=====

```

\*\*\*No Entries in table\*\*\*

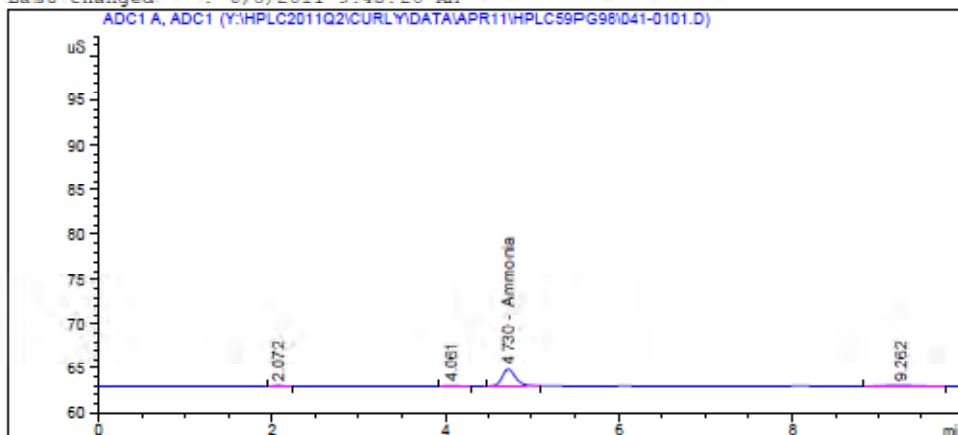
=====  
 Calibration Curves  
 =====



Ammonia at exp. RT: 4.747  
 ADC1 A, ADC1  
 Correlation: 0.99981  
 Residual Std. Dev.: 4.84743  
 Formula:  $y = ax^2 + bx + c$   
     a: -1.92654  
     b: 75.28177  
     c: 5.41618  
 x: Amount  
 y: Area  
 Calibration Level Weights:  
     Level 1 : 1  
     Level 2 : 0.518603  
     Level 3 : 0.180242  
     Level 4 : 0.072189  
     Level 5 : 0.052269  
     Level 6 : 0.043013  
     Level 7 : 0.035643

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\041-0101.D  
Sample Name: HPLC59pg98 #1

```
=====
Acq. Operator   : EO                      Seq. Line :    1
Acq. Instrument : Curly                   Location  : Vial 41
Injection Date  : 6/6/2011 3:21:34 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.730	BB	20.72075	1.02169e-2	2.11703e-1		Ammonia

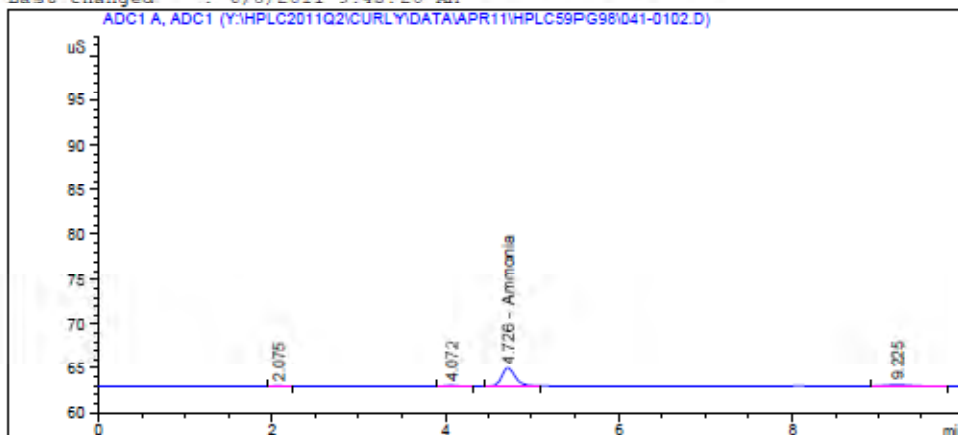
Totals : 2.11703e-1

\*\*\* End of Report \*\*\*



Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\041-0102.D  
Sample Name: HPLC59pg98 #1

```
=====
Acq. Operator   : EO                      Seq. Line :    1
Acq. Instrument : Curly                   Location  : Vial 41
Injection Date  : 6/6/2011 3:33:22 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:     : 1.0000
Dilution:       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

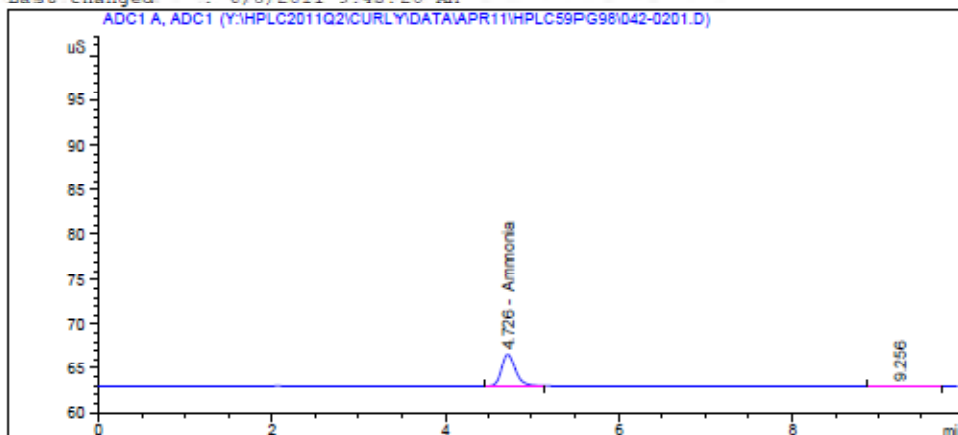
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.726	BB	22.70175	1.02169e-2	2.31943e-1		Ammonia

Totals : 2.31943e-1

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\042-0201.D  
Sample Name: HPLC59pg98 #2

```
=====
Acq. Operator   : EO                      Seq. Line :    2
Acq. Instrument : Curly                   Location  : Vial 42
Injection Date  : 6/6/2011 3:45:10 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

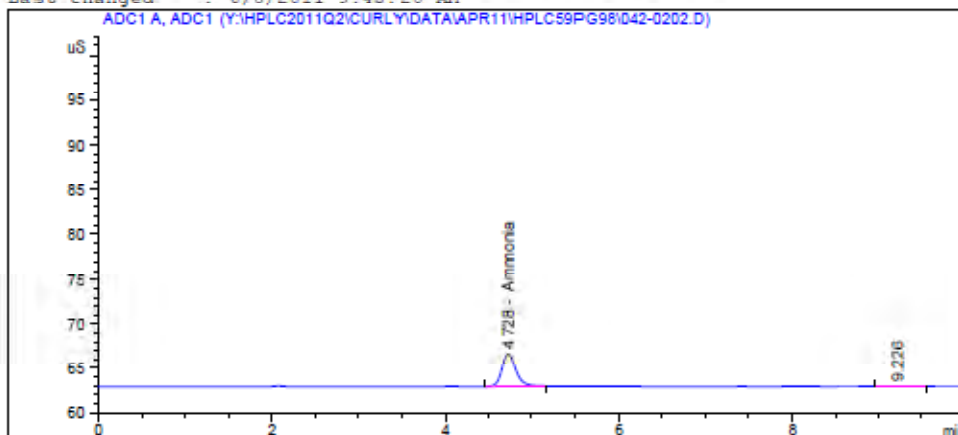
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.726	BB	41.76476	1.17073e-2	4.88952e-1		Ammonia

Totals : 4.88952e-1

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\042-0202.D  
Sample Name: HPLC59pg98 #2

```
=====
Acq. Operator   : EO                      Seq. Line :    2
Acq. Instrument : Curly                   Location  : Vial 42
Injection Date  : 6/6/2011 3:56:58 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      :      Signal
Calib. Data Modified :      Wednesday, June 08, 2011 9:45:14 AM
Multiplier:      :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

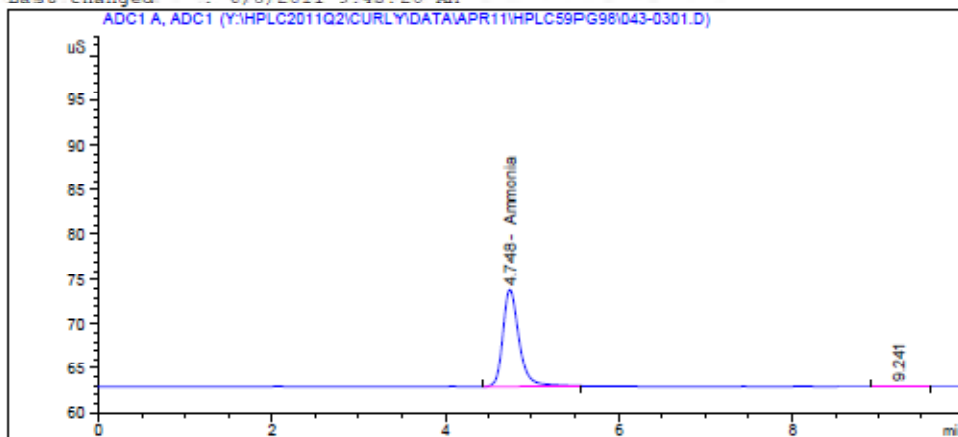
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.728	BB	41.96506	1.17164e-2	4.91681e-1		Ammonia

Totals : 4.91681e-1

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\043-0301.D  
Sample Name: HPLC59pg98 #3

```
=====
Acq. Operator   : EO                      Seq. Line :    3
Acq. Instrument : Curly                   Location  : Vial 43
Injection Date  : 6/6/2011 4:08:46 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

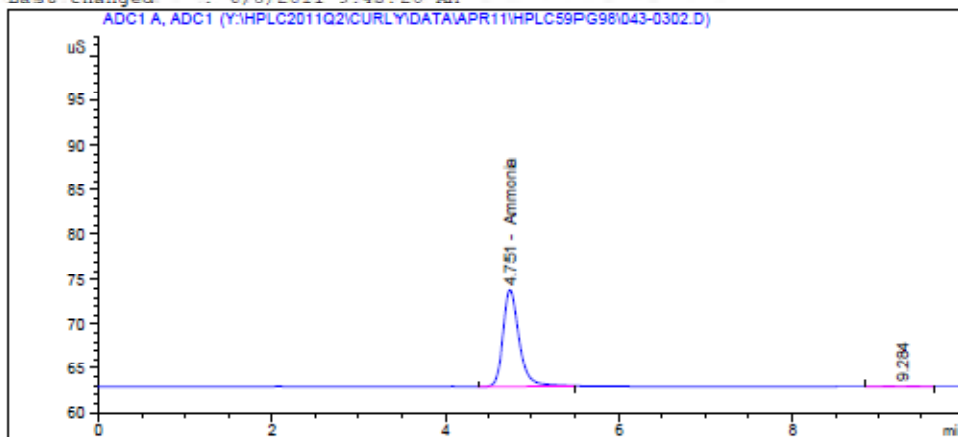
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.748	BB	144.72870	1.34570e-2	1.94762		Ammonia

Totals : 1.94762

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\043-0302.D  
Sample Name: HPLC59pg98 #3

```
=====
Acq. Operator   : EO                      Seq. Line :    3
Acq. Instrument : Curly                   Location  : Vial 43
Injection Date  : 6/6/2011 4:20:41 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

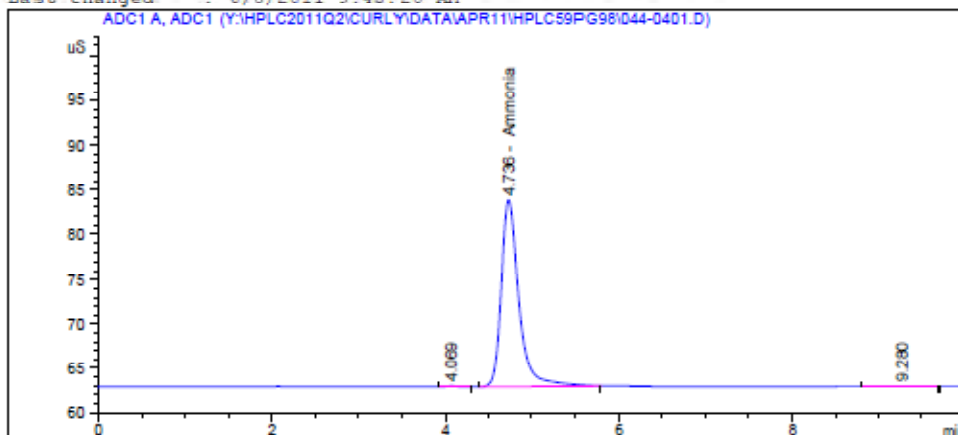
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.751	BB	144.28908	1.34531e-2	1.94114		Ammonia

Totals : 1.94114

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\044-0401.D  
Sample Name: HPLC59pg98 #4

```
=====
Acq. Operator   : EO                      Seq. Line :    4
Acq. Instrument : Curly                   Location  : Vial 44
Injection Date  : 6/6/2011 4:32:30 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

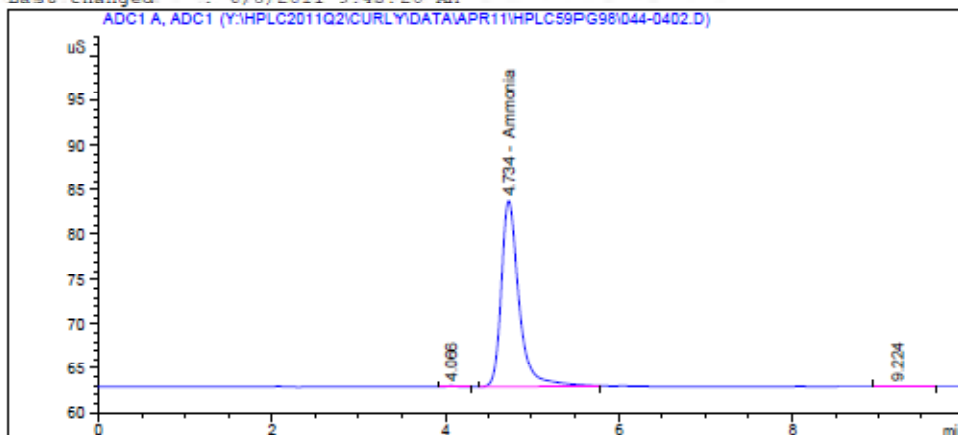
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.736	BB	300.59253	1.47082e-2	4.42118		Ammonia

Totals : 4.42118

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\044-0402.D  
Sample Name: HPLC59pg98 #4

```
=====
Acq. Operator   : EO                      Seq. Line :    4
Acq. Instrument : Curly                  Location  : Vial 44
Injection Date  : 6/6/2011 4:44:19 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:     : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

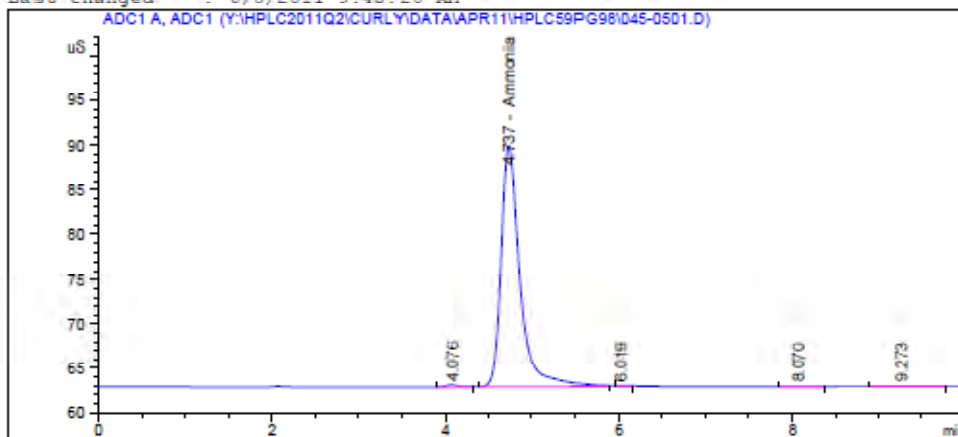
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.734	BB	300.92099	1.47109e-2	4.42682		Ammonia

Totals : 4.42682

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\045-0501.D  
Sample Name: HPLC59pg98 #5

```
=====
Acq. Operator   : EO                      Seq. Line :    5
Acq. Instrument : Curly                   Location  : Vial 45
Injection Date  : 6/6/2011 4:56:11 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.737	BB	415.14658	1.57433e-2	6.53578		Ammonia

