ENTEC SERVICES, INC.
STACK TESTING AND POLLUTION CONTROL SYSTEM EVALUATION

EMISSIONS TESTING

ON THE

FUEL GAS SYSTEMS AND FLUID CATALYTIC CRACKING UNIT (FCCU)

JUNE 15 - 19, 2011
PROJECT NO.: 511150

Prepared for

HOVENSA LLC

1 Estate Hope
Christiansted, US Virgin Islands 00820-5652

ENTEC SERVICES, INC.

30 Monroe Drive
Pelham, Alabama 35124
(205) 358-1011

ENTEC SERVICES, INC.
STACK TESTING AND POLLUTION CONTROL SYSTEM EVALUATION

EMISSIONS TESTING

ON THE

FUEL GAS SYSTEMS AND FLUID CATALYTIC CRACKING UNIT (FCCU)

HOVENSA LLC

CONDUCTED ON

JUNE 15 - 19, 2011

I certify that I have personally examined and am familiar with the information contained herein. Based on my inquiries of the individuals immediately responsible for obtaining the information, I believe the contents of this report deliverable to be true, accurate, and complete, to the best of my knowledge.

Entec Project No. 511150

Report Submitted: August 30, 2011

Completed By:

Reviewed By:

Tasso Stratas

Technical Report Writer

Troy Burrows

QA / QC Manager

TABLE OF CONTENTS

SECTION		PAGE
1.0	EXECUTIVE SUMMARY	1
2.0	SUMMARY OF TEST RESULTS	2
3.0	PROCESS DESCRIPTION	18
3.1	FUEL GAS SYSTEM UNIT DESCRIPTION	18
3.2	FLUID CATALYTIC CRACKING UNIT DESCRIPTION (AREA V)	19
4.0	REFERENCE METHOD TEST PROCEDURES	22
4.1	EPA METHOD 1 – TRAVERSE POINT LAYOUT	22
4.2	EPA METHOD 2 – VELOCITY	22
4.3	EPA METHOD 3A – MOLECULAR WEIGHT DETERMINATION	22
4.4	EPA METHOD 4 – MOISTURE CONTENT	23
4.5	EPA METHOD 5 / 202 – TOTAL PARTICULATE DETERMINATION	23
4.6	EPA METHOD 18 – SPECIATED VOLATILE ORGANIC HAPS	24
4.7	EPA METHOD 23 – DIOXINS / FURANS DETERMINATION	24
4.8	EPA METHOD 25A – TOTAL HYDROCARBONS	25
4.9	EPA METHOD 26A – HYD CHLORIDE, FLOURIDE, AND CHLORINE	25
4.10	EPA METHOD 29 – METALS DETERMINATION	25
4.11	EPA METHOD 30B – SPECIATED MERCURY	26
4.12	EPA METHOD 0010 – SPECIATED SEMI-VOLATILE ORGANIC HAPS	26
4.13	EPA METHOD 0011 – ALDEHYDES	26
4.14	EPA METHOD 0061 – HEXAVALENT CHROMIUM	27
4.15	EPA METHOD CTM 027 – AMMONIA	27
4.16	EPA METHOD OTM 029 – HYDROGEN CYANIDE	27
5.0	QA / QC PROCEDURES	40
6.0	CALIBRATION PROCEDURES	40

LIST OF APPENDICES

APPENDIX			PAGE
A	RAW TEST DATA AND EMISSION CALCULATIONS FLUID CATALYTIC CRACKING UNIT		41
	A.1	METHOD 26A – HYD. CHLORIDE, FLOURIDE, AND CHLORINE	42
	A.2	METHOD 30B – SPECIATED MERCURY	52
	A.3	METHOD OTM 029 – HYDROGEN CYANIDE	63
	A.4	METHOD 0010 / 25A – SPECIATED SEMI-VOLATILE ORGANIC HAPS	73
	A.5	METHOD 0011 – ALDEHYDES	88
	A.6	METHOD 23 – DIOXINS / FURANS DETERMINATION	98
	A.7	METHOD 5 / 202 – TOTAL PARTICULATE DETERMINATION	109
	A.8	METHOD 29 – METALS DETERMINATION	119
	A.9	METHOD 0061 – HEXAVALENT CHROMIUM	129
	A.10	METHOD CTM 027 – AMMONIA	139
	A.11	METHOD 18 – SPECIATED VOLATILE ORGANIC HAPS	149
	A.12	METHOD 3A / 25A – GAS EMISSION TESTING	151
B	OPERATIONAL AND PRODUCTION DATA		187
	B.1	CEMS HOURLY	188
	B.2	PROCESS DATA	294
	B.3	FUEL GAS DRUM DATA	296
C	LABORATORY CHAINS OF CUSTODY AND LABORATORY DATA		311
	C.1	METHOD 30B – SPECIATED MERCURY	312
	C.2	METHOD 0010 / 25A – SPECIATED SEMI-VOLATILE ORGANIC HAPS	317
	C.3	METHOD 23 – DIOXINS / FURANS	352
	C.4	METHOD 29 – METALS	387
	C.5	METHOD 0061 – HEXAVALENT CHROMIUM	417
	C.6	METHOD 18 – SPECIATED VOLATILE ORGANIC HAPS	442
	C.7	METHOD CTM 027 – AMMONIA	444
		METHOD 26A – HYD. CHLORIDE, FLOURIDE, AND CHLORINE	
		METHOD 0011 – ALDEHYDES	
		METHOD OTM 029 – HYDROGEN CYANIDE	
		METHOD 5 / 202 – PARTICULATE MATTER	
	C.8	FUEL SAMPLE RESULTS	485
D	QA/QC DOCUMENTS AND CHECKLISTS		541
E	CALIBRATION DATA		560
F	TEST PROTOCOL		574
G	QSTI CERTIFICATIONS		600
H	HAND CALCULATIONS		621
I	EPA ICR DOCUMENTS		626
J	EPA ERT TEST REPORT		650

LIST OF TABLES

TABLE		PAGE
2-1	EMISSIONS SUMMARY – METHOD 26A	3
2-2	EMISSIONS SUMMARY – METHOD 30B	4
2-3	EMISSIONS SUMMARY – METHOD OTM 029	5
2-4	EMISSIONS SUMMARY – METHOD 0010	6
2-5	EMISSIONS SUMMARY – METHOD 0011	9
2-6	EMISSIONS SUMMARY – METHOD 23	10
2-7	EMISSIONS SUMMARY – METHOD 5 / 202	11
2-8	EMISSIONS SUMMARY – METHOD 29	12
2-9	EMISSIONS SUMMARY – METHOD 0061	13
2-10	EMISSIONS SUMMARY – METHOD CTM 027	14
2-11	EMISSIONS SUMMARY – CEMS DATA	15
2-12	EMISSIONS SUMMARY – METHOD 18	16
3-1	TOTAL DISSOLVED SOLIDS IN SCRUBBER WATER	19
3-2	EXTENDED REFINERY GAS ANALYSIS	20

LIST OF FIGURES

FIGURE		PAGE
4-1	TRAVERSE POINT LAYOUT	28
4-2	METHOD 26A SAMPLE TRAIN DIAGRAM	29
4-3	METHOD 30B SAMPLE TRAIN DIAGRAM	30
4-4	METHOD OTM 029 SAMPLE TRAIN DIAGRAM	31
4-5	METHOD 0010 SAMPLE TRAIN DIAGRAM	32
4-6	METHOD 0011 SAMPLE TRAIN DIAGRAM	33
4-7	METHOD 23 SAMPLE TRAIN DIAGRAM	34
4-8	METHOD 5 / 202 SAMPLE TRAIN DIAGRAM	35
4-9	METHOD 29 SAMPLE TRAIN DIAGRAM	36
4-10	METHOD 0061 SAMPLE TRAIN DIAGRAM	37
4-11	METHOD CTM 027 SAMPLE TRAIN DIAGRAM	38
4-12	METHOD 25A SAMPLE TRAIN DIAGRAM	39

1.0 EXECUTIVE SUMMARY

On March 31, 2011 the U. S. Environmental Protection Agency (US EPA) issued an Information Collection Request (the Refinery ICR) to Hovensa, LLC. Within the Refinery ICR, Component 4, Table 1.1 specified the emission sources and pollutants that were required to be tested, Component 4, Table 1.2 Summary of Petroleum Refinery Source Test Methods and Alternate Methods, and Component 4, Table 1.7 Summary of Test Methods and Alternate Methods for Organic Compounds, Reduced Sulfur, and other Parameters for Refinery Fuel Gas specified the test methods and parameters for each pollutant to be tested. These enclosures are included as attachments to this report and can be located in Appendix I.

Testing was conducted at Hovensa LLC St Croix, Christiansted, US Virgin Islands Facility on June 15 - 19, 2011 by Mr. Chuck Duncan III, Mr. Lynn Beane, Mr. Kevin Rosenberg, Mr. Tim Draheim, Mr. Chuck Duncan IV, Mr. Ben Rogers, and Mr. Andrew Imes, of Entec Services, Inc. Mr. Mike Hartman and Mr. Darrell Doerle of Air Tech Environmental also supported the project. Representing Hovensa LLC was Mr. Bernd Haneke who coordinated testing with plant production personnel.

2.0 SUMMARY OF TEST RESULTS

Emission testing was conducted on the identified sources utilizing the following test methods 1, 2, 3A, 4, 5 / 202, 18, 23, 25A, 26A, 29, 30B, 0010, 0011, 0061, CTM 027, and OTM 029 of EPA 40 CFR Part 60, Appendix A, Appendix M, EPA SW-846 Test Methods, EPA Other Test Methods, EPA Conditional Test Methods, ASTM Test Methods, and (Aldehydes alternative) Test Methods, with the latest revisions, and/or alternate test approaches as identified and approved in the submitted Test Protocol, for each identified method for the complete test program.

The approach and procedures for the emissions test were submitted to the Environmental Protection Agency (EPA) in a test protocol plan prepared and submitted by Entec Services, Inc. EPA indicated the scope and objectivity of the test plan were sufficient to satisfy the ICR requirements for the facility. A copy of the original test protocol plan is contained in Appendix F.

Entec Services, Inc. did not deviate from the enclosed Test Protocol. Meterbox NC M5-3 did not pass the optional pre-test 10 minute calibration check (allowable = ±3.0%, result = -3.9%) or the Alternative 009 post-test calibration calculation (allowable = ± 5.0%, result = -6.44%). This meterbox was recalibrated after the test team returned in accordance with the method and found to be within method tolerances; no data adjustment was necessary.

OTM-29 was performed on the FCCU stack for hydrogen cyanide (HCN) emissions. Method modifications published in March 2011 increased the normality of the absorbing solution to 6N NaOH in an attempt to maintain the ph of the solution above 12 for the duration of sampling. This was the concentration used in the sampling at Hovensa.

The caustic impinger solution of the OTM-29 train will absorb carbon dioxide and potentially cause elevated HCN results due to an overstatement of stack gas moisture. Therefore, a second modification to the method includes monitoring the OTM-29 train exhaust for CO_2 and comparing to the stack concentration. Actual CO_2 measurements of the train exhaust were not performed for this test. However, an alternative approach was employed to correct the sample volume for the absorbed amount of CO_2. The first step was to compare moisture results of the OTM-29 train with the other methodologies run concurrently. These sampling results indicated the stack gas was saturated but not super-saturated. Thus, the excess moisture measured with the OTM-29 train was assumed to be the result of CO_2 absorption in the caustic solution. The excess moisture was converted to a weight gain and then to an equivalent volume of CO_2, which was used to adjust the sample volume.

No other difficulties or problems were encountered during the sampling. The emissions test summaries on the following pages give a detailed summary of each test.

Table 2-1
Emissions Summary - Method 26A

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Hydrogen Chloride, Hydrogen Flouride, & Chlorine

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/15/11	6/15/11	6/15/11	-
Emission Test Run Time Began - Ended		1000-1250	1320-1530	1542-1844	-
Oxygen Concentration	%	2.0	2.0	2.0	2.0
Carbon Dioxide Concentration	%	13.8	13.8	13.8	13.8
Isokinetic Sampling Rate	%	94.61	94.66	94.46	94.58
Stack Temperature	°F	144	144	144	144
Moisture Content	% volume	22.02	22.14	21.97	22.04
Stack Gas Velocity	f/s	63.46	63.53	63.38	63.45
Stack Gas Flow @ Actual Conditions	acfm	361,826	362,231	361,386	361,814
Stack Gas Flow @ Standard Conditions	scfm	313,996	314,174	313,636	313,935
Stack Gas Flow @ Dry Standard Conditions	dscfm	244,846	244,621	244,732	244,733
Hydrogen Chloride Emissions	lb/hr	0.84	1.19	0.94	0.99
Hydrogen Flouride Emissions	lb/hr	0.03	0.03	0.03	0.03
Chlorine Emissions	lb/hr	0.01	0.01	0.01	0.01
Hydrogen Chloride Emissions	mg/dscm	0.92	1.30	1.02	1.08
Hydrogen Flouride Emissions	mg/dscm	0.03	0.04	0.03	0.03
Chlorine Emissions	mg/dscm	0.01	0.01	0.01	0.01

***Indicates a non-detect or analytical result below the MDL was used to calcualte emissions =**

Table 2-2
Emissions Summary - Method 30B

Test Performed For: **Hovensa, LLC**
US Virgin Island - St. Criox

Source(s) Tested: **Fluid Catalytic Cracking Unit (FCCU)**
Test Condition: **Petroleum Refinery ICR**
Test(s) Performed: **Speciated Mercury**

Run Number		Run 1	Run 2	Run 3
Date of Run		6/15/11	6/15/11	6/15/11
Emission Test Run Time Began - Ended		1000 - 1200	1320 - 1520	1542 - 1742
Oxygen Concentration	%	2.0	2.0	1.9
Carbon Dioxide Concentration	%	13.8	13.8	13.8
Stack Temperature	°F	140.3	140.5	140.6
Oxidized Mercury Emissions	ug/dscm	0.032	0.032	0.029
Elemental Mercury Emissions	ug/dscm	0.273	0.303	0.271
Oxidized Mercury Emissions	lb/hr	3.04E-05	3.01E-05	2.70E-05
Elemental Mercury Emissions	lb/hr	2.57E-04	2.86E-04	2.55E-04

Table 2-3
Emissions Summary - Method OTM 029

Test Performed For: **Hovensa, LLC**
US Virgin Island - St. Criox

Source(s) Tested: **Fluid Catalytic Cracking Unit (FCCU)**
Test Condition: **Petroleum Refinery ICR**
Test(s) Performed: **Hydrogen Cyanide**

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/15/11	6/15/11	6/15/11	-
Emission Test Run Time Began - Ended		1000-1151	1320-1440	1542-1656	-
Oxygen Concentration	%	1.9	2.0	1.8	1.9
Carbon Dioxide Concentration	%	13.8	13.8	13.8	13.8
Isokinetic Sampling Rate	%	99.72	100.84	100.66	100.41
Stack Temperature	°F	141	140	141	141
Moisture Content	% volume	20.13	19.88	20.28	20.10
Stack Gas Velocity	f/s	64.83	64.90	65.28	65.00
Stack Gas Flow @ Actual Conditions	acfm	369,650	370,063	372,243	370,652
Stack Gas Flow @ Standard Conditions	scfm	322,682	323,312	324,783	323,592
Stack Gas Flow @ Dry Standard Conditions	dscfm	257,724	259,052	258,901	258,559
Hydrogen Cyanide Emissions	lb/hr	99.84	107.79	107.65	105.09
Hydrogen Cyanide Emissions	ug/dscm	1.03E+05	1.11E+05	1.11E+05	1.09E+05

Table 2-4
Emissions Summary - Methods 0010 & 25A

Test Performed For:	**Hovensa, LLC**
	US Virgin Island - St. Criox
Source(s) Tested:	**Fluid Catalytic Cracking Unit (FCCU)**
Test Condition:	**Petroleum Refinery ICR**
Test(s) Performed:	**Speciated Semi Volatile Organic HAP's & Total Hydrocarbons**

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/16/11	6/16/11	6/17/11	-
Emission Test Run Time Began - Ended		1013-1330	1418-1736	843-1213	-
Oxygen Concentration	%	1.7	1.6	1.6	1.6
Carbon Dioxide Concentration	%	13.9	14.1	14.1	14.1
Isokinetic Sampling Rate	%	91.16	91.27	92.57	91.67
Stack Temperature	°F	145	144	145	145
Moisture Content	% volume	22.20	22.12	22.41	22.24
Stack Gas Velocity	f/s	66.00	66.35	66.91	66.42
Stack Gas Flow @ Actual Conditions	acfm	376,310	378,349	381,524	378,727
Stack Gas Flow @ Standard Conditions	scfm	326,184	328,033	331,125	328,447
Stack Gas Flow @ Dry Standard Conditions	dscfm	253,758	255,470	256,918	255,382
Total VOC Concentration, ppm as propane	ppmvd	28.8	25.2	35.6	29.9
Total VOC Emissions, as propane	**Lbs/Hr**	**50.19**	**44.17**	**62.89**	**52.42**

Table 2-4
Emissions Summary - Methods 0010 & 25A

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Speciated Semi Volatile Organic HAP's & Total Hydrocarbons

Run Number		Run 1	Run 2	Run 3	Average
Acenaphthene emissions	lb/hr	1.12E-04	1.12E-04	1.28E-04	1.18E-04
Acenaphthylene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Aniline emissions	lb/hr	5.10E-01	5.53E-01	3.72E-01	4.78E-01
Anthracene emissions	lb/hr	8.18E-04	3.95E-04	1.06E-03	7.57E-04
Benzidine emissions	lb/hr	1.28E+00	1.28E+00	1.28E+00	1.28E+00
Benz(a)anthracene emissions	lb/hr	9.13E-04	9.18E-04	9.90E-04	9.40E-04
Benzo(b)fluoranthene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(k)fluoranthene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(g,h,i)perylene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(a)pyrene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(e)pyrene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Biphenyl emissions	lb/hr	5.62E-02	5.62E-02	5.62E-02	5.62E-02
Cresol emissions**	lb/hr	6.98E+00	7.20E+00	5.30E+00	6.49E+00
Chrysene emissions	lb/hr	8.64E-04	8.46E-04	9.28E-04	8.80E-04
Dibenz(a,h)anthracene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Dibenzofuran emissions	lb/hr	3.87E-02	3.87E-02	3.87E-02	3.87E-02
Dibenzo(a,e)pyrene emissions	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
3,3-Dimethoxybenzidine emissions	lb/hr	1.12E+00	1.12E+00	1.12E+00	1.12E+00
4-Dimethylaminoazobenzene emissions	lb/hr	3.55E-02	3.55E-02	3.55E-02	3.55E-02
7,12-Dimethylbenz(a)anthracene emissions	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
3,3-Dimethylbenzidine emissions	lb/hr	6.06E-01	6.06E-01	6.06E-01	6.06E-01
a,a-Dimethylphenethylamine emissions	lb/hr	2.81E-01	2.81E-01	2.81E-01	2.81E-01
2,4-Dimethylphenol emissions	lb/hr	3.82E-01	5.77E-01	3.30E-01	4.29E-01
Fluoranthene emissions	lb/hr	1.76E-03	1.21E-03	1.77E-03	1.58E-03
Fluorene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Indeno(1,2,3-cd)pyrene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Isophorone emissions	lb/hr	4.20E-02	4.20E-02	4.20E-02	4.20E-02
3-Methylchloanthrene emissions	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
2-Methylnaphthalene emissions	lb/hr	1.33E-04	1.12E-04	1.14E-04	1.20E-04
Naphthalene emissions	lb/hr	2.64E-04	2.18E-04	2.73E-04	2.52E-04
Perylene emissions	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Phenanthrene emissions	lb/hr	2.22E-03	1.32E-03	3.44E-03	2.33E-03
Phenol emissions	lb/hr	6.41E+00	6.91E+00	4.88E+00	6.07E+00
1,4-Phenylenediamine emissions	lb/hr	2.81E-01	2.81E-01	2.81E-01	2.81E-01
Pyrene emissions	lb/hr	5.07E-03	4.15E-03	5.39E-03	4.87E-03
o-Toluidine emissions	lb/hr	1.03E-01	1.48E-01	7.80E-02	1.10E-01

Table 2-4
Emissions Summary - Methods 0010 & 25A

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Speciated Semi Volatile Organic HAP's & Total Hydrocarbons

Run Number		Run 1	Run 2	Run 3	Average
Acenaphthene emissions	ug/dscm	1.18E-01	1.17E-01	1.31E-01	1.22E-01
Acenaphthylene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Aniline emissions	ug/dscm	5.37E+02	5.77E+02	3.81E+02	4.98E+02
Anthracene emissions	ug/dscm	8.61E-01	4.13E-01	1.08E+00	7.86E-01
Benzidine emissions	ug/dscm	1.35E+03	1.33E+03	1.31E+03	1.33E+03
Benz(a)anthracene emissions	ug/dscm	9.61E-01	9.58E-01	1.01E+00	9.77E-01
Benzo(b)fluoranthene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(k)fluoranthene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(g,h,i)perylene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(a)pyrene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(e)pyrene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Biphenyl emissions	ug/dscm	5.91E+01	5.86E+01	5.75E+01	5.84E+01
Cresol emissions**	ug/dscm	7.34E+03	7.51E+03	5.42E+03	6.76E+03
Chrysene emissions	ug/dscm	9.10E-01	8.83E-01	9.50E-01	9.14E-01
Dibenz(a,h)anthracene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Dibenzofuran emissions	ug/dscm	4.07E+01	4.03E+01	3.96E+01	4.02E+01
Dibenzo(a,e)pyrene emissions	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
3,3-Dimethoxybenzidine emissions	ug/dscm	1.18E+03	1.17E+03	1.15E+03	1.17E+03
4-Dimethylaminoazobenzene emissions	ug/dscm	3.74E+01	3.71E+01	3.63E+01	3.69E+01
7,12-Dimethylbenz(a)anthracene emissions	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
3,3-Dimethylbenzidine emissions	ug/dscm	6.38E+02	6.33E+02	6.20E+02	6.30E+02
a,a-Dimethylphenethylamine emissions	ug/dscm	2.96E+02	2.93E+02	2.87E+02	2.92E+02
2,4-Dimethylphenol emissions	ug/dscm	4.02E+02	6.02E+02	3.38E+02	4.47E+02
Fluoranthene emissions	ug/dscm	1.85E+00	1.27E+00	1.81E+00	1.64E+00
Fluorene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Indeno(1,2,3-cd)pyrene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Isophorone emissions	ug/dscm	4.42E+01	4.39E+01	4.30E+01	4.37E+01
3-Methylchloanthrene emissions	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
2-Methylnaphthalene emissions	ug/dscm	1.40E-01	1.17E-01	1.17E-01	1.25E-01
Naphthalene emissions	ug/dscm	2.78E-01	2.27E-01	2.80E-01	2.62E-01
Perylene emissions	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Phenanthrene emissions	ug/dscm	2.34E+00	1.37E+00	3.52E+00	2.41E+00
Phenol emissions	ug/dscm	6.74E+03	7.21E+03	5.00E+03	6.32E+03
1,4-Phenylenediamine emissions	ug/dscm	2.96E+02	2.93E+02	2.87E+02	2.92E+02
Pyrene emissions	ug/dscm	5.33E+00	4.33E+00	5.51E+00	5.06E+00
o-Toluidine emissions	ug/dscm	1.08E+02	1.55E+02	7.98E+01	1.14E+02

***Indicates an analytical result below the MDL was used to calcualte emissions =**

Table 2-5
Emissions Summary - Method 0011

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Aldehydes (Formaldehyde, Acetaldehyde, & Propanal)

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/17/11	6/17/11	6/17/11	-
Emission Test Run Time Began - Ended		825-1012	1037-1200	1223-1335	-
Oxygen Concentration	%	1.6	1.6	1.6	1.6
Carbon Dioxide Concentration	%	14.2	14.1	14.1	14.1
Isokinetic Sampling Rate	%	97.21	97.95	98.44	97.87
Stack Temperature	°F	144	144	144	144
Moisture Content	% volume	21.56	21.84	22.15	21.85
Stack Gas Velocity	f/s	67.58	68.24	68.18	68.00
Stack Gas Flow @ Actual Conditions	acfm	385,332	389,117	388,752	387,734
Stack Gas Flow @ Standard Conditions	scfm	334,971	338,060	337,460	336,830
Stack Gas Flow @ Dry Standard Conditions	dscfm	262,737	264,217	262,728	263,227
Formaldehyde Emissions	lb/hr	0.0008	0.4630	0.0006	0.1548
Acetaldehyde Emissions	lb/hr	0.0276	0.0254	0.0227	0.0252
Propanal Emissions	lb/hr	0.0013	0.0011	0.0010	0.0011
Formaldehyde Concentrations	ug/dscm	7.84E-01	4.68E+02	6.41E-01	1.56E+02
Acetaldehyde Concentrations	ug/dscm	2.81E+01	2.57E+01	2.30E+01	2.56E+01
Propanal Concentractions	ug/dscm	1.28E+00	1.14E+00	1.05E+00	1.16E+00

***Indicates an analytical result of non-detect or result below the MDL was used to calcualte emissions =**

Table 2-6
Emissions Summary - Method 23

Test Performed For:	**Hovensa, LLC**
	US Virgin Island - St. Criox
Source(s) Tested:	**Fluid Catalytic Cracking Unit (FCCU)**
Test Condition:	**Petroleum Refinery ICR**
Test(s) Performed:	**Dioxins & Furans**

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/16/11	6/16/11	6/17/11	-
Emission Test Run Time Began - Ended		1013-1330	1418-1736	843-1213	-
Oxygen Concentration	%	1.7	1.6	1.6	1.6
Carbon Dioxide Concentration	%	13.9	14.1	14.1	14.1
Isokinetic Sampling Rate	%	97.62	98.18	96.93	97.58
Stack Temperature	°F	141	141	142	141
Moisture Content	% volume	20.46	20.33	20.57	20.46
Stack Gas Velocity	f/s	65.39	65.60	69.95	66.98
Stack Gas Flow @ Actual Conditions	acfm	372,859	374,067	398,868	381,932
Stack Gas Flow @ Standard Conditions	scfm	324,779	325,999	348,134	332,971
Stack Gas Flow @ Dry Standard Conditions	dscfm	258,315	259,715	276,527	264,852
26a. Dioxin (Target PCDDs) Mass Emissions	lb / hr	9.09E-09	7.97E-09	1.17E-08	7.20E-09
26b. Furan (Target PCDFs) Mass Emissions	lb / hr	8.78E-09	8.33E-09	1.04E-08	6.89E-09
26c. Combined Target DD/DF Mass Emissions	lb / hr	1.79E-08	1.63E-08	2.22E-08	1.41E-08
26d. PCB-77 33'44'-TeCB Mass Emissions	lb / hr	2.04E-09	2.02E-08	1.39E-09	5.90E-09
26e. PCB-81 344'5-TeCB Mass Emissions	lb / hr	4.06E-10	1.39E-09	5.52E-10	5.88E-10
26f. PCB-105 233'44'-PeCB Mass Emissions	lb / hr	5.05E-09	1.25E-08	3.01E-09	5.14E-09
26g. PCB-114 2344'5-PeCB Mass Emissions	lb / hr	4.17E-10	9.47E-10	4.03E-10	4.42E-10
26h. PCB-118 23'44'5-PeCB Mass Emissions	lb / hr	1.18E-08	2.81E-08	7.62E-09	1.19E-08
26i. PCB-123 2'344'5-PeCB Mass Emissions	lb / hr	7.95E-10	1.30E-09	3.75E-10	6.17E-10
26j. PCB-126 33'44'5-PeCB Mass Emissions	lb / hr	5.55E-10	6.21E-10	5.44E-10	4.30E-10
26k. PCB-156 233'44'5-HxCB Mass Emissions	lb / hr	1.13E-09	6.82E-10	6.98E-10	6.27E-10
26l. PCB-157 233'44'5'-HxCB Mass Emissions	lb / hr	3.23E-10	3.28E-10	2.95E-10	2.37E-10
26m. PCB-167 23'44'55'-HxCB Mass Emissions	lb / hr	6.02E-10	4.19E-10	2.84E-10	3.26E-10
26n. PCB-169 33'44'55'-HxCB Mass Emissions	lb / hr	4.25E-10	4.50E-10	4.03E-10	3.19E-10
26o. PCB-189 233'44'55'-HpCB Mass Emissions	lb / hr	5.99E-10	4.86E-10	4.83E-10	3.92E-10
15a. Dioxin (Target PCDDs) Conc. @ STP	pg / dscm	9.40E+00	8.24E+00	1.21E+01	7.44E+00
15b. Furan (Target PCDFs) Conc. @ STP	pg / dscm	9.07E+00	8.61E+00	1.08E+01	7.12E+00
15c. Combined Target DD/DF Conc. @ STP	pg / dscm	1.85E+01	1.68E+01	2.29E+01	1.46E+01
15d. PCB-77 33'44'-TeCB Conc. @ STP	pg / dscm	2.11E+00	2.09E+01	1.43E+00	6.10E+00
15e. PCB-81 344'5-TeCB Conc. @ STP	pg / dscm	4.19E-01	1.44E+00	5.71E-01	6.08E-01
15f. PCB-105 233'44'-PeCB Conc. @ STP	pg / dscm	5.22E+00	1.29E+01	3.11E+00	5.31E+00
15g. PCB-114 2344'5-PeCB Conc. @ STP	pg / dscm	4.31E-01	9.78E-01	4.16E-01	4.56E-01
15h. PCB-118 23'44'5-PeCB Conc. @ STP	pg / dscm	1.22E+01	2.91E+01	7.87E+00	1.23E+01
15i. PCB-123 2'344'5-PeCB Conc. @ STP	pg / dscm	8.22E-01	1.34E+00	3.88E-01	6.38E-01
15j. PCB-126 33'44'5-PeCB Conc. @ STP	pg / dscm	5.73E-01	6.42E-01	5.62E-01	4.44E-01
15k. PCB-156 233'44'5-HxCB Conc. @ STP	pg / dscm	1.17E+00	7.05E-01	7.22E-01	6.48E-01
15l. PCB-157 233'44'5'-HxCB Conc. @ STP	pg / dscm	3.34E-01	3.39E-01	3.05E-01	2.45E-01
15m. PCB-167 23'44'55'-HxCB Conc. @ STP	pg / dscm	6.22E-01	4.34E-01	2.94E-01	3.37E-01
15n. PCB-169 33'44'55'-HxCB Conc. @ STP	pg / dscm	4.39E-01	4.65E-01	4.16E-01	3.30E-01
15o. PCB-189 233'44'55'-HpCB Conc. @ STP	pg / dscm	6.19E-01	5.02E-01	4.99E-01	4.05E-01

***Indicates an analytical Detection Limit or Estimated Maximum Concentration was used to calculate emissions =**

Table 2-7
Emissions Summary - Methods 5/202

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Total Particulate w/ Condensibles (Dry Impinger)

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/18/11	6/18/11	6/19/11	-
Emission Test Run Time Began - Ended		750-1148	1244-1547	746-1049	-
Oxygen Concentration	%	1.8	1.7	1.9	1.8
Carbon Dioxide Concentration	%	14.1	14.1	14.0	14.1
Isokinetic Sampling Rate	%	98.05	95.90	96.45	96.80
Stack Temperature	°F	141	141	142	141
Moisture Content	% volume	20.21	20.26	20.62	20.36
Stack Gas Velocity	f/s	65.02	65.32	67.40	65.91
Stack Gas Flow @ Actual Conditions	acfm	370,735	372,459	384,309	375,834
Stack Gas Flow @ Standard Conditions	scfm	323,957	325,409	335,372	328,246
Stack Gas Flow @ Dry Standard Conditions	dscfm	258,497	259,488	266,214	261,400
Total Particulate Emissions	**gr/dscf**	**0.0129**	**0.0167**	**0.0215**	**0.0170**
Total Particulate Emissions	**Lbs/Hr**	**28.51**	**37.09**	**49.06**	**38.22**
Particulate Emissions, condensible	**gr/dscf**	**0.0074**	**0.0092**	**0.0138**	**0.0101**
Particulate Emissions, condensible	**Lbs/Hr**	**16.37**	**20.41**	**31.56**	**22.78**
Particulate Emissions, filterable	**gr/dscf**	**0.0055**	**0.0075**	**0.0077**	**0.0069**
Particulate Emissions, filterable	**Lbs/Hr**	**12.13**	**16.68**	**17.50**	**15.44**

Table 2-8
Emissions Summary - Method 29

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Metals

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/18/11	6/18/11	6/19/11	-
Emission Test Run Time Began - Ended		752-1145	1244-1547	746-1049	-
Oxygen Concentration	%	1.8	1.7	1.9	1.8
Carbon Dioxide Concentration	%	14.1	14.1	14.0	14.1
Isokinetic Sampling Rate	%	94.15	94.37	94.25	94.26
Stack Temperature	°F	145	144	145	144
Moisture Content	% volume	22.16	22.05	22.19	22.13
Stack Gas Velocity	f/s	68.84	68.06	68.29	68.40
Stack Gas Flow @ Actual Conditions	acfm	392,535	388,069	389,400	390,001
Stack Gas Flow @ Standard Conditions	scfm	340,935	337,168	338,184	338,762
Stack Gas Flow @ Dry Standard Conditions	dscfm	265,386	262,828	263,151	263,789
Antimony Emissions	lb/hr	0.0022	0.0019	0.0018	0.0020
Arsenic Emissions	lb/hr	0.0002	0.0003	0.0002	0.0002
Beryllium Emissions	lb/hr	0.00001	0.00001	0.00001	0.00001
Cadmium Emissions	lb/hr	0.0003	0.0001	0.0001	0.0002
Chromium Emissions	lb/hr	0.0016	0.0009	0.0017	0.0014
Colbalt Emissions	lb/hr	0.0021	0.0005	0.0005	0.0010
Lead Emissions	lb/hr	0.0026	0.0012	0.0018	0.0019
Manganese Emissions	lb/hr	0.0121	0.0033	0.0036	0.0063
Nickel Emissions	lb/hr	0.0059	0.0049	0.0050	0.0053
Selenium Emissions	lb/hr	0.0014	0.0014	0.0012	0.0014
Antimony Emissions	mg/dscm	2.23E-03	1.88E-03	1.78E-03	1.96E-03
Arsenic Emissions	mg/dscm	2.46E-04	2.59E-04	1.73E-04	2.26E-04
Beryllium Emissions	mg/dscm	1.31E-05	1.31E-05	1.31E-05	1.31E-05
Cadmium Emissions	mg/dscm	2.94E-04	1.48E-04	1.08E-04	1.84E-04
Chromium Emissions	mg/dscm	1.61E-03	8.62E-04	1.67E-03	1.38E-03
Colbalt Emissions	mg/dscm	2.14E-03	4.86E-04	4.86E-04	1.04E-03
Lead Emissions	mg/dscm	2.60E-03	1.22E-03	1.81E-03	1.87E-03
Manganese Emissions	mg/dscm	1.21E-02	3.28E-03	3.57E-03	6.33E-03
Nickel Emissions	mg/dscm	5.96E-03	4.89E-03	5.02E-03	5.29E-03

***Denotes an analytical Detection Limit value was used to calculate emissions =**

Table 2-9
Emissions Summary - Method 0061

Test Performed For: **Hovensa, LLC**
US Virgin Island - St. Criox

Source(s) Tested: **Fluid Catalytic Cracking Unit (FCCU)**
Test Condition: **Petroleum Refinery ICR**
Test(s) Performed: **Hexavalent Chromium**

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/18/11	6/18/11	6/19/11	-
Emission Test Run Time Began - Ended		750-1104	1244-1533	746-1049	-
Oxygen Concentration	%	1.8	1.7	1.9	1.8
Carbon Dioxide Concentration	%	14.1	14.1	14.0	14.1
Isokinetic Sampling Rate	%	97.03	97.36	95.01	96.46
Stack Temperature	°F	144	144	144	144
Moisture Content	% volume	21.88	20.93	18.91	20.57
Stack Gas Velocity	f/s	68.28	68.60	68.43	68.44
Stack Gas Flow @ Actual Conditions	acfm	389,319	391,159	390,189	390,222
Stack Gas Flow @ Standard Conditions	scfm	338,430	339,871	339,110	339,137
Stack Gas Flow @ Dry Standard Conditions	dscfm	264,375	268,746	274,972	269,364
Hexavalent Chromium Emissions	lb/hr	0.0011	0.0002	0.0014	0.0009
Hexavalent Chromium Emissions	ug/dscm	1.13	0.16	1.36	0.88

***Denotes an analytical Detection Limit value was used to calculate emissions =**

Table 2-10
Emissions Summary - Method CTM 027

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Ammonia

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/18/11	6/18/11	6/19/11	-
Emission Test Run Time Began - Ended		752-1140	1245-1547	753-1049	-
Oxygen Concentration	%	1.8	1.7	1.9	1.8
Carbon Dioxide Concentration	%	14.1	14.1	14.0	14.1
Isokinetic Sampling Rate	%	93.30	93.80	93.10	93.40
Stack Temperature	°F	145	144	145	145
Moisture Content	% volume	22.41	22.08	22.24	22.24
Stack Gas Velocity	f/s	66.99	66.89	66.55	66.81
Stack Gas Flow @ Actual Conditions	acfm	381,998	381,403	379,469	380,956
Stack Gas Flow @ Standard Conditions	scfm	331,544	331,267	329,521	330,777
Stack Gas Flow @ Dry Standard Conditions	dscfm	257,245	258,119	256,230	257,198
Ammonia Emissions	lb/hr	12.72	10.20	6.64	9.85
Ammonia Emissions	ppmvd	18.64	14.91	9.77	14.44

Table 2-11
Emissions Summary - CEMS DATA

Daily Average (24hr) of Gas Pollutants During ICR Testing

Test Performed For:	**Hovensa, LLC**	**Testing Performed By:**
	St. Croix, US VI	**Birmingham Division**
Source(s) Tested:	**FCCU**	**Project Manager:**
Test Condition:	**Normal**	**Chuck Duncan III**
Test(s) Performed:	**Source CEMS System (O2, CO2, Nox, SO2, & CO)**	

Date	6/15/2011	6/16/2011	6/17/2011	6/18/2011	6/19/2011
Parameter					
Oxygen, %	1.71	1.46	1.38	1.47	1.68
Carbon Dioxide, %	13.97	14.13	14.30	14.29	14.11
NOx, ppmv	14.52	11.88	11.42	11.68	12.85
NOx, lbs/hr	24.83	20.25	20.12	20.61	22.01
SO2, ppmv	0.41	0.41	0.41	0.40	0.54
SO2, lbs/hr	2.48	2.07	2.74	2.27	4.62
CO, ppmv	30.49	36.78	36.42	35.02	27.14
CO, lbs/hr	33.95	40.96	41.39	40.11	30.05

Table 2-12
Emissions Summary - Method 18

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Speciated Volatile Organic Compounds

Run Number		Run 1	Run 2	Run 3	Average
Date of Run		6/16/11	6/16/11	6/17/11	-
Moisture Content	% volume				22.24
Stack Gas Flow @ Dry Standard Conditions	dscfm				255,382
Acetone	Concentration (ug/m3)	0.682	0.682	0.682	0.682
Acetonitrile	Concentration (ug/m3)	1.183	1.183	1.183	1.183
Acrylonitrile	Concentration (ug/m3)	0.656	0.656	0.656	0.656
Benzene	Concentration (ug/m3)	0.141	0.141	0.141	0.141
1,3 Butadiene	Concentration (ug/m3)	0.399	0.399	0.399	0.399
Chlorobenzene	Concentration (ug/m3)	0.193	0.193	0.193	0.193
Cumene	Concentration (ug/m3)	0.386	0.386	0.386	0.386
1,2 Dibromomethane	Concentration (ug/m3)	0.579	0.579	0.579	0.579
Ethylbenzene	Concentration (ug/m3)	0.129	0.129	0.129	0.129
Hexane	Concentration (ug/m3)	0.643	0.643	0.643	0.643
Methanol	Concentration (ug/m3)	0.141	0.141	0.141	0.141
Methyl isobutyl ketone	Concentration (ug/m3)	0.360	0.360	0.360	0.360
Methyl t-butyl ether	Concentration (ug/m3)	0.386	0.386	0.386	0.386
Methylene chloride	Concentration (ug/m3)	0.772	0.772	0.772	0.772
2-Nitropropane	Concentration (ug/m3)	0.900	0.900	0.900	0.900
Pentane	Concentration (ug/m3)	0.643	0.643	0.643	0.643
Styrene	Concentration (ug/m3)	0.437	0.437	0.437	0.437
Tetrachloroethene	Concentration (ug/m3)	0.360	0.360	0.360	0.360
Toluene	Concentration (ug/m3)	0.656	0.656	0.656	0.656
Trichloroethene	Concentration (ug/m3)	0.129	0.129	0.129	0.129
2,2,4 Trimethylpentane	Concentration (ug/m3)	0.450	0.450	0.450	0.450
Xylenes	Concentration (ug/m3)	0.129	0.129	0.129	0.129
Methane	Concentration (ug/m3)	0.643	0.643	0.643	0.643
Ethane	Concentration (ug/m3)	0.643	0.643	0.643	0.643

Table 2-12
Emissions Summary - Method 18

Test Performed For: Hovensa, LLC
US Virgin Island - St. Criox

Source(s) Tested: Fluid Catalytic Cracking Unit (FCCU)
Test Condition: Petroleum Refinery ICR
Test(s) Performed: Speciated Volatile Organic Compounds

Run Number		Run 1	Run 2	Run 3	Average
Acetone	Mass Rate (lbs/hr)	1.573	1.573	1.573	1.573
Acetonitrile	Mass Rate (lbs/hr)	1.930	1.930	1.930	1.930
Acrylonitrile	Mass Rate (lbs/hr)	1.383	1.383	1.383	1.383
Benzene	Mass Rate (lbs/hr)	0.439	0.439	0.439	0.439
1,3 Butadiene	Mass Rate (lbs/hr)	0.857	0.857	0.857	0.857
Chlorobenzene	Mass Rate (lbs/hr)	0.863	0.863	0.863	0.863
Cumene	Mass Rate (lbs/hr)	1.843	1.843	1.843	1.843
1,2 Dibromomethane	Mass Rate (lbs/hr)	3.999	3.999	3.999	3.999
Ethylbenzene	Mass Rate (lbs/hr)	0.543	0.543	0.543	0.543
Hexane	Mass Rate (lbs/hr)	2.202	2.202	2.202	2.202
Methanol	Mass Rate (lbs/hr)	0.180	0.180	0.180	0.180
Methyl isobutyl ketone	Mass Rate (lbs/hr)	1.433	1.433	1.433	1.433
Methyl t-butyl ether	Mass Rate (lbs/hr)	1.357	1.357	1.357	1.357
Methylene chloride	Mass Rate (lbs/hr)	2.605	2.605	2.605	2.605
2-Nitropropane	Mass Rate (lbs/hr)	3.188	3.188	3.188	3.188
Pentane	Mass Rate (lbs/hr)	1.844	1.844	1.844	1.844
Styrene	Mass Rate (lbs/hr)	1.810	1.810	1.810	1.810
Tetrachloroethene	Mass Rate (lbs/hr)	2.373	2.373	2.373	2.373
Toluene	Mass Rate (lbs/hr)	2.402	2.402	2.402	2.402
Trichloroethene	Mass Rate (lbs/hr)	0.671	0.671	0.671	0.671
2,2,4 Trimethylpentane	Mass Rate (lbs/hr)	2.044	2.044	2.044	2.044
Xylenes	Mass Rate (lbs/hr)	0.543	0.543	0.543	0.543
Methane	Mass Rate (lbs/hr)	0.410	0.410	0.410	0.410
Ethane	Mass Rate (lbs/hr)	0.768	0.768	0.768	0.768

**No compounds were detected. These are the estimated emission rates based on calculated detection limits.

3.0 PROCESS DESCRIPTION

Hovensa is a joint venture between a subsidiary of Hess Corporation and a subsidiary of Petroleos de Venezuela, S.A. (PDVSA). The company operates a petroleum refinery in the south-central Estate Hope region of St. Croix, which is located in the United States Virgin Islands (USVI). The facility is one of the most modern refineries in the United States and has a crude oil processing capacity of 350,000 barrels per day (BPD).

The refinery was strategically located to serve gasoline and heating oil markets in both the United States Gulf Coast and along the eastern seaboard, providing a ready market for finished products. The refinery is capable of receiving and processing crudes from all over the world, although the majority of crude is supplied from Venezuela.

Testing at the facility was required on the Fuel Gas System (7) and the Fluid Catalytic Cracking Unit (FCCU).

3.1 FUEL GAS SYSTEM UNIT(S) DESCRIPTION

The fuel system provides refinery fuel gas to the process heaters and boilers and the fuel gas is supplied to a common header which connects both the east and west refineries. The main producers of refinery gas are the FCC Unit and Coker Units which pass through amine scrubbers to remove H2S to below fuel gas permit levels. The other refinery process units' off-gases are routed through either the High Pressure Treater or Low Pressure Treater to remove H2S prior to be routed to the fuel gas header. To maintain a stable fuel gas distribution header pressure nominally between 50 to 55 psig, vaporized propane or butane is added to supplement the header pressure. There are four vaporizers in the east refinery and three vaporizers in the west refinery. Prior to the fuel gas being distributed to fuel gas consumers, the refinery gas is mixed in fuel gas balance drums (see below list). Typically fuel gas flows from the east refinery to the west refinery, since the major fuel gas producers are in the east refinery. After the fuel gas is mixed in the fuel gas drums, the gas is routed to the fuel gas consumers. The fuel gas drums tested included:

- West Refinery Area 1 – D-1110
- West Refinery Area 2 – D-905
- West Refinery Area 2 – D-2112
- East Refinery Area 3 – D-3307
- East Refinery Area 3 – D-3354
- FCC – D-7939
- Coker – D-8535

3.2 FLUID CATALYTIC CRACKING UNIT DESCRIPTION (AREA V)

The FCCU converts heavy oils into wide boiling range material from which lower molecular weight products such as naphtha and middle distillates are fractionated by distillation. The feedstock is generally a heavy distillate or gas oil with a boiling range of about 500° to 1,000° F. The FCCU consists of a catalyst section and a fractionating section which operates as an integrated processing unit. The catalyst section consists of a reactor, regenerator, standpipes, and risers. The catalyst is in the form of very small spherical particles that behave as a fluid when aerated. The reactor effluent is separated by distillation in the fractionator into recycle oil, middle distillate, naphtha, liquefied petroleum gas (LPG), and off-gas.

A low sulfur content feedstock (≤ 0.6 weight percent) and a high efficiency venturi wet gas scrubber (WGS) are used to reduce sulfur dioxide (SO_2) emissions from the FCCU complex. Oxides of nitrogen (NO_x) emissions from the FCCU complex are controlled using temperature controls and by minimizing the oxidation conditions.

The major components of the particulate matter (PM) emissions consist essentially of catalyst fines and sodium sulfate salts emitted with the FCCU regenerator flue gas. PM regenerator emissions are controlled by the high efficiency scrubber. Carbon monoxide (CO) is emitted during the regeneration of the catalyst in the FCCU. CO emissions are reduced using a high temperature regenerator. Volatile organic compounds (VOCs) are emitted from the FCCU during the regeneration of the catalyst. Combustion controls (e.g., temperature and excess air) are used to reduce VOC emissions.

Table 3-1

Total Dissolved Solids in Scrubber Water

Test Parameter	Test Method	Run 1	Run 2	Run 3
Total Dissolved Solids, mg	ASTM D-5907	5,689.3	7,721.0	7,819.3

Core Lab
)eerwood Glen Drive
Park, TX 77536
78-1300 Telephone
76-9209 Facsimile

Table 3-2

Entec Services, Inc
301 Brookdale Street
Kannapolis, NC 28083
ATTN: Troy Burrows

Analysis	Method	Units	D8535-1 Coker Fuel Gas Run 1 6/15/11 1:10:00 PM	D8535-2 Coker Fuel Gas Run 2 6/15/11 2:10:00 PM	D8535-3 Coker Fuel Gas Run 3 6/15/11 3:30:00 PM	D905-1 West Area 2 Fuel Gas Run 1 6/14/11 2:12:00 PM	D905-2 West Area 2 Fuel Gas Run 2 6/14/11 4:10:00 PM	D905-3 West Area 2 Fuel Gas Run 3 6/15/11 9:25:00 AM	D1110-1 West Area 1 Fuel Gas Run 1 6/14/11 2:19:00 PM	D1110-2 West Area 1 Fuel Gas Run 2 6/14/11 3:55:00 PM	D1110-3 West Area 1 Fuel Gas Run 3 6/15/11 9:20:00 AM	D2112-1 West Area 2 Fuel Gas Run 1 6/14/11 3:30:00 PM	D2112-2 West Area 2 Fuel Gas Run 2 6/14/11 4:30:00 PM	D2112-3 West Area 2 Fuel Gas Run 3 6/15/11 8:35:00 AM	D7939-1 FCCU Fuel Gas Run 1 6/14/11 2:00:00 PM	D7939-2 FCCU Fuel Gas Run 2 6/14/11 3:00:00 PM	D7939-3 FCCU Fuel Gas Run 3 6/14/11 4:00:00 PM	D3307-1 East Area 3 Fuel Gas Run 1 6/14/11 2:15:00 PM
			111928-1	111928-2	111928-3	111928-4	111928-5	111928-6	111928-7	111928-8	111928-9	111928-10	111928-11	111928-12	111928-13	111928-14	111928-15	111928-16
Extended Refinery Gas Analysis																		
Hydrogen	ASTM D-1946	Mol %	8.63	8.57	8.69	45.86	46.13	38.26	48.72	51.2	40.24	48.59	48.57	39.96	4.93	5.88	5.86	24.49
Oxygen	ASTM D-1946	Mol %	0.02	0.02	0.02	0.06	0.02	0.01	0.03	0.02	0.01	0.33	0.06	0.06	0.02	0.02	0.03	0.95
Nitrogen	ASTM D-1946	Mol %	0.09	0.09	0.11	1.92	1.09	0.58	1.39	0.45	0.32	1.64	0.54	0.37	0.76	0.89	0.78	5.22
Carbon Monoxide	ASTM D-1946	Mol %	0.75	0.74	0.73	0.11	0.13	0.13	0.09	0.09	0.09	0.1	0.1	0.15	0.04	0.05	0.04	0.3
Carbon Dioxide	ASTM D-1946	Mol %	0.03	0.03	0.02	0.09	0.1	0.02	0.11	0.04	0.06	0.04	0.03	0.01	0.1	0.12	0.1	0.26
Hydrogen Sulfide	ASTM D-1946	Mol %	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Methane	ASTM D-1946	Mol %	61.93	60.57	60.97	16.99	17.8	18.02	15.37	15.49	15.78	16.05	16.22	17.45	4.66	5.19	4.4	27.24
Ethylene	ASTM D-1946	Mol %	2.4	2.37	2.32	0.98	1.96	0.04	0.25	0.56	0.03	0.07	0.17	0.03	1.98	2.3	1.83	5.2
Acetylene	ASTM D-2712M	Mol %	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethane	ASTM D-1946	Mol %	19.57	20.1	19.6	13.26	12.94	14.74	12.67	12	12.99	12.7	12.92	14.99	2.32	2.65	2.27	15.21
Propylene	UOP-539	Mol %	1.77	2.05	2.03	0.11	0.38	0.13	0.06	0.32	0.1	0.06	0.08	0.12	52.47	49.77	51.49	0.9
Propane	ASTM D-1945	Mol %	2.94	3.61	3.69	9.9	8.74	12.02	9.9	8.96	10.76	10.11	10.16	12.25	15.09	14.18	14.84	8.76
Propadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Methylacetylene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001
Isobutane	ASTM D-1945	Mol %	0.22	0.22	0.22	2.96	2.67	4.53	3.07	2.85	6.25	3.01	3.04	3.85	6.06	5.88	5.75	3.08
Isobutylene	UOP-539	Mol %	0.22	0.23	0.23	0.09	0.01	0.16	0.07	0.07	0.11	0.07	0.08	0.13	2.76	2.68	2.57	0.1
1-Butene	UOP-539	Mol %	0.25	0.24	0.24	0.08	0.08	0.13	0.06	0.07	0.12	0.07	0.08	0.13	2.53	2.33	2.34	0.11
1,3-Butadiene	UOP-539	Mol %	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	0.12	0.12	0.00
n-Butane	ASTM D-1945	Mol %	0.69	0.67	0.66	4.2	4.06	7.26	4.71	4.34	10.35	4.16	4.68	6.29	1.99	1.87	1.83	4.94
trans-2-Butene	UOP-539	Mol %	0.14	0.19	0.19	0.42	0.95	0.33	0.22	0.19	0.28	0.23	0.25	0.33	2.28	2.72	2.6	0.16
cis-2-Butene	UOP-539	Mol %	0.08	0.12	0.12	0.27	0.62	0.22	0.12	0.14	0.18	0.14	0.16	0.21	1.48	1.79	1.72	0.11
1,2-Butadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
3-Methyl-1-butene	ASTM D-2712M	Mol %	0.028	0.035	0.035	0.049	0.006	0.005	0.003	0.004	0.003	0.003	0.003	<0.001	0.063	0.06	0.055	0.024
Isopentane	ASTM D-1945	Mol %	0.06	0.06	0.05	1.44	1.21	1.71	2.06	2.06	1.24	1.38	1.48	1.83	0.25	0.28	0.24	0.24
1,4-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1-Pentene	ASTM D-2712M	Mol %	0.033	0.026	0.039	0.024	0.01	0.005	0.004	0.005	0.003	0.003	0.004	0.004	0.035	0.033	0.026	0.039
2-Methyl-1-pentene	ASTM D-2712M	Mol %	<0.001	0.011	0.016	0.013	0.015	0.006	0.006	0.008	0.004	0.005	0.006	0.005	0.051	0.048	0.037	0.068
n-Pentane	ASTM D-1945	Mol %	0.07	0.03	0.02	0.81	0.72	1.07	0.76	0.77	0.76	0.83	0.9	1.18	0.01	0.01	0.01	0.81
2-Methyl-1,3-butadiene (Isoprene)	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-2-Pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
cis-2-Pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2-Methyl-2-pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
3-Methyl-1,2-Butadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentane	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	0.006	0.008	0.008	0.005	0.005	0.005	0.006	0.007	0.009	<0.001	<0.001	<0.001	0.005
Benzene	GPA 2286	Mol %	<0.001	<0.001	<0.001	0.032	0.045	0.045	0.028	0.031	0.022	0.034	0.036	0.053	<0.001	<0.001	<0.001	0.020
Molar Mass Ratio	ASTM D-3588		0.69089	0.70263	0.69856	0.67659	0.65009	0.81223	0.66642	0.63362	0.8269	0.65234	0.66196	0.7881	1.42346	1.4131	1.42159	0.83583
Gross Heating Value (Dry)	ASTM D-3588	BTU/CF	1214.1	1232.2	1226.1	1192.9	1165.5	1423.2	1188.7	1156.5	1451.1	1158.8	1197	1389.4	2299.4	2281.6	2296.4	1345.6
Pressure Base		psia	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696
Average Molecular Weight	ASTM D-3588	g/mol	20.0	20.4	20.2	19.6	18.8	23.5	19.4	18.4	24.0	18.9	19.2	22.8	41.2	40.9	41.2	24.2
Total Reduced Sulfur (TRS)	ASTM D-5504	ppm v as H2S	45	16	94	3	2	4	1	1	3	1	2	1	36	12	6	11

The analytical results, opinions or interpretations contained in the report are based upon information and material supplied by the client for whose exclusive and confidential use the report has been made. The analytical results, opinions, or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warranty or representation, expressed or implied, of any type, and expressly declaims same as in the productivity, proper operations or profitableness of any oil, gas, coal, or other mineral property, well or land in connection with such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the written approval of Core Laboratories.