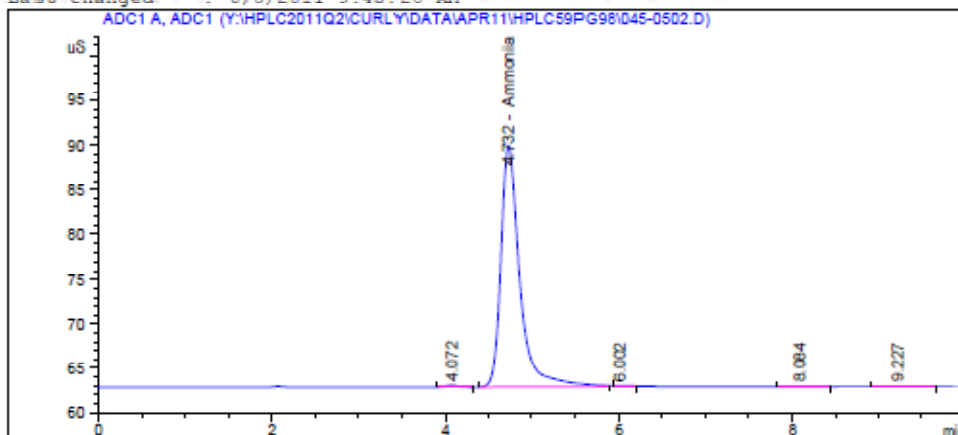
Totals : 6.53578

\*\*\* End of Report \*\*\*



Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\045-0502.D  
Sample Name: HPLC59pg98 #5

```
=====
Acq. Operator   : EO                      Seq. Line :    5
Acq. Instrument : Curly                  Location  : Vial 45
Injection Date  : 6/6/2011 5:07:59 PM    Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

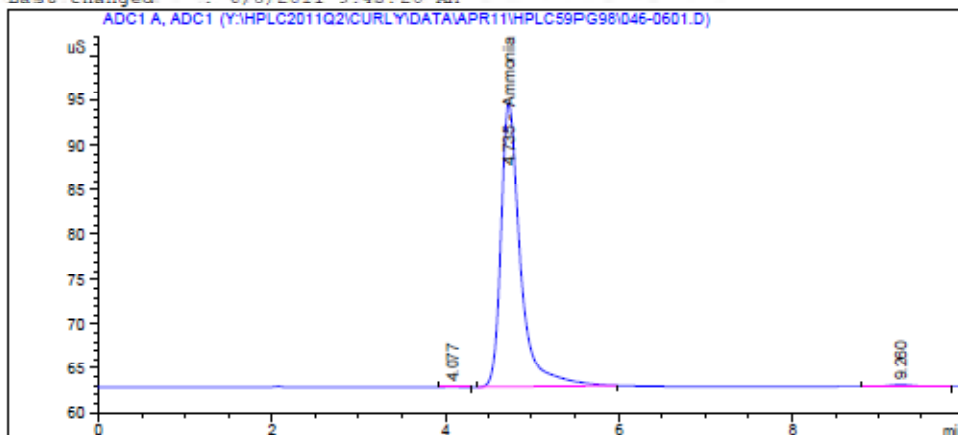
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.732	BB	415.89869	1.87479e-2	6.54481		Ammonia

Totals : 6.54481

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\046-0601.D  
Sample Name: HPLC59pg98 #6

```
=====
Acq. Operator   : EO                      Seq. Line :    6
Acq. Instrument : Curly                   Location  : Vial 46
Injection Date  : 6/6/2011 5:19:49 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

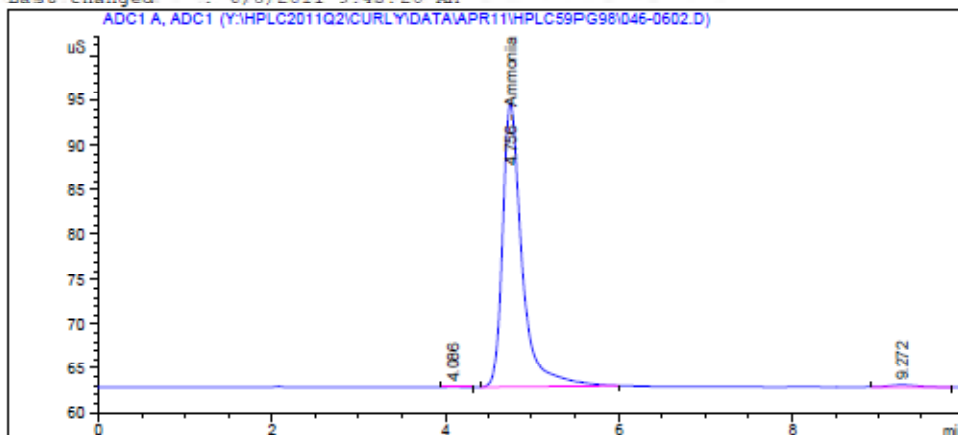
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.735	BB	504.63745	1.67749e-2	8.46523		Ammonia

Totals : 8.46523

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\046-0602.D  
Sample Name: HPLC59pg98 #6

```
=====
Acq. Operator   : EO                      Seq. Line :    6
Acq. Instrument : Curly                   Location  : Vial 46
Injection Date  : 6/6/2011 5:31:40 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

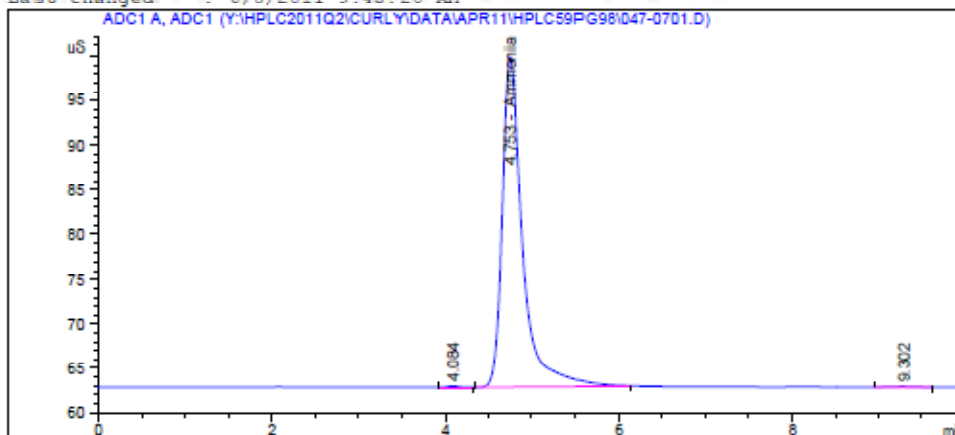
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.756	BB	504.88150	1.67781e-2	8.47095		Ammonia

Totals : 8.47095

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\047-0701.D  
Sample Name: HPLC59pg98 #7

```
=====
Acq. Operator   : EO                      Seq. Line :    7
Acq. Instrument : Curly                  Location  : Vial 47
Injection Date  : 6/6/2011 5:43:29 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:     : 1.0000
Dilution:       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

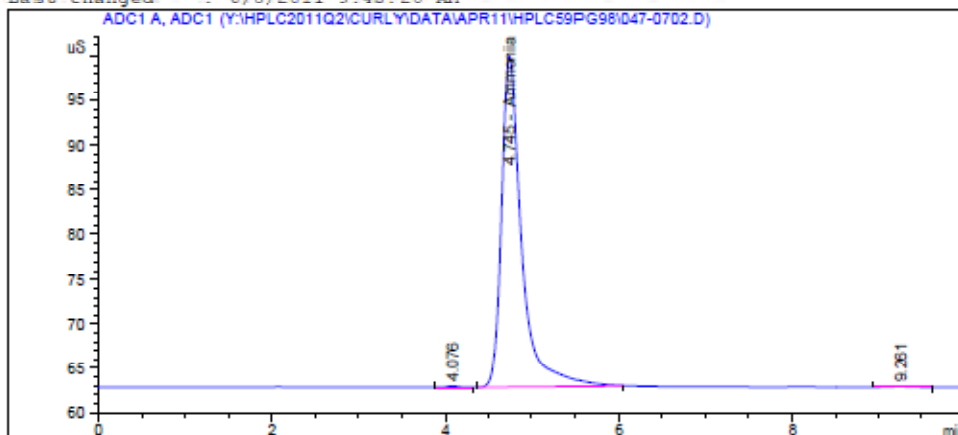
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.753	BB	610.80927	1.85367e-2	11.32237		Ammonia

Totals : 11.32237

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\047-0702.D  
Sample Name: HPLC59pg98 #7

```
=====
Acq. Operator   : EO                      Seq. Line :    7
Acq. Instrument : Curly                   Location  : Vial 47
Injection Date  : 6/6/2011 5:55:19 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

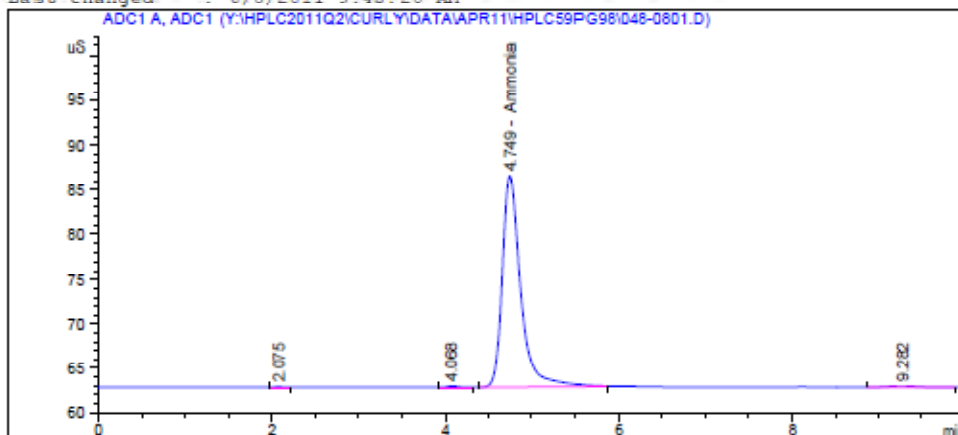
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.745	BB	607.45898	1.84658e-2	11.21721		Ammonia

Totals : 11.21721

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\048-0801.D  
Sample Name: HPLC59pg98 #SS

```
=====
Acq. Operator   : EO                      Seq. Line :    8
Acq. Instrument : Curly                   Location  : Vial 48
Injection Date  : 6/6/2011 6:07:08 PM      Inj       :    1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



External Standard Report

```
=====
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: ADC1 A, ADC1

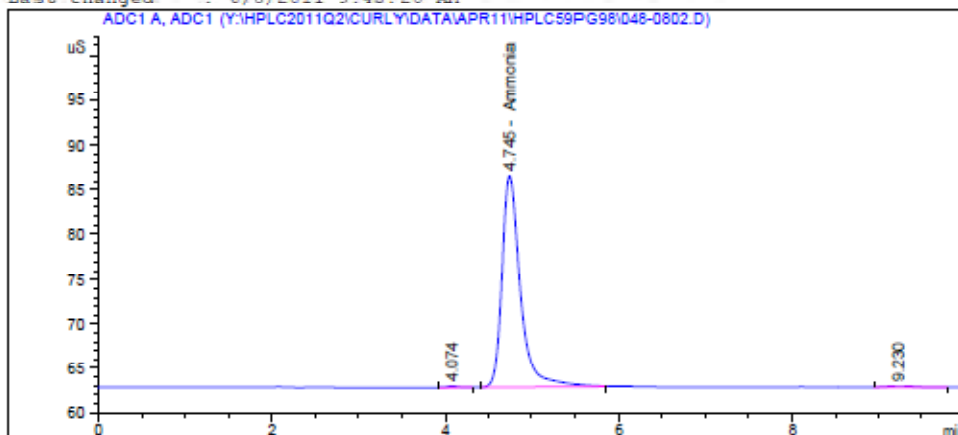
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.749	BB	355.61334	1.51775e-2	5.39731		Ammonia

Totals : 5.39731

\*\*\* End of Report \*\*\*

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\048-0802.D  
Sample Name: HPLC59pg98 #SS

```
=====
Acq. Operator   : EO                      Seq. Line :    8
Acq. Instrument : Curly                  Location  : Vial 48
Injection Date  : 6/6/2011 6:18:59 PM      Inj       :    2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      :      Signal
Calib. Data Modified :      Wednesday, June 08, 2011 9:45:14 AM
Multiplier:      :      1.0000
Dilution:        :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

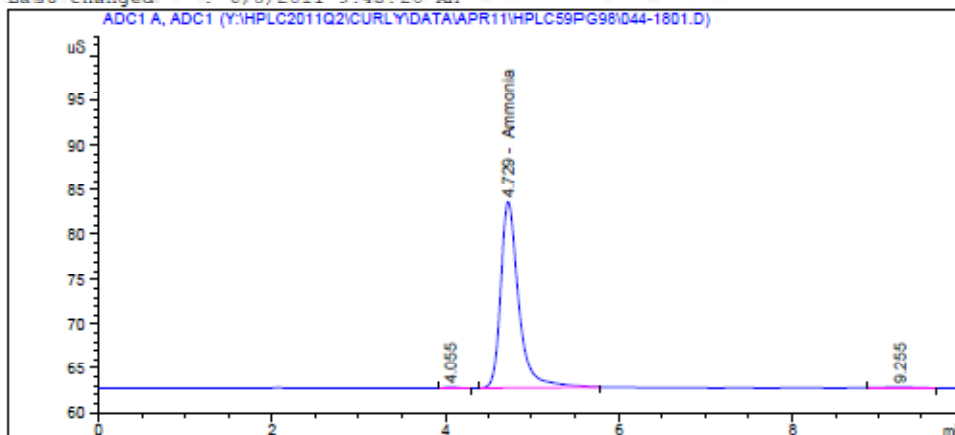
RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.745	BB	355.60239	1.51774e-2	5.39711		Ammonia

Totals : 5.39711

```
=====
*** End of Report ***
=====
```

Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\044-1801.D  
Sample Name: HPLC59pg98 #4

```
=====
Acq. Operator   : EO                      Seq. Line : 18
Acq. Instrument : Curly                   Location  : Vial 44
Injection Date  : 6/6/2011 10:05:12 PM    Inj       : 1
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.729	BB	305.75320	1.47506e-2	4.51004		Ammonia

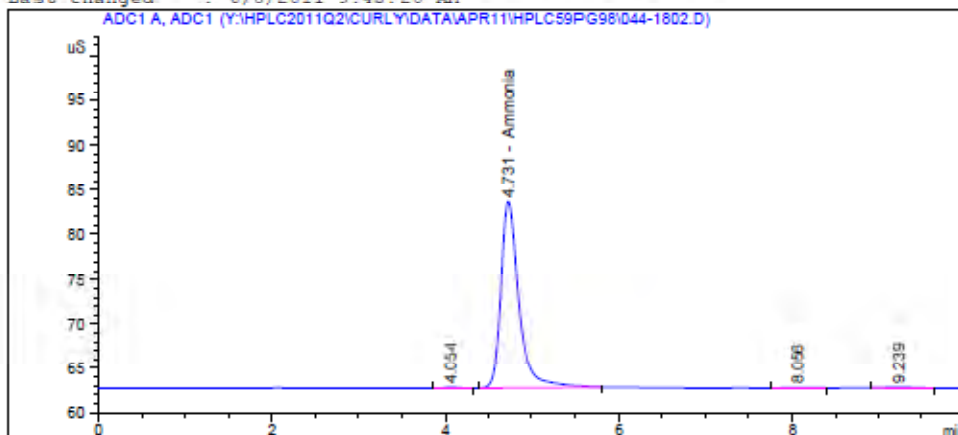
Totals : 4.51004

```
=====
*** End of Report ***
=====
```



Data File Y:\HPLC2011Q2\CURLY\DATA\APR11\HPLC59PG98\044-1802.D  
Sample Name: HPLC59pg98 #4

```
=====
Acq. Operator   : EO                      Seq. Line : 18
Acq. Instrument : Curly                   Location  : Vial 44
Injection Date  : 6/6/2011 10:17:12 PM    Inj       : 2
                                           Inj Volume: 25.000 ul
Acq. Method     : H:\HPLC2011Q1\CURLY\METHODS\AMMONIA.M
Last changed    : 6/2/2011 10:10:26 AM by EO
Analysis Method : Y:\HPLC2011Q2\CURLY\METHODS\HPLC59PG98.M
Last changed    : 6/8/2011 9:45:20 AM
=====
```



```
=====
                        External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : Wednesday, June 08, 2011 9:45:14 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: ADC1 A, ADC1

RetTime [min]	Type	Area [uS*s]	Amt/Area	Amount [ug/mL]	Grp	Name
4.731	BB	306.23929	1.47546e-2	4.51844		Ammonia

Totals : 4.51844

```
=====
*** End of Report ***
=====
```

method: C:\HPLC2010Q4\CURLY\METHODS\AMMONIA.M  
Modified on: 2/14/2011 at 4:56:34 PM

#### Method Information

Method: C:\HPLC2010Q4\CURLY\METHODS\AMMONIA.M  
Modified: 2/14/2011 at 4:56:34 PM

Column: Dionex IonPac CS12 (250 mm x 4 mm)  
Mobile Phase: 0.02 N MethaneSulfonic Acid  
Detection: Suppressed Conductivity  
Flow Rate: 1.0 mL/min  
Temp: 30C

---

#### ANALOG DIGITAL CONVERTER

---

Signal 1  
-----

Description: Dionex ED40  
Source: Signal  
Unit: uS  
Units/Volt: 1000.000  
Peakwidth (Data Rate): 0.053 Min (5.00 Hz)  
Stop Time: No Limit  
Data Storage: All

Start Signal Source: External Device Will Start 35900

Timed Event Table:  
<no events>

Sequence: Y:\HPLC2011Q2\CURLY\SEQUENCE\HPLC59PG98.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName DataFile	Method AutoBalance	Inj LimsID	SampleType	InjVolume
====	=====	=====	=====	=====	=====	=====
1	Vial 41	HPLC59pg98 #1	AMMONIA	2	Sample	
2	Vial 42	HPLC59pg98 #2	AMMONIA	2	Sample	
3	Vial 43	HPLC59pg98 #3	AMMONIA	2	Sample	
4	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
5	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
6	Vial 46	HPLC59pg98 #6	AMMONIA	2	Sample	
7	Vial 47	HPLC59pg98 #7	AMMONIA	2	Sample	
8	Vial 48	HPLC59pg98 #88	AMMONIA	2	Sample	
9	Vial 49	0.04N H2SO4 RB	AMMONIA	2	Sample	
10	Vial 50	1/2-1 *4 0411-77	AMMONIA	2	Sample	
11	Vial 51	MS 1/2-1 *4 0411-77	AMMONIA	2	Sample	
12	Vial 52	MSD 1/2-1 *4 0411-7 7	AMMONIA	2	Sample	
13	Vial 53	3-1 0411-77	AMMONIA	2	Sample	
14	Vial 54	1/2-2 *4 0411-77	AMMONIA	2	Sample	
15	Vial 55	3-2 0411-77	AMMONIA	2	Sample	
16	Vial 56	1/2-3 *4 0411-77	AMMONIA	2	Sample	
17	Vial 57	3-3 0411-77	AMMONIA	2	Sample	
18	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
19	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
20	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
21	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
22	Vial 58	U1 R1 I1 0611-50	AMMONIA	2	Sample	
23	Vial 59	MS U1 R1 I1 0611-50	AMMONIA	2	Sample	
24	Vial 60	MSD U1 R1 I1 0611-5 0	AMMONIA	2	Sample	
25	Vial 61	U1 R1 I2 0611-50	AMMONIA	2	Sample	
26	Vial 62	U1 R2 I1 0611-50	AMMONIA	2	Sample	

Sequence: Y:\HPLC2011Q2\CURLY\SEQUENCE\HPLC59pg98.S

Line	Location	SampleName DataFile	Method AutoBalance	Inj LimsID	SampleType	InjVolume
====	=====	=====	=====	=====	=====	=====
27	Vial 63	U1 R2 I2 0611-50	AMMONIA	2	Sample	
28	Vial 64	U1 R3 I1 0611-50	AMMONIA	2	Sample	
29	Vial 65	U1 R3 I2 0611-50	AMMONIA	2	Sample	
30	Vial 66	U2 R1 I1 0611-50	AMMONIA	2	Sample	
31	Vial 67	U2 R1 I2 0611-50	AMMONIA	2	Sample	
32	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
33	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
34	Vial 48	HPLC59pg98 #88	AMMONIA	2	Sample	
35	Vial 49	0.04N H2SO4 RB	AMMONIA	2	Sample	
36	Vial 68	U2 R2 I1 0611-50	AMMONIA	2	Sample	
37	Vial 69	U2 R2 I2 0611-50	AMMONIA	2	Sample	
38	Vial 70	U2 R3 I1 0611-50	AMMONIA	2	Sample	
39	Vial 71	U2 R3 I2 0611-50	AMMONIA	2	Sample	
40	Vial 72	H2SO4 blank 0611-50	AMMONIA	2	Sample	
41	Vial 73	U3-1 0611-55	AMMONIA	2	Sample	
42	Vial 74	MS U3-1 0611-55	AMMONIA	2	Sample	
43	Vial 75	MSD U3-1 0611-55	AMMONIA	2	Sample	
44	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
45	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
46	Vial 76	U3-2 0611-55	AMMONIA	2	Sample	
47	Vial 77	U3-3 0611-55	AMMONIA	2	Sample	
48	Vial 78	U3-4 0611-55	AMMONIA	2	Sample	
49	Vial 79	U3-5 0611-55	AMMONIA	2	Sample	
50	Vial 80	U3-6 0611-55	AMMONIA	2	Sample	
51	Vial 81	U3-7 0611-55	AMMONIA	2	Sample	
52	Vial 82	U3-8 0611-55	AMMONIA	2	Sample	
53	Vial 83	U3-9 0611-55	AMMONIA	2	Sample	
54	Vial 84	U3-10 0611-55	AMMONIA	2	Sample	
55	Vial 85	U4-1 0611-55	AMMONIA	2	Sample	
56	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	

Sequence: Y:\HPLC2011Q2\CURLY\SEQUENCE\HPLC59PG98.S

Line	Location	SampleName DataFile	Method AutoBalance	Inj LimsID	SampleType	InjVolume
====	=====	=====	=====	=====	=====	=====
57	Vial 46	HPLC59pg98 #5	AMMONIA	2	Sample	
58	Vial 48	HPLC59pg98 #SS	AMMONIA	2	Sample	
59	Vial 49	0.04N H2SO4 RB	AMMONIA	2	Sample	
60	Vial 86	MS U4-1 0611-55	AMMONIA	2	Sample	
61	Vial 87	MSD U4-1 0611-55	AMMONIA	2	Sample	
62	Vial 88	U4-2 0611-55	AMMONIA	2	Sample	
63	Vial 89	U4-3 0611-55	AMMONIA	2	Sample	
64	Vial 90	U4-4 0611-55	AMMONIA	2	Sample	
65	Vial 91	U4-5 0611-55	AMMONIA	2	Sample	
66	Vial 92	U4-6 0611-55	AMMONIA	2	Sample	
67	Vial 93	U4-7 0611-55	AMMONIA	2	Sample	
68	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
69	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	
70	Vial 94	U4-8 0611-55	AMMONIA	2	Sample	
71	Vial 95	U4-9 0611-55	AMMONIA	2	Sample	
72	Vial 96	U4-10 0611-55	AMMONIA	2	Sample	
73	Vial 97	Blank 0611-55	AMMONIA	2	Sample	
74	Vial 44	HPLC59pg98 #4	AMMONIA	2	Sample	
75	Vial 45	HPLC59pg98 #5	AMMONIA	2	Sample	

**This Is The Last Page  
Of This Report.**



EA# 0411-77 Page 80 of 80

***Enthalpy:***  
***Analytical Report 0511-67***



# Shaw Environmental, Inc.

Air Measurements Division - 4171 Essen Lane  
Baton Rouge, LA 70809

CITGO ICR Testing  
Project # 142733

Analytical Report  
(0511-67)

## *EPA Method 18 Bags & Condensates*

1,2-Dibromoethane, 1,3-Butadiene, Acetone, Acetonitrile, Acrolein, Acrylonitrile,  
Benzene, Carbon disulfide, Dichloromethane, Hexane, Pentane, Tetrachloroethene,  
Toluene, Trichloroethene

## *EPA Method 18 Adsorbents*

2,2,4-Trimethylpentane, 2-Nitropropane, Chlorobenzene, Cumene, Ethylbenzene,  
Methyl isobutyl ketone, Methyl t-butyl ether, m-Xylene, Nitrobenzene, o-Xylene,  
p-Xylene, Styrene

## *EPA Method 308*

Methanol



## Enthalpy Analytical, Inc.

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



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

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 94 pages.

*Valgena Respass*

QA Review Performed by – Valgena Respass

Report Issued: 06/08/2011



EA# 0511-67 Page 2 of 94

# Summary of Results



EA# 0511-67 Page 3 of 94

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

Compound	Sample ID / Adjusted Concentration (ppm)		
	<i>052311-18-Bag 1</i>	<i>052311-18-Bag 2</i>	<i>052311-18-Bag 3</i>
1-3 Butadiene #	0.282 ND	0.282 ND	0.282 ND
Acetonitrile #	1.12 ND	1.12 ND	1.12 ND
Acrolein	0.290 ND	0.290 ND	0.290 ND
Acetone	0.396 ND	0.396 ND	0.396 ND
Acrylonitrile	0.365 ND	0.365 ND	0.365 ND
Pentane	0.242 ND	0.242 ND	0.242 ND
Methylene chloride	0.981 ND	0.981 ND	0.981 ND
Hexane	0.242 ND	0.242 ND	0.242 ND
Benzene	0.251 ND	0.251 ND	0.251 ND
Trichloroethene	0.368 ND	0.368 ND	0.368 ND
Toluene	0.240 ND	0.240 ND	0.240 ND
1,2 Dibromoethane	0.287 ND	0.287 ND	0.287 ND
Tetrachloroethene	0.272 ND	0.272 ND	0.272 ND
# Results not adjusted.			

Company	Shaw Environmental, Inc.
Analyst	KAM
Parameters	EPA Method 18 Bag FPD

Client #	142733
Job #	0511-67
# Samples	3

Compound	Sample ID / Sample Concentration (ppm)		
	<i>052311-Bag 1</i>	<i>052311-Bag 2</i>	<i>052311-Bag 3</i>
Carbon Disulfide	0.138 J	0.132 J	0.118 J

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Cond

Client #	142733
Job #	0511-67
# Samples	3

Compound	Sample ID / Catch Weight (ug)		
	<i>R1 Bag KO</i> <i>052011-18-U-31</i>	<i>R2 Bag KO</i> <i>052011-18-U-33</i>	<i>R3 Bag KO</i> <i>052011-18-U-35</i>
1,3-Butadiene	9.35 ND	9.35 ND	9.35 ND
Pentane	5.31 ND	5.31 ND	5.31 ND
Acrolein	7.01 ND	7.01 ND	7.01 ND
Acetone	49.1 J	48.3 J	6.72 ND
Dichloromethane	11.2 ND	59.0 J	11.2 ND
Hexane	5.57 ND	5.57 ND	5.57 ND
Benzene	7.40 ND	7.40 ND	7.40 ND
Trichloroethylene	12.4 ND	12.4 ND	12.4 ND
Toluene	9.38 J	7.31 ND	7.31 ND
Tetrachloroethylene	13.7 ND	13.7 ND	13.7 ND
1,2-Dibromoethane	18.3 ND	18.3 ND	18.3 ND

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Cond

Client #	142733
Job #	0511-67
# Samples	3

Compound	Sample ID / Catch Weight (ug)		
	<i>R1 Bag KO</i>	<i>R2 Bag KO</i>	<i>R3 Bag KO</i>
	<i>052011-18-U-31</i>	<i>052011-18-U-33</i>	<i>052011-18-U-35</i>
Carbon disulfide	5.36 ND	5.36 ND	5.36 ND

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Compound	Sample ID / Adjusted Catch Weight (ug)		
	<i>05202011-18-U</i>		
	<i>Run 1</i>	<i>Run 2</i>	<i>Run 3</i>
MTBE	0.982 ND	0.982 ND	0.982 ND
2-Nitropropane	1.42 ND	1.42 ND	1.67 J
Isooctane	0.830 ND	0.830 ND	0.830 ND
MIBK	1.01 ND	1.01 ND	1.01 ND
Chlorobenzene	1.37 ND	1.37 ND	1.37 ND
Ethylbenzene	1.04 ND	1.04 ND	1.04 ND
p-Xylene	1.04 ND	1.04 ND	1.04 ND
Styrene	1.16 ND	1.16 ND	1.16 ND
o-Xylene	1.07 ND	1.07 ND	1.07 ND
Cumene	1.03 ND	1.03 ND	1.03 ND
Nitrobenzene	1.40 J	1.39 J	1.28 J

Company	Shaw Environmental, Inc.
Analyst	KAM
Parameters	EPA Method 308

Client #	142733
Job #	0511-67
# Samples	3 Runs

Compound	Sample ID / Catch Weight (ug)		
	<i>R1</i>	<i>R2</i>	<i>R3</i>
Methanol	3.44 ND	310	1.95 J



# Results



EA# 0511-67 Page 10 of 94

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.282 (ppm)  
 LOQ 2.57 (ppm)  
 Compound 1-3 Butadiene

Lower Curve Limit 2.57 (ppm)  
 Upper Curve Limit 257 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.282	0.282	0.282	0.0	0.282	1	100	0.282	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.282	0.282	0.282	0.0	0.282	1	100	0.282	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.282	0.282	0.282	0.0	0.282	1	100	0.282	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.282	0.282	0.282	0.0	0.282	1	100	0.282	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	2.62	2.62	2.62	0.1	2.93	2.91	2.99	1.6	2.94	1	100	2.94	

0511-67 res bag.fid

EA# 0511-67 Page 11 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 1.12 (ppm) Lower Curve Limit 4.85 (ppm)  
 LOQ 4.85 (ppm) Upper Curve Limit 250 (ppm)  
 Compound Acetonitrile

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	1.12	1.12	1.12	0.0	1.12	1	100	1.12	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	1.12	1.12	1.12	0.0	1.12	1	100	1.12	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	1.12	1.12	1.12	0.0	1.12	1	100	1.12	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	1.12	1.12	1.12	0.0	1.12	1	100	1.12	ND
052311-M18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	3.45	3.45	3.45	0.1	3.64	3.47	3.58	2.6	3.56	1	100	3.56	J

0511-67 res bag.fid

EA# 0511-67 Page 12 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.283 (ppm)  
 LOQ 2.57 (ppm)  
 Compound Acrolein

Lower Curve Limit 2.57 (ppm)  
 Upper Curve Limit 257 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.283	0.283	0.283	0.0	0.283	1	97.5	0.290	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.283	0.283	0.283	0.0	0.283	1	97.5	0.290	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.283	0.283	0.283	0.0	0.283	1	97.5	0.290	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.283	0.283	0.283	0.0	0.283	1	100	0.283	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	3.59	3.59	3.59	0.0	6.32	5.97	6.14	2.9	6.14	1	100	6.14	

0511-67 res bag.fid

EA# 0511-67 Page 13 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.415 (ppm) Lower Curve Limit 4.99 (ppm)  
 LOQ 4.99 (ppm) Upper Curve Limit 257 (ppm)  
 Compound Acetone

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.415	0.415	0.415	0.0	0.415	1	105	0.396	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.415	0.415	0.415	0.0	0.415	1	105	0.396	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.415	0.415	0.415	0.0	0.415	1	105	0.396	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.415	0.415	0.415	0.0	0.415	1	100	0.415	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	3.70	3.70	3.70	0.1	6.56	6.46	6.79	2.8	6.61	1	100	6.61	

0511-67 res bag fid

EA# 0511-67 Page 14 of 94

7/7/2011

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.319 (ppm)  
LOQ 4.97 (ppm)  
Compound Acrylonitrile

Lower Curve Limit 4.97 (ppm)  
Upper Curve Limit 256 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.319	0.319	0.319	0.0	0.319	1	87.5	0.365	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.319	0.319	0.319	0.0	0.319	1	87.5	0.365	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.319	0.319	0.319	0.0	0.319	1	87.5	0.365	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.319	0.319	0.319	0.0	0.319	1	100	0.319	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	4.11	4.11	4.11	0.0	5.36	5.49	5.61	2.3	5.49	1	100	5.49	

0511-67 res bag.fid

EA# 0511-67 Page 15 of 94

7/7/2011

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.257 (ppm)  
 LOQ 2.57 (ppm)  
 Compound Pentane

Lower Curve Limit 2.57 (ppm)  
 Upper Curve Limit 257 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	106	0.242	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	106	0.242	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	106	0.242	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	100	0.257	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	4.19	4.19	4.19	0.0	6.72	6.73	6.62	1.0	6.69	1	100	6.69	

0511-67 res bag.fid

EA# 0511-67 Page 16 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.958 (ppm) Lower Curve Limit 2.57 (ppm)  
 LOQ 2.57 (ppm) Upper Curve Limit 257 (ppm)  
 Compound Methylene chloride

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.958	0.958	0.958	0.0	0.958	1	97.6	0.981	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.958	0.958	0.958	0.0	0.958	1	97.6	0.981	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.958	0.958	0.958	0.0	0.958	1	97.6	0.981	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.958	0.958	0.958	0.0	0.958	1	100	0.958	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	4.51	4.51	4.51	0.0	6.42	5.96	6.08	4.4	6.15	1	100	6.15	

0511-67 res bag fid

EA# 0511-67 Page 17 of 94

7/7/2011



Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.259 (ppm)  
LOQ 2.57 (ppm)  
Compound Hexane

Lower Curve Limit 2.57 (ppm)  
Upper Curve Limit 257 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.259	0.259	0.259	0.0	0.259	1	107	0.242	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.259	0.259	0.259	0.0	0.259	1	107	0.242	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.259	0.259	0.259	0.0	0.259	1	107	0.242	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.259	0.259	0.259	0.0	0.259	1	100	0.259	ND
052311-M18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	5.78	5.78	5.78	0.0	6.83	6.72	6.70	1.2	6.75	1	100	6.75	