Core Lab
)eerwood Glen Drive
Park, TX 77536
78-1300 Telephone
76-9209 Facsimile

Table 3-2

Entec Services, Inc
301 Brookdale Street
Kannapolis, NC 28083
ATTN: Troy Burrows

Analysis	Method	Units	D3307-2 East Area 3 Fuel Gas Run 2 6/14/11 3:15:00 PM	D3307-3 East Area 3 Fuel Gas Run 3 6/14/11 4:15:00 PM	D3354-1 East Area 3 Fuel Gas Run 1 6/14/11 2:10:00 PM	D3354-2 East Area 3 Fuel Gas Run 2 6/14/11 3:10:00 PM	D3354-3 East Area 3 Fuel Gas Run 3 6/14/11 4:10:00 PM
Extended Refinery Gas Analysis			**111928-17**	**111928-18**	**111928-19**	**111928-20**	**111928-21**
Hydrogen	ASTM D-1946	Mol %	20.36	25.65	22.56	22.69	24.01
Oxygen	ASTM D-1946	Mol %	4.27	0.05	0.3	1.05	0.04
Nitrogen	ASTM D-1946	Mol %	16.89	1.98	2.74	5.32	1.56
Carbon Monoxide	ASTM D-1946	Mol %	0.24	0.34	0.28	0.28	0.32
Carbon Dioxide	ASTM D-1946	Mol %	0.2	0.21	0.22	0.21	0.2
Hydrogen Sulfide	ASTM D-1946	Mol %	<0.01	<0.01	<0.01	<0.01	<0.01
Methane	ASTM D-1946	Mol %	22.12	29.14	25.23	24.75	27.21
Ethylene	ASTM D-1946	Mol %	3.96	4.31	4.8	4.67	3.96
Acetylene	ASTM D-2712M	Mol %	<0.01	<0.01	<0.01	<0.01	<0.01
Ethane	ASTM D-1946	Mol %	12.25	15.07	13.83	13.6	14.34
Propylene	UOP-539	Mol %	0.7	0.65	0.81	0.8	0.6
Propane	ASTM D-1945	Mol %	7.12	8.18	7.91	7.73	7.8
Propadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
Methylacetylene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
Isobutane	ASTM D-1945	Mol %	2.66	2.8	3.41	3.24	2.85
Isobutylene	UOP-539	Mol %	0.26	0.35	0.78	0.72	0.74
1-Butene	UOP-539	Mol %	0.29	0.42	0.88	0.79	0.88
1,3-Butadiene	UOP-539	Mol %	0.01	0.01	0.01	0.01	0.02
n-Butane	ASTM D-1945	Mol %	5.06	6.44	9.03	8.2	8.86
trans-2-Butene	UOP-539	Mol %	0.56	1.02	1.86	1.78	2.25
cis-2-Butene	UOP-539	Mol %	0.42	0.75	1.33	1.28	1.69
1,2-Butadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
3-Methyl-1-butene	ASTM D-2712M	Mol %	0.042	0.043	0.059	0.058	0.07
Isopentane	ASTM D-1945	Mol %	1.48	1.58	1.89	1.79	1.76
1,4-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
1-Pentene	ASTM D-2712M	Mol %	0.047	0.041	0.052	0.05	0.044
2-Methyl-1-pentene	ASTM D-2712M	Mol %	0.079	0.068	0.086	0.083	0.069
n-Pentane	ASTM D-1945	Mol %	0.67	0.64	0.71	0.66	0.57
2-Methyl-1,3-butadiene (Isoprene)	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
trans-2-Pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
cis-2-Pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
2-Methyl-2-pentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
3-Methyl-1,2-Butadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
2,3-Pentadiene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentene	ASTM D-2712M	Mol %	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentane	ASTM D-2712M	Mol %	0.004	0.004	0.005	0.005	0.025
Benzene	GPA 2286	Mol %	0.016	0.012	0.024	0.018	0.013
Molar Mass Ratio	ASTM D-3588		0.88667	0.83879	0.95789	0.92846	0.91406
Gross Heating Value (Dry)	ASTM D-3588	BTU/CF	1169.1	1420.9	1583.4	1482.7	1541.7
Pressure Base		psia	14.696	14.696	14.696	14.696	14.696
Average Molecular Weight	ASTM D-3588	g/mol	25.7	24.3	27.7	26.9	26.5
Total Reduced Sulfur (TRS)	ASTM D-5504	ppm v as H2S	11	32	10	5	12

The analytical results, opinions or interpretations contained in the report are based upon information and material supplied by the client for whose exclusive use and for the specific purpose for which it was prepared. Core Laboratories makes no warranty or representation as to the productivity, proper operations or profitableness of any oil, gas, coal, or other mineral property, well or sand in connection with such report is used or relied upon.

4.0 REFERENCE METHOD TEST PROCEDURES

Emission rates were determined using US EPA Reference Test Methods 1, 2, 3, 4, 5 / 202, 18, 23, 25A, 26A, 29, 30B, 0010, 0011, 0061, CTM027, and OTM029 of US EPA 40 CFR Part 60, Appendix A and Appendix M, EPA SW-846 Test Methods, EPA Other Test Methods, EPA Conditional Test Methods, ASTM Test Methods, and (Aldehydes alternative) Test Methods, with the latest revisions for each identified method for the complete test program. Calibration and quality assurance procedures of US EPA 40 CFR Part 60, Appendix A and the "Quality Assurance Handbook for Air Pollution Measurement System" Volume III Stationary Source-Specific Methods were followed throughout the duration of field and laboratory testing for all methods. The most current version for each method (as described in the Federal Register) was used.

4.1 EPA METHOD 1 - TRAVERSE POINT LAYOUT

For Information on stack dimensions, traverse points, distance to disturbance and other relevant data, refer to the drawings presented in Figures 4-1, "Stack Drawing and Traverse Point Location".

4.2 EPA METHOD 2 - VELOCITY

The velocity of the gas stream was determined according to EPA Reference Method 2 by reading the instantaneous velocity head with an inclined manometer at each sampling point with a calibrated S-type pitot. The stack pressure was measured with the static side of an S-type pitot tube. A calibrated pyrometer was used to measure stack temperature at each sampling point.

All test data, worksheets, and spreadsheets presenting the calculations are included in Appendix A. Pitot tube, thermocouple, and other measurement device calibration worksheets used for the test series are presented in Appendix E.

4.3 EPA METHOD 3A - MOLECULAR WEIGHT DETERMINATION-INSTRUMENTAL ANALYSIS

The carbon dioxide concentrations were determined using EPA Reference Method 3A, and oxygen concentrations were determined by the facility CEMS. A sample of the flue gas was extracted from the gas stream during each test. Moisture was removed from the sample and was analyzed on a dry basis with an Instrumental gas analyzer. The molecular weight of the gas was calculated using the moisture, oxygen and carbon dioxide content and the measured stack gas temperature.

4.4 EPA METHOD 4 - MOISTURE CONTENT

The moisture content of the vent gas stream was determined in conjunction with each of the sampling methods, unless otherwise specified within the method documentation. The dry gas meter and thermocouple calibration forms are contained in Appendix E.

4.5 EPA METHOD 5 / 202 TOTAL PARTICULATE DETERMINATION (DRY IMPINGER)

Particulate matter was withdrawn isokinetically from the source and collected on a quartz filter maintained at a temperature of 160 ± 14° C (320 ± 25° F). The condensable particulate matter (CPM) portion was collected in the dry impingers after the filterable PM has been collected on a filter (CPM Filter) maintained between 65° F - 85° F. The total of the impinger fractions and the CPM filter represented the CPM. This method eliminated the use of water as the collection media in impingers and includes the addition of a condenser followed by a water dropout impinger immediately after the heated filter.

CPM was collected in the water dropout impinger, the modified Greenburg Smith impinger, and the CPM filter of the sampling train. The impinger contents were purged with nitrogen immediately after sample collection to remove dissolved sulfur dioxide (SO_2) gases from the impingers. The CPM filter was extracted with water and hexane. The impinger solution was then extracted with hexane. The organic and aqueous fractions were dried and the residues were weighed. The total of the aqueous and organic fractions represented the CPM (Dry Impinger and Additional Filter). The potential artifacts from SO_2 were reduced using a condenser and water dropout impinger to separate CPM from reactive gases. No water was added to the impingers prior to the start of sampling. To improve the collection efficiency of CPM, an additional filter (the "CPM filter") was placed between the second and third impingers.

4.6 EPA METHOD 18 - SPECIATED VOLATILE ORGANIC HAP'S WITH METHANE & ETHANE

A gas sample was extracted using the direct interface option from the emission source and diluted with clean dry air. An aliquot of the diluted sample was then analyzed for the target compounds by GC/FID. The targeted organic components of the gas mixture were separated by gas chromatography (GC) and individually quantified by flame ionization detection principles.

All of the compounds were injected into the appropriate column to determine retention time, detection limits, and response factors. This was done prior to the field test. All of the equipment and calibration compounds were shipped to the field where it was set up identically to the laboratory. The column was calibrated over a range of 0-25 ppmv of the selected compounds. A preliminary sample was obtained, in triplicate, to determine which compounds of interest were in the gas stream and were needed to be sampled. A complete calibration for these compounds was performed prior to testing. At this time, we also determined the need for sample dilution to avoid detector saturation or moisture condensation. The preliminary test also determined the range of the calibration standards for the test runs.

Any compounds that were on the Table 1-3 list that were detected at greater than the detection limit were considered present. A calibration standard was prepared to bracket the concentration of that compound per Section 10 of Method 18. The calibration of columns/FID were conducted per Section 8 pre- and post-sampling. In addition to the calibrations, the compound with the highest boiling point for each column was spiked at the probe to provide a bias check for the sampling system, demonstrating that target specie, if present, was detected.

Each sample run consisted of five injections per Method 18. The samples took approximately 25 minutes per injection and, therefore, the sample run was conducted over a 3-hour period. The volatile organics were sampled at the same time as the THC (Method 25A) and the other manual organic sampling trains.

4.7 EPA METHOD 23 - DIOXIN-FURAN DETERMINATION

This method is applicable for the determination of polychlorinated dibenzo-p-dioxins (PCDD's) and polychlorinated dibenzofurans (PCDF's) from stationary sources. A sample was withdrawn from the gas stream isokinetically and collected in the sample probe, on a quartz filter, and on a packed column of adsorbent material. The PCDD's and PCDF's were extracted from the sample, separated by high resolution gas chromatography, and measured by high resolution mass spectrometry.

4.8 EPA METHOD 25A - TOTAL HYDROCARBON (VOC's)

Total hydrocarbons were continuously measured using a California Analytical Model 300 (or equivalent) flame ionization detector. A sample was extracted from the sources being tested through a heated sample line and pumped into a flame ionization detector. An electrometer coupled with a potentiometer recorder detected the increase in ion intensity resulting from the introduction into a hydrogen flame of a sample of air containing organic compounds. The analyzer was calibrated using propane. The analyzers had a digital readout, as well as 0-10 volt output terminals. The full scale of the instrument was set as required throughout the duration of the test period. The data acquisition system collected data with a minimum of one sample reading every 10 seconds with minute averages.

4.9 EPA METHOD 26A - HYDROGEN CHLORIDE, FLUORIDE, AND CHLORINE

Gaseous and particulate pollutants were withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. The probe was maintained greater than at 248 degrees F during the entire test duration. The cyclone collected any liquid droplets and it was not necessary if the source emissions did not contain them; however, it was preferable to include the cyclone in the sampling train to protect the filter from any liquid present. The optional filter collected particulate matter including halide salts but was not routinely recovered or analyzed. Acidic and alkaline absorbing solutions collected the gaseous hydrogen halides and halogens, respectively. Following sampling of emissions containing liquid droplets, any halides/halogens dissolved in the liquid in the cyclone and on the filter were vaporized to gas and collected in the impingers by pulling conditioned ambient air through the sampling train. The hydrogen halides were solubilized in the acidic solution and form chloride (Cl-), bromide (Br-), and fluoride (F-) ions. The halogens had a very low solubility in the acidic solution and pass through to the alkaline solution where they were hydrolyzed to form a proton (H+), the halide ion, and the hypohalous acid (HClO or HBrO). Sodium thiosulfate was added to the alkaline solution to assure reaction with the hypohalous acid to form a second halide ion such that 2 halide ions were formed for each molecule of halogen gas. The halide ions in the separate solutions were measured by ion chromatography (IC).

4.10 EPA METHOD 29 - METALS DETERMINATION (NON-MERCURY)

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 then collected in an aqueous acidic solution of hydrogen peroxide (analyzed for the targeted HAP Metals). The recovered samples were digested, and appropriate fractions were analyzed for Sb, As, Be, Cd, Cr, Co, Pb, Mn, Ni, and Se by inductively coupled argon plasma emission spectroscopy. Graphite furnace atomic absorption spectroscopy (GFAAS) was used for analysis of Sb, As, Cd, Pb, and Se if these elements required

greater analytical sensitivity than can be obtained by ICAP. If one so chooses, AAS may be used for analysis of all listed metals if the resulting in-stack method detection limits met the goal of the testing program. Similarly, inductively coupled plasma-mass spectroscopy (ICP-MS) was used for analysis of Sb, As, Be, Cd, Cr, Pb, Mn, and Ni.

4.11 EPA METHOD 30B – SPECIATED MERCURY

Known volumes of flue gas were extracted from a stack through paired, in-stack sorbent media traps at an appropriate flow rate. Collection of speciated (oxidized and elemental) mercury on the sorbent media in the stack mitigated potential loss of mercury during transport through a probe/sample line. For each test run, paired train sampling was required to determine measurement precision and verify acceptability of the measured emissions data. A field recovery test which assessed recovery of an elemental Hg spike to determine measurement bias was also used to verify data acceptability.

Entec had discussed the 30B approach with Mr. Rob Keeney of Aura Scientific who submitted to EPA in May 2011 an SOP detailing the advantages of utilizing this approach. With a two (2) hour run time an expected detection limit of 0.25 micro-grams / dscf was met.

4.12 EPA METHOD 0010 - SPECIATED SEMI-VOLATILE ORGANIC HAP'S

Gaseous and particulate pollutants were withdrawn from an emission source at an isokinetic sampling rate and were collected in a multi-component sampling train. Principal components of the train included a pre-cleaned high-efficiency glass- or quartz-fiber filter and a packed bed of porous polymeric adsorbent resin (Spiked XAD-2 with dueterated compounds). The filter was used to collect organic-laden particulate materials and the porous polymeric resin to adsorb semi-volatile organic species. Semi-volatile species were defined as compounds with boiling points >100°C.

4.13 EPA METHOD 0011 – ALDEHYDES

Gaseous and particulate pollutants were withdrawn isokinetically from an emission source and were collected in aqueous acidic 2,4-dinitrophenylhydrazine (DNDH). The chemicals were used within four (4) days of manufacture and analyzed within fifteen (15) days. Formaldehyde present in the emissions reacted with the 2,4-dinitrophenylhydrazine to form the formaldehyde dinitrophenylhydrazone derivative. The dinitrophenylhydrazone derivative was extracted, solvent-exchanged, concentrated, and then analyzed by high performance liquid chromatography (HPLC) according to Method 8315 or other appropriate technique.

4.14 EPA METHOD 0061 - HEXAVALENT CHROMIUM

The sampling system collected the Cr+6 emissions isokinetically from the source. To eliminate the possibility of Cr+6 reduction between the nozzle and impinger, the emission samples were collected with a re-circulatory train where the impinger reagent was continuously re-circulated to the nozzle. Recovery procedures include a post-sampling purge and filtration. The impinger train samples were analyzed for Cr+6 by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The IC/PCR separated the Cr+6 as chromate (CrO =) from 4 other diphenylcarbazide reactions that occur in the post-column reactor. To increase sensitivity for trace levels of chromium, a pre-concentration system was used in conjunction with the IC/PCR.

4.15 EPA METHOD CTM 027 – AMMONIA

A stack gas sample was withdrawn isokinetically from the source and was collected with a heated probe and filter greater than 250 degrees Fahrenheit in order to minimize either negative or positive reactions that would bias the ammonia results. Samples passed through an in-stack filter and were collected in impingers containing sulfuric acid solution. All collected sample fractions were analyzed using ion chromatography.

4.16 EPA METHOD OTM 029 - HYDROGEN CYANIDE

Gaseous and particulate pollutants were withdrawn from an emission source at an isokinetic sampling rate and were collected in a multi-component sampling train. The primary components of the sampling train included a heated probe, a heated filter, three impingers containing sodium hydroxide (NaOH) solution, and an impinger containing silica gel. Hydrogen cyanide present in the stack gas stream reacted with the NaOH to form a cyanide ion, which was retained in the alkaline solution until analyzed by ion chromatography (IC). Particulate cyanide salts were retained on the filter, and were not analyzed during routine execution of the method. Sampling was conducted isokinetically because of the significant solubility of HCN in water droplets which was present in combustion stacks, especially those equipped with wet scrubber systems. Analysis was performed by liquid chromatography using an ion chromatograph equipped with an appropriate electrochemical detector.

Figure 4-1
Entec Services, Inc

30 Monroe Drive - Pelham, Alabama 35124

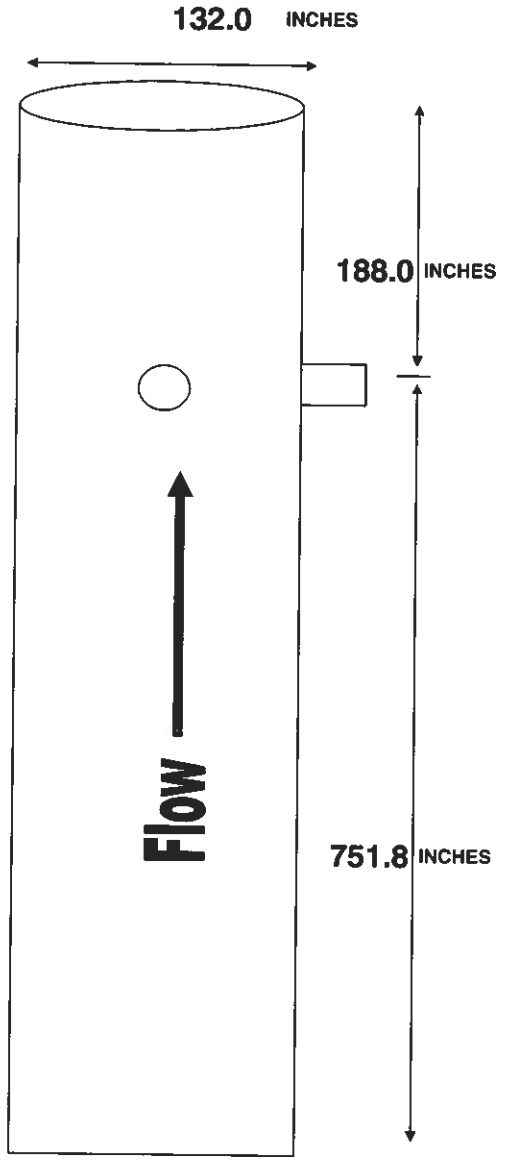
STACK DRAWING & TRAVERSE POINT LOCATION

Client: **Hovensa, LLC** Job No. : **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Input By: **L. Beane**

Type of Traverse: Velocity (V) or Particulate (P):	P	Port Type	Nipple	Port Diameter	4.0"
Stack Diameter, inches:	132	Stack Area, Ft^2:			95.033
Stack Height, feet:	227.5	Number of Ports:			4

Stack Properties:	Inches	Duct Diameters		
Upstream From Flow Disturbance (A):	188.0	1.42	Length of Port, inches:	9.00
Downstream From Flow Disturbance (B):	751.8	5.70	Total Number of Traverse Points:	20
			Number of Points per port / traverse:	5 | 10



Point No.	Inside Stack Inches	Outside Nipple Inches
1	3.4	12.4
2	10.8	19.8
3	19.3	28.3
4	29.8	38.8
5	45.1	54.1
6	86.9	95.9
7	102.2	111.2
8	112.7	121.7
9	121.2	130.2
10	128.6	137.6

* Adjusted points diameter > 24" no point closer than 1.0 inch
* Adjusted points diameter ≤ 24" no point closer than 0.5 inch

Stack Diameters between 12-24 inches minimum points are 8 ; 4 points per port if the 8 / 2 diameters downstream and upstream criteria is met.

Upstream & Downstream Based on Source Drawings

Test Ports Located at elevation - 312' - 10"

Last Disturbance at elevation - 250' - 2 1/4"

Figure 4-2
Method 26A Sampling Train

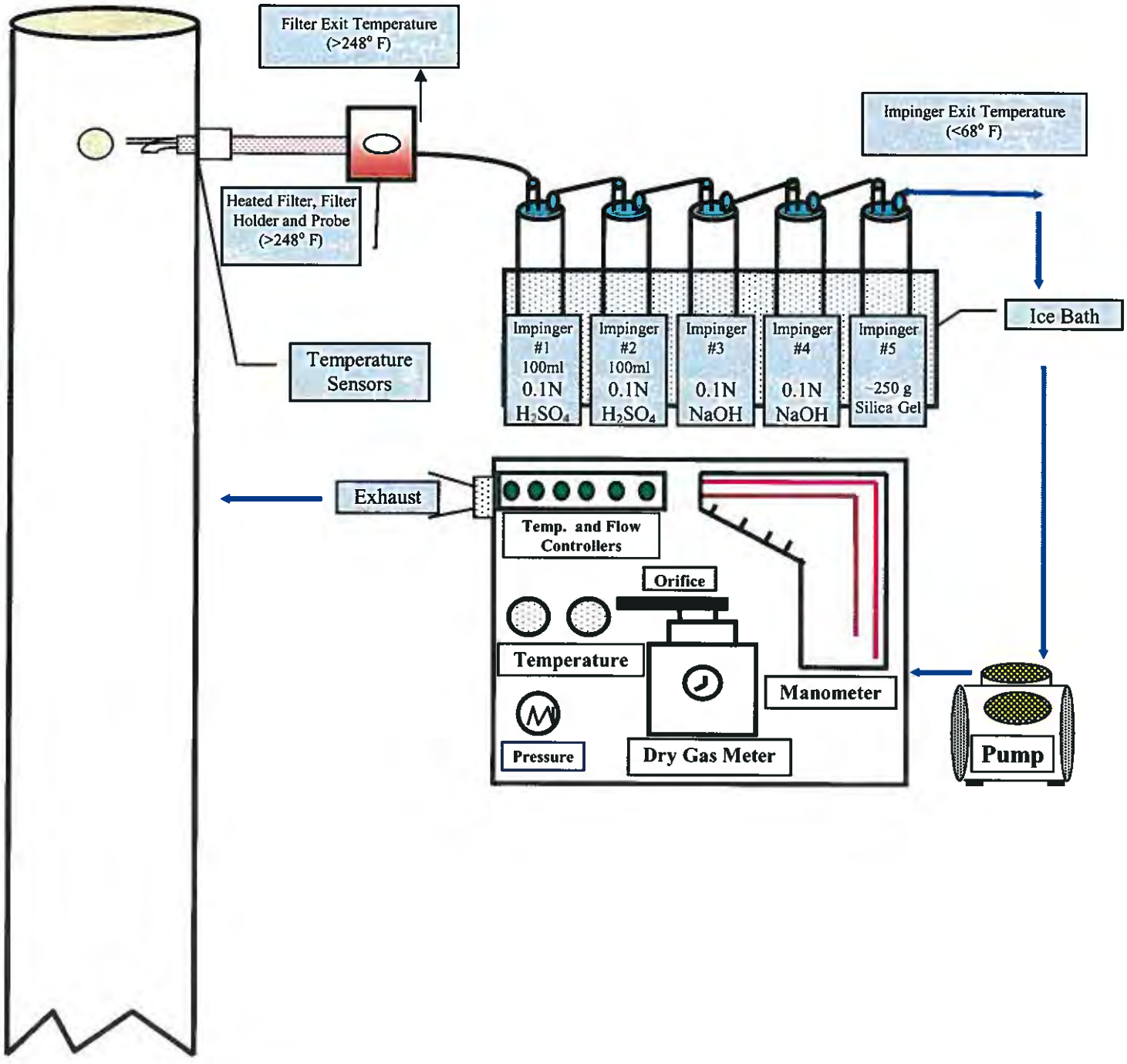


Figure 4-3
Method 30B

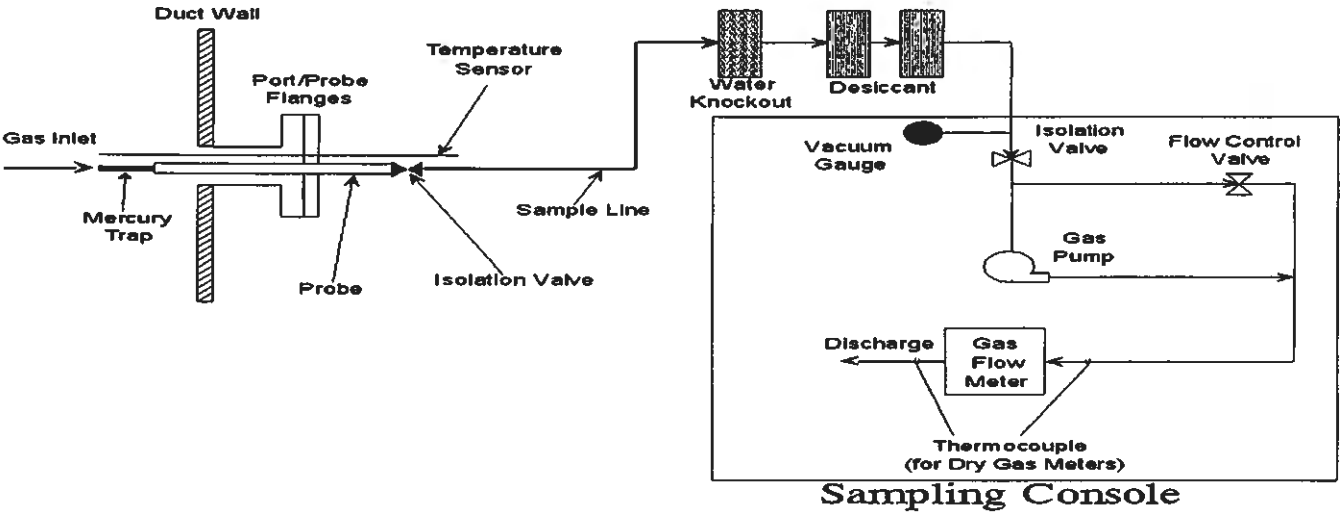


Figure 4-4
Method OTM 029

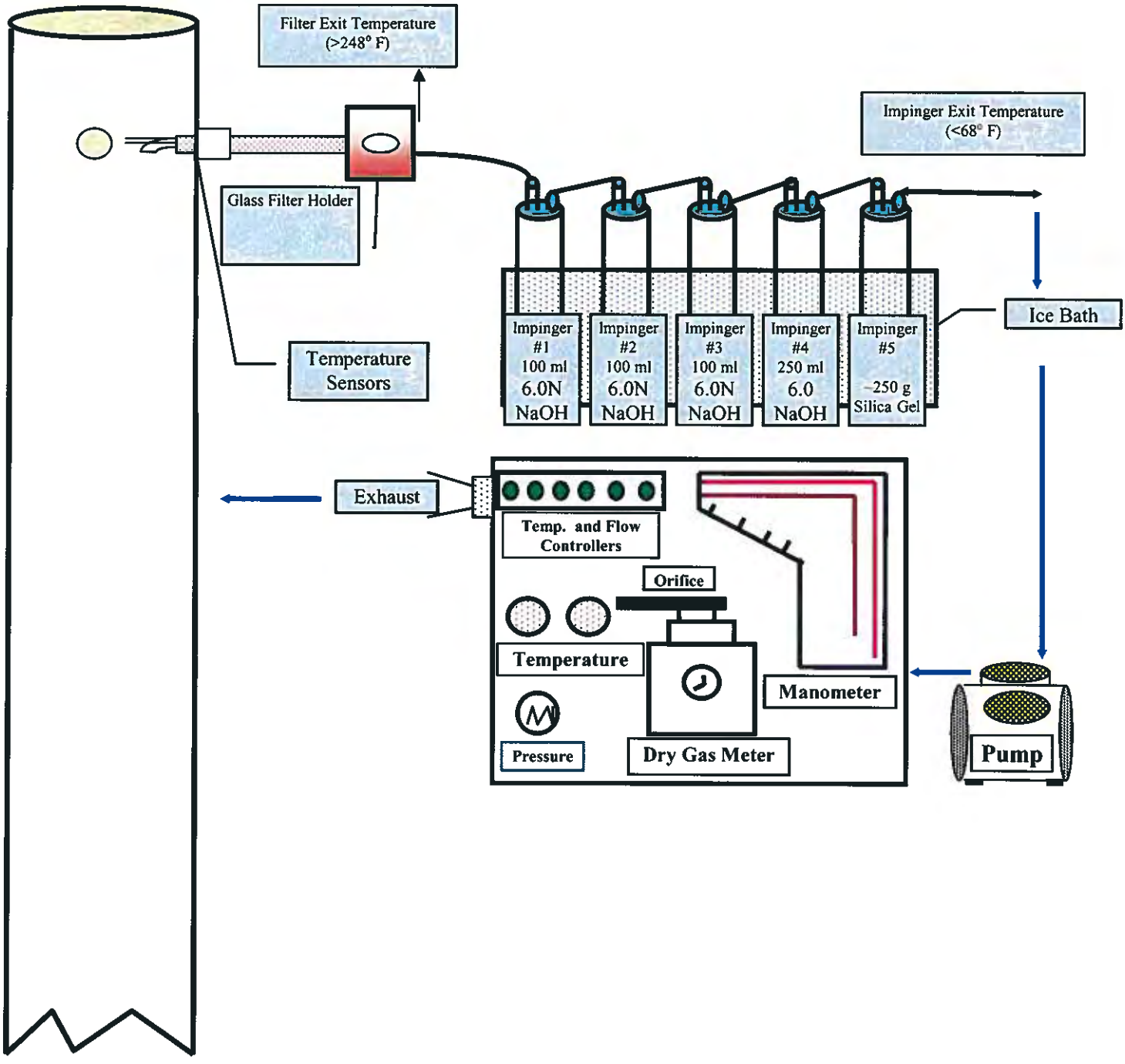


Figure 4-5
Method 0010 Sample Train

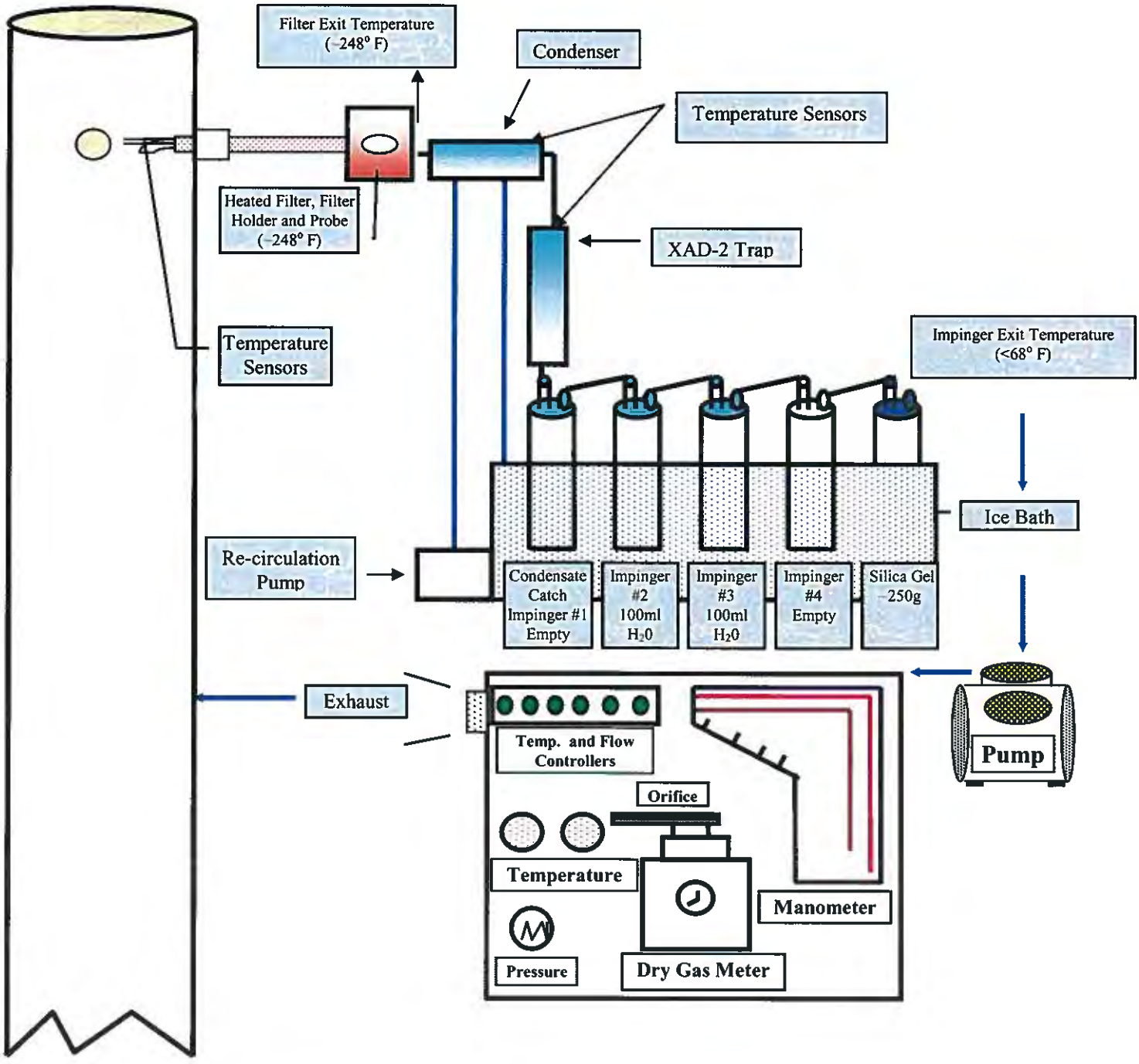


Figure 4-6
Method 0011

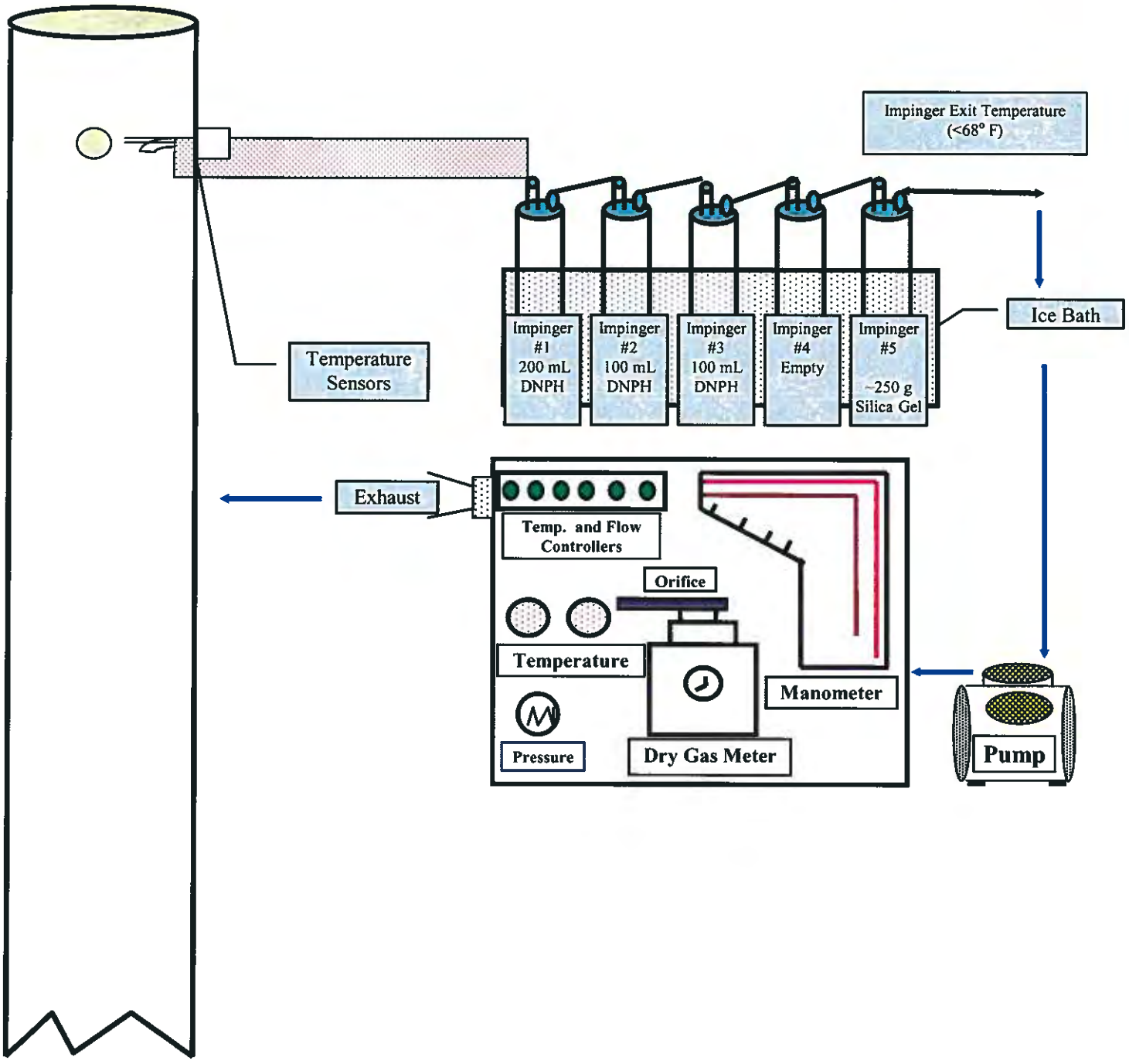


Figure 4-7
Method 23 Dioxin - Furan Sample Train

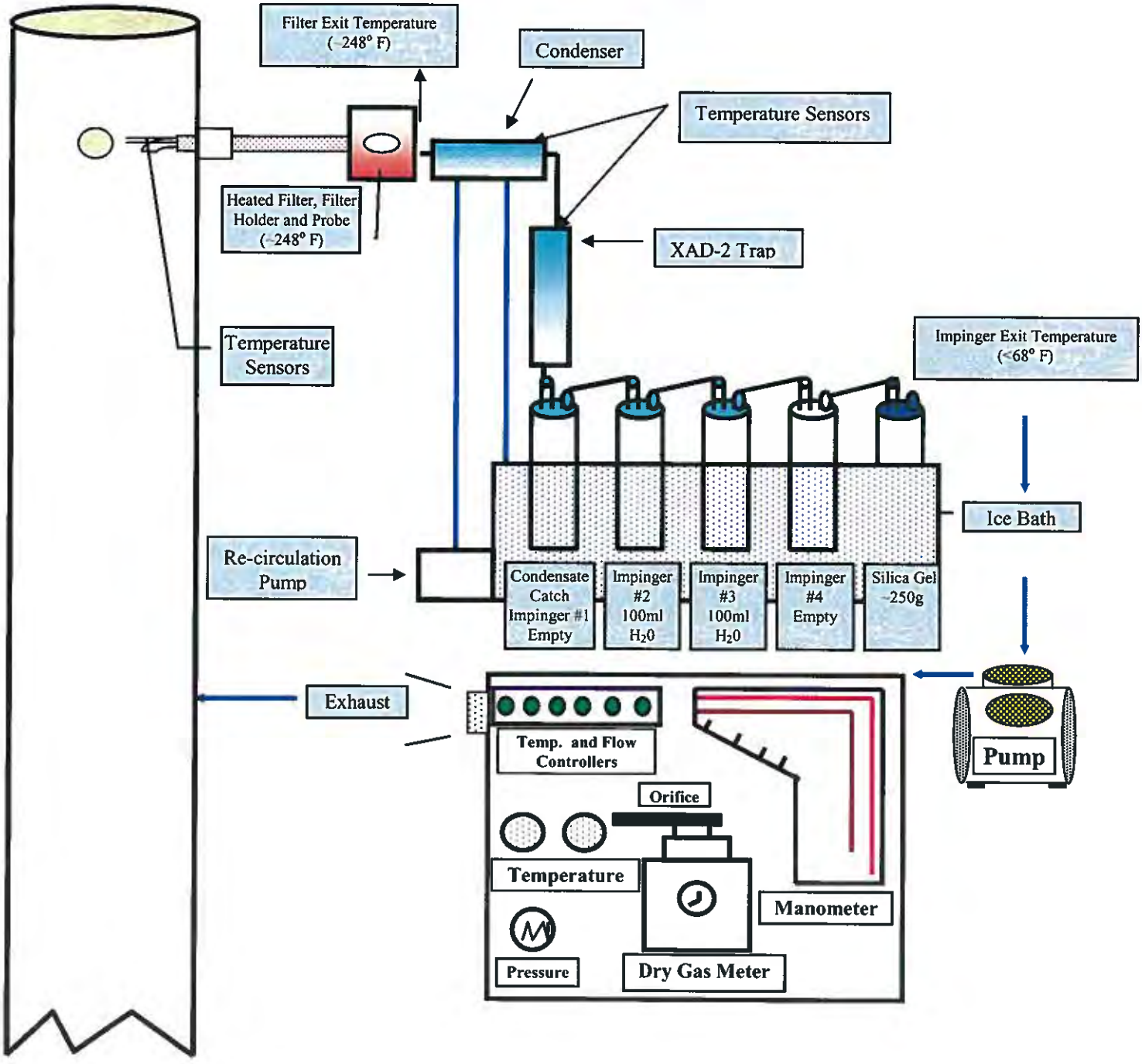


Figure 4-8
Method 5 / 202 Particulate and Condensible Particulate Sample Train

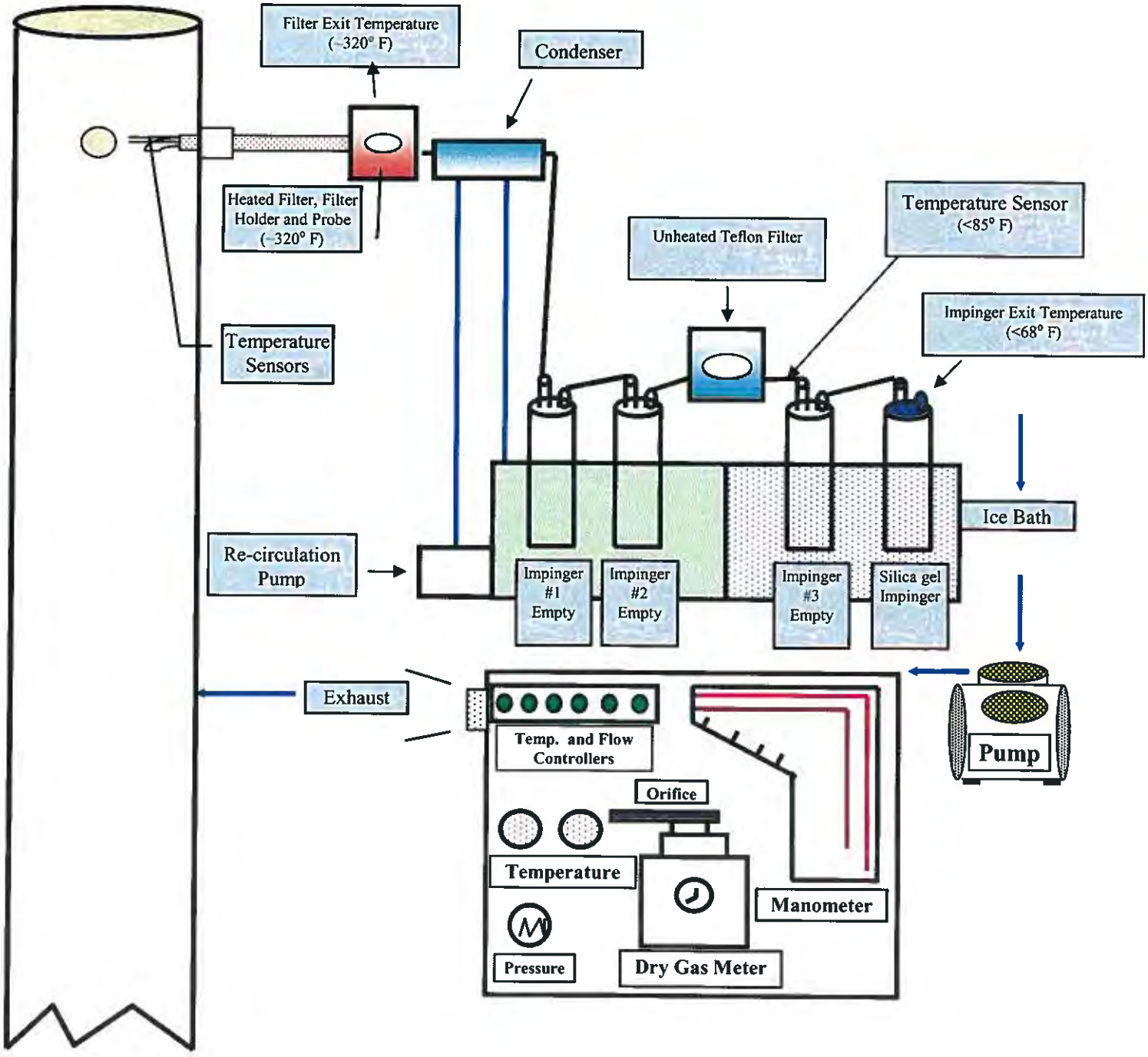


Figure 4-9
Method 29
Non-Mercury Train

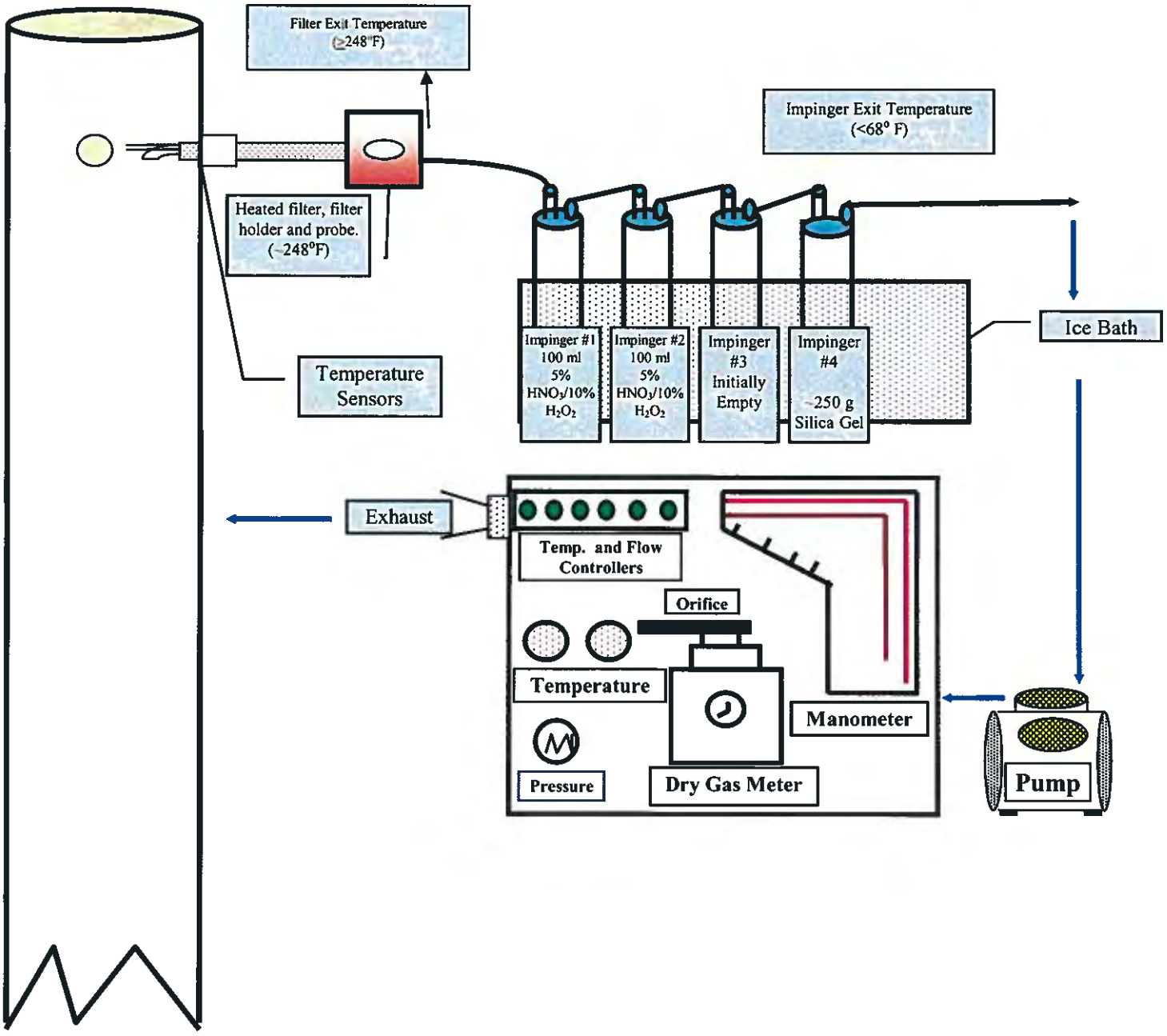


Figure 4-10
Method 0061

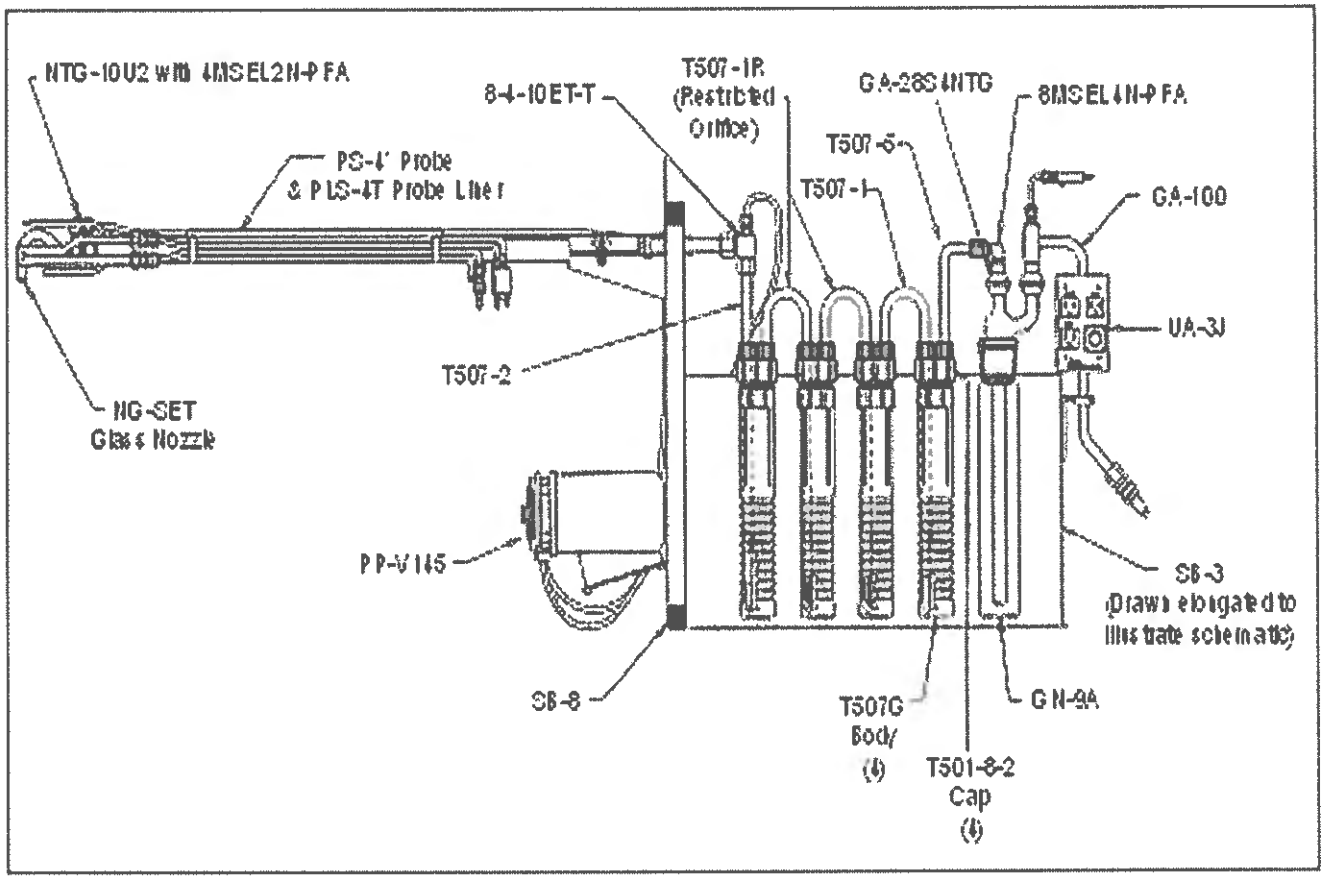


Figure 4-11

Method CTM 027

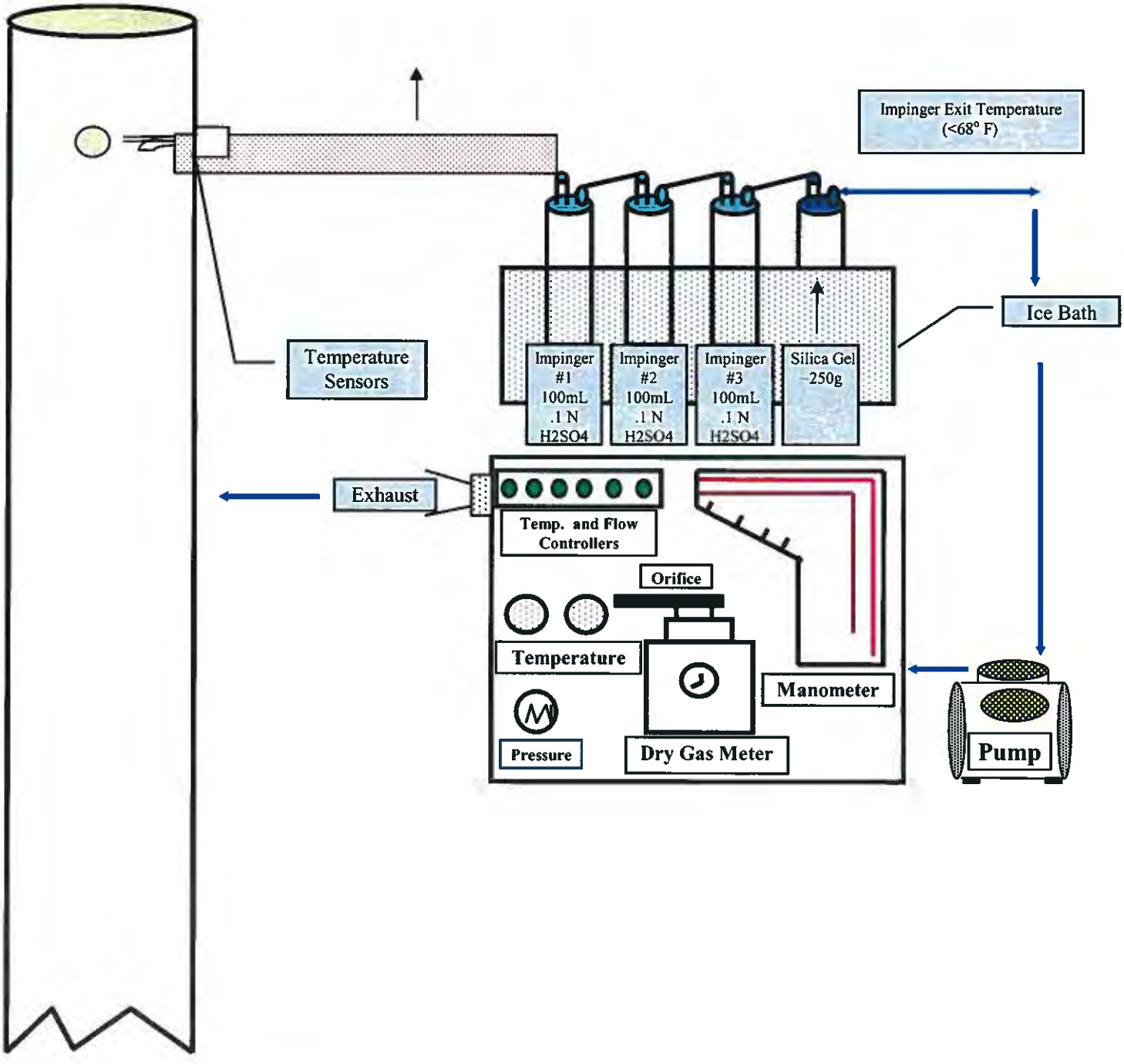
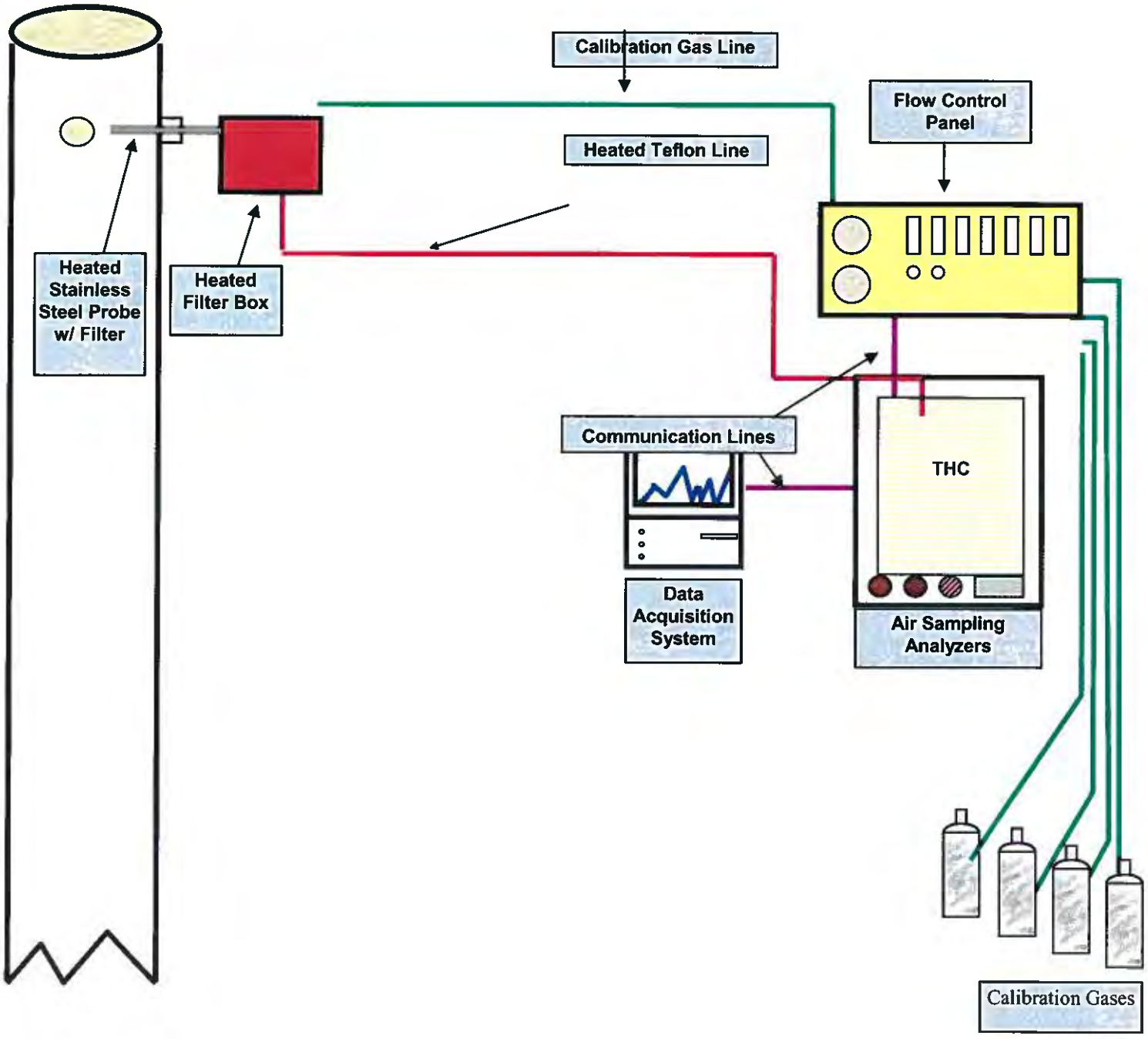


Figure 4-12
Gas Emissions Sampling Train
EPA Method 25A



5.0 QA / QC PROCEDURES

Specific Quality Assurance / Quality Control (QA / QC) procedures were adhered to during this test project to provide valid and scientifically defensible data. For any environmental field and laboratory measurement, a degree of uncertainty exists in the data due to inherent limitations of the measurement systems employed. Entec Services, Inc. objective of the QA / QC program is to produce data of known precision, accuracy, representation, completeness, and comparability. Special Entec-designed QA/QC checklists are contained in Appendix D.

6.0 CALIBRATION PROCEDURES

All of the emission testing equipment used was calibrated according to the procedures outlined in the EPA 40 CFR Part 60 Appendix "A" and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, EPA-600/4-94-038c. Complete calibration records are located in the appendix of this report.

APPENDIX A

RAW TEST DATA AND EMISSIONS CALCULATIONS

FLUID CATALYTIC CRACKING UNIT

APPENDIX A.1

METHOD 26A

HYDROGEN CHLORIDE, FLOURIDE, AND CHLORINE

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	Acetone (Not Required for analysis No PM)
TEST PERFORMED:	Hydrogen Chloride, Hydrogen Flouride, & Chlorine
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 71 DSCF (120 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
HCl, HF, & Cl2	EPA Method	26A

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Kevin Rosenberg
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Andrew Imes
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/15/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/15/11	06/15/11	06/15/11	
Emission Test Run Time Began - Ended	-	Military Time	1000-1250	1320-1530	1542-1844	
Sampling Time	θ	minutes	120	120	120	120
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.76	29.76	29.76	29.76
Stack Static Pressure	P_g	in. H_20	-0.49	-0.58	-0.53	-0.53
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.985	0.985	0.985	0.985
Meter Delta H @	ΔH@	in. H_20	1.894	1.894	1.894	1.894
Nozzle Diameter	D_n	inches	0.250	0.250	0.250	0.250
Meter Volume	V_m	dcf	105.452	105.862	105.791	105.702
Meter Temperature	t_m	°F	90.8	93.2	93.7	92.5
Avg. Orifice Delta H	ΔH	in. H_20	2.86	2.87	2.86	2.86
Impingers Weight Gain (Moisture)	W_{imp}	grams	612.2	607.0	607.0	608.7
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	29.5	30.4	28.1	29.3
Oxygen Concentration, dry basis	O_2	%	1.96	1.96	2.00	1.97
Carbon Dioxide Concentration, dry basis	CO_2	%	13.77	13.77	13.75	13.76
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_20)^{1/2}$	1.029	1.030	1.028	1.029
Stack Temperature	t_s	°F	144.2	144.4	144.1	144.2
Analytical Lab Data Input						
Total Hydrogen Chloride collected	HCl	HClmg	2.588	3.660	2.882	3.043
Total Hydrogen Fluoride collected *	HF	HFmg	0.094	0.101	0.095	0.097
Total Chlorine Collected *	Cl2	Cl_2mg	0.028	0.032	0.032	0.031

*Indicates a non-detect or analytical result below the MDL =

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/15/11	06/15/11	06/15/11	
Emission Test Run Time Began - Ended		-	Military Time	1000-1250	1320-1530	1542-1844	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.72	29.72	29.72	29.72
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	29.97	29.97	29.97	29.97
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	99.707	99.662	99.503	99.624
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	2.823	2.822	2.818	2.821
4a. Standard Volume of Water Vapor Condensed	$=0.04706*W_{imp}$	$V_{wc(std)}$	scf	28.810	28.565	28.565	28.647
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715*W_{sg}$	$V_{wsg(std)}$	scf	1.391	1.433	1.325	1.383
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2325	0.2314	0.2310	0.2316
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[6.37-(2627/(ts+460-98.2))]}/P_s$	TB_{ws}	fraction	0.2202	0.2214	0.2197	0.2204
7. Standard Water Volume @ Saturation (Theoretical)	$=V_{m(std)} * (TB_{ws})/(1-TB_{ws})$	$TV_{w(std)}$	scf	28.159	28.337	28.015	28.170
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{tc}	ml	598.2	602.0	595.2	598.5
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2)+ 0.44*(CO_2)+0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.282	30.282	30.280	30.281
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws})+18.0*(B_{ws})$	M_s	g/g-mole	27.577	27.563	27.582	27.574
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	63.46	63.53	63.38	63.454
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_a	acfm	361,826	362,231	361,386	361,814
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	313,996	314,174	313,636	313,935
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_a*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	244,846	244,621	244,732	244,733
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc}+ V_m*Y*P_m/T_m]$	V_n	scf	147.351	147.586	146.939	147.292
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	94.61	94.66	94.46	94.58
Analytical Lab Data Calculated							
Hydrogen Chloride Concentration @ Standard Conditions	$=(0.01543*HCl_{mg})/V_{m(std)}$	c_s	gr/dscf	4.01E-04	5.67E-04	4.47E-04	4.71E-04
Hyrogen Flouride Concentration @ Standard Conditions	$=(0.01543*HF_{mg})/V_{m(std)}$	c_s	gr/dscf	1.45E-05	1.57E-05	1.47E-05	1.50E-05
Chlorine Concentration @ Standard Conditions	$=(0.01543*Cl2_{mg})/V_{m(std)}$	c_s	gr/dscf	4.33E-06	5.02E-06	4.93E-06	4.76E-06
Hydrogen Chloride Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.84	1.19	0.94	0.99
Hydrogen Flouride Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.03	0.03	0.03	0.03
Chlorine Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.01	0.01	0.01	0.01
Analytical Lab Data Calculated (Metric)							
Hydrogen Chloride Emissions	$= c_s*V_{m(std)}$	c_s	mg/dscm	0.92	1.30	1.02	1.08
Hydrogen Flouride Emissions	$= c_s*V_{m(std)}$	c_s	mg/dscm	0.03	0.04	0.03	0.03
Chlorine Emissions	$= c_s*V_{m(std)}$	c_s	mg/dscm	0.01	0.01	0.01	0.01