0511-67 res bag fid

EA# 0511-67 Page 18 of 94

7/7/2011

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.256 (ppm)  
 LOQ 2.56 (ppm)  
 Compound Benzene

Lower Curve Limit 2.56 (ppm)  
 Upper Curve Limit 256 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.256	0.256	0.256	0.0	0.256	1	102	0.256	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.256	0.256	0.256	0.0	0.256	1	102	0.256	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.256	0.256	0.256	0.0	0.256	1	102	0.256	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.256	0.256	0.256	0.0	0.256	1	100	0.256	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	6.50	6.50	6.50	0.0	6.48	6.36	6.38	1.1	6.41	1	100	6.41	

0511-67 res bag.fid

EA# 0511-67 Page 19 of 94

7/7/2011

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.401 (ppm)  
LOQ 4.97 (ppm)  
Compound Trichloroethene

Lower Curve Limit 4.97 (ppm)  
Upper Curve Limit 256 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.401	0.401	0.401	0.0	0.401	1	109	0.368	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.401	0.401	0.401	0.0	0.401	1	109	0.368	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.401	0.401	0.401	0.0	0.401	1	109	0.368	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.401	0.401	0.401	0.0	0.401	1	100	0.401	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	6.89	6.89	6.89	0.0	6.94	6.78	6.80	1.5	6.84	1	100	6.84	

0511-67 res bag.fid

EA# 0511-67 Page 20 of 94

7/7/2011

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameters	EPA Method 18 Bags FID

Client #	142733
Job #	0511-67
# Samples	3 Bags, 1 S&R

MDL 0.245 (ppm)  
LOQ 4.97 (ppm)  
Compound Toluene

Lower Curve Limit 4.97 (ppm)  
Upper Curve Limit 256 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.245	0.245	0.245	0.0	0.245	1	102	0.240	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.245	0.245	0.245	0.0	0.245	1	102	0.240	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.245	0.245	0.245	0.0	0.245	1	102	0.240	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.245	0.245	0.245	0.0	0.245	1	100	0.245	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	7.56	7.56	7.56	0.0	6.47	6.38	6.36	1.1	6.41	1	100	6.41	

0511-67 res bag.fid

EA# 0511-67 Page 21 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.257 (ppm) Lower Curve Limit 4.99 (ppm)  
 LOQ 4.99 (ppm) Upper Curve Limit 257 (ppm)  
 Compound 1,2 Dibromoethane

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	89.6	0.287	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	89.6	0.287	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	89.6	0.287	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.257	0.257	0.257	0.0	0.257	1	100	0.257	ND
052311-18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	7.83	7.84	7.84	0.0	5.85	5.61	5.66	0.5	5.64	1	100	5.64	

0511-67 res bag.fid

EA# 0511-67 Page 22 of 94

7/7/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM / CJT	Job #	0511-67
Parameters	EPA Method 18 Bags FID	# Samples	3 Bags, 1 S&R

MDL 0.291 (ppm) Lower Curve Limit 4.99 (ppm)  
 LOQ 4.99 (ppm) Upper Curve Limit 257 (ppm)  
 Compound Tetrachloroethene

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Rec Eff (%)	Adj Conc (ppm)	Qual
052311-18-Bag 1	018B0101.D	018B0102.D	018B0103.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.291	0.291	0.291	0.0	0.291	1	107	0.272	ND
052311-18-Bag 2	021B0201.D	021B0202.D	021B0203.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.291	0.291	0.291	0.0	0.291	1	107	0.272	ND
052311-18-Bag 3	023B0301.D	023B0302.D	023B0303.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.291	0.291	0.291	0.0	0.291	1	107	0.272	ND
N2 Blank	017B0401.D	017B0402.D	017B0403.D	GC114P176R_ICR.M	NA	NA	NA	NA	0.291	0.291	0.291	0.0	0.291	1	100	0.291	ND
052311-M18-Bag1 SPK	019B0901.D	019B0902.D	019B0903.D	GC114P176R_ICR.M	7.98	7.98	7.98	0.0	6.81	6.76	6.65	1.3	6.74	1	100	6.74	

0511-67 res bag.fid

EA# 0511-67 Page 23 of 94

7/7/2011

v (6) Viewed by MSS: 5/25/11

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameter	Bag Spike & Recovery

Client #	142733
Job #	0511-67
Unspiked Sample ID	052311-M18-BagT

$$\% \text{ Recovery} = (T - U) / S \times 100$$

T = after spike concentration

U = before spike concentration

S = theoretical spike concentration

	1,3-Butadiene			Acetonitrile			Acrolein			Acetone																										
	MW	Inj 1	Inj 2	Inj 3	MW	Inj 1	Inj 2	Inj 3	MW	Inj 1	Inj 2	Inj 3																								
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)																								
What was the conc of the bag before spiking?	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																								
U (before spiking)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																								
Avg ppm	0.00				0.00				0.00																											
What was added to the bag?																																				
Gas Spike #1	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)																								
	267	29.91	72.0	0	29.91	72.0	267	29.91	72.0	267	29.91	72.0																								
Volume Added (mL)	150	Total up	96.0	0	Total up	0.0	150	Total up	89.1	150	Total up	92.3																								
Gas Spike #2	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)	Conc. ppm	Flow (mL/gal)	T (F)																								
	0	29.91	72.0	249	29.91	72.0	0	29.91	72.0	0	29.91	72.0																								
Volume Added (mL)	150	Total up	0.0	150	Total up	89.3	150	Total up	0.0	150	Total up	0.0																								
Total Vol (mL) added as gas	300			300			300			300																										
Other volume (mL) Added	0			0			0			0																										
Volume (mL) used in analysis	6.070			6.070			6.070			6.070																										
What volume was in the bag after analysis?	<table border="1"> <tr> <td>Sampled</td> <td>5/23/11 10:25 AM</td> <td>Delta</td> <td>Hours</td> </tr> <tr> <td>Analyzed</td> <td>5/25/11 11:01 AM</td> <td>Delta</td> <td>72:36:00</td> </tr> <tr> <td>Spike</td> <td>5/25/11 1:55 PM</td> <td>Delta</td> <td>75:15:00</td> </tr> <tr> <td>Spike Analyzed</td> <td>5/25/11 5:10 PM</td> <td></td> <td></td> </tr> <tr> <td>Total Vol. After Analysis</td> <td>0</td> <td>(mL)</td> <td></td> </tr> <tr> <td>Spill hold equal to or greater than original hold</td> <td></td> <td></td> <td>YES</td> </tr> </table>												Sampled	5/23/11 10:25 AM	Delta	Hours	Analyzed	5/25/11 11:01 AM	Delta	72:36:00	Spike	5/25/11 1:55 PM	Delta	75:15:00	Spike Analyzed	5/25/11 5:10 PM			Total Vol. After Analysis	0	(mL)		Spill hold equal to or greater than original hold			YES
Sampled	5/23/11 10:25 AM	Delta	Hours																																	
Analyzed	5/25/11 11:01 AM	Delta	72:36:00																																	
Spike	5/25/11 1:55 PM	Delta	75:15:00																																	
Spike Analyzed	5/25/11 5:10 PM																																			
Total Vol. After Analysis	0	(mL)																																		
Spill hold equal to or greater than original hold			YES																																	
Ending Volume in Bag (mL)	0	5,770	5,770	5,770	5,770	5,770	5,770	5,770	5,770	5,770	5,770	5,770																								
Original volume in the bag (mL)	0	300	300	300	300	300	300	300	300	300	300	300																								
Total volume added (mL)	0	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05																								
Dilution Factor caused by addition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																								
Dilution Adjusted Base Conc (ppm) "U"	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																								
Theoretical Spike Conc (ppm) "S"	0.00	6.38	6.11	6.38	6.11	6.38	6.11	6.38	6.11	6.38	6.11	6.38																								
What was the conc of the bag after spiking?																																				
Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3	Inj 3																								
(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)																								
2.93	2.91	2.89	3.64	3.47	3.56	5.39	5.37	5.14	6.58	6.46	6.79	6.79																								
Avg ppm	2.94			3.56			5.14		6.61																											
Final Concentration (ppm) "T"																																				
RECOVERY %	45.7 %			58.3 %			81.5 %		105 %																											

5/20/11 5:50

5/13/07 res bag 50 % Precision

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameter	Bag Spike & Recovery

Client #	142733
Job #	0511-67
Unspiked Sample ID	052311-M18-BagT

$$\% \text{ Recovery} = (T - U) / S \times 100$$

T = after spike concentration

U = before spike concentration

S = theoretical spike concentration

	Acrylonitrile			Pentane			Methylene chloride			Hexane																																
	MW	53.05		MW	72.15		MW	84.93		MW	86.18																															
What was the conc of the bag before spiking?	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)																														
U (before spiking)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																														
Avg ppm	0.00			0.00			0.00			0.00																																
What was added to the bag?	Conc. ppm	Flow (mHg)	T (F)	Conc. ppm	Flow (mHg)	T (F)	Conc. ppm	Flow (mHg)	T (F)	Conc. ppm	Flow (mHg)	T (F)																														
Gas Spike #1	257	29.91	72.0	257	29.91	72.0	257	29.91	72.0	257	29.91	72.0																														
Volume Added (mL)	150	Total up	84	150	Total up	114.7	150	Total up	135.0	150	Total up	137.0																														
Gas Spike #2	0	29.91	72.0	0	29.91	72.0	0	29.91	72.0	0	29.91	72.0																														
Volume Added (mL)	150	Total up	0.0	150	Total up	0.0	150	Total up	0.0	150	Total up	0.0																														
Total Vol (mL) added as gas	300			300			300			300																																
Other volume (mL) Added	0			0			0			0																																
Volume (mL) used in analysis	6.070			6.070			6.070			6.070																																
What volume was in the bag after analysis?	<table border="1"> <tr> <td>(In. Hg)</td> <td>Sampled</td> <td>5/23/11 10:25 AM</td> <td>Delta</td> <td>Hours</td> </tr> <tr> <td>(°F)</td> <td>Analyzed</td> <td>5/25/11 11:01 AM</td> <td></td> <td>72:36:00</td> </tr> <tr> <td>(mm Hg)</td> <td>Spiked</td> <td>5/25/11 1:55 PM</td> <td>Delta</td> <td>Hours</td> </tr> <tr> <td>(L)</td> <td></td> <td></td> <td></td> <td>75:15:00</td> </tr> <tr> <td>0</td> <td>Spoke Analyzed</td> <td>5/31/11 5:10 PM</td> <td></td> <td></td> </tr> <tr> <td>Total Vol. After Analysis (L)</td> <td>Spoke hold equal to or greater than original hold</td> <td></td> <td>YES</td> <td></td> </tr> </table>												(In. Hg)	Sampled	5/23/11 10:25 AM	Delta	Hours	(°F)	Analyzed	5/25/11 11:01 AM		72:36:00	(mm Hg)	Spiked	5/25/11 1:55 PM	Delta	Hours	(L)				75:15:00	0	Spoke Analyzed	5/31/11 5:10 PM			Total Vol. After Analysis (L)	Spoke hold equal to or greater than original hold		YES	
(In. Hg)	Sampled	5/23/11 10:25 AM	Delta	Hours																																						
(°F)	Analyzed	5/25/11 11:01 AM		72:36:00																																						
(mm Hg)	Spiked	5/25/11 1:55 PM	Delta	Hours																																						
(L)				75:15:00																																						
0	Spoke Analyzed	5/31/11 5:10 PM																																								
Total Vol. After Analysis (L)	Spoke hold equal to or greater than original hold		YES																																							
Ending Volume in Bag (mL)	0			5,770			5,770			5,770																																
Original volume in the bag (mL)	300			300			300			300																																
Total volume added (mL)	1.05			1.05			1.05			1.05																																
Dilution Factor caused by addition	0.00			0.00			0.00			0.00																																
Dilution Adjusted Base Conc (ppm) "U"	8.27			6.38			6.38			6.38																																
Theoretical Spike Conc (ppm) "S"	8.27			6.38			6.38			6.38																																
What was the conc of the bag after spiking?	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)	Inj 1 (ppm)	Inj 2 (ppm)	Inj 3 (ppm)																														
T (Final Concentration (ppm))	5.35	5.49	5.61	5.72	6.73	6.62	5.42	5.90	5.06	5.63	6.72	6.70																														
Avg ppm	5.49			6.09			5.75			6.75																																
RECOVERY %	67.5 %			105 %			91.5 %			107 %																																



Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameter	Bag Spike & Recovery

Client #	142733
Job #	0511-67
Unspiked Sample ID	052311-M18-BagT

$$\% \text{ Recovery} = (T - U) / S \times 100$$

T = after spike concentration

U = before spike concentration

S = theoretical spike concentration

	Benzene			Trichloroethene			Toluene			1,3-Dibromomethane																						
	MW	Inj 1	Inj 2	Inj 3	MW	Inj 1	Inj 2	Inj 3	MW	Inj 1	Inj 2	Inj 3																				
	78.11	(ppm)	(ppm)	(ppm)	131.39	(ppm)	(ppm)	(ppm)	92.14	(ppm)	(ppm)	(ppm)																				
What was the conc of the bag before spiking?																																
U (before spiking)	0	0	0	0	0	0	0	0	0	0	0	0																				
Avg ppm	0.0				0.0				0.0																							
What was added to the bag?																																
Gas Spike #1	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)																				
Volume Added (mL)	25.91	25.91	72.0	25.91	25.91	72.0	25.91	25.91	72.0	25.91	25.91	72.0																				
Gas Spike #2	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)	Conc. ppm	Flow (mL/g)	T (F)																				
Volume Added (mL)	150	150	0.0	150	150	0.0	150	150	0.0	150	150	0.0																				
Total Vol (mL) added as gas	300			300			300			300																						
Other volume (mL) Added	0			0			0			0																						
Volume (mL) used in analysis	6.070			6.070			6.070			6.070																						
What volume was in the bag after analysis?	<table border="1"> <tr> <td>Sampled</td> <td>5/23/11 10:25 AM</td> <td>Delta</td> <td>72:36:00</td> </tr> <tr> <td>Analyzed</td> <td>5/25/11 11:01 AM</td> <td></td> <td></td> </tr> <tr> <td>Spike</td> <td>5/25/11 1:55 PM</td> <td>Delta</td> <td>75:15:00</td> </tr> <tr> <td>Spike Analyzed</td> <td>5/25/11 5:10 PM</td> <td></td> <td></td> </tr> <tr> <td>Total Vol. After Analysis</td> <td>0 (mL)</td> <td>Spike hold equal to or greater than original hold</td> <td>YES</td> </tr> </table>												Sampled	5/23/11 10:25 AM	Delta	72:36:00	Analyzed	5/25/11 11:01 AM			Spike	5/25/11 1:55 PM	Delta	75:15:00	Spike Analyzed	5/25/11 5:10 PM			Total Vol. After Analysis	0 (mL)	Spike hold equal to or greater than original hold	YES
Sampled	5/23/11 10:25 AM	Delta	72:36:00																													
Analyzed	5/25/11 11:01 AM																															
Spike	5/25/11 1:55 PM	Delta	75:15:00																													
Spike Analyzed	5/25/11 5:10 PM																															
Total Vol. After Analysis	0 (mL)	Spike hold equal to or greater than original hold	YES																													
Ending Volume in Bag (mL)	0			5,770			5,770			5,770																						
Original volume in the bag (mL)	5,770			5,770			5,770			5,770																						
Total volume added (mL)	300			300			300			300																						
Dilution Factor caused by addition	1.05			1.05			1.05			1.05																						
Dilution Adjusted Base Conc (ppm) "U"	0.00			0.00			0.00			0.00																						
Theoretical Spike Conc (ppm) "S"	8.27			8.27			8.27			8.38																						
What was the conc of the bag after spiking?																																
Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3	Inj 1	Inj 2	Inj 3																					
(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)																					
5.48	5.36	5.30	5.94	6.78	6.80	5.47	5.38	5.30	5.65	5.61	5.65																					
Avg ppm	5.41		5.94	6.84		5.47	5.41		5.65	5.64																						
Final Concentration (ppm) "T"																																
RECOVERY %	102 %			109 %			102 %			99.6 %																						

v 1.0 Viewed by MSS 5/25/11

Company	Shaw Environmental, Inc.
Analyst	MGM / CJT
Parameter	Bag Spike & Recovery

Client #	142733
Job #	0511-67
Unspiked Sample ID	052311-M18-BagT

$$\% \text{ Recovery} = (T - U) / S \times 100$$

T = after spike concentration

U = before spike concentration

S = theoretical spike concentration

What was the conc of the bag before spiking?

Tetrachloroethene			
MW 186.0			
mg 1	mg 2	mg 3	
(ppm)	(ppm)	(ppm)	
0	0	0	
Avg ppm 0.0			

U (before spike)

What was added to the bag?