Post Meter Orifice Cal. **(EMC ALT-009 Yqa)**		Y_{qa}		1.0477	1.0471	1.0464	1.0470
% Difference, **(Calibration must be within 5% of original Y-factor)**							-6.30%

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

HYDROGEN CHLORIDE, FLUORIDE, & CHLORINE - METHOD 26A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.20	1.0954	3.22	144	87
1-2	1.20	1.0954	3.22	144	86
1-3	1.10	1.0488	2.95	144	88
1-4	1.10	1.0488	2.95	145	89
1-5	0.87	0.9327	2.33	144	91
2-1	1.10	1.0488	2.95	145	90
2-2	1.20	1.0954	3.22	145	91
2-3	1.20	1.0954	3.22	144	93
2-4	1.10	1.0488	2.95	144	93
2-5	0.65	0.8062	1.74	144	94
3-1	1.20	1.0954	3.22	144	92
3-2	1.20	1.0954	3.22	144	93
3-3	1.10	1.0488	2.95	144	93
3-4	1.00	1.0000	2.68	145	94
3-5	0.67	0.8185	1.80	144	95
4-1	1.20	1.0954	3.22	143	88
4-2	1.20	1.0954	3.22	144	88
4-3	1.10	1.0488	2.95	144	90
4-4	1.10	1.0488	2.95	145	90
4-5	0.85	0.9220	2.28	144	90
K-Factor					
2.68	**1.07**	**1.0292**	**2.86**	**144.2**	**90.8**

Entec Services, Inc.

511150 Hovensa LLC

Page 47 of 701

Plant: Hovensa

Site: US Virgin Islands

Date: 6-15-2011

Run No.: 1

Time: 1000 / 1250

Job No.: 511150

Barametric Pressure: 29.76

Stack Pressure: -0.49

Stack Diameter: 132.0"

K Factor: 2.68

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: KR

Assistant: AE

Orsat / Fyrite (CEMS) Gas Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Nozzle Calibrations:

Pre-Test:	Post-Test:
0.250	0.250
0.250	0.250
0.250	0.250
Average: 0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000, Vacuum 10"

Post-Test: Volume @ 0.000, Vacuum 10"

Pitot Check Pre: Positive 4.1, Negative 4.8

Pitot Check Post: Positive 5.2, Negative 6.0

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:		317.152		
Initial: LR 211.700		211.700		
Net:		105.452		

Total: 105.452 Cubic Ft.

Greater 248

Equipment Checklist:

Meter Box ID: NC-M5-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105291
CP Value: 0.84
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: TCG-003
Impinger Outlet ID: GN-29
Filter ID: R-1,2,3
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A/1	6	217.22	1.2	3.2	144	269	276	67	248	87	9.0	
/2	12	222.75	1.2	3.2	144	288	275	67	249	86	9.0	
/3	18	228.14	1.1	3.0	144	310	302	67	249	88	8.0	
/4	24	233.51	1.1	3.0	145	310	313	67	249	89	8.0	
/5	30	238.332	0.87	2.3	144	333	335	65	249	91	7.0	
B/1	36	243.67	1.1	3.0	145	297	274	67	249	90	8.0	
/2	42	249.22	1.2	3.2	145	286	285	64	272	91	9.0	
/3	48	254.74	1.2	3.2	144	304	289	66	272	93	9.0	
/4	54	260.16	1.1	3.0	144	302	280	67	268	93	9.0	
/5	60	264.382	0.65	1.7	144	294	283	68	260	94	6.0	
C/1	66	269.80	1.2	3.2	144	315	302	67	248	92	9.0	
/2	72	275.48	1.2	3.2	144	317	303	64	300	93	9.0	
/3	78	280.88	1.1	3.0	144	312	303	67	293	93	9.0	
/4	84	286.09	1.0	2.7	145	315	302	66	276	94	8.0	
/5	90	290.332	0.67	1.8	144	314	301	67	267	95	6.0	
A/1	96	295.81	1.2	3.2	143	265	343	67	249	88	9.0	
/2	102	301.32	1.2	3.2	144	305	270	64	249	88	9.0	
/3	108	306.76	1.1	3.0	144	302	289	67	249	90	9.0	
/4	114	312.20	1.1	3.0	145	318	298	67	249	90	9.0	
/5	120	317.152	0.85	2.3	144	307	292	67	252	90	8.0	
/												
/												
/												
/												
/												

Field Notes:

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

HYDROGEN CHLORIDE, FLUORIDE, & CHLORINE - METHOD 26A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.20	1.0954	3.22	144	86
1-2	1.20	1.0954	3.22	145	88
1-3	1.20	1.0954	3.22	145	90
1-4	1.10	1.0488	2.95	145	91
1-5	0.86	0.9274	2.30	144	90
2-1	1.20	1.0954	3.22	145	91
2-2	1.20	1.0954	3.22	145	92
2-3	1.20	1.0954	3.22	144	92
2-4	1.20	1.0954	3.22	144	93
2-5	0.92	0.9592	2.47	144	94
3-1	1.20	1.0954	3.22	144	93
3-2	1.20	1.0954	3.22	145	94
3-3	1.10	1.0488	2.95	144	95
3-4	0.97	0.9849	2.60	144	96
3-5	0.65	0.8062	1.74	144	96
4-1	1.20	1.0954	3.22	144	95
4-2	1.20	1.0954	3.22	145	96
4-3	1.10	1.0488	2.95	145	97
4-4	0.84	0.9165	2.25	144	97
4-5	0.65	0.8062	1.74	144	97
K-Factor					
2.68	**1.07**	**1.0298**	**2.87**	**144.4**	**93.2**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa
US Virgin Islands
Site: FCC Stack

Date: 6-15-2011

Run No.: 2

Time: 1320 / 1530

Moisture: Initial / Final / Totals
Impinger No. 1
Impinger No. 2
Impinger No. 3: See Recovery Sheet
Silica Gel

Analyst: KR
Assistant: AT

Orsat / Fyrite / (CEMS) Gas Analysis: Average:
O2:
CO2:
CO:
N2:

Job No.: 511150

Barametric Pressure: 29.76

Stack Pressure: -0.58

Stack Diameter: 152.0"

K Factor: 2.68

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Pitot Check Pre:	
Volume @	0.000	10"	Positive	5.2
			Negative	6.0
	Post-Test:	Vacuum	Pitot Check Post:	
Volume @	0.001	10"	Positive	4.3
			Negative	4.4

Equipment Checklist:
Meter Box ID: NC-MS-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105291
CP Value: ~~Pglass~~ 0.81
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: TCG-003
Impinger Outlet ID: GN-29
Filter ID: 1, 2, 3
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	423.464			
Initial:	317.602			
Net:	105.862			

Total: ~~105.872~~ DUP 105.862 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	6	323.12	1.2	3.2	144	306	296	67	248	86	8.0	
/ 2	12	328.71	1.2	3.2	145	306	291	62	249	88	8.0	
/ 3	18	334.28	1.2	3.2	145	306	295	61	251	90	8.0	
/ 4	24	339.78	1.1	3.0	145	303	295	61	248	91	8.0	
/ 5	30	344.602	0.86	2.3	144	304	295	61	251	90	7.0	
B / 1	36	350.18	1.2	3.2	145	310	312	64	249	91	8.0	
/ 2	42	355.69	1.2	3.2	145	312	306	61	259	92	8.0	
/ 3	48	361.14	1.2	3.2	144	311	313	63	261	92	9.0	
/ 4	54	366.78	1.2	3.2	144	314	305	67	261	93	9.0	
/ 5	60	372.002	0.92	2.5	144	310	310	68	260	94	9.0	
C / 1	66	377.65	1.2	3.2	144	311	308	67	251	93	9.0	
/ 2	72	383.11	1.2	3.2	145	308	309	62	281	94	9.0	
/ 3	78	388.56	1.1	3.0	144	309	309	62	286	95	9.0	
/ 4	84	393.63	0.97	2.6	144	313	313	63	291	96	8.0	
/ 5	90	397.814	0.65	1.7	144	317	313	66	284	96	6.0	
D / 1	96	403.30	1.2	3.2	144	310	306	66	249	95	9.0	
/ 2	102	408.89	1.2	3.2	145	315	302	66	281	96	9.0	
/ 3	108	414.36	1.1	3.0	145	310	301	67	282	97	~~8.0~~ 9.0	
/ 4	114	419.26	0.84	2.3	144	312	305	67	282	97	8.0	
/ 5	120	423.464	0.65	1.70	144	314	307	67	278	97	6.8	
/												
/												
/												
/												
/												

Field Notes:

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

HYDROGEN CHLORIDE, FLUORIDE, & CHLORINE - METHOD 26A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.20	1.0954	3.22	145	92
1-2	1.20	1.0954	3.22	144	92
1-3	1.10	1.0488	2.95	144	94
1-4	0.89	0.9434	2.39	144	94
1-5	0.66	0.8124	1.77	144	95
2-1	1.20	1.0954	3.22	144	93
2-2	1.20	1.0954	3.22	144	94
2-3	1.20	1.0954	3.22	144	94
2-4	1.10	1.0488	2.95	145	95
2-5	0.79	0.8888	2.12	145	95
3-1	1.20	1.0954	3.22	143	93
3-2	1.20	1.0954	3.22	145	95
3-3	1.20	1.0954	3.22	144	94
3-4	1.10	1.0488	2.95	145	96
3-5	1.00	1.0000	2.68	144	96
4-1	1.20	1.0954	3.22	144	94
4-2	1.20	1.0954	3.22	144	96
4-3	1.10	1.0488	2.95	144	96
4-4	0.89	0.9434	2.39	143	87
4-5	0.68	0.8246	1.82	143	88
K-Factor					
2.68	**1.07**	**1.0281**	**2.86**	**144.1**	**93.7**

Entec Services, Inc.