Conc. ppm	Flow (ml/gal)	T (F)
257	25.91	72.0
150	Total gal	254

Gas Spike #1

Volume Added (ml)

Conc. ppm	Flow (ml/gal)	T (F)
0	25.91	72.0
150	Total gal	0.0

Gas Spike #2

Volume Added (ml)

Total Vol (ml) added as gas 300

Other volume (ml) Added 0

Volume (ml) used in analysis 6.070

What volume was in the bag after analysis?

Sampled	5/23/11 10:25 AM	Delta	None
Analyzed	5/25/11 11:01 AM	Delta	72.000
Spliked	5/25/11 1:55 PM	Delta	None
Splike Analyzed	5/31/11 5:10 PM	Delta	75.150
Total Vol. After Analysis	0 (ml)	Spike hold equal to or greater than original hold	YES

Ending Volume in Bag (ml) 0

Original volume in the bag (ml) 5.710

Total volume added (ml) 300

Dilution Factor caused by addition 1.05

Dilution Adjusted Base Conc (ppm) "U" 0.00

Theoretical Spike Conc (ppm) "S" 8.38

What was the conc of the bag after spiking?

mg 1	mg 2	mg 3
(ppm)	(ppm)	(ppm)
5.81	5.75	5.65
Avg ppm 5.74		

Final Concentration (ppm) "T"

RECOVERY % 107 %

5/3/2011 5:50

3513-07 res bag 5d % Recovery

Company	Shaw Environmental, Inc.
Analyst	KAM
Parameters	EPA Method 18 Bag GC/FPD

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.0139 (ppm)  
 LOQ 0.865 (ppm)  
 Compound Carbon Disulfide

Lower Curve Limit 0.865 (ppm)  
 Upper Curve Limit 10.1 (ppm)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ppm)	Conc # 2 (ppm)	Conc # 3 (ppm)	% Diff Conc	Avg Conc (ppm)	DF	Sample Conc (ppm)	Qual
052311-Bag 1	008B0101.D	008B0102.D	008B0103.D	GC105P166P.M	5.09	5.09	5.08	0.1	0.151	0.137	0.125	9.3	0.138	1	0.138	J
052311-Bag 2	003B0201.D	003B0202.D	003B0203.D	GC105P166P.M	5.08	5.08	5.08	0.1	0.135	0.133	0.129	2.5	0.132	1	0.132	J
052311-Bag 3	009B0301.D	009B0302.D	009B0303.D	GC105P166P.M	5.08	5.08	5.08	0.0	0.116	0.119	0.119	1.8	0.118	1	0.118	J

0511-67 res bag FPD

EA# 0511-67 Page 28 of 94

7/1/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.220 (ug/mL)  
 LOQ 2.20 (ug/mL)  
 Compound 1,3-Butadiene

Lower Curve Limit 2.20 (ug/mL)  
 Upper Curve Limit 183 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.220	0.220	0.220	0.0	0.220	1	42.5	9.35	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.220	0.220	0.220	0.0	0.220	1	42.5	9.35	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.220	0.220	0.220	0.0	0.220	1	42.5	9.35	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.220	0.220	0.220	0.0	0.220	1	1.00	0.220	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	4.73	4.73	4.73	0.1	11.2	11.1	11.0	0.6	11.1	1	2.14	23.8	
																Spike Amount (ug)	22.0
																Native Amount (ug)	0.0
																Spike Recovery (%)	108%

0511-67 res bag cond

EA# 0511-67 Page 29 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.125 (ug/mL) Lower Curve Limit 1.25 (ug/mL)  
 LOQ 1.25 (ug/mL) Upper Curve Limit 208 (ug/mL)  
 Compound Pentane

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.125	0.125	0.125	0.0	0.125	1	42.5	5.31	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.125	0.125	0.125	0.0	0.125	1	42.5	5.31	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.125	0.125	0.125	0.0	0.125	1	42.5	5.31	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.125	0.125	0.125	0.0	0.125	1	1.00	0.125	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	5.63	5.63	5.63	0.1	5.61	5.47	5.43	2.0	5.50	1	2.14	11.8	
																Spike Amount (ug)	12.5
																Native Amount (ug)	0.0
																Spike Recovery (%)	94.3%

0511-67 res bag cond

EA# 0511-67 Page 30 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.165 (ug/mL) Lower Curve Limit 1.65 (ug/mL)  
 LOQ 1.65 (ug/mL) Upper Curve Limit 138 (ug/mL)  
 Compound Acrolein

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.165	0.165	0.165	0.0	0.165	1	42.5	7.01	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.165	0.165	0.165	0.0	0.165	1	42.5	7.01	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.165	0.165	0.165	0.0	0.165	1	42.5	7.01	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.165	0.165	0.165	0.0	0.165	1	1.00	0.165	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	6.10	6.10	6.10	0.1	9.33	9.38	9.38	0.3	9.36	1	2.14	20.0	
																Spike Amount (ug)	16.5
																Native Amount (ug)	0.0
																Spike Recovery (%)	121%

0511-67 res bag cond

EA# 0511-67 Page 31 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.158 (ug/mL) Lower Curve Limit 1.58 (ug/mL)  
 LOQ 1.58 (ug/mL) Upper Curve Limit 132 (ug/mL)  
 Compound Acetone

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	6.14	6.13	6.14	0.2	1.17	1.15	1.15	1.5	1.16	1	42.5	49.1	J
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	6.15	6.16	6.17	0.2	1.14	1.14	1.14	0.2	1.14	1	42.5	40.3	J
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.158	0.158	0.158	0.0	0.158	1	42.5	6.72	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.158	0.158	0.158	0.0	0.158	1	1.00	0.158	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	6.24	6.24	6.23	0.1	8.08	8.11	8.09	0.2	8.09	1	2.14	17.3	
																Spike Amount (ug)	15.8
																Native Amount (ug)	2.44
																Spike Recovery (%)	94.2%

0511-67 res bag cond

EA# 0511-67 Page 32 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.264 (ug/mL)  
LOQ 2.64 (ug/mL)  
Compound Dichloromethane

Lower Curve Limit 2.64 (ug/mL)  
Upper Curve Limit 221 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.264	0.264	0.264	0.0	0.264	1	42.5	11.2	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	6.52	6.54	6.54	0.2	1.39	1.39	1.39	0.2	1.39	1	42.5	59.0	J
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.264	0.264	0.264	0.0	0.264	1	42.5	11.2	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.264	0.264	0.264	0.0	0.264	1	1.00	0.264	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	6.55	6.55	6.55	0.1	9.52	9.53	9.52	0.1	9.52	1	2.14	20.4	
																Spike Amount (ug)	26.5
																Native Amount (ug)	0.0
																Spike Recovery (%)	76.9%

0511-67 res bag cond

EA# 0511-67 Page 33 of 94

6/30/2011



Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.131 (ug/mL) Lower Curve Limit 1.31 (ug/mL)  
 LOQ 1.31 (ug/mL) Upper Curve Limit 109 (ug/mL)  
 Compound Hexane

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.131	0.131	0.131	0.0	0.131	1	42.5	5.57	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.131	0.131	0.131	0.0	0.131	1	42.5	5.57	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.131	0.131	0.131	0.0	0.131	1	42.5	5.57	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.131	0.131	0.131	0.0	0.131	1	1.00	0.131	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	6.85	6.85	6.84	0.1	3.10	3.11	3.10	0.2	3.10	1	2.14	6.63	
																Spike Amount (ug)	13.1
																Native Amount (ug)	0.0
																Spike Recovery (%)	50.6%

0511-67 res bag cond

EA# 0511-67 Page 34 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.174 (ug/mL) Lower Curve Limit 1.74 (ug/mL)  
 LOQ 1.74 (ug/mL) Upper Curve Limit 146 (ug/mL)  
 Compound Benzene

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.174	0.174	0.174	0.0	0.174	1	42.5	7.40	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.174	0.174	0.174	0.0	0.174	1	42.5	7.40	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.174	0.174	0.174	0.0	0.174	1	42.5	7.40	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.174	0.174	0.174	0.0	0.174	1	1.00	0.174	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	8.16	8.16	8.16	0.0	8.19	8.21	8.17	0.3	8.19	1	2.14	17.5	
																Spike Amount (ug)	17.5
																Native Amount (ug)	0.0
																Spike Recovery (%)	100%

0511-67 res bag cond

EA# 0511-67 Page 35 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.292 (ug/mL)  
LOQ 2.92 (ug/mL)  
Compound Trichloroethylene

Lower Curve Limit 2.92 (ug/mL)  
Upper Curve Limit 244 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.292	0.292	0.292	0.0	0.292	1	42.5	12.4	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.292	0.292	0.292	0.0	0.292	1	42.5	12.4	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.292	0.292	0.292	0.0	0.292	1	42.5	12.4	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.292	0.292	0.292	0.0	0.292	1	1.00	0.292	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	8.57	8.57	8.57	0.0	12.8	12.7	12.7	0.6	12.7	1	2.14	27.3	
																Spike Amount (ug)	29.3
																Native Amount (ug)	0.0
																Spike Recovery (%)	93.2%

0511-67 res bag cond

EA# 0511-67 Page 36 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.172 (ug/mL) Lower Curve Limit 1.72 (ug/mL)  
 LOQ 1.72 (ug/mL) Upper Curve Limit 144 (ug/mL)  
 Compound Toluene

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	9.32	NA	NA	NA	0.318	0.172	0.172	44.1	0.221	1	42.5	9.38	J
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	42.5	7.31	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	42.5	7.31	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	9.32	9.32	9.32	0.0	1.08	0.931	0.840	13.9	0.952	1	1.00	0.952	J
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	9.44	9.44	9.44	0.0	7.75	7.73	7.71	0.3	7.73	1	2.14	16.5	
																Spike Amount (ug)	17.3
																Native Amount (ug)	0.465
																Spike Recovery (%)	93.1%

0511-67 res bag cond

EA# 0511-67 Page 37 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.322 (ug/mL)  
LOQ 3.22 (ug/mL)  
Compound Tetrachloroethylene

Lower Curve Limit 3.22 (ug/mL)  
Upper Curve Limit 269 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.322	0.322	0.322	0.0	0.322	1	42.5	13.7	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.322	0.322	0.322	0.0	0.322	1	42.5	13.7	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.322	0.322	0.322	0.0	0.322	1	42.5	13.7	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.322	0.322	0.322	0.0	0.322	1	1.00	0.322	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	9.81	9.81	9.81	0.0	13.5	13.3	13.3	1.0	13.4	1	2.14	28.6	
																Spike Amount (ug)	32.3
																Native Amount (ug)	0.0
																Spike Recovery (%)	88.6%

0511-67 res bag cond

EA# 0511-67 Page 38 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.431 (ug/mL)  
LOQ 4.31 (ug/mL)  
Compound 1,2-Dibromoethane

Lower Curve Limit 4.31 (ug/mL)  
Upper Curve Limit 360 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019F1301.D	019F1302.D	019F1303.D	0611-67.M	NA	NA	NA	NA	0.431	0.431	0.431	0.0	0.431	1	42.5	18.3	ND
R2 Bag KO	020F1401.D	020F1402.D	020F1403.D	0611-67.M	NA	NA	NA	NA	0.431	0.431	0.431	0.0	0.431	1	42.5	18.3	ND
R3 Bag KO	021F1501.D	021F1502.D	021F1503.D	0611-67.M	NA	NA	NA	NA	0.431	0.431	0.431	0.0	0.431	1	42.5	18.3	ND
RB H2O	016F1001.D	016F1002.D	016F1003.D	0611-67.M	NA	NA	NA	NA	0.431	0.431	0.431	0.0	0.431	1	1.00	0.431	ND
R1 Bag KO MS	023F3803.D	023F3804.D	023F3805.D	0611-67.M	10.16	10.16	10.16	0.0	19.2	19.2	19.2	0.1	19.2	1	2.14	41.1	
																Spike Amount (ug)	43.2
																Native Amount (ug)	0.0
																Spike Recovery (%)	95.2%

0511-67 res bag cond

EA# 0511-67 Page 39 of 94

6/30/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Bag Condensates FPD

Client #	142733
Job #	0511-67
# Samples	3

MDL 0.126 (ug/mL)  
LOQ 1.26 (ug/mL)  
Compound Carbon disulfide

Lower Curve Limit 1.26 (ug/mL)  
Upper Curve Limit 12.5 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
R1 Bag KO	019B2401.D	019B2402.D	019B2403.D	GC116P41CS.M	NA	NA	NA	NA	0.126	0.126	0.126	0.0	0.126	1	42.5	5.36	ND
R2 Bag KO	020B2501.D	020B2502.D	020B2503.D	GC116P41CS.M	NA	NA	NA	NA	0.126	0.126	0.126	0.0	0.126	1	42.5	5.36	ND
R3 Bag KO	021B2601.D	021B2602.D	021B2603.D	GC116P41CS.M	NA	NA	NA	NA	0.126	0.126	0.126	0.0	0.126	1	42.5	5.36	ND
RB H2O	016B2101.D	016B2102.D	016B2103.D	GC116P41CS.M	NA	NA	NA	NA	0.126	0.126	0.126	0.0	0.126	1	42.5	5.36	ND
R1 Bag KO MS	023B4201.D	023B4202.D	023B4203.D	GC116P41CS.M	1.80	1.81	1.81	0.4	4.98	4.86	4.86	1.6	4.90	1	2.14	10.5	
																Spike Amount (ug)	12.6
																Native Amount (ug)	0.0
																Spike Recovery (%)	83.2%

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.148 (ug/mL)  
LOQ 1.48 (ug/mL)  
Compound MTBE

Lower Curve Limit 1.48 (ug/mL)  
Upper Curve Limit 1.476 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	98.7	0.982	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
																		0.982	ND
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.140	0.140	0.140	0.0	0.140	1.31	5.00	0.989	100	0.989	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	4.05	4.05	4.05	0.0	5.07	4.91	4.89	2.2	4.96	1	5.00	24.8	100	24.8	
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	4.05	4.05	4.05	0.1	0.909	0.812	0.870	6.3	0.867	1	5.00	4.33	100	4.33	J
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	4.05	4.05	4.05	0.0	3.14	3.12	2.96	3.7	3.07	1	5.00	15.4	100	15.4	
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
																		44.5	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	98.7	0.982	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.140	0.140	0.140	0.0	0.140	1	5.00	0.730	90.7	0.747	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
																		0.982	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	100	0.989	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	4.05	4.04	4.04	0.0	5.28	5.00	5.00	3.9	5.09	1	5.00	25.5	100	25.5	
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	4.05	NA	4.05	NA	0.356	0.148	0.411	51.8	0.305	1	5.00	1.52	100	1.52	J
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	4.05	4.05	4.05	0.0	3.10	3.03	3.17	2.3	3.10	1	5.00	15.5	100	15.5	
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
																		42.5	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	98.7	0.982	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R3 CT FH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	98.7	0.747	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.140	0.140	0.140	0.0	0.140	1	5.00	0.730	90.7	0.747	ND
																		0.982	ND

0511-67 res m18 adsorbents

EA# 0511-67 Page 41 of 94

7/8/2011



Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-87  
# Samples 3 Runs, 3 Spikes

MDL 0.148 (ug/mL)  
LOQ 1.48 (ug/mL)  
Compound MTBE

Lower Curve Limit 1.48 (ug/mL)  
Upper Curve Limit 1.476 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	100	0.989	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P087.M	4.05	4.05	4.04	0.0	5.56	5.61	5.45	1.8	5.54	1	5.00	27.7	100	27.7	J
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P087.M	4.05	4.05	4.05	0.1	1.00	0.998	1.11	7.8	1.03	1	5.00	5.16	100	5.16	J
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P087.M	4.05	4.05	4.05	0.0	2.22	2.28	2.33	2.7	2.27	1	5.00	11.4	100	11.4	J
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
44.2																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P087.M	4.05	4.04	4.04	0.0	12.2	11.8	11.9	2.1	12.0	1	5.00	59.9	100	59.9	
																	Spike Amount (ug)		73.8
																	Spike Recovery (%)		81.2%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1	5.00	0.738	100	0.738	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P087.M	4.04	4.05	4.05	0.0	9.04	9.05	9.01	0.2	9.03	1	5.00	45.2	100	45.2	
																	Spike Amount (ug)		44.3
																	Spike Recovery (%)		102%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P087.M	NA	NA	NA	NA	0.148	0.148	0.148	0.0	0.148	1.31	5.00	0.989	100	0.989	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P087.M	4.04	4.05	4.05	0.0	5.42	5.59	5.63	2.2	5.55	1	5.00	27.7	100	27.7	
% Difference																			0.1%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P087.M	4.05	4.05	4.05	0.0	3.20	3.18	3.07	2.5	3.15	1	5.00	15.8	100	15.8	
% Difference																			2.7%

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.193 (ug/mL)  
LOQ 1.93 (ug/mL)  
Compound 2-Nitropropane

Lower Curve Limit 1.93 (ug/mL)  
Upper Curve Limit 1.936 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	89.7	1.42	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
																		1.42	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	100	1.27	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	5.27	5.27	5.27	0.0	10.1	9.73	9.74	2.6	9.87	1	5.00	49.3	100	49.3	
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	5.27	5.27	5.27	0.0	0.566	0.569	0.605	1.5	0.566	1	5.00	2.98	100	2.98	J
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
																		52.3	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	89.7	1.42	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
																		1.42	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	100	1.27	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	5.27	5.27	5.27	0.0	10.7	10.1	10.0	3.9	10.3	1	5.00	51.5	100	51.5	
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	5.27	5.27	NA	0.193	0.208	0.253	16.3	0.217	1	5.00	1.09	100	1.09	J
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
																		52.6	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	89.7	1.42	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	5.23	5.23	5.23	0.1	0.525	0.296	0.277	8.3	0.300	1	5.00	1.50	99.7	1.67	J
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	89.7	1.078	ND
																		1.67	J

0511-67 res m18 adsorbents

EA# 0511-67 Page 43 of 94

7/8/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-67
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.193 (ug/mL)  
LOQ 1.93 (ug/mL)  
Compound 2-Nitropropane

Lower Curve Limit 1.93 (ug/mL)  
Upper Curve Limit 1.936 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	100	1.27	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	5.27	5.27	5.27	0.0	10.4	10.6	10.2	1.9	10.4	1	5.00	52.0	100	52.0	J
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	5.27	5.27	5.27	0.1	0.522	0.383	0.412	18.8	0.439	1	5.00	2.20	100	2.20	J
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
																			54.2
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	5.27	5.27	5.27	0.0	13.5	13.2	13.0	1.8	13.2	1	5.00	66.2	100	66.2	
																	Spike Amount (ug)		66.8
																	Spike Recovery (%)		68.4%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	5.27	5.27	5.27	0.0	11.3	11.5	11.5	0.9	11.4	1	5.00	57.2	100	57.2	
																	Spike Amount (ug)		58.1
																	Spike Recovery (%)		66.5%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1.31	5.00	1.27	100	1.27	ND
																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	5.27	5.27	5.27	0.0	10.1	10.5	10.5	2.7	10.3	1	5.00	51.7	100	51.7	
																			0.5%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.193	0.193	0.193	0.0	0.193	1	5.00	0.967	100	0.967	ND
																			NA

0511-67 res m18 adsorbents

EA# 0511-67 Page 44 of 94

7/8/2011

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.138 (ug/mL)  
LOQ 1.38 (ug/mL)  
Compound Isocane

Lower Curve Limit 1.38 (ug/mL)  
Upper Curve Limit 1.377 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.630	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
																		0.630	ND
																		0.630	ND
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.130	0.130	0.130	0.0	0.130	1.31	5.00	0.604	100	0.604	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	5.48	5.48	5.48	0.0	9.27	8.90	8.87	2.9	9.02	1	5.00	45.1	100	45.1	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
																		45.1	ND
																		45.1	ND
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.630	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.130	0.130	0.130	0.0	0.130	1	5.00	0.600	100	0.631	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
																		0.630	ND
																		0.630	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.604	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	5.48	5.48	5.48	0.0	9.38	8.86	8.83	4.0	9.02	1	5.00	45.1	100	45.1	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.130	0.130	0.130	0.0	0.130	1	5.00	0.600	100	0.600	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
																		45.1	ND
																		45.1	ND
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.630	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R3 CT FH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.631	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.130	0.130	0.130	0.0	0.130	1	5.00	0.600	100	0.631	ND
																		0.630	ND

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.138 (ug/mL)  
LOQ 1.38 (ug/mL)  
Compound Isooctane

Lower Curve Limit 1.38 (ug/mL)  
Upper Curve Limit 1.377 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.604	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	5.48	5.48	5.48	0.0	8.61	8.07	8.75	1.9	8.61	1	5.00	44.6	100	44.6	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
44.0																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	5.40	5.40	5.40	0.0	14.2	13.7	13.0	1.9	13.9	1	5.00	69.4	100	69.4	
																	Spike Amount (ug)		68.9
																	Spike Recovery (%)		101%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	5.48	5.48	5.48	0.0	8.66	8.73	8.74	0.6	8.71	1	5.00	43.5	100	43.5	
																	Spike Amount (ug)		41.3
																	Spike Recovery (%)		105%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1.31	5.00	0.604	100	0.604	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	5.48	5.48	5.48	0.0	8.61	8.96	8.67	2.7	8.65	1	5.00	44.2	100	44.2	
% Difference																			0.0%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.138	0.138	0.138	0.0	0.138	1	5.00	0.688	100	0.688	ND
% Difference																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.150 (ug/mL)  
LOQ 1.50 (ug/mL)  
Compound MBK

Lower Curve Limit 1.50 (ug/mL)  
Upper Curve Limit 1.502 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	104	1.01	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
																		1.01	ND
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	100	1.05	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	5.78	5.78	5.78	0.0	10.2	9.75	9.71	3.2	9.89	1	5.00	49.4	100	49.4	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
																		49.4	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	104	1.01	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
																		1.01	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	100	1.05	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	5.78	5.78	5.78	0.0	10.4	9.79	9.68	4.2	9.94	1	5.00	49.7	100	49.7	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
																		49.7	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	104	1.01	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	104	0.785	ND
																		1.01	ND

0511-67 res m18 adsorbents

EA# 0511-67 Page 47 of 94

7/8/2011

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-67
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.150 (ug/mL) Lower Curve Limit 1.50 (ug/mL)  
LOQ 1.50 (ug/mL) Upper Curve Limit 1.502 (ug/mL)  
Compound MIBK

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	100	1.05	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	5.78	5.78	5.78	0.0	9.89	10.0	9.80	1.3	9.91	1	5.00	49.5	100	49.5	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
																			49.0
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	5.70	5.70	5.70	0.0	14.3	13.9	13.9	1.0	14.0	1	5.00	70.1	100	70.1	
																			Spike Amount (ug)
																			73.8
																			Spike Recovery (%)
																			95.0%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	5.78	5.78	5.78	0.0	9.78	9.91	9.95	1.0	9.88	1	5.00	49.4	100	49.4	
																			Spike Amount (ug)
																			47.8
																			Spike Recovery (%)
																			103%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1.31	5.00	1.05	100	1.05	ND
																			% Difference
																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	5.78	5.78	5.78	0.0	9.82	10.0	9.84	3.1	9.82	1	5.00	49.1	100	49.1	
																			% Difference
																			0.9%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.150	0.150	0.150	0.0	0.150	1	5.00	0.798	100	0.798	ND
																			% Difference
																			NA

0511-67 res m18 adsorbents

EA# 0511-67 Page 48 of 94

7/8/2011

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client #142733  
Job #0511-87  
# Samples 3 Runs, 3 Spikes

MDL 0.221 (ug/mL)  
LOQ 2.21 (ug/mL)  
Compound Chlorobenzene

Lower Curve Limit 2.21 (ug/mL)  
Upper Curve Limit 2.212 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	106	1.37	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
																		1.37	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	100	1.45	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	6.91	6.91	6.91	0.0	14.3	13.7	13.7	2.9	13.9	1	5.00	69.4	100	69.4	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
																		69.4	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	106	1.37	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
																		1.37	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	100	1.45	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	6.91	6.91	6.91	0.0	14.6	13.9	13.8	3.8	14.1	1	5.00	70.5	100	70.5	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
																		70.5	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	106	1.37	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	106	1.04	ND
																		1.37	ND



Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-87
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.221 (ug/mL)  
LOQ 2.21 (ug/mL)  
Compound Chlorobenzene

Lower Curve Limit 2.21 (ug/mL)  
Upper Curve Limit 2.212 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	100	1.45	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	6.91	6.91	6.91	0.0	14.1	14.5	14.0	2.2	14.2	1	5.00	71.2	100	71.2	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
																			1.2
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	6.91	6.91	6.91	0.0	22.9	22.5	22.3	1.5	22.6	1	5.00	113	100	113	
																			Spike Amount (ug)
																			111
																			Spike Recovery (%)
																			102%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	6.91	6.91	6.91	0.0	13.6	13.9	14.0	1.9	13.9	1	5.00	69.3	100	69.3	
																			Spike Amount (ug)
																			68.4
																			Spike Recovery (%)
																			104%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1.31	5.00	1.45	100	1.45	ND
																			% Difference
																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	6.91	6.91	6.91	0.0	13.4	14.3	14.3	4.1	14.0	1	5.00	70.0	100	70.0	
																			% Difference
																			1.8%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.221	0.221	0.221	0.0	0.221	1	5.00	1.11	100	1.11	ND
																			% Difference
																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client #142733  
Job #0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.173 (ug/mL)  
LOQ 1.73 (ug/mL)  
Compound Ethylbenzene

Lower Curve Limit 1.73 (ug/mL)  
Upper Curve Limit 1.731 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.04	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
																		1.04	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	7.03	7.03	7.04	0.0	11.4	11.0	11.0	2.7	11.1	1	5.00	55.6	100	55.6	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
																		55.6	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.04	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
																		1.04	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	7.03	7.03	7.03	0.0	11.7	11.1	11.0	3.9	11.3	1	5.00	56.5	100	56.5	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
																		56.5	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.04	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.794	ND
																		1.04	ND

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-87
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.173 (ug/mL)  
 LOQ 1.73 (ug/mL)  
 Compound Ethylbenzene

Lower Curve Limit 1.73 (ug/mL)  
 Upper Curve Limit 1.731 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	7.03	7.03	7.03	0.0	11.3	11.7	11.3	2.2	11.4	1	5.00	57.2	100	57.2	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
57.2																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	7.03	7.03	7.03	0.0	10.1	17.0	17.7	1.3	17.0	1	5.00	09.2	100	09.2	
Spike Amount (ug)																			88.6
Spike Recovery (%)																			103%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	7.03	7.04	7.03	0.0	10.8	11.0	11.1	1.0	11.0	1	5.00	54.9	100	54.9	
Spike Amount (ug)																			51.0
Spike Recovery (%)																			106%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	7.03	7.03	7.03	0.0	10.7	11.5	11.4	4.3	11.2	1	5.00	56.1	100	56.1	
% Difference																			1.9%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.885	100	0.885	ND
% Difference																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.172 (ug/mL)  
LOQ 1.72 (ug/mL)  
Compound p-Xylene

Lower Curve Limit 1.72 (ug/mL)  
Upper Curve Limit 1.719 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.04	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
																		1.04	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.13	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	7.11	7.11	7.11	0.0	11.4	11.0	11.0	2.8	11.1	1	5.00	55.6	100	55.6	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
																		55.6	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.04	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
																		1.04	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.13	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	7.10	7.10	7.10	0.0	11.7	11.1	11.0	4.1	11.3	1	5.00	56.3	100	56.3	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
																		56.3	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.04	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.788	ND
																		1.04	ND

0511-67 res m18 adsorbents

EA# 0511-67 Page 53 of 94

7/8/2011

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.172 (ug/mL)  
LOQ 1.72 (ug/mL)  
Compound p-Xylene

Lower Curve Limit 1.72 (ug/mL)  
Upper Curve Limit 1.719 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.13	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	7.11	7.10	7.11	0.0	11.3	11.7	11.3	2.1	11.4	1	5.00	57.1	100	57.1	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
57.1																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	7.11	7.10	7.11	0.0	17.9	17.7	17.5	1.2	17.7	1	5.00	80.5	100	80.5	
Spike Amount (ug)																			85.8
Spike Recovery (%)																			103%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	7.11	7.11	7.11	0.0	10.8	11.0	11.1	1.8	11.0	1	5.00	54.8	100	54.8	
Spike Amount (ug)																			51.6
Spike Recovery (%)																			106%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1.31	5.00	1.13	100	1.13	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	7.10	7.11	7.10	0.0	10.7	11.4	11.4	4.1	11.2	1	5.00	56.1	100	56.1	
% Difference																			1.9%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.172	0.172	0.172	0.0	0.172	1	5.00	0.859	100	0.859	ND
% Difference																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.181 (ug/mL) Lower Curve Limit 1.81 (ug/mL)  
LOQ 1.81 (ug/mL) Upper Curve Limit 1.810 (ug/mL)  
Compound Styrene

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	102	1.16	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
																		1.10	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.101	0.101	0.101	0.0	0.101	1.31	5.00	1.19	100	1.19	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	7.26	7.26	7.26	0.0	11.2	10.7	10.7	3.3	10.9	1	5.00	54.4	100	54.4	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
																		54.4	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	102	1.16	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
																		1.16	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	100	1.19	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	7.26	7.26	7.26	0.0	11.5	10.8	10.7	4.9	11.0	1	5.00	55.0	100	55.0	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
																		55.0	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	102	1.16	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	102	0.886	ND
																		1.16	ND

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.181 (ug/mL)  
LOQ 1.81 (ug/mL)  
Compound Styrene

Lower Curve Limit 1.81 (ug/mL)  
Upper Curve Limit 1.810 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	100	1.19	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	7.26	7.26	7.26	0.0	11.2	11.5	11.1	2.0	11.2	1	5.00	56.2	100	56.2	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
																			56.2
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	7.26	7.26	7.26	0.0	10.0	10.5	10.3	1.2	10.5	1	5.00	62.7	100	62.7	
																	Spike Amount (ug)		90.5
																	Spike Recovery (%)		102%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	7.26	7.26	7.26	0.0	11.1	11.3	11.4	1.7	11.2	1	5.00	56.2	100	56.2	
																	Spike Amount (ug)		54.3
																	Spike Recovery (%)		104%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1.31	5.00	1.19	100	1.19	ND
																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	7.26	7.26	7.26	0.0	10.6	11.3	11.2	3.8	11.0	1	5.00	55.2	100	55.2	
																	% Difference		1.7%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.181	0.181	0.181	0.0	0.181	1	5.00	0.904	100	0.904	ND
																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.176 (ug/mL)  
LOQ 1.76 (ug/mL)  
Compound o-Xylene

Lower Curve Limit 1.76 (ug/mL)  
Upper Curve Limit 1.756 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	108	1.07	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
																		1.07	ND
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	100	1.15	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	7.31	7.31	7.31	0.0	11.4	10.9	10.9	3.3	11.1	1	5.00	55.4	100	55.4	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
																		55.4	ND
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	108	1.07	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.070	108	0.013	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
																		1.07	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	100	1.15	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	7.31	7.31	7.31	0.0	11.8	11.0	10.9	4.7	11.2	1	5.00	56.2	100	56.2	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.070	100	0.070	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
																		56.2	ND
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	108	1.07	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	108	0.813	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.070	108	0.013	ND
																		1.07	ND

0511-67 res m18 adsorbents

EA# 0511-67 Page 57 of 94

7/8/2011



Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-87
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.176 (ug/mL)  
LOQ 1.76 (ug/mL)  
Compound o-Xylene

Lower Curve Limit 1.76 (ug/mL)  
Upper Curve Limit 1.756 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	100	1.15	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	7.31	7.31	7.31	0.0	11.4	11.6	11.3	1.9	11.4	1	5.00	57.1	100	57.1	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
57.1																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	7.31	7.31	7.31	0.0	10.1	17.9	17.7	1.1	17.9	1	5.00	09.5	100	09.5	
Spike Amount (ug)																			87.1
Spike Recovery (%)																			103%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	7.31	7.31	7.31	0.0	10.8	11.0	11.1	1.6	11.0	1	5.00	54.8	100	54.8	
Spike Amount (ug)																			82.7
Spike Recovery (%)																			104%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1.31	5.00	1.15	100	1.15	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	7.31	7.31	7.31	0.0	10.8	11.4	11.4	3.8	11.2	1	5.00	56.1	100	56.1	
% Difference																			1.9%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.176	0.176	0.176	0.0	0.176	1	5.00	0.878	100	0.878	ND
% Difference																			NA

0511-87 res m18 adsorbents

EA# 0511-67 Page 58 of 94

7/8/2011

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client #142733  
Job #0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.173 (ug/mL)  
LOQ 1.73 (ug/mL)  
Compound Cumene

Lower Curve Limit 1.73 (ug/mL)  
Upper Curve Limit 1.733 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	111	1.03	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
																		1.03	NU
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	7.55	7.55	7.55	0.0	11.6	11.1	11.1	3.1	11.3	1	5.00	56.4	100	56.4	ND
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
																		56.4	
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	111	1.03	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
																		1.03	ND
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	7.55	7.55	7.55	0.0	12.0	11.3	11.2	4.8	11.5	1	5.00	57.5	100	57.5	ND
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	100	0.886	ND
																		57.5	
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	111	1.03	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.886	111	0.780	ND
																		1.03	ND

0511-67 res m18 adsorbents

EA# 0511-67 Page 59 of 94

7/8/2011

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-67  
# Samples 3 Runs, 3 Spikes