Plant: Hovense
US Virgin Islands
Site: FCC Stack

Date: 6-15-2011

Run No.: 3

Time: 1542 ~~[illegible]~~ KR RAIN Delay
1844

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: KR
Assistant: AT

Orsat / Fyrite / CEMS Gas Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barametric Pressure: 29.76

Stack Pressure: -0.53

Stack Diameter: 132.0"

K Factor: 2.68

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 10"

Post-Test: Volume @ 0.000 Vacuum 13"

Pitot Check Pre: Positive 4.3 Negative 4.4

Pitot Check Post: Positive 5.2 Negative 6.1

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	529.693			
Initial:	423.802			
Net:	105.791			

Total: 105.791 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC-MS-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105291
CP Value: 0.84
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: TCG-003
Impinger Outlet ID: GN-29
Filter ID: R1,2,3
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
DB/1	6	429.42	1.2	3.2	145	316	297	67	251	92	10.0	
/2	12	435.21	1.2	3.2	144	308	305	67	285	92	10.0	
/3	18	440.52	1.1	3.0	144	305	309	68	284	94	10.0	
/4	24	445.55	0.89	2.4	144	304	299	67	278	94	8.0	
/5	30	449.879	0.66	1.8	144	315	303	67	278	95	7.0	
A/1	36	455.38	1.2	3.2	144	320	312	67	248	93	10.0	
/2	42	460.95	~~1.1~~ 1.2	~~3.2~~ 3.2	144	317	311	67	277	94	10.0	
/3	48	466.72	1.2	3.2	144	318	315	67	268	94	10.0	
/4	54	471.99	1.1	3.0	145	322	312	66	256	95	10.0	
/5	60	476.660	0.79	2.12	145	320	313	65	253	95	8.0	
3B/1	66	482.21	1.2	3.2	143	303	316	67	257	93	10.0	
/2	72	487.73	1.2	3.2	145	307	309	66	264	95	10.0	
/3	78	493.27	1.2	3.2	144	320	311	67	268	94	10.0	
/4	84	498.65	1.1	3.0	145	311	309	67	270	96	10.0	
/5	90	504.018	1.0	2.68	144	307	308	67	273	96	9.0	
4C/1	96	509.52	1.2	3.2	144	314	307	66	248	94	10.0	
/2	102	515.00	1.2	3.2	144	317	310	67	280	96	10.0	
/3	108	520.50	1.1	3.0	144	310	308	67	279	96	10.0	
/4	114	525.43	0.89	2.4	143	325	320	66	272	87	9.0	
/5	120	529.693	0.68	1.8	143	315	310	65	282	88	7.0	
/												
/												
/												
/												
/												

Field Notes:

Method 26A Field Data Sheet

APPENDIX A.2

METHOD 30B

SPECIATED MERCURY

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
TEST PERFORMED:	Speciated Mercury
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 60 liters (120 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Speciated Mercury	EPA Method	30B

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Tim Draheim
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Chuck Duncan IV
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/15/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data						
Run Number	-	-	1A	1B	2A	2B	3A	3B	AVERAGE
Test Date	-	-	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11	
Sorbent Tube ID	-	-	014067	011367	014086	009342	013960	011220	
Spike Level	-	-	N/A	50 ng	N/A	50 ng	N/A	50 ng	
Emission Test Run Time Began - Ended	-	Military Time	1000	1200	1320	1520	1542	1742	
Sampling Time	θ	minutes	120	120	120	120	120	120	120
Stack Area	A_s	Ft^2	95.033	95.033	95.033	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.76	29.76	29.76	29.76	29.76	29.76	29.76
Stack Static Pressure	P_g	in. H_20	-0.60	-0.60	-0.60	-0.60	-0.60	-0.60	-0.60
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Target Sample Flow Rate	V	Liters / min	0.5	0.5	0.5	0.5	0.5	0.5	0.50
Actual Volume Collected	V_l	Liters	60.095	60.310	59.974	59.824	60.191	59.598	59.999
Sampled gas volume, meters	V_m	dcm	0.0601	0.0603	0.0600	0.0598	0.0602	0.0596	0.0600
Meter Temperature	t_m	°F	83.9	85.3	81.0	83.0	83.5	85.0	83.63
Oxygen Concentration, dry basis	O_2	%	1.95	1.95	1.95	1.95	1.89	1.89	1.93
Carbon Dioxide Concentration, dry basis	CO_2	%	13.79	13.79	13.80	13.80	13.82	13.82	13.80
Stack Temperature	t_s	°F	140.3	140.3	140.5	140.5	140.6	140.6	140.45
Analytical Lab Data Input									
Oxidized Mercury Collected	Hg^{+2}	ng	1.8	-	1.8	-	1.6	-	1.73
Elemental Mercury Collected	Hg^0	ng	15.2	-	17.1	-	15.1	-	15.80
Total Mercury Collected	m_t	ng	17.0	70.8	18.9	71.2	16.7	71.9	
Amount of Spiked Mercury	m_{spiked}	ng	-	50.0	-	50.0	-	50.0	50.0
Mercury Spike Recovery	R	%	-	107.5	-	104.6	-	110.5	107.5

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data					
Run Number	-	-	1A	1B	2A	2B	3A	3B
Test Date	-	-	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11
Sorbent Tube ID	-	-	014067	011367	014086	009342	013960	011220
Spike Level	-	-	N/A	50 ng	N/A	50 ng	N/A	50 ng
Emission Test Run Time Began - Ended	-	Military Time	1000	1200	1320	1520	1542	1742
Sampling Time	θ	minutes	120	120	120	120	120	120
Stack Area	A_s	Ft^2	95.033	95.033	95.033	95.033	95.033	95.033
Barometric Pressure	P_{bar}	in. Hg	29.76	29.76	29.76	29.76	29.76	29.76
Stack Static Pressure	P_g	in. H_20	-0.60	-0.60	-0.60	-0.60	-0.60	-0.60
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	1.000	1.000	1.000	1.000	1.000	1.000
Target Sample Flow Rate	V	Liters / min	0.5	0.5	0.5	0.5	0.5	0.5
Actual Volume Collected	V_l	Liters	60.095	60.310	59.974	59.824	60.191	59.598
Sampled gas volume, meters	V_m	dcm	0.0601	0.0603	0.0600	0.0598	0.0602	0.0596
Meter Temperature	t_m	°F	83.9	85.3	81.0	83.0	83.5	85.0
Oxygen Concentration, dry basis	O_2	%	1.95	1.95	1.95	1.95	1.89	1.89
Carbon Dioxide Concentration, dry basis	CO_2	%	13.79	13.79	13.80	13.80	13.82	13.82
Stack Temperature	t_s	°F	140.3	140.3	140.5	140.5	140.6	140.6
Analytical Lab Data Input								
Oxidized Mercury Collected	Hg^{+2}	ng	1.8	-	1.8	-	1.6	-
Elemental Mercury Collected	Hg^0	ng	15.2	-	17.1	-	15.1	-
Total Mercury Collected	m_1	ng	17.0	70.8	18.9	71.2	16.7	71.9
Amount of Spiked Mercury	m_{spiked}	ng	-	50.0	-	50.0	-	50.0
Mercury Spike Recovery	R	%	-	107.5	-	104.6	-	110.5

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC | Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) | Data Input By: Lynn Beane

Description	Formulas	Symbol	Units	Calculated Data					
Run Number		-	-	1A	1B	2A	2B	3A	3B
Test Date		-	-	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11	06/15/11
Emission Test Run Time Began - Ended		-	Military Time	1000	1200	1320	1520	1542	1742
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.72	29.72	29.72	29.72	29.72	29.72
2. Meter Pressure	$= (P_{bar})*25.4$	P_m	in. Hg	755.90	755.90	755.90	755.90	755.90	755.90
3. Total Sample Volume (Corrected)	$V_{m(std)} = V_m \left[\frac{P_{bar} + \frac{P*W}{760}}{760} \right] \left(\frac{293}{273+T} \right)$	$V_{m(std)}$	liters	55.709	55.908	56.484	56.343	55.798	55.248
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	0.056	0.056	0.056	0.056	0.056	0.055
12. Stack Gas Flow @ Actual Conditions*	$= 60*v_s*A_s$	Q_a	acfm	365,738	365,738	366,147	366,147	366,815	366,815
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	318,339	318,339	318,743	318,743	319,210	319,210
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_a*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{sd}	dscfm	251,285	251,285	251,837	251,837	251,817	251,817
Analytical Lab Data Calculated									
15a. Oxidized Mercury concentration @ Standard Conditions	$=Hg^{+2} / V_{m(std)}$	C_{Hg+2}	ug/dscm	0.032	-	0.032	-	0.029	-
15b. Elemental Mercury concentration @ Standard Conditions	$=Hg^{0} / V_{m(std)}$	C_{Hg0}	ug/dscm	0.273	-	0.303	-	0.271	-
16a. Oxidized Mercury emissions, lbs/hr	=ug/dscm*g/1000000ug*dscm/35.315ft3*lb/453.59g*60min/hr*ft3/min	M_{Hg+2}	lbs/hr	3.04E-05	-	3.01E-05	-	2.70E-05	-
16b. Elemental Mercury emissions, lbs/hr		M_{Hg0}	lbs/hr	2.57E-04	-	2.86E-04	-	2.55E-04	-
Breakthrough	≤10% for > 1ug/dscm or ≤20% for ≤ 1 ug/dscm	B	%	5.8	1.2	5.9	2.1	7.0	2.7
Percentage of Spiked Mercury Recovered	85% ≤ R ≤ 115%	R	%	-	107.5	-	104.6	-	110.5
Calculation of Paired Trap Agreement	≤10% for > 1ug/dscm or ≤20% for ≤ 1 ug/dscm	RD	-	-	9.96	-	5.71	-	13.68

*Stack Gas Flow was based on the average flow data from each run of the M26A and OTM 029 trains since the Mercury Sampling System was single point

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client:	Hovensa, LLC	Sorben Tube ID (A)	014067	Spike Level (A)	N/A	Test Date:	6/15/2011
Source:	Fluid Catalytic Cracking Unit (FCCU)	Sorben Tube ID (B)	011357	Spike Level (B)	50 ng	Run Number:	1
Start Time:	1000	Meter ID (A)	30B-A	Meter ID (B):	30B-B	Pre Leak Check (A)	0.003 @ 10"	Pre Leak Check (B)	0.001 @ 10"
End Time:	1200	DGM Cal. Fac. (A)	1.000	DGM Cal. Fac. (B)	1.000	Post Leak Check (A)	0.000 @ 8"	Post Leak Check (B)	0.001 @ 7"
Barametric Pressure:	29.76	Initial DGM (A)	0.000			Initial DGM (B)	0.000		
Static Pressure:	-0.60	Final DGM (A)	60.095	Total Volume (A)	60.095 Liters	Final DGM (B)	60.310	Total Volume (B)	60.310 Liters

SPECIATED MERCURY - METHOD 30B

					Temperatures (°F)								
Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DBM B	Pump Vac. (A)	Pump Vac. (B)
5.0	3.060	3.400	0.5	0.5	140	N/A	N/A	238	238	83	84	3.0	1.0
10.0	6.120	6.420	0.5	0.5	140	N/A	N/A	235	235	83	85	4.0	1.0
15.0	8.460	8.952	0.5	0.5	140	N/A	N/A	250	250	84	85	4.0	1.0
20.0	10.970	10.940	0.5	0.5	140	N/A	N/A	251	251	84	85	4.0	1.0
25.0	13.130	13.130	0.5	0.5	140	N/A	N/A	235	235	84	85	4.0	1.0
30.0	15.100	15.140	0.5	0.5	140	N/A	N/A	250	250	84	85	4.0	1.0
35.0	17.400	17.200	0.5	0.5	140	N/A	N/A	243	243	84	85	3.0	1.0
40.0	19.920	19.900	0.5	0.5	140	N/A	N/A	240	240	84	85	3.0	1.0
45.0	21.740	21.960	0.5	0.5	140	N/A	N/A	241	241	84	85	3.0	1.0
50.0	24.850	24.890	0.5	0.5	140	N/A	N/A	246	246	84	85	3.0	1.0
55.0	27.660	27.610	0.5	0.5	140	N/A	N/A	236	236	84	86	3.0	1.0
60.0	30.230	30.320	0.5	0.5	140	N/A	N/A	235	235	84	86	3.0	1.0
65.0	32.600	32.780	0.5	0.5	141	N/A	N/A	239	239	84	86	4.0	1.0
70.0	35.100	35.200	0.5	0.5	141	N/A	N/A	255	255	84	86	4.0	1.0
75.0	37.490	37.470	0.5	0.5	141	N/A	N/A	255	235	84	86	4.0	1.0
80.0	39.780	39.950	0.5	0.5	141	N/A	N/A	253	253	84	85	4.0	1.0
85.0	42.240	42.470	0.5	0.5	141	N/A	N/A	254	254	84	86	4.0	1.0
90.0	44.710	44.970	0.5	0.5	141	N/A	N/A	234	239	84	86	4.0	1.0
95.0	47.470	47.870	0.5	0.5	140	N/A	N/A	232	232	84	86	4.0	1.0
100.0	49.890	50.250	0.5	0.5	140	N/A	N/A	238	238	84	86	4.0	1.0
105.0	52.640	52.780	0.5	0.5	140	N/A	N/A	255	255	84	85	4.0	1.0
110.0	55.290	55.250	0.5	0.5	140	N/A	N/A	238	238	84	85	4.0	1.0
115.0	57.460	57.910	0.5	0.5	140	N/A	N/A	235	235	84	85	4.0	1.0
120.0	60.095	60.310	0.5	0.5	140	N/A	N/A	245	245	84	85	4.0	1.0
	Total Volumes:		Averages:		Averages:			Averages:		Averages:		Averages:	
	60.095	60.310	0.50	0.50	140.3	N/A	N/A	243.0	242.4	83.9	85.3	3.7	1.0

ENTEC Services, Inc.

30 Monroe Drive, Pelham AL 35124

Client: Hovensa, LLC
Source: Fluid Catalytic Cracking Unit (FCCU)

Sorbent Tube ID (A): 014067 Sample
Sorbent Tube ID (B): 011367 Spike
Spike Level (A): –
Spike Level (B): 50ng
Test Date: 6-15-11
Run Number: 1

Start Time: 1000
End Time: 1200
Meter ID (A): 30B A
DGM Cal. Fac. (A): 1.000
Initial DGM (A): 0.000
Final DGM (A): 60.095
Total Volume (A): 60.095 Liters

Meter ID (B): 30B B
DGM Cal. Fac. (B): 1.000
Pre Leak Check (A): 0.003 @ 10"
Post Leak Check (A): 0.000 @ 8"
Initial DGM (B): 0.000
Final DGM (B): 60.310
Pre Leak Check (B): 0.001 @ 10"
Post Leak Check (B): 0.001 @ 7"
Total Volume (B): 60.310 Liters

SPECIATED MERCURY - METHOD 30B

Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Temperatures (°F) Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DGM B	Pump Vac. (A)	Pump Vac. (B)
5.0	3.060	3.900	0.5	0.5	140			238	238	83	84	3.0	1.0
10.0	6.120	6.420	0.5	0.5	140			235	235	83	85	4.0	1.0
15.0	8.460	8.952	0.5	0.5	140			250	250	84	85	4.0	1.0
20.0	10.920	11.440	0.5	0.5	140			251	251	84	85	4.0	1.0
25.0	13.350	13.920	0.5	0.5	140			235	235	84	85	4.0	1.0
30.0	15.690	16.140	0.5	0.5	140			250	250	84	85	4.0	1.0
35.0	17.900	17.250	0.5	0.5	140			243	243	84	85	3.0	1.0
40.0	19.920	19.980	0.5	0.5	140			240	240	84	85	3.0	1.0
45.0	21.740	21.960	0.5	0.5	140			241	241	84	85	3.0	1.0
50.0	23.850	24.090	0.5	0.5	140			246	246	84	85	3.0	1.0
55.0	27.660	27.610	0.5	0.5	140			236	236	84	86	3.0	1.0
60.0	30.230	30.320	0.5	0.5	140			235	235	84	86	3.0	1.0
65.0	32.600	32.780	0.5	0.5	141			239	239	84	86	4.0	1.0
70.0	35.190	35.200	0.5	0.5	141			255	255	84	86	4.0	1.0
75.0	37.990	37.970	0.5	0.5	141			235	235	84	86	4.0	1.0
80.0	39.780	39.950	0.5	0.5	141			253	253	84	85	4.0	1.0
85.0	42.240	42.470	0.5	0.5	141			254	254	84	86	4.0	1.0
90.0	44.710	44.970	0.5	0.5	141			234	234	84	86	4.0	1.0
95.0	47.470	47.870	0.5	0.5	140			232	232	84	86	4.0	1.0
100.0	49.890	50.250	0.5	0.5	140			238	238	84	86	4.0	1.0
105.0	52.640	52.790	0.5	0.5	140			255	255	84	85	4.0	1.0
110.0	55.290	55.250	0.5	0.5	140			238	238	84	85	4.0	1.0
115.0	57.960	57.910	0.5	0.5	140			235	235	84	85	4.0	1.0
120.0	60.095	60.310	0.5	0.5	140			245	245	84	85	4.0	1.0

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client:	Hovensa, LLC			Sorben Tube ID (A)	014086		Spike Level (A)	N/A		Test Date:	6/15/2011
Source:	Fluid Catalytic Cracking Unit (FCCU)			Sorben Tube ID (B)	009342		Spike Level (B)	50 ng		Run Number:	2
Start Time:	1320	Meter ID (A)	30B-A	Meter ID (B):	30B-B		Pre Leak Check (A)	0.004 @ 15"		Pre Leak Check (B)	0.002 @ 12"
End Time:	1520	DGM Cal. Fac. (A)	1.000	DGM Cal. Fac. (B)	1.000		Post Leak Check (A)	0.001 @ 8"		Post Leak Check (B)	0.000 @ 7"
Barametric Pressure:	29.78	Initial DGM (A)	0.000				Initial DGM (B)	0.000			
Static Pressure:	-0.60	Final DGM (A)	59.974	Total Volume (A)	59.974	Liters	Final DGM (B)	59.824		Total Volume (B)	59.824 Liters

SPECIATED MERCURY - METHOD 30B

					Temperatures (°F)								
Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DBM B	Pump Vac. (A)	Pump Vac. (B)
5.0	2.620	2.550	0.5	0.5	141	N/A	N/A	243	243	81	82	3.0	1.0
10.0	5.180	5.080	0.5	0.5	141	N/A	N/A	237	237	81	83	3.0	1.0
15.0	7.590	7.530	0.5	0.5	141	N/A	N/A	236	236	81	83	3.0	1.0
20.0	10.000	10.070	0.5	0.5	141	N/A	N/A	252	252	81	83	3.0	1.0
25.0	12.630	12.750	0.5	0.5	141	N/A	N/A	250	250	81	83	3.0	1.0
30.0	14.630	15.110	0.5	0.5	141	N/A	N/A	233	233	81	83	3.0	1.0
35.0	17.170	17.340	0.5	0.5	141	N/A	N/A	250	250	81	83	3.0	1.0
40.0	19.570	19.760	0.5	0.5	140	N/A	N/A	251	251	81	83	3.0	1.0
45.0	22.000	22.100	0.5	0.5	140	N/A	N/A	238	238	81	83	3.0	1.0
50.0	24.630	24.770	0.5	0.5	140	N/A	N/A	236	236	81	83	3.0	1.0
55.0	27.230	27.310	0.5	0.5	140	N/A	N/A	255	255	81	83	3.0	1.0
60.0	29.980	29.920	0.5	0.5	140	N/A	N/A	250	250	81	83	3.0	1.0
65.0	32.570	32.450	0.5	0.5	140	N/A	N/A	233	233	81	83	3.0	1.0
70.0	35.150	35.000	0.5	0.5	140	N/A	N/A	257	257	81	83	3.0	1.0
75.0	37.790	37.550	0.5	0.5	140	N/A	N/A	257	259	81	83	3.0	1.0
80.0	40.260	40.150	0.5	0.5	140	N/A	N/A	235	235	81	83	3.0	1.0
85.0	42.830	42.670	0.5	0.5	140	N/A	N/A	257	257	81	83	3.0	1.0
90.0	45.370	45.290	0.5	0.5	141	N/A	N/A	258	258	81	83	3.0	1.0
95.0	47.960	47.840	0.5	0.5	141	N/A	N/A	250	250	81	83	3.0	1.0
100.0	50.450	50.240	0.5	0.5	140	N/A	N/A	235	235	81	83	3.0	1.0
105.0	53.200	53.190	0.5	0.5	140	N/A	N/A	255	255	81	83	3.0	1.0
110.0	55.410	55.160	0.5	0.5	141	N/A	N/A	248	248	81	83	3.0	1.0
115.0	57.700	57.590	0.5	0.5	141	N/A	N/A	234	234	81	83	3.0	1.0
120.0	59.974	59.824	0.5	0.5	140	N/A	N/A	248	248	81	83	3.0	1.0
	Total Volumes:		Averages:		Averages:			Averages:		Averages:		Averages:	
	59.974	59.824	0.50	0.50	140.5	N/A	N/A	245.8	245.8	81.0	83.0	3.0	1.0

ENTEC Services, Inc.

30 Monroe Drive, Pelham AL 35124

Client: Hovensa, LLC
Source: Fluid Catalytic Cracking Unit (FCCU)

Sorben Tube ID (A): 014086 sample
Sorben Tube ID (B): 009342 spike
Spike Level (A): -
Spike Level (B): 50.ng
Test Date: 6-15-11
Run Number: 2

Start Time: 1320
End Time: ~~1420~~ 1540
Meter ID (A): 30B-A
DGM Cal. Fac. (A): 1.000
Initial DGM (A): 0.000
Final DGM (A): 59.974

Meter ID (B): 30B-B
DGM Cal. Fac. (B): 1.000
Total Volume (A): 59.974 Liters

Pre Leak Check (A): 0.004 @ 15"
Post Leak Check (A): 0.001 @ 6"
Initial DGM (B): 0.000
Final DGM (B): 59.824
Pre Leak Check (B): 0.002 @ 12"
Post Leak Check (B): 0.000 @ 7"
Total Volume (B): 59.824 Liters

SPECIATED MERCURY - METHOD 30B

Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Temperatures (°F) Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DGM B	Pump Vac. (A)	Pump Vac. (B)
5.0	2.620	2.550	0.5	0.5	141			243	243	81	82	3.0	1.0
10.0	5.180	5.080	0.5	0.5	141			237	237	81	83	3.0	1.0
15.0	7.590	7.530	0.5	0.5	141			236	236	81	83	3.0	1.0
20.0	10.080	10.070	0.5	0.5	141			252	252	81	83	3.0	1.0
25.0	12.630	12.750	0.5	0.5	141			250	250	81	83	3.0	1.0
30.0	15.830	15.110	0.5	0.5	141			233	233	81	83	3.0	1.0
35.0	17.170	17.340	0.5	0.5	141			250	250	81	83	3.0	1.0
40.0	19.576	19.760	0.5	0.5	140			251	251	81	83	3.0	1.0
45.0	22.000	22.180	0.5	0.5	140			238	238	81	83	3.0	1.0
50.0	24630	24.770	0.5	0.5	140			236	236	81	83	3.0	1.0
55.0	27.230	27.310	0.5	0.5	140			255	255	81	83	3.0	1.0
60.0	29.980	29.920	0.5	0.5	140			250	250	81	83	3.0	1.0
65.0	32.576	32.450	0.5	0.5	140			253	237	81	83	3.0	1.0
70.0	35.150	35.060	0.5	0.5	140			257	257	81	83	3.0	1.0
75.0	37.790	37.556	0.5	0.5	140			257	257	81	83	3.0	1.0
80.0	40.260	40.150	0.5	0.5	140			235	235	81	83	3.0	1.0
85.0	42.836	42.670	0.5	0.5	140			257	257	81	83	3.0	1.0
90.0	45.370	45.290	0.5	0.5	141			258	258	81	83	3.0	1.0
95.0	47.960	47.840	0.5	0.5	141			250	250	81	83	3.0	1.0
100.0	50.450	50.290	0.5	0.5	140			235	235	81	83	3.0	1.0
105.0	53.100	53.190	0.5	0.5	140			255	255	81	83	3.0	1.0
110.0	55.410	55.160	0.5	0.5	141			248	248	81	83	3.0	1.0
115.0	57.700	57.590	0.5	0.5	141			234	234	81	83	3.0	1.0
120.0	59.974	59.824	0.5	0.5	140			248	248	81	83	3.0	1.0

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client:	Hovensa, LLC			Sorben Tube ID (A)	013960		Spike Level (A)	N/A		Test Date:	6/15/2011
Source:	Fluid Catalytic Cracking Unit (FCCU)			Sorben Tube ID (B)	011220		Spike Level (B)	50 ng		Run Number:	3
Start Time:	1542	Meter ID (A)	30B-A	Meter ID (B):	30B-B		Pre Leak Check (A)	0.001 @ 10"		Pre Leak Check (B)	0.002 @ 10"
End Time:	1742	DGM Cal. Fac. (A)	1.000	DGM Cal. Fac. (B)	1.000		Post Leak Check (A)	0.001 @ 7"		Post Leak Check (B)	0.003 @ 13"
Barometric Pressure:	29.76	Initial DGM (A)	0.000				Initial DGM (B)	0.000			
Static Pressure:	-0.60	Final DGM (A)	60.191	Total Volume (A)	60.191	Liters	Final DGM (B)	59.598		Total Volume (B)	59.598 Liters

SPECIATED MERCURY - METHOD 30B

					Temperatures (°F)								
Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DBM B	Pump Vac. (A)	Pump Vac. (B)
5.0	2.410	2.360	0.5	0.5	141	N/A	N/A	235	235	83	85	3.0	1.0
10.0	5.100	5.070	0.5	0.5	141	N/A	N/A	234	234	83	85	3.0	1.0
15.0	7.620	7.530	0.5	0.5	140	N/A	N/A	245	245	83	85	3.0	1.0
20.0	10.000	10.000	0.5	0.5	140	N/A	N/A	245	245	83	85	3.0	1.0
25.0	11.810	11.870	0.5	0.5	140	N/A	N/A	245	245	83	85	3.0	1.0
30.0	14.320	14.380	0.5	0.5	140	N/A	N/A	232	232	83	85	3.0	1.0
35.0	16.970	17.110	0.5	0.5	141	N/A	N/A	253	253	84	85	3.0	1.0
40.0	19.760	19.890	0.5	0.5	141	N/A	N/A	234	234	84	85	3.0	1.0
45.0	22.610	22.630	0.5	0.5	141	N/A	N/A	234	234	84	85	3.0	1.0
50.0	25.200	25.150	0.5	0.5	141	N/A	N/A	257	257	84	85	3.0	1.0
55.0	27.710	27.700	0.5	0.5	140	N/A	N/A	258	258	84	85	3.0	1.0
60.0	30.420	30.270	0.5	0.5	140	N/A	N/A	238	238	84	85	3.0	1.0
65.0	32.770	32.780	0.5	0.5	141	N/A	N/A	233	233	84	85	3.0	1.0
70.0	34.810	35.000	0.5	0.5	141	N/A	N/A	239	249	84	85	3.0	1.0
75.0	37.250	37.470	0.5	0.5	140	N/A	N/A	250	250	84	85	3.0	1.0
80.0	39.630	39.970	0.5	0.5	141	N/A	N/A	248	248	84	85	3.0	1.0
85.0	42.140	42.420	0.5	0.5	142	N/A	N/A	250	250	84	85	3.0	1.0
90.0	44.840	44.990	0.5	0.5	140	N/A	N/A	257	257	84	85	3.0	1.0
95.0	47.360	47.360	0.5	0.5	141	N/A	N/A	232	232	84	85	3.0	1.0
100.0	49.330	49.780	0.5	0.5	141	N/A	N/A	240	240	83	85	3.0	1.0
105.0	52.480	52.160	0.5	0.5	141	N/A	N/A	257	257	83	85	3.0	1.0
110.0	55.170	54.650	0.5	0.5	140	N/A	N/A	247	247	83	85	3.0	1.0
115.0	57.770	57.040	0.5	0.5	140	N/A	N/A	232	232	83	85	3.0	1.0
120.0	60.191	59.598	0.5	0.5	140	N/A	N/A	250	250	83	85	3.0	1.0
	Total Volumes:		Averages:		Averages:			Averages:		Averages:		Averages:	
	60.191	59.598	0.50	0.50	140.6	N/A	N/A	243.5	244.0	83.5	85.0	3.0	1.0

ENTEC Services, Inc.

30 Monroe Drive, Pelham AL 35124

Client: Hovensa, LLC

Source: Fluid Catalytic Cracking Unit (FCCU)

Sorben Tube ID (A): 013960 smoke

Sorben Tube ID (B): 011220 spike

Spike Level (A): -

Spike Level (B): 50.4g

Test Date: 6/15/11

Run Number: 3

Start Time: 1542

End Time: 1742

Meter ID (A): 30B-A

DGM Cal. Fac. (A): 1.000

Initial DGM (A): 0.000

Final DGM (A): 60.191

Meter ID (B): 30B-B

DGM Cal. Fac. (B): 1.000

Total Volume (A): 60.191 Liters

Pre Leak Check (A): 0.001 @ 30"

Post Leak Check (A): 0.001 @ 7"

Initial DGM (B): 0.000

Final DGM (B): 59.598

Pre Leak Check (B): 0.002 @ 10"

Post Leak Check (B): 0.003 @ 13

Total Volume (B): 59.598 Liters

SPECIATED MERCURY - METHOD 30B

					Temperatures (°F)								
Sample Time (Min.)	DGM A Volume (L)	DGM B Volume (L)	Flow Rate A Volume (L)	Flow Rate B Volume (L)	Stack	Chiller	Heated Line	Trap A	Trap B	DGM A	DBM B	Pump Vac. (A)	Pump Vac. (B)
5.0	2.410	2.360	0.5	0.5	141			235	235	83	85	3.0	1.0
10.0	5.100	5.070	0.5	0.5	141			234	234	83	85	3.0	1.0
15.0	7.620	7.590	0.5	0.5	140			245	245	83	85	3.0	1.0
20.0	10.000	10.000	0.5	0.5	140			245	245	83	85	3.0	1.0
25.0	11.810	11.870	0.5	0.5	140			245	245	83	85	3.0	1.0
30.0	14.320	14.390	0.5	0.5	140			232	232	83	85	3.0	1.0
35.0	16.990	17.110	0.5	0.5	141			253	253	84	85	3.0	1.0
40.0	19.760	19.890	0.5	0.5	141			234	234	84	85	3.0	1.0
45.0	22.610	22.630	0.5	0.5	141			234	234	84	85	3.0	1.0
50.0	25.200	25.150	0.5	0.5	141			257	257	84	85	3.0	1.0
55.0	27.710	27.700	0.5	0.5	140			258	258	84	85	3.0	1.0
60.0	30.420	30.270	0.5	0.5	140			238	238	84	85	3.0	1.0
65.0	32.770	32.780	0.5	0.5	141			233	233	84	85	3.0	1.0
70.0	34.810	35.000	0.5	0.5	141			249	249	84	85	3.0	1.0
75.0	37.250	37.470	0.5	0.5	140			250	250	84	85	3.0	1.0
80.0	39.670	39.970	0.5	0.5	141			248	248	84	85	3.0	1.0
85.0	42.140	42.420	0.5	0.5	142			250	250	84	85	3.0	1.0
90.0	44.840	44.990	0.5	0.5	140			257	257	84	85	3.0	1.0
95.0	47.360	47.360	0.5	0.5	141			232	232	84	85	3.0	1.0
100.0	49.980	49.780	0.5	0.5	141			240	240	83	85	3.0	1.0
105.0	52.480	52.160	0.5	0.5	141			257	257	83	85	3.0	1.0
110.0	55.170	54.650	0.5	0.5	140			247	247	83	85	3.0	1.0
115.0	57.770	57.040	0.5	0.5	140			232	232	83	85	3.0	1.0
120.0	60.191	59.598	0.5	0.5	140			250	250	83	85	3.0	1.0

APPENDIX A.3

METHOD OTM 029

HYDROGEN CYANIDE

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC		
PLANT LOCATION:	US Virgin Island - St. Criox		
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)		
SOURCE CONDITION:	Petroleum Refinery ICR		
SOURCE SHAPE:	Circular		
PROBE WASH CHEMICAL(S):	Acetone (Not Required for analysis No PM)		
TEST PERFORMED:	Hydrogen Cyanide		
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 32 DSCF (60 minutes)		
REFERENCE TEST METHODS:	Sample Location	EPA Method	1
	Volumetric Flow	EPA Method	2
	Molecular Weight	EPA Method	3A
	Moisture Content	EPA Method	4
	Hydrogen Cyanide	EPA Method	OTM029
PROJECT MANAGER	Mr. Chuck Duncan		
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Ben Rogers		
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Andrew Imes		
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS		
RULING AGENCY :	Environmental Protection Agency (EPA)		
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers		
DATES TESTS CONDUCTED:	06/15/11		
ENTEC PROJECT NUMBER:	511150		

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/15/11	06/15/11	06/15/11	
Emission Test Run Time Began - Ended		-	Military Time	1000-1151	1320-1440	1542-1656	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.72	29.72	29.72	29.72
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	In. Hg	29.89	29.89	29.89	29.89
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	41.745	42.187	42.257	42.063
3b. Standard Meter Volume Corrected for CO2 *	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	43.300	45.002	44.179	44.160
3c. (Metric) Standard Meter Volume Corrected for CO2 *	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	1.226	1.274	1.251	1.250
4a. Standard Volume of Water Vapor Condensed	$=0.04706 * W_{imp}$	$V_{wc(std)}$	scf	14.278	17.775	15.619	15.891
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715 * W_{sg}$	$V_{wsg(std)}$	scf	0.613	0.655	0.580	0.616
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2559	0.2905	0.2683	0.2716
5a. Moisture Fraction Corrected for CO2 *	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2629	0.3040	0.2771	0.2814
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[8.37-(2827/(ts+440-95.2))]}/P_s$	TB_{ws}	fraction	0.2013	0.1988	0.2028	0.2010
7. Standard Water Volume @ Saturation (Theoretical)	$=Vm(std) * (TBws)/(1-TBws)$	TV_{wstch}	scf	10.914	11.163	11.242	11.106
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	231.9	237.2	238.8	236.0
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.286	30.286	30.286	30.286
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.812	27.844	27.794	27.817
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*SQRT((T_s) / (P_s*M_w))$	v_s	ft/s	64.83	64.90	65.28	65.004
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_a	acfm	369,650	370,063	372,243	370,652
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	322,682	323,312	324,783	323,592
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	257,724	259,052	258,901	258,559
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	60.326	61.067	61.321	60.905
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	99.72	100.84	100.66	100.41
Analytical Lab Data Calculated							
Hydrogen Cyanide Concentration @ Standard Conditions	$=0.01543*(m_{n/1000})/V_{m(std)}$	c_s	gr/dscf	4.52E-02	4.85E-02	4.85E-02	4.74E-02
Hydrogen Cyanide Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	99.84	107.79	107.65	105.09
Analytical Lab Data Calculated (Metric)							
Hydrogen Cyanide Emissions	$= c_s*V_{m(std)}$	c_s	ug/dscm	1.03E+05	1.11E+05	1.11E+05	1.09E+05
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		1.0068	0.9998	0.9989	1.0018
% Difference, (Calibration must be within 5% of original Y-factor)							0.81%

* Test Note: Volumes Calculated and Corrected for CO2 Absorption

An Alternative Approach to Volume Correction for CO_2 Absorption Other Test Method OTM-029 (HCN)

Run No.	1	2	3
VMstd	41.745	42.187	42.257
%M actual	26.3	30.4	27.7
%M saturation	20.13	19.88	20.28
Excess Moisture	6.16	10.52	7.42
Weight gain, g	58.12	105.19	71.83
Equiv CO_2, Ft^3	1.56	2.82	1.92
Corr VMstd	43.300	45.002	44.179

Assumptions:

[1]Stack moisture determinations by additional sampling trains on this source reveal actual moistures were near saturation but not in excess. Therefore, since the OTM-029 train was in excess of saturation, the additional moisture is assumed to come from CO2 absorption.

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

HYDROGEN CYANIDE - OTM 029

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	2.03	141	84
1-2	1.30	1.1402	2.03	141	84
1-3	1.20	1.0954	1.87	141	84
1-4	1.10	1.0488	1.71	140	85
1-5	0.69	0.8307	1.08	140	86
2-1	1.30	1.1402	2.03	141	86
2-2	1.30	1.1402	2.03	141	87
2-3	1.10	1.0488	1.71	140	87
2-4	0.97	0.9849	1.51	140	88
2-5	0.69	0.8307	1.08	140	88
3-1	1.30	1.1402	2.03	141	87
3-2	1.30	1.1402	2.03	141	88
3-3	1.30	1.1402	2.03	141	88
3-4	1.10	1.0488	1.71	140	88
3-5	0.80	0.8944	1.25	140	89
4-1	1.30	1.1402	2.03	141	89
4-2	1.30	1.1402	2.03	141	89
4-3	1.30	1.1402	2.03	141	89
4-4	1.10	1.0488	1.71	141	89
4-5	0.90	0.9487	1.40	141	90
K-Factor					
1.56	**1.13**	**1.0591**	**1.77**	**140.7**	**87.3**

Entec Services, Inc.

Plant: Hovensa
Christiansted, St. Croix
Site: FCC Stack
Date: 6/15/11
Run No.: 1
Time: 10:00 11:51

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: BR
Assistant: AI/DN

Orsat / Fyrite / ENTEC CEMS - Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barometric Pressure: 29.76
Stack Pressure: -.49
Stack Diameter: 132.0"
K Factor: 1.56

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum	Pitot Check Pre:	
0.000	6"	Positive	3.6
		Negative	4.2
Post-Test: Volume @	**Vacuum**	**Pitot Check Post:**	
0.000	8"	Positive	4.3
		Negative	4.6

Equipment Checklist:
Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 110[illegible]90
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: TCD-005
Impinger Outlet ID: GN-8
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	822.695	844.688		
Initial:	801.737	822.747		
Net:	20.958	21.941		

Total: 42.899 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
D / 1	0	801.737	1.30	2.03	141	243	249	66	258	84	5	
/ 2	3	804.005	1.30	2.03	141	237	231	59	263	84	5	
/ 3	6	806.200	1.20	1.87	141	232	230	58	269	84	5	
/ 4	9	808.560	1.10	1.72	140	229	193	56	269	85	5	
/ 5	12	810.695	0.69	1.08	140	229	215	57	265	86	5	
C / 1	15	812.365	1.30	2.03	141	239	227	60	248	86	6	
/ 2	18	814.630	1.30	2.03	141	233	225	56	263	87	7	
/ 3	21	816.925	1.10	1.72	140	228	218	56	263	87	6	
/ 4	24	819.050	0.97	1.51	140	226	220	56	258	88	5	
/ 5	27	821.055	0.69	1.08	140	227	220	57	254	88	4	
B / 1	30	822.695	1.30	2.03	141	224	219	59	243	87	7	
/ 2	33	825.035	1.30	2.03	141	224	221	57	244	88	7	
/ 3	36	827.355	1.30	2.03	141	231	219	57	244	88	7	
/ 4	39	829.650	1.10	1.72	140	234	217	58	246	88	6	
/ 5	42	831.805	0.80	1.25	140	228	219	61	237	89	4	
A / 1	45	833.668	1.30	2.03	141	235	224	64	235	89	8	
/ 2	48	835.955	1.30	2.03	141	241	228	54	242	89	8	
/ 3	51	838.285	1.30	2.03	141	241	226	53	240	89	8	
/ 4	54	840.610	1.10	1.72	141	240	228	52	238	89	6	
/ 5	57	842.740	0.90	1.40	141	243	232	53	237	90	5	
/	60	844.688										
/												
/												
/												
/												

Field Notes:

Method OTM 029 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

HYDROGEN CYANIDE - OTM 029

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	2.03	141	81
1-2	1.30	1.1402	2.03	141	81
1-3	1.30	1.1402	2.03	141	82
1-4	1.10	1.0488	1.71	140	82
1-5	0.87	0.9327	1.36	140	83
2-1	1.30	1.1402	2.03	140	84
2-2	1.30	1.1402	2.03	140	84
2-3	1.10	1.0488	1.71	140	85
2-4	1.10	1.0488	1.71	140	85
2-5	0.80	0.8944	1.25	140	85
3-1	1.30	1.1402	2.03	140	85
3-2	1.30	1.1402	2.03	140	85
3-3	1.20	1.0954	1.87	140	86
3-4	0.95	0.9747	1.48	140	87
3-5	0.75	0.8660	1.17	140	87
4-1	1.30	1.1402	2.03	140	87
4-2	1.30	1.1402	2.03	140	89
4-3	1.30	1.1402	2.03	140	88
4-4	1.10	1.0488	1.71	141	88
4-5	0.75	0.8660	1.17	139	88
K-Factor					
1.56	**1.14**	**1.0613**	**1.77**	**140.2**	**85.1**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa
Site: Christiansted, St Croix / FCC Stack
Date: 6/15/11
Run No.: 2
Time: 1320 / 1440

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	Set Recovery	Sheet	
Silica Gel			

Analyst: BR
Assistant: AE, CDN

Orsat / Fyrite (ENTEC CEMS) Analysis: Average:

O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barometric Pressure: 29.76
Stack Pressure: -.049
Stack Diameter: 132.0"
K Factor: 1.56

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Post-Test:	Vacuum
Volume @	0.000	5"	0.000	10"

Pitot Check Pre: Positive 4.3 / Negative 4.6
Pitot Check Post: Positive 5.2 / Negative 3.8

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	888.046			
Initial:	844.864			
Net:	43.182			

Total: 43.182 Cubic Ft.

Equipment Checklist:
Meter Box ID: Aqua C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: FCD-005
Impinger Outlet ID: GN-8
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Page 70 of 701

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B 1	0	844.864	1.30	2.03	141	245	229	63	225	81	8	
2	3	847.130	1.30	2.03	141	242	240	59	229	81	8	
3	6	849.435	1.30	2.03	141	259	247	55	233	82	8	
4	9	851.745	1.10	1.72	140	265	256	52	235	82	6	
5	12	853.890	0.87	1.36	140	269	258	53	234	83	5	
C 1	15	855.830	1.30	2.03	140	267	264	52	239	84	9	
2	18	858.120	1.30	2.03	140	259	254	51	248	84	8	
3	21	860.480	1.10	1.72	140	251	245	51	253	85	7	
4	24	862.565	1.10	1.72	140	244	242	52	260	85	7	
5	27	864.710	0.80	1.25	140	244	243	53	259	85	5	
P 1	30	866.582	1.30	2.03	140	246	241	52	241	85	10	
2	33	868.880	1.30	2.03	140	236	242	50	255	85	10	
3	36	871.175	1.20	1.87	140	238	242	51	263	86	10	
4	39	873.420	0.95	1.48	140	232	236	52	260	87	8	
5	42	875.560	0.75	1.17	140	230	231	53	259	87	8	
A 1	45	877.233	1.30	2.03	140	237	232	52	233	87	10	
2	48	879.505	1.30	2.03	140	240	234	51	243	89	10	
3	51	881.785	1.30	2.03	140	241	233	48	251	88	10	
4	54	884.065	1.10	1.72	141	239	232	48	249	88	10	
5	57	886.275	0.75	1.17	139	239	234	49	239	88	5	
1	60	888.046										
1												
1												
1												
1												

Field Notes:

Method 0114 01A Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/15/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

HYDROGEN CYANIDE - OTM 029

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	2.03	142	84
1-2	1.30	1.1402	2.03	141	84
1-3	1.30	1.1402	2.03	141	84
1-4	1.20	1.0954	1.87	141	85
1-5	0.95	0.9747	1.48	141	85
2-1	1.20	1.0954	1.87	141	86
2-2	1.30	1.1402	2.03	141	86
2-3	1.20	1.0954	1.87	141	86
2-4	1.20	1.0954	1.87	141	87
2-5	0.96	0.9798	1.50	141	89
3-1	1.30	1.1402	2.03	141	88
3-2	1.20	1.0954	1.87	141	88
3-3	1.20	1.0954	1.87	141	88
3-4	1.10	1.0488	1.71	141	89
3-5	0.85	0.9220	1.32	140	89
4-1	1.20	1.0954	1.87	141	89
4-2	1.20	1.0954	1.87	141	89
4-3	1.10	1.0488	1.71	141	90
4-4	1.10	1.0488	1.71	141	90
4-5	0.69	0.8307	1.08	140	90
K-Factor					
1.56	**1.14**	**1.0659**	**1.78**	**141.0**	**87.3**

Entec Services, Inc.

511150 Hovensa LLC

Page 72 of 701

Plant: Hovensa
Site: Christiansted, St. Croix FCC stack
Date: 6/15/11
Run No.: 3
Time: 1542 1656

Moisture: Initial / Final / Totals
Impinger No. 1
Impinger No. 2
Impinger No. 3 — See Recovery Sheet.
Silica Gel

Analyst: BK
Assistant: AI, CDK

Orsat / Fyrite / ~~ENTEC CEMS~~ PLT — Analysis: — Average:
O2:
CO2:
CO:
N2:

Job No.: 511150
Barometric Pressure: 29.76
Stack Pressure: -0.49
Stack Diameter: 132.0"
K Factor: 1.56

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Pitot Check Pre:	Post-Test:	Vacuum	Pitot Check Post:
Volume @	0.000	6"	Positive 6.2	0.000	6"	Positive 6.6
			Negative 3.8			Negative 6.2

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	931.655			
Initial:	888.237			
Net:	43.418			

Total: 43.418 Cubic Ft.

Equipment Checklist:
Meter Box ID: AaxC
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 1105390
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: FED-008
Impinger Outlet ID: GM-8
Filter ID:
Fyrite ID:
Acetone Lot No:

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	0	888.237	1.30	2.03	142	251	254	66	252	84	5	
/ 2	3	890.490	1.30	2.03	141	247	238	64	254	84	5	
/ 3	6	892.795	1.30	2.03	141	249	239	62	246	84	5	
/ 4	9	895.115	1.20	1.87	141	248	244	60	249	85	5	
/ 5	12	897.375	0.95	1.48	141	249	241	60	247	85	4	
B / 1	15	899.760	1.20	1.87	141	244	239	60	235	86	5.0	
/ 2	18	901.675	1.30	2.07	141	246	239	61	240	86	5	
/ 3	21	903.980	1.20	1.87	141	247	239	52	251	86	5	
/ 4	24	906.220	1.20	1.87	141	245	239	50	247	87	5	
/ 5	27	908.450	0.96	1.50	141	246	243	50	246	89	4	
C / 1	30	910.460	1.30	2.03	141	249	243	49	245	88	5	
/ 2	33	912.755	1.20	1.87	141	247	242	49	248	88	5	
/ 3	36	915.010	1.20	1.87	141	245	244	49	252	88	5	
/ 4	39	917.250	1.10	1.72	141	247	242	49	256	89	5	
/ 5	42	919.375	0.85	1.33	140	248	242	50	256	89	4	
D / 1	45	921.257	1.20	1.87	141	237	243	58	246	89	5	
/ 2	48	923.475	1.20	1.87	141	240	242	56	260	89	5	
/ 3	51	925.715	1.10	1.72	141	231	231	57	264	90	5	
/ 4	54	927.835	1.10	1.72	141	226	224	60	265	90	5	
/ 5	57	929.950	0.69	1.06	140	227	231	61	264	90	3	
/	60	931.655										
/												
/												
/												
/												

Field Notes:

Method OTM-034 Field Data Sheet

APPENDIX A.4

METHOD 0010 AND 25A

SPECIATED SEMI-VOLATILE ORGANIC HAPS

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	1/1 Methanol / Methanol Chloride
TEST PERFORMED:	Speciated Semi Volatile Organic HAP's & Total Hydrocarbons
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 141 DSCF (180 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Semi Volatile Organic HAP's	EPA Method	0010
Total Hydrocarbons	EPA Method	25A

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Tim Draheim
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Andrew Imes
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/16/11 06/17/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data				
Run Number	-	-	1	2	3	Lab Code	AVERAGE
Test Date	-	-	06/16/11	06/16/11	06/17/11		
Emission Test Run Time Began - Ended	-	Military Time	1013-1330	1418-1736	843-1213		
Total Dibenz [a, h] Anthracene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Dibenzofuran Collected	-	ug	172	172	172	MDL	172.0
Total Dibenzo (a, e) Pyrene Collected	-	ug	1.0	1.0	1.0	MDL	1.0
Total 3,3' - Dimethoxybenzidine Collected	-	ug	5,000	5,000	5,000	MDL	5,000
Total 4-Dimethylaminoazobenzene Collected	-	ug	158	158	158	MDL	158
Total 7,12 - Dimethylbenz (a) Anthracene Collected	-	ug	1.0	1.0	1.0	MDL	1.0
Total 3,3' - Dimethylbenzidine Collected	-	ug	2,697	2,697	2,697	MDL	2,697
Total a,a-Dimethylphenethylamine Collected	-	ug	1,250	1,250	1,250	MDL	1,250
Total 2,4 - Dimethylphenol Collected	-	ug	1,700	2,566	1,468		1,911
Total Fluoranthene Collected	-	ug	7.8	5.4	7.9		7.0
Total Fluorene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Indeno (1,2,3-cd) Pyrene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Isophorone Collected	-	ug	187	187	187	MDL	187
Total 3-Methylchloanthrene Collected	-	ug	1.0	1.0	1.0	MDL	1.0
Total 2-Methylnaphthalene Collected	-	ug	0.59	0.50	0.51	MDL	0.53
Total Naphthalene Collected	-	ug	1.2	1.0	1.2		1.1
Total Perylene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Phenanthrene Collected	-	ug	9.9	5.9	15.3		10.4
Total Phenol Collected	-	ug	28,524	30,748	21,735		27,002
Total 1,4-Phenylenediamine Collected	-	ug	1,250	1,250	1,250	MDL	1,250
Total Pyrene Collected	-	ug	22.5	18.5	24.0		21.7
Total o-Toluidine Collected **	-	ug	458	660	347	J	488

**A "J" flag denotes values between the MDL and LOQ =

MDL = Minimum Detection Limit

LOQ = Limit of Quantification

* Lab report identifies cresol as 2-Methylphenol and 3/4-Methylphenol.