MDL 0.173 (ug/mL)  
LOQ 1.73 (ug/mL)  
Compound Cumene

Lower Curve Limit 1.73 (ug/mL)  
Upper Curve Limit 1.733 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	7.55	7.55	7.55	0.0	11.6	11.9	11.5	2.2	11.7	1	5.00	58.4	100	58.4	ND
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
58.4																			
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	7.55	7.55	7.55	0.0	10.0	17.0	17.6	1.1	17.0	1	5.00	00.9	100	00.9	
Spike Amount (ug)																			86.1
Spike Recovery (%)																			103%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	7.55	7.55	7.55	0.0	10.9	11.2	11.2	1.9	11.1	1	5.00	55.4	100	55.4	
Spike Amount (ug)																			52.0
Spike Recovery (%)																			107%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1.31	5.00	1.14	100	1.14	ND
% Difference																			NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	7.55	7.55	7.55	0.0	11.0	11.7	11.7	4.2	11.5	1	5.00	57.3	100	57.3	
% Difference																			1.0%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.173	0.173	0.173	0.0	0.173	1	5.00	0.866	100	0.866	ND
% Difference																			NA

Company Shaw Environmental, Inc.  
Analyst JBB  
Parameters EPA Method 18 Adsorbents

Client # 142733  
Job # 0511-87  
# Samples 3 Runs, 3 Spikes

MDL 0.240 (ug/mL)  
LOQ 2.40 (ug/mL)  
Compound Nitrobenzene

Lower Curve Limit 2.40 (ug/mL)  
Upper Curve Limit 2.404 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R1 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	98.6	1.63	ND
R1 XAD FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	8.71	8.71	8.71	0.0	0.279	0.240	0.288	8.5	0.271	1	5.00	1.35	98.6	1.40	J
R1 XAD BH	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R1 CT FH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R1 CT BH	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
																		1.40	J
R1 SP TUBE KO EXT	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.50	100	1.50	ND
R1 SP XAD FH	010F1001.D	010F1002.D	010F1003.D	GC121P067.M	8.70	8.70	8.70	0.0	14.3	13.7	13.7	2.8	13.9	1	5.00	89.4	100	89.4	J
R1 SP XAD BH	011F1101.D	011F1102.D	011F1103.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R1 SP CT FH	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R1 SP CT BH	016F1601.D	016F1602.D	016F1603.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
																		89.4	J
R2 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	98.6	1.63	ND
R2 XAD FH	017F1701.D	017F1702.D	017F1703.D	GC121P067.M	8.71	8.71	NA	NA	0.280	0.299	0.240	11.2	0.289	1	5.00	1.35	98.6	1.39	J
R2 XAD BH	018F1801.D	018F1802.D	018F1803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R2 CT FH	019F1901.D	019F1902.D	019F1903.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R2 CT BH	020F2001.D	020F2002.D	020F2003.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
																		1.39	J
R2 SP TUBE KO EXT	007F0701.D	007F0702.D	007F0703.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	100	1.58	ND
R2 SP XAD FH	021F2101.D	021F2102.D	021F2103.D	GC121P067.M	8.70	8.70	8.70	0.0	15.1	14.3	14.2	4.2	14.5	1	5.00	72.7	100	72.7	J
R2 SP XAD BH	022F2201.D	022F2202.D	022F2203.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R2 SP CT FH	023F2301.D	023F2302.D	023F2303.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R2 SP CT BH	024F2401.D	024F2402.D	024F2403.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
																		72.7	J
R3 TUBE KO EXT	008F0801.D	008F0802.D	008F0803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	98.6	1.63	ND
R3 XAD FH	027F2701.D	027F2702.D	027F2703.D	GC121P067.M	8.71	NA	NA	NA	0.264	0.240	0.240	8.3	0.248	1	5.00	1.34	98.6	1.28	J
R3 XAD BH	028F2801.D	028F2802.D	028F2803.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R3 CT FH	029F2901.D	029F2902.D	029F2903.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
R3 CT BH	030F3001.D	030F3002.D	030F3003.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	98.6	1.24	ND
																		1.28	J

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-87
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs, 3 Spikes

MDL 0.240 (ug/mL)  
 LOQ 2.40 (ug/mL)  
 Compound Nitrobenzene

Lower Curve Limit 2.40 (ug/mL)  
 Upper Curve Limit 2.404 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	Aliquot Factor / DF	Vol (mL)	Catch Weight (ug)	Rec Eff (%)	Adj Catch Weight (ug)	Qual
R3 SP TUBE KO EXT	006F0901.D	006F0902.D	006F0903.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	100	1.58	ND
R3 SP XAD FH	031F3101.D	031F3102.D	031F3103.D	GC121P067.M	8.70	8.70	8.70	0.0	14.6	15.0	14.4	2.0	14.7	1	5.00	73.3	100	73.3	
R3 SP XAD BH	032F3201.D	032F3202.D	032F3203.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R3 SP CT FH	033F3301.D	033F3302.D	033F3303.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
R3 SP CT BH	034F3401.D	034F3402.D	034F3403.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
																		13.3	
AQ LCS	012F1201.D	012F1202.D	012F1203.D	GC121P067.M	0.70	0.70	0.70	0.0	24.5	24.3	24.0	1.1	24.3	1	5.00	121	100	121	
																		Spike Amount (ug)	120
																		Spike Recovery (%)	101%
AQ MB	013F1301.D	013F1302.D	013F1303.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
XAD MB	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
CT MB	005F0501.D	005F0502.D	005F0503.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
XAD LCS	003F0301.D	003F0302.D	003F0303.D	GC121P067.M	8.70	8.70	8.70	0.0	14.1	14.4	14.6	1.9	14.4	1	5.00	71.8	100	71.8	
																		Spike Amount (ug)	72.1
																		Spike Recovery (%)	96.5%
R1 TUBE KO EXT LD	004F0401.D	004F0402.D	004F0403.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1.31	5.00	1.58	100	1.58	ND
																		% Difference	NA
R3 SP XAD FH LD	035F3501.D	035F3502.D	035F3503.D	GC121P067.M	8.70	8.70	8.70	0.0	13.8	14.7	14.7	4.1	14.4	1	5.00	71.9	100	71.9	
																		% Difference	1.9%
R1 SP CT FH LD	015F1501.D	015F1502.D	015F1503.D	GC121P067.M	NA	NA	NA	NA	0.240	0.240	0.240	0.0	0.240	1	5.00	1.20	100	1.20	ND
																		% Difference	NA

0511-87 res m18 adsorbents

EA# 0511-67 Page 62 of 94

7/8/2011

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte MTBE

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	44.3	60.3	100
	Spike	44.5		56.4	
Run 2	Sample	0.00	44.3	59.4	95.9
	Spike	42.5		55.3	
Run 3	Sample	0.00	44.3	59.2	99.9
	Spike	44.2		55.3	

Avg Recovery: 98.7

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte 2-Nitropropane

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	59.1	60.3	88.5
	Spike	52.3		56.4	
Run 2	Sample	0.00	59.1	59.4	88.9
	Spike	52.6		55.3	
Run 3	Sample	0.00	59.1	59.2	91.7
	Spike	54.2		55.3	

Avg Recovery: 89.7

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Isooctane

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	41.3	60.3	109
	Spike	45.1		56.4	
Run 2	Sample	0.00	41.3	59.4	109
	Spike	45.1		55.3	
Run 3	Sample	0.00	41.3	59.2	108
	Spike	44.6		55.3	

Avg Recovery: 109



Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte MIBK

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	47.8	60.3	103
	Spike	49.4		56.4	
Run 2	Sample	0.00	47.8	59.4	104
	Spike	49.7		55.3	
Run 3	Sample	0.00	47.8	59.2	104
	Spike	49.5		55.3	

Avg Recovery: 104

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Chlorobenzene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	66.4	60.3	105
	Spike	69.4		56.4	
Run 2	Sample	0.00	66.4	59.4	106
	Spike	70.5		55.3	
Run 3	Sample	0.00	66.4	59.2	107
	Spike	71.2		55.3	

Avg Recovery: 106

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Ethylbenzene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	51.9	60.3	107
	Spike	55.6		56.4	
Run 2	Sample	0.00	51.9	59.4	109
	Spike	56.5		55.3	
Run 3	Sample	0.00	51.9	59.2	110
	Spike	57.2		55.3	

Avg Recovery: 109

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte p-Xylene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	51.6	60.3	108
	Spike	55.6		56.4	
Run 2	Sample	0.00	51.6	59.4	109
	Spike	56.3		55.3	
Run 3	Sample	0.00	51.6	59.2	111
	Spike	57.1		55.3	

Avg Recovery: 109

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Styrene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	54.3	60.3	100
	Spike	54.4		56.4	
Run 2	Sample	0.00	54.3	59.4	101
	Spike	55.0		55.3	
Run 3	Sample	0.00	54.3	59.2	103
	Spike	56.2		55.3	

Avg Recovery: 102

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte o-Xylene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	52.3	60.3	106
	Spike	55.4		56.4	
Run 2	Sample	0.00	52.3	59.4	107
	Spike	56.2		55.3	
Run 3	Sample	0.00	52.3	59.2	109
	Spike	57.1		55.3	

Avg Recovery: 108

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Cumene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	51.8	60.3	109
	Spike	56.4		56.4	
Run 2	Sample	0.00	51.8	59.4	111
	Spike	57.5		55.3	
Run 3	Sample	0.00	51.8	59.2	113
	Spike	58.4		55.3	

Avg Recovery: 111

Company	Shaw Environmental, Inc.
Analyst	JBB
Parameters	EPA Method 18 Adsorb.

Client #	142733
Job #	0511-67
# Samples	3 Runs, 3 Spikes

Location CITGO  
Analyte Nitrobenzene

Sample ID	Type	Catch Weight (ug)	Spike AMT (ug)	Sample Vol	Rec. (%)
Run 1	Sample	0.00	72.1	60.3	96.3
	Spike	69.4		56.4	
Run 2	Sample	0.00	72.1	59.4	101
	Spike	72.7		55.3	
Run 3	Sample	0.00	72.1	59.2	102
	Spike	73.3		55.3	

Avg Recovery: 99.6



Company	Shaw Environmental, Inc.
Analyst	KAM
Parameters	EPA Method 308

Client #	142733
Job #	0511-67
# Samples	3 Runs

MDL 0.0809 (ug/mL)  
 LOQ 1.58 (ug/mL)  
 Compound Methanol

Lower Curve Limit 1.58 (ug/mL)  
 Upper Curve Limit 3,161 (ug/mL)

Sample ID	Lab ID # 1	Lab ID # 2	Lab ID # 3	Analysis Method	Ret Time (min)	Ret Time (min)	Ret Time (min)	% Diff Ret	Conc # 1 (ug/mL)	Conc # 2 (ug/mL)	Conc # 3 (ug/mL)	% Diff Conc	Avg Conc (ug/mL)	DF	Vol (mL)	Catch Weight (ug)	Qual
18-U-25 Dry KO R1	015F1301.D	015F1302.D	015F1303.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	42.5	3.44	ND
18-U-26 SI Gel R1 FH	069B2701.D	069B2702.D	069B2703.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	5.00	0.405	ND
18-U-26 SI Gel R1 BH	070B3001.D	070B3002.D	070B3003.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	5.00	0.405	ND
																3.44	ND
18-U-27 Dry KO R2	016F1401.D	016F1402.D	016F1403.D	GC120P119.M	3.30	3.30	3.30	0.1	1.10	1.08	1.09	1.0	1.09	1	42.5	46.4	J
18-U-28 SI Gel R2 FH	071B3101.D	071B3102.D	071B3103.D	GC120P119.M	3.44	3.44	3.44	0.0	35.5	35.9	35.7	0.5	35.7	1	5.00	178	
18-U-28 SI Gel R2 BH	072B3201.D	072B3202.D	072B3203.D	GC120P119.M	3.44	3.44	3.44	0.1	16.8	17.3	16.8	2.2	17.0	1	5.00	84.8	
																310	
18-U-29 Dry KO R3	017F1501.D	017F1502.D	017F1503.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	42.5	3.44	ND
18-U-30 SI Gel R3 FH	073B3301.D	073B3302.D	073B3303.D	GC120P119.M	3.44	3.44	3.45	0.2	0.362	0.426	0.363	9.1	0.390	1	5.00	1.95	J
18-U-30 SI Gel R3 BH	074B3401.D	074B3402.D	074B3403.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	5.00	0.405	ND
																1.95	J
SG Method Blank	075B3501.D	075B3502.D	075B3503.D	GC120P119.M	3.45	3.47	NA	NA	0.272	0.376	0.0809	66.7	0.243	1	5.00	1.21	J
Lab Blank H2O	008F0801.D	008F0802.D	008F0803.D	GC120P119.M	3.30	3.30	3.30	0.1	0.610	0.577	0.606	3.5	0.598	1	5.00	2.99	J
Lab Blank 3% n-Propanol	057B1801.D	057B1802.D	057B1803.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	5.00	0.405	ND
18-U-25 Dry KO R1-LD	018F1601.D	018F1602.D	018F1603.D	GC120P119.M	NA	NA	NA	NA	0.0809	0.0809	0.0809	0.0	0.0809	1	42.5	3.44	ND
															% Difference	NA	
18-U-26 SI Gel R1 FI-LD	077B3701.D	077B3702.D	077B3703.D	GC120P119.M	NA	NA	NA	NA	0.0009	0.0009	0.0009	0.0	0.0009	1	5.00	0.405	ND
															% Difference	NA	
Prep49p001 LCS	076B3601.D	076B3602.D	076B3603.D	GC120P119.M	3.44	3.44	3.44	0.0	35.6	35.6	35.5	0.1	35.6	1	5.00	178	
															Spike Amount (ug)	198	
															Spike Recovery (%)	90.0%	

# Narrative Summary



EA# 0511-67 Page 75 of 94

## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	MGM/ CJT	Job #	0511-67
Parameters	EPA Method 18 Bags GC FID	# Samples	3 Bags, 1 S&R

**Custody** Heather Tarjeft received the samples on 5/26/11 after being relinquished by Shaw Environmental, Inc. The samples were received at ambient temperature in good condition. The bag samples received on 5/24/11 had low volume. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for 1,3-butadiene, acetonitrile, acrolein, acetone, acrylonitrile, pentane, dichloromethane (methylene chloride), hexane, benzene, trichloroethene, toluene, 1,2-dibromoethane, and tetrachloroethene using the analytical procedures in EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (40 CFR Part 60, Appendix A).

All samples and standards were introduced directly to the column using an automated multi-port Valco gas sampling valve equipped with a stainless steel loop. All target analytes were referenced to certified gas phase standards.

The Agilent Technologies Model 6890, Gas Chromatograph "Gummo" (S/N US00028451) was equipped with a Flame Ionization Detector and a Restek Rtx-1 30m x 0.32mm x 4.0um column (S/N 869999), for these analyses.

**Calibration** The calibration curves are included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.

For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.

**Chromatographic Conditions** The acquisition method gc114p165.M is included in the Calibration Curve Chromatograms section of this report.



## Enthalpy Analytical Narrative Summary (continued)

### QC Notes

As required by the method, a recovery study is performed on a bag sample. The bag sample *052311-M18-Bag 1* was spiked at 1:55 PM on 5/28/11, held for the appropriate time, then analyzed. The recovery efficiency values met the method-required limits of between 70 to 130% for all analytes except 1, 3-butadiene and acetonitrile. The recovery efficiency values were used to adjust the results following equation 18-7 from section 12.8 on Method 18, excluding 1, 3-butadiene and acetonitrile.

### Reporting Notes

These analytical results are reported on a wet basis. The user of this report should determine the percent moisture in the sample and correct the reported value to ppmvd as appropriate.

The results presented in this report are representative of the samples as provided to the laboratory.



EA# 0511-67 Page 77 of 94



## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KAM	Job #	0511-67
Parameters	EPA Method 18 Bags GC FPD	# Samples	3

**Custody** Heather Tarjeft received the samples on 5/26/11 after being relinquished by Shaw Environmental, Inc. The samples were received at ambient temperature in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for carbon disulfide using the analytical procedures in EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (40 CFR Part 60, Appendix A).

All samples and standards were introduced directly to the column using an automated multi-port Valco gas sampling valve equipped with a stainless steel loop. Carbon disulfide was referenced to gas phase standards prepared using certified permeation devices.

The Hewlett Packard Model 5890, Series II Plus Gas Chromatograph "Harpo" (S/N 3336A50179) was equipped with a Flame Photometric Detector and a Restek Rtx-1 60 m x 0.53 mm x 5.0 um (S/N 30589) column, for these analyses.

**Calibration** The calibration curves are included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.

For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.

**Chromatographic Conditions** The acquisition method gc105p164.M is included in the Calibration Curve Chromatograms section of this report.

**QC Notes** A recovery study was not performed and the results were not adjusted.

**Reporting Notes** These analytical results are reported on a wet basis. The user of this report should determine the percent moisture in the sample and correct the reported value to ppmvd as appropriate.

The results presented in this report are representative of the samples as provided to the laboratory.



## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc	Client #	142733
Analyst	JBB	Job #	0511-67
Parameters	EPA Method 18 Bag Cond.	# Samples	3

<b>Custody</b>	Heather Tarjeft received the samples on 5/24/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 10.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.
<b>Analysis</b>	<p>The samples were analyzed for 1,3-butadiene, pentane, acrolein, acetone, dichloromethane (methylene chloride), hexane, benzene, trichloroethene, toluene, tetrachloroethene, 1,2-dibromoethane and carbon disulfide using the analytical procedures in EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (40 CFR Part 60, Appendix A).</p> <p>The Hewlett Packard Model 5890, Series II Gas Chromatograph "Oscar" (S/N 2938A25721) was equipped with a Flame Ionization Detector and column (Restek Rtx-624 105 m x 0.53 mm x 3.0 um, S/N 1032767) and a Flame Photometric Detector and column (Restek Stabilwax 30 m x 0.53 mm x 1.5 um, S/N 1033248).</p>
<b>Calibration</b>	<p>The calibration curves are included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.</p> <p>For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.</p>
<b>Chromatographic Conditions</b>	The acquisition methods gc116p38.M and gc116p41.M are included in the Calibration Curve Chromatograms section of this report.
<b>QC Notes</b>	<p>The analysis of the laboratory reagent blank contained not target compounds at concentrations greater than the LOQ.</p> <p>Two matrix spikes (MS) were prepared using aliquots of sample <i>R1 Bag KO</i>. One was spiked with pentane, and the other with all the remaining target analytes. The recovery values ranged from 50.6% to 121%.</p>
<b>Reporting Notes</b>	The results presented in this report are representative of the samples as provided to the laboratory.





## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	JBB	Job #	0511-67
Parameters	EPA Method 18 Adsorbents	# Samples	3 Runs

**Custody** Heather Tarjeft received the samples on 5/24/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 10.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for methyl t-butyl ether (MTBE), 2-nitropropane, 2,2,4-trimethylpentane (isooctane), methyl isobutyl ketone (MIBK), chlorobenzene, ethylbenzene, m/p-xylene, styrene, o-xylene, cumene, and nitrobenzene using the analytical procedures in EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (40 CFR Part 60, Appendix A).

The condensate volumes were received with zero headspace, with a volume measured at 41.8 mL. A 10 mL aliquot was removed and archived. The sample was extracted by adding 5 mL of carbon disulfide to the containers and shaking by hand for one minute. The results were adjusted for the aliquot by using an aliquot factor.

The SKC XAD-4 (Cat# 226-175) tubes were desorbed in two fractions, the whole first tube combined with the front half (FH) of the second tube in series and the back half (BH) of the second tube. The SKC Charcoal (Cat# 226-16) tube was desorbed in two fractions, front half (FH) and back half (BH). Each of the fractions were desorbed using 5 mL of carbon disulfide and shaken at 500 rpm for 30 minutes.

The XAD R2 SP Tube 2 was received with the back end broken but with adsorbent present but the plug missing. In comparison with the other tubes, an estimate of one-half to two-thirds of the media was lost. The remaining media was desorbed.

The Hewlett Packard Model 6890, Gas Chromatograph "Lucy" (S/N US00039147) was equipped with a Flame Ionization Detector and a Restek Rtx-1 30m x 0.32mm x 4.0um column (S/N 450928).



## Enthalpy Analytical Narrative Summary (continued)

<b>Calibration</b>	<p>The calibration curves are included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.</p> <p>The first page of each curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.</p>
<b>Chromatographic Conditions</b>	<p>The acquisition method gc121p067.M is included in the Calibration Curve Chromatograms section of this report.</p>
<b>QC Notes</b>	<p>As by the method, a recovery study is performed for the compounds of interest during the field test. The train collection efficiency (R) was calculated using equations 18-7, 18-8, and 18-9 in EPA Method 18. The reported results have been adjusted for these recovery efficiency values. The spike amount and spike results are presented in the Results section of this report.</p> <p>Laboratory Duplicate (LD) samples were prepared using aliquots of the samples <i>Run 1 Tube KO EXT</i>, <i>Run 3 SP XAD FH</i>, and <i>Run 1 SP CT FH</i>. The duplicate results were within 5% of the original results.</p> <p>No target compounds were detected at concentrations greater than the detection limits in the analysis of the laboratory method blanks.</p> <p>Prior to sample collection, four XAD-4 tube spikes were prepared from a spike solution and shipped to the client. The spike solution was retained by the lab for use in preparing Laboratory Control Samples (LCS). An aqueous and XAD media LCS were prepared and analyzed with these samples. The spike recovery values are presented in the Results section of this report.</p>
<b>Reporting Notes</b>	<p>The m- and p- xylene isomers are inseparable and indistinguishable with the equipment and conditions used for this project. The instrument was calibrated using p-xylene; However, any p-xylene results shown are accurate representation of the total of m-xylene and p-xylene present in the sample.</p> <p>The results presented in this report are representative of the samples as provided to the laboratory.</p>



EA# 0511-67 Page 81 of 94



## Enthalpy Analytical Narrative Summary

Company	Shaw Environmental, Inc.	Client #	142733
Analyst	KAM	Job #	0511-67
Parameters	EPA Method 308	# Samples	3 Runs

**Custody** Heather Tarjeft received the samples on 5/24/11 after being relinquished by Shaw Environmental, Inc. The samples were received at 10.4°C in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

**Analysis** The samples were analyzed for methanol using the analytical procedures in EPA Method 308, Procedure for Determination of Methanol Emission from Stationary Sources (40 CFR Part 63, Appendix A).

The silica gel tubes (SKC-226-22) were desorbed in two fractions, front half (FH) and back half (BH), using 5.00 mL of a 3% n-propanol in deionized water solution. Each fraction was shaken for 30 minutes at 500 rpm.

The Hewlett Packard Model 5890, Series II Gas Chromatograph "Penn" (S/N 2750A17269) was equipped with two Flame Ionization Detectors, and two Restek Stabilwax 30m x 0.53mm x 2.0 um columns(S/N 810087 and S/N 808560), for these analyses.

**Calibration** The calibration curves are included in the Calibration Curve Chromatograms section of this report and referenced in the Analysis Method column on the Detailed Results page.

For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.

**Chromatographic Conditions** The acquisition method gc120p119.M is included in the Calibration Curve Chromatograms section of this report.

**QC Notes** Methanol was not identified above the LOQ in the analyses of the method blanks and reagent blanks.



## Enthalpy Analytical Narrative Summary (continued)

### QC Notes (continued)

Laboratory Duplicate (LD) analyses were performed using aliquots of the samples *18-U-25 Dry KO RI* and *18-U-26 SI Gel RI FH*. The results of the duplicate analyses did not differ from those of the initial analyses.

A Laboratory Control Sample (LCS) was prepared and analyzed with the samples. The recovery value was 90.0%.

A one injection confirmation analysis was performed on sample *18-U-28-SG R2 FH*; the analysis confirmed the initial result.

### Reporting Notes

The results presented in this report are representative of the samples as provided to the laboratory.



## General Reporting Notes

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

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





## General Reporting Notes

(continued)

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

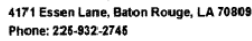


EA# 0511-67 Page 85 of 94

# Sample Custody



EA# 0511-67 Page 86 of 94



Date 05/20/11 Page 1 of 6

SPIKED UNSPIKED

Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: Time: R. 12:30	Signature: Time: R. 12:30	Signature: Time:	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date: R. 05/20/11	Printed Name: Date: R. 05/20/11	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company: S. 11/11	Company: S. 11/11	Company:	Company:	Company:	Laboratory:

Temp = 10.40°C Raytek gun#1

Shaw Environmental, Inc.  
4171 Essen Lane, Baton Rouge, LA 70809  
Phone: 225-932-2746

Date 05/20/11 Page 2 of 6

PROJECT INFORMATION				PRESERVATIVE						
Project Number: 142733										
Project Name: CITGO ICR Testing										
Delivered Via:										
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 10 days (50%)										

## COMMENTS

**Contact: Richard Ishikawa 225-241-9584**

[illegible][illegible]

Baro Temp Ambient  
WWTube Temp = 10.4°C Raytek gun #1

EA# 0511-67 Page 88 of 94

Shaw Environmental, Inc.  
4171 Essen Lane, Baton Rouge, LA 70809  
Phone: 225-932-2745

PROJECT INFORMATION				PRESERVATIVE						
Project Number: 142733										
Project Name: CITGO ICR Testing										
Delivered Via:										
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days										

Contact: Richard Ishikawa 225-241-9584						STANDARD VCM/FS						
Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size								
142733-052011-18-U-5 DICKENS R2	05/20/11	13:50	WATER	1	✓							
142733-052011-18-U-6 XAD 1	05/20/11	13:50	XAD	1	✓							
142733-052011-18-U-7 XAD 2	05/20/11	13:50	XAD	1	✓							
142733-052011-18-U-7 XAD CHLORAL	05/20/11	13:50	CHLORAL	1	✓							
142733-052011-18-U-7 DICKENS R2	05/20/11	13:50	WATER	1	✓							
142733-052011-18-U-18 XAD 1	05/20/11	13:50	XAD	1	✓							
142733-052011-18-U-19 XAD 2	05/20/11	13:50	XAD	1	✓							
142733-052011-18-U-20 CHLORAL	05/20/11	13:50	CHLORAL	1	✓							

<b>Relinquished by Collector:</b>	<b>Received by: 1.</b>	<b>Relinquished by: 1.</b>	<b>Received by: 2.</b>	<b>Relinquished by: 2.</b>	<b>Received by: (lab)</b>
Signature: Time: [Signature] 17:30	Signature: Time: [Signature] 18:40pm	Signature: Time:	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company: St Andrews University of Scotland	Company: Guthrie	Company:	Company:	Company:	Laboratory:

Tempo 10.40°C Raytek gnt#1



**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
(COC/RFA)**

Date 05/20/11 Page 4 of 6

PROJECT INFORMATION					PRESERVATIVE				
Project Number: 142733									
Project Name: CITGO ICR Testing									
Delivered Via:									
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days									
COMMENTS									
Contact: Richard Ishikawa 225-241-9584									
Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	STERILIZED VOLS				
142733-052011-18-U-27 PRR KROCKOUT	05/20/11	13:50	Water	1	✓				
142733-052011-18-U-25 <del>PRR</del> SLUGG	05/20/11	13:50	Water	1	✓				
142733-052011-18-U-33 DI KROCKOUT	05/20/11	13:50	Water	1	✓				
142733-052011-18-U-34 BAC	05/20/11	13:50	AIR	1	✓				
Low Volume HCT 5/24/11									

Relinquished by: Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: <u>[Signature]</u> Time: <u>6:30</u>	Signature: <u>[Signature]</u> Time: <u>5/24/11</u>	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Richard Ishikawa</u> Date: <u>05/20/11</u>	Printed Name: <u>Heather Tipton</u> Date: <u>5/24/11</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>Shaw</u>	Company: <u>Entech</u>	Company: _____	Company: _____	Company: _____	Laboratory: _____

Bag temp = Ambient  
WVA tube temp = 10.4°C Analyte good!

**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
(COC/RFA)**

Date \_\_\_\_\_ Page 5 of 6

PROJECT INFORMATION							PRESERVATIVE																																																																																																																																																																																																																					
Project Number: 142733																																																																																																																																																																																																																												
Project Name: CITGO ICR Testing																																																																																																																																																																																																																												
Delivered Via:																																																																																																																																																																																																																												
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 10 DM <input checked="" type="checkbox"/> STD																																																																																																																																																																																																																												
COMMENTS																																																																																																																																																																																																																												
Contact: Richard Ishikawa 225-241-9584																																																																																																																																																																																																																												
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sample ID</th> <th>Sample Collection Date</th> <th>Sample Collection Time</th> <th>Sample Matrix</th> <th>Number of Containers and Size</th> <th>SPECIFIED VOLUPTS</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>142733-052011-18-U-9</td> <td>DI KICKOUT</td> <td>05/20/11</td> <td>15:40</td> <td>WATER</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-10</td> <td>XAD 1</td> <td>05/20/11</td> <td>15:40</td> <td>XAD</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-11</td> <td>XAD 2</td> <td>05/20/11</td> <td>15:40</td> <td>XAD</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-12</td> <td>CHARCOAL</td> <td>05/20/11</td> <td>15:40</td> <td>CHARCOAL</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-21</td> <td>DI KICKOUT</td> <td>05/20/11</td> <td>15:40</td> <td>WATER</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-22</td> <td>XAD 1</td> <td>05/20/11</td> <td>15:40</td> <td>XAD</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-23</td> <td>XAD 2</td> <td>05/20/11</td> <td>15:40</td> <td>XAD</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>142733-052011-18-U-24</td> <td>CHARCOAL</td> <td>05/20/11</td> <td>15:40</td> <td>CHARCOAL</td> <td>1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>																	Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	SPECIFIED VOLUPTS												142733-052011-18-U-9	DI KICKOUT	05/20/11	15:40	WATER	1	✓											142733-052011-18-U-10	XAD 1	05/20/11	15:40	XAD	1	✓											142733-052011-18-U-11	XAD 2	05/20/11	15:40	XAD	1	✓											142733-052011-18-U-12	CHARCOAL	05/20/11	15:40	CHARCOAL	1	✓											142733-052011-18-U-21	DI KICKOUT	05/20/11	15:40	WATER	1	✓											142733-052011-18-U-22	XAD 1	05/20/11	15:40	XAD	1	✓											142733-052011-18-U-23	XAD 2	05/20/11	15:40	XAD	1	✓											142733-052011-18-U-24	CHARCOAL	05/20/11	15:40	CHARCOAL	1	✓																																																													
Sample ID	Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	SPECIFIED VOLUPTS																																																																																																																																																																																																																							
142733-052011-18-U-9	DI KICKOUT	05/20/11	15:40	WATER	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-10	XAD 1	05/20/11	15:40	XAD	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-11	XAD 2	05/20/11	15:40	XAD	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-12	CHARCOAL	05/20/11	15:40	CHARCOAL	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-21	DI KICKOUT	05/20/11	15:40	WATER	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-22	XAD 1	05/20/11	15:40	XAD	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-23	XAD 2	05/20/11	15:40	XAD	1	✓																																																																																																																																																																																																																						
142733-052011-18-U-24	CHARCOAL	05/20/11	15:40	CHARCOAL	1	✓																																																																																																																																																																																																																						

Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: _____ Time: 12:30	Signature: _____ Time: 12:40	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: _____ Date: 05/20/11	Printed Name: _____ Date: 05/20/11	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: Shaw	Company: Entrolab	Company: _____	Company: _____	Company: _____	Laboratory: _____

Temp = 10.4°C Raytek gnt #1

EA# 0511-67 Page 91 of 94

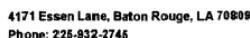
**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS  
(COC/RFA)**

Date 6/5/20/11 Page 6 of 6

PROJECT INFORMATION						PRESERVATIVE									
Project Number: 142733															
Project Name: CITGO ICR Testing															
Delivered Via:															
TAT: <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 10 day STD															
COMMENTS															
Contact: Richard Ishikawa 225-241-9584															
Sample ID		Sample Collection Date	Sample Collection Time	Sample Matrix	Number of Containers and Size	SPECIFIED VOLUMES									
142733-052011-18-U-29 DRY KNOCKOUT		05/20/11	15:40	WATER	1										
142733-052011-18-U-30 SILICA GEL		05/20/11	15:40	SILICA GEL	1										
142733-052011-18-U-35 DI KNOCKOUT		05/20/11	15:40	WATER	1										
142733-052011-18-U-36 BAG 2		05/20/11	15:40	BAG	1										
Low Volume MTS/DNA															

Relinquished by Collector:	Received by: 1.	Relinquished by: 1.	Received by: 2.	Relinquished by: 2.	Received by: (lab)
Signature: <u>[Signature]</u> Time: <u>18:30</u>	Signature: <u>[Signature]</u> Time: <u>[Signature]</u>	Signature: <u>[Signature]</u> Time: <u>[Signature]</u>	Signature: <u>[Signature]</u> Time: <u>[Signature]</u>	Signature: <u>[Signature]</u> Time: <u>[Signature]</u>	Signature: <u>[Signature]</u> Time: <u>[Signature]</u>
Printed Name: <u>Richard Ishikawa</u> Date: <u>05/20/11</u>	Printed Name: <u>Heather Tipton</u> Date: <u>5/24/11</u>	Printed Name: <u>[Signature]</u> Date: <u>[Signature]</u>	Printed Name: <u>[Signature]</u> Date: <u>[Signature]</u>	Printed Name: <u>[Signature]</u> Date: <u>[Signature]</u>	Printed Name: <u>[Signature]</u> Date: <u>[Signature]</u>
Company: <u>SHAW</u>	Company: <u>Enthalogy</u>	Company: <u>[Signature]</u>	Company: <u>[Signature]</u>	Company: <u>[Signature]</u>	Laboratory: <u>[Signature]</u>

Bag temp = Ambient  
WAT/Tube temp = 10.4°C Analyte good  
EA# 0511-67 Page 92 of 94



Date 5/23/11 Page 1 of 1

[illegible]

**This Is The Last Page  
Of This Report.**



EA# 0511-67 Page 94 of 94