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data				
Run Number	-	-	1	2	3	Lab Code	AVERAGE
Test Date	-	-	06/16/11	06/16/11	06/17/11		
Emission Test Run Time Began - Ended	-	Military Time	1013-1330	1418-1736	843-1213		
Sampling Time	θ	minutes	180	180	180		180
Stack Area	A_s	Ft^2	95.033	95.033	95.033		
Barometric Pressure	P_{bar}	in. Hg	29.74	29.74	29.80		29.76
Stack Static Pressure	P_g	in. H_20	-0.49	-0.49	-0.49		-0.49
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84		0.84
Meter Correction Factor	Y	-	0.985	0.985	0.985		0.985
Meter Delta H @	ΔH@	in. H_20	1.894	1.894	1.894		1.894
Nozzle Diameter	D_n	inches	0.250	0.250	0.250		0.250
Meter Volume	V_m	dcf	158.965	160.305	162.812		160.694
Meter Temperature	t_m	°F	94.0	94.3	93.1		93.8
Avg. Orifice Delta H	ΔH	in. H_20	2.91	2.94	2.98		2.94
Impingers Weight Gain (Moisture)	W_{imp}	grams	874.0	876.4	975.2		908.5
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	45.2	35.9	39.4		40.2
Oxygen Concentration, dry basis	O_2	%	1.71	1.55	1.60		1.62
Carbon Dioxide Concentration, dry basis	CO_2	%	13.94	14.09	14.14		14.06
VOC Concentration as propane, wet basis	VOC	ppm	22.4	19.6	27.7		23.2
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_20)^{1/2}$	1.070	1.076	1.085		1.077
Stack Temperature	t_s	°F	144.5	144.4	145.0		144.6
Analytical Lab Data Input							
Total Acenaphthene Collected	-	ug	0.50	0.50	0.57	MDL	0.52
Total Acenaphthylene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Aniline Collected	-	ug	2,271	2,461	1,655		2,129
Total Anthracene Collected	-	ug	3.6	1.8	4.7		3.4
Total Benzidine Collected	-	ug	5,690	5,690	5,690	MDL	5,690
Total Benzo [a] Anthracene Collected	-	ug	4.1	4.1	4.4		4.2
Total Benzo [b] Fluoranthene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Benzo [k] Fluoranthene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Benzo [g, h, i] Perylene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Benzo [a] Pyrene Collected	-	ug	0.50	0.50	0.50	MDL	0.50
Total Benzo [e] Pyrene Collected	-	ug	0.50	0.50	0.50	MDL	0.5
Total Biphenyl Collected	-	ug	250	250	250	MDL	250.0
Total Cresol Collected*	-	ug	31,041	32,033	23,588		28,887
Total Chrysene Collected	-	ug	3.8	3.8	4.1		3.9

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.70	29.70	29.76	29.72
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	29.95	29.96	30.02	29.98
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	V_{mstd}	dscf	149.354	150.543	153.553	151.150
3A. (Metric) Standard Meter Volume	$=V_{mstd} * 0.0283168465921$	V_{mstd}	dscm	4.229	4.263	4.348	4.280
4a. Standard Volume of Water Vapor Condensed	$=0.04706*W_{wc}$	V_{wstd}	scf	41.130	41.243	45.893	42.756
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715*W_{sg}$	$V_{wstd_{sg}}$	scf	2.131	1.693	1.858	1.894
5. Moisture Fraction	$=(V_{wstd} + V_{wstd})/(V_{mstd} + V_{wstd} + V_{wstd})$	B_{ws}	fraction	0.2246	0.2219	0.2372	0.2279
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[8.27-2827.9/T_m+4.93\log T_m]}/P_s$	TB_{ws}	fraction	0.2220	0.2212	0.2241	0.2224
7. Standard Water Volume @ Saturation (Theoretical)	=Vm(std) * (TBws)/(1-TBws)	TV_{wstd}	scf	42.627	42.759	44.352	43.246
8. Volume of Water @ Saturation (Theoretical)	$=TV_{wstd}/0.04707$	TV_{ls}	ml	905.6	908.4	942.2	918.8
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.299	30.316	30.326	30.314
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.568	27.592	27.564	27.575
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt }\Delta P)_{avg}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	66.00	66.35	66.91	66.420
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_s	acfm	376,310	378,349	381,524	378,727
13. Stack Gas Flow @ Standard Conditions	$= Q_s*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	326,184	328,033	331,125	328,447
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	253,758	255,470	256,918	255,382
14A. (Metric) Stack Gas Flow @ Dry Standard Conditions	=Qstd 0.0283168466	Q_{std}	dscmm	7,186	7,234	7,275	7,232
16. VOC's as propane Gas Concentration	$=C_{ppm} /(1-Bws)* MW / 385.1 \times 10^6$	C_{VOC}	lbs/dscf	3.30E-06	2.88E-06	4.08E-06	3.42E-06
21. VOC's as propane Gas Emissions	$=C_{VOC} * Q_{std} * 60$	VOC-lb/hr	lb/hr	50.19	44.17	62.89	52.42
21a. VOC's as propane Gas Concentration (Dry)	$=C_{ppm} /(1-B_{ws})$	ppm Dry	ppm_{vd}	28.79	25.17	35.64	29.87
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	scf	221.495	222.965	228.039	224.166
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	91.16	91.27	92.57	91.67

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
Analytical Lab Data Calculated							
Acenaphthene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.89E-08	5.41E-08
Acenaphthylene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Aniline concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	2.35E-04	2.54E-04	1.71E-04	2.20E-04
Anthracene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	3.76E-07	1.82E-07	4.87E-07	3.48E-07
Benzidine concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.88E-04	5.88E-04	5.88E-04	5.88E-04
Benz(a)anthracene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	4.20E-07	4.22E-07	4.55E-07	4.32E-07
Benzo(b)fluoranthene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Benzo(k)fluoranthene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Benzo(g,h,i)perylene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Benzo(a)pyrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Benzo(e)pyrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Biphenyl concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	2.58E-05	2.58E-05	2.58E-05	2.58E-05
Cresol concentration at standard conditions**	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	3.21E-03	3.31E-03	2.44E-03	2.98E-03
Chrysene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	3.97E-07	3.89E-07	4.27E-07	4.04E-07
Dibenz(a,h)anthracene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Dibenzofuran concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.78E-05	1.78E-05	1.78E-05	1.78E-05
Dibenzo(a,e)pyrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.03E-07	1.03E-07	1.03E-07	1.03E-07
3,3-Dimethoxybenzidine conentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-04	5.17E-04	5.17E-04	5.17E-04
4-Dimethylaminoazobenzene conentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.63E-05	1.63E-05	1.63E-05	1.63E-05
7,12-Dimethylbenz(a)anthracene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.03E-07	1.03E-07	1.03E-07	1.03E-07
3,3-dimethylbenzidine concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	2.79E-04	2.79E-04	2.79E-04	2.79E-04
a,a-Dimethylphenethylamine concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.29E-04	1.29E-04	1.29E-04	1.29E-04
2,4-Dimethylphenol concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.76E-04	2.65E-04	1.52E-04	1.97E-04
Fluoranthene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	8.07E-07	5.58E-07	8.14E-07	7.26E-07
Fluorene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Indeno(1,2,3-cd)pyrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Isophorone concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.93E-05	1.93E-05	1.93E-05	1.93E-05
3-Methylchloanthrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.03E-07	1.03E-07	1.03E-07	1.03E-07
2-Methylnaphthalene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	6.14E-08	5.17E-08	5.26E-08	5.52E-08
Naphthalene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.21E-07	1.00E-07	1.26E-07	1.16E-07
Perylene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	5.17E-08	5.17E-08	5.17E-08	5.17E-08
Phenanthrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.02E-06	6.05E-07	1.58E-06	1.07E-06
Phenol concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	2.95E-03	3.18E-03	2.25E-03	2.79E-03
1,4-Phenylenediamine concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	1.29E-04	1.29E-04	1.29E-04	1.29E-04
Pyrene concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	2.33E-06	1.91E-06	2.48E-06	2.24E-06
o-Toluidine concentration at standard conditions	$=0.01543*(m_{n\text{-}10000}/V_{m(std)})$	c_a	gr/dscf	4.73E-05	6.82E-05	3.58E-05	5.05E-05

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
Acenaphthene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.28E-04	1.18E-04
Acenaphthylene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Aniline emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	5.10E-01	5.53E-01	3.72E-01	4.78E-01
Anthracene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	8.18E-04	3.95E-04	1.06E-03	7.57E-04
Benzidine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.28E+00	1.28E+00	1.28E+00	1.28E+00
Benz(a)anthracene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	9.13E-04	9.18E-04	9.90E-04	9.40E-04
Benzo(b)fluoranthene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(k)fluoranthene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(g,h,i)perylene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(a)pyrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Benzo(e)pyrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Biphenyl emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	5.62E-02	5.62E-02	5.62E-02	5.62E-02
Cresol emissions**	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	6.98E+00	7.20E+00	5.30E+00	6.49E+00
Chrysene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	8.64E-04	8.46E-04	9.28E-04	8.80E-04
Dibenz(a,h)anthracene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Dibenzofuran emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	3.87E-02	3.87E-02	3.87E-02	3.87E-02
Dibenzo(a,e)pyrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
3,3-Dimethoxybenzidine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E+00	1.12E+00	1.12E+00	1.12E+00
4-Dimethylaminoazobenzene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	3.55E-02	3.55E-02	3.55E-02	3.55E-02
7,12-Dimethylbenz(a)anthracene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
3,3-Dimethylbenzidine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	6.06E-01	6.06E-01	6.06E-01	6.06E-01
a,a-Dimethylphenethylamine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.81E-01	2.81E-01	2.81E-01	2.81E-01
2,4-Dimethylphenol emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	3.82E-01	5.77E-01	3.30E-01	4.29E-01
Fluoranthene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.76E-03	1.21E-03	1.77E-03	1.58E-03
Fluorene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Indeno(1,2,3-cd)pyrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Isophorone emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	4.20E-02	4.20E-02	4.20E-02	4.20E-02
3-Methylchloanthrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.25E-04	2.25E-04	2.25E-04	2.25E-04
2-Methylnaphthalene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.33E-04	1.12E-04	1.14E-04	1.20E-04
Naphthalene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.64E-04	2.18E-04	2.73E-04	2.52E-04
Perylene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.12E-04	1.12E-04	1.12E-04	1.12E-04
Phenanthrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.22E-03	1.32E-03	3.44E-03	2.33E-03
Phenol emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	6.41E+00	6.91E+00	4.88E+00	6.07E+00
1,4-Phenylenediamine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	2.81E-01	2.81E-01	2.81E-01	2.81E-01
Pyrene emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	5.07E-03	4.15E-03	5.39E-03	4.87E-03
o-Toluidine emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	1.03E-01	1.48E-01	7.80E-02	1.10E-01

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
Analytical Lab Data Calculated (Metric)							
Acenaphthene concentration at standard conditions	$= c_s * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.31E-01	1.22E-01
Acenaphthylene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Aniline concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	5.37E+02	5.77E+02	3.81E+02	4.98E+02
Anthracene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	8.61E-01	4.13E-01	1.08E+00	7.86E-01
Benzidine concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.35E+03	1.33E+03	1.31E+03	1.33E+03
Benz(a)anthracene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	9.61E-01	9.58E-01	1.01E+00	9.77E-01
Benzo(b)fluoranthene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(k)fluoranthene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(g,h,i)perylene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(a)pyrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Benzo(e)pyrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Biphenyl concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	5.91E+01	5.86E+01	5.75E+01	5.84E+01
Cresol concentration at standard conditions**	$= cs * V_{m(std)}$	c_s	ug/dscm	7.34E+03	7.51E+03	5.42E+03	6.76E+03
Chrysene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	9.10E-01	8.83E-01	9.50E-01	9.14E-01
Dibenz(a,h)anthracene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Dibenzofuran concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	4.07E+01	4.03E+01	3.96E+01	4.02E+01
Dibenzo(a,e)pyrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
3,3-Dimethoxybenzidine conentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E+03	1.17E+03	1.15E+03	1.17E+03
4-Dimethylaminoazobenzene conentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	3.74E+01	3.71E+01	3.63E+01	3.69E+01
7,12-Dimethylbenz(a)anthracene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
3,3-dimethylbenzidine concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	6.38E+02	6.33E+02	6.20E+02	6.30E+02
a,a-Dimethylphenethylamine concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.96E+02	2.93E+02	2.87E+02	2.92E+02
2,4-Dimethylphenol concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	4.02E+02	6.02E+02	3.38E+02	4.47E+02
Fluoranthene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.85E+00	1.27E+00	1.81E+00	1.64E+00
Fluorene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Indeno(1,2,3-cd)pyrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Isophorone concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	4.42E+01	4.39E+01	4.30E+01	4.37E+01
3-Methylchloanthrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.36E-01	2.35E-01	2.30E-01	2.34E-01
2-Methylnaphthalene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.40E-01	1.17E-01	1.17E-01	1.25E-01
Naphthalene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.78E-01	2.27E-01	2.80E-01	2.62E-01
Perylene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.18E-01	1.17E-01	1.15E-01	1.17E-01
Phenanthrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.34E+00	1.37E+00	3.52E+00	2.41E+00
Phenol concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	6.74E+03	7.21E+03	5.00E+03	6.32E+03
1,4-Phenylenediamine concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	2.96E+02	2.93E+02	2.87E+02	2.92E+02
Pyrene concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	5.33E+00	4.33E+00	5.51E+00	5.06E+00
o-Toluidine concentration at standard conditions	$= cs * V_{m(std)}$	c_s	ug/dscm	1.08E+02	1.55E+02	7.98E+01	1.14E+02

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
Acenaphthene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.72E-05	5.30E-05
Acenaphthylene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Aniline emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	2.32E-01	2.51E-01	1.66E-01	2.16E-01
Anthracene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	3.71E-04	1.79E-04	4.73E-04	3.41E-04
Benzidine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.80E-01	5.79E-01	5.71E-01	5.77E-01
Benz(a)anthracene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	4.14E-04	4.16E-04	4.42E-04	4.24E-04
Benzo(b)fluoranthene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Benzo(k)fluoranthene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Benzo(g,h,i)perylene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Benzo(a)pyrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Benzo(e)pyrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Biphenyl emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	2.55E-02	2.55E-02	2.51E-02	2.53E-02
Cresol emissions**	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	3.16E+00	3.26E+00	2.37E+00	2.93E+00
Chrysene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	3.92E-04	3.83E-04	4.15E-04	3.97E-04
Dibenz(a,h)anthracene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Dibenzofuran emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.75E-02	1.75E-02	1.73E-02	1.74E-02
Dibenzo(a,e)pyrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.02E-04	1.02E-04	1.00E-04	1.01E-04
3,3-Dimethoxybenzidine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-01	5.09E-01	5.02E-01	5.07E-01
4-Dimethylaminoazobenzene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.61E-02	1.61E-02	1.59E-02	1.60E-02
7,12-Dimethylbenz(a)anthracene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.02E-04	1.02E-04	1.00E-04	1.01E-04
3,3-Dimethylbenzidine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	2.75E-01	2.75E-01	2.71E-01	2.73E-01
a,a-Dimethylphenethylamine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.27E-01	1.27E-01	1.25E-01	1.27E-01
2,4-Dimethylphenol emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.73E-01	2.61E-01	1.47E-01	1.94E-01
Fluoranthene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	7.96E-04	5.50E-04	7.91E-04	7.12E-04
Fluorene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Indeno(1,2,3-cd)pyrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Isophorone emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.91E-02	1.90E-02	1.88E-02	1.90E-02
3-Methylchloanthrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.02E-04	1.02E-04	1.00E-04	1.01E-04
2-Methylnaphthalene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	6.06E-05	5.09E-05	5.11E-05	5.42E-05
Naphthalene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.20E-04	9.87E-05	1.22E-04	1.14E-04
Perylene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	5.10E-05	5.09E-05	5.02E-05	5.07E-05
Phenanthrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.01E-03	5.96E-04	1.54E-03	1.05E-03
Phenol emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	2.91E+00	3.13E+00	2.18E+00	2.74E+00
1,4-Phenylenediamine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	1.27E-01	1.27E-01	1.25E-01	1.27E-01
Pyrene emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	2.30E-03	1.88E-03	2.41E-03	2.20E-03
o-Toluidine emissions	$= (60/1,000,000,000)*c_s*Q_{std}$	-	kg/hr	4.67E-02	6.72E-02	3.48E-02	4.96E-02
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		1.0540	1.0510	1.0403	1.0484
% Difference. (Calibration must be within 5% of original Y-factor)							-6.44%

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/16/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

SEMI VOLATILE ORGANIC HAPS & VOC'S - METHOD 0010 & 25A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	3.28	144	88
1-2	1.30	1.1402	3.28	145	92
1-3	1.30	1.1402	3.28	145	93
1-4	1.10	1.0488	2.77	145	94
1-5	0.83	0.9110	2.09	145	94
2-1	1.30	1.1402	3.28	145	94
2-2	1.30	1.1402	3.28	145	94
2-3	1.10	1.0488	2.77	144	95
2-4	1.10	1.0488	2.77	144	94
2-5	0.89	0.9434	2.25	144	95
3-1	1.30	1.1402	3.28	144	94
3-2	1.30	1.1402	3.28	144	95
3-3	1.20	1.0954	3.03	145	96
3-4	0.96	0.9798	2.42	144	95
3-5	0.74	0.8602	1.87	144	95
4-1	1.30	1.1402	3.28	144	94
4-2	1.30	1.1402	3.28	145	94
4-3	1.30	1.1402	3.28	144	94
4-4	1.20	1.0954	3.03	145	95
4-5	0.92	0.9592	2.32	145	94
K-Factor					
2.52	**1.15**	**1.0696**	**2.91**	**144.5**	**94.0**

Entec Services, Inc.

Plant: Hovensa
Site: St. Croix USVI FCCU Stack
Date: 6-16-11

511150 Hovensa LLC

Run No.: 1

Time:
1013
1330

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	SEE Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: TO/BR
Assistant: AI, CDIV

Orsat / Fyrite / ENTEC CEMS - Analysis: Average:

O2:	Plant CEMS	
CO2:		
CO:		
N2:		

Job No.: 511150

Barometric Pressure: 29.74

Stack Pressure: -0.49

Stack Diameter: 132"

K Factor: 2.52

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Pitot Check Pre:	
Volume @	0.002	10"	Positive	4.3
			Negative	5.1

	Post-Test:	Vacuum	Pitot Check Post:	
Volume @	0.000	15"	Positive	4.6
			Negative	5.1

Equipment Checklist:
Meter Box ID: NCMS-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: TC-005
Impinger Outlet ID: OU-11
Filter ID: Run 1
Fyrite ID:
Acetone Lot No:

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	691.130			
Initial:	532.165			
Net:	158.965			

Total: 158.965 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger (5)	Filter Outlet / Condenser (4)	Meter Avg.	Vacuum	Other
B / 1	9	540.39	1.30	3.276	144	250	229	66	66	88	9	
/ 2	18	548.87	1.30	3.276	145	257	232	66	67	93	11	
/ 3	27	557.34	1.30	3.276	145	246	232	66	66	93	11	
/ 4	36	565.22	1.10	2.77	145	239	237	66	67	94	10	
/ 5	45	572.07	0.83	2.09	145	236	236	66	63	94	8	
C / 1	54	580.51	1.30	3.276	145	239	233	65	65	94	11	
/ 2	63	588.96	1.30	3.276	145	240	234	65	66	94	11	
/ 3	72	596.79	1.10	2.776	144	239	235	66	67	95	10	
/ 4	81	604.57	1.10	2.77	144	237	233	66	63	94	10	
/ 5	90	611.67	0.89	2.24	144	242	233	66	64	95	9	
D / 1	99	620.080	1.30	3.27	144	230	228	67	65	94	11	
/ 2	108	628.52	1.30	3.276	144	232	230	66	66	95	11	
/ 3	117	636.81	1.20	3.02	145	230	233	66	66	96	12	
/ 4	126	643.07	0.96	2.42	144	229	231	66	65	95	10	
/ 5	135	650.60	0.74	1.86	144	234	230	66	63	95	9	
A / 1	144	658.89	1.30	3.276	144	244	236	67	65	94	13	
/ 2	153	667.38	1.30	3.276	145	234	235	66	65	94	13	
/ 3	162	675.78	1.30	3.276	144	244	234	66	66	94	13	
/ 4	171	683.93	1.20	3.02	145	232	233	67	66	95	13	
/ 5	180	691.130	0.92	2.32	145	231	232	66	65	94	11	
/												
/												
/												
/												
/												

Field Notes: 180 min 141 dscf

Method 0010 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC**

Source: **Fluid Catalytic Cracking Unit (FCCU)**

Test Date: **6/16/2011**

Run Number: **2**

SEMI VOLATILE ORGANIC HAPS & VOC'S - METHOD 0010 & 25A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	3.28	145	89
1-2	1.30	1.1402	3.28	146	91
1-3	1.30	1.1402	3.28	145	93
1-4	1.20	1.0954	3.03	145	94
1-5	0.89	0.9434	2.25	146	94
2-1	1.30	1.1402	3.28	144	93
2-2	1.30	1.1402	3.28	144	94
2-3	1.20	1.0954	3.03	144	95
2-4	1.10	1.0488	2.77	144	96
2-5	0.79	0.8888	1.99	144	96
3-1	1.30	1.1402	3.28	144	94
3-2	1.30	1.1402	3.28	144	95
3-3	1.10	1.0488	2.77	144	96
3-4	1.10	1.0488	2.77	144	95
3-5	0.81	0.9000	2.04	144	96
4-1	1.30	1.1402	3.28	144	94
4-2	1.30	1.1402	3.28	144	95
4-3	1.30	1.1402	3.28	144	95
4-4	1.20	1.0954	3.03	144	95
4-5	0.91	0.9539	2.30	144	95
K-Factor					
2.52	**1.17**	**1.0760**	**2.94**	**144.4**	**94.3**

Entec Services, Inc.

Plant: Hovensa
St Croix USVI
Site: FCC Stack
Date: 6/16/11
Run No.: 2
Time: 1418 1736

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: BR
Assistant: AF, CDII

Orsat / Fyrite / ENTEC CEMS - Analysis:

			Average:
O2:			
CO2:	Plant CEMS		
CO:			
N2:			

Job No.: 511150
Barometric Pressure: 29.74
Stack Pressure: -0.49
Stack Diameter: 11' x 132"
K Factor: 2.52

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum	Pitot Check Pre:	
0.000	10"	Positive	4.6
		Negative	5.1
Post-Test: Volume @	**Vacuum**	**Pitot Check Post:**	
0.000	11"	Positive	6.2
		Negative	4.7

Equipment Checklist:
Meter Box ID: NC-M5-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: TC-005
Impinger Outlet ID: GN-11
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	851.873			
Initial:	691.568			
Net:	160.305			

Total: 160.305 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger (5)	Condenser (4) Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	0	691.568	1.30	3.27	145	233	230	67	64	89	8	
/ 2	9	699.97	1.30	3.27	146	237	233	67	64	91	10	
/ 3	18	708.40	1.30	3.27	145	233	234	66	63	93	10	
/ 4	27	716.85	1.20	3.02	145	232	232	66	65	94	10	
/ 5	36	724.99	0.89	2.24	146	233	234	67	66	94	8	
D / 1	45	732.10	1.30	3.27	144	225	225	66	64	93	10	
/ 2	54	740.54	1.30	3.27	144	230	232	66	65	94	10	
/ 3	63	749.01	1.20	3.02	144	238	230	64	62	95	10	
/ 4	72	757.14	1.10	2.77	144	225	225	63	62	96	10	
/ 5	81	765.14	0.79	1.99	144	227	229	63	62	96	8	
C / 1	90	771.71	1.30	3.27	144	238	228	66	61	94	10	
/ 2	99	780.14	1.30	3.27	144	231	230	63	62	95	10	
/ 3	108	788.610	1.10	2.77	144	230	232	66	62	96	10	
/ 4	117	796.52	1.10	2.77	144	228	233	67	62	95	10	
B / 5	126	804.35	0.81	2.04	144	226	229	62	59	96	8	
/ 1	135	811.10	1.30	3.27	144	226	230	60	60	94	11	
/ 2	144	819.58	1.30	3.27	144	225	232	59	61	95	11	
/ 3	153	827.06	1.30	3.27	144	225	231	60	62	95	11	
/ 4	162	836.470	1.20	3.02	144	225	231	62	64	95	11	
/ 5	171	844.68	0.91	2.29	144	225	231	63	61	95	8	
/	180	851.873										
/												
/												
/												
/												

Field Notes:

Method 0010 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/16/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

SEMI VOLATILE ORGANIC HAPS & VOC'S - METHOD 0010 & 25A

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	3.28	146	87
1-2	1.30	1.1402	3.28	146	91
1-3	1.30	1.1402	3.28	146	91
1-4	1.20	1.0954	3.03	145	92
1-5	0.96	0.9798	2.42	145	94
2-1	1.40	1.1832	3.53	145	92
2-2	1.30	1.1402	3.28	145	93
2-3	1.30	1.1402	3.28	145	94
2-4	1.20	1.0954	3.03	145	94
2-5	1.00	1.0000	2.52	145	94
3-1	1.30	1.1402	3.28	145	93
3-2	1.30	1.1402	3.28	145	95
3-3	1.20	1.0954	3.03	145	94
3-4	1.00	1.0000	2.52	145	94
3-5	0.81	0.9000	2.04	145	95
4-1	1.30	1.1402	3.28	145	94
4-2	1.30	1.1402	3.28	144	94
4-3	1.20	1.0954	3.03	144	94
4-4	1.00	1.0000	2.52	144	93
4-5	0.99	0.9950	2.50	144	93
K-Factor					
2.52	**1.18**	**1.0851**	**2.98**	**145.0**	**93.1**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa
Site: St Croix, USVI — FCCU Stack
Date: 6-17-11
Run No.: 3
Time: 0843 / 1213

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	56E	Recovery Sheet	
Impinger No. 3			
Silica Gel			

Analyst: TD
Assistant: CDU/AE

Orsat / Fyrite / ENTEC CEMS - Analysis: Average:

O2:		
CO2:	Plant CEMS	
CO:		
N2:		

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.49
Stack Diameter: 132"
K Factor: 2.52

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum
Volume @	0.000 e	13"
Post-Test:		
Volume @	0.008	15"

Pitot Check Pre: Positive 5.4 ✓ Negative 6.1 ✓
Pitot Check Post: Positive 6.3 ✓ Negative 5.7 ✓

Equipment Checklist:
Meter Box ID: NC MS-3
Delta H @: 1.994
Y - Factor: 0.985
Probe ID: 119890
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: EC-005
Impinger Outlet ID: GN-11
Filter ID: /
Fyrite ID: N/A
Acetone Lot No: /

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	894.619	936 #262 894.900	976.002	1016.093
Initial:	853.000	~~934.890~~	936.262	976.002
Net:	41.619	41.362	39.740	40.091

Total: 162.812 Cubic Ft.
132.721

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	~~Filter~~ Condenser Outlet	Meter Avg.	Vacuum	Other
B / 1	9	861.38	1.30	3.28	146	238	229	68	63	87	8.0	
/ 2	18	~~870~~ 869.860	1.30	3.28	146	239	230	68	65	91	10.0	
/ 3	27	876.800	1.30	3.28	146	239	232	67	66	91	10.0	
/ 4	36	885.61	1.20	3.02	145	245	225	67	67	92	10.0	
/ 5	45	894.619	0.96	2.42	145	239	228	66	67	94	10.0	
A / 1	54	903.710	1.40	3.53	145	242	233	66	59	92	11.0	
/ 2	63	912.12	1.30	3.28	145	242	227	67	65	93	11.0	
/ 3	72	920.60	1.30	3.28	145	240	230	67	68	94	11.0	
/ 4	81	928.76	1.20	3.02	145	241	225	64	60	94	11.0	
/ 5	90	936.262	1.00	2.52	145	240	226	63	59	94	10.0	
D / 1	99	944.65	1.30	3.28	145	230	225	67	59	93	11.0	
/ 2	108	953.18	1.30	3.28	145	236	227	61	57	95	11.0	
/ 3	117	961.40	1.20	3.02	145	234	226	63	56	94	11.0	
/ 4	126	968.990	1.00	2.52	145	234	225	64	58	94	11.0	
/ 5	135	976.002	0.81	2.04	145	234	226	64	60	95	10.0	
C / 1	144	984.49	1.30	3.28	145	244	232	66	64	94	12.0	
/ 2	153	993.83	1.30	3.29	144	240	230	60	56	94	12.0	
/ 3	162	1002.10	1.20	3.02	144	240	230	61	62	94	13.0	
/ 4	171	1008.69	1.00	2.52	144	241	231	61	57	93	12.0	
/ 5	180	1016.093	0.99	2.49	144	239	230	62	58	93	11.5	
/												
/												
/												
/												
/												

Field Notes:

Method 0010 Field Data Sheet

APPENDIX A.5

METHOD 0011

ALDEHYDES

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	DNPH
TEST PERFORMED:	Aldehydes (Formaldehyde, Acetaldehyde, & Propanal)
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 46 DSCF

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Semi Volatile Organic HAP's	EPA Method	0011

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Kevin Rosenberg
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Andrew Imes
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/17/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

INPUT TEST DATA

Client:	Hovensa, LLC	Job No.:	511150
Source:	Fluid Catalytic Cracking Unit (FCCU)	Data Input By:	L. Beane

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/17/11	06/17/11	06/17/11	
Emission Test Run Time Began - Ended	-	Military Time	825-1012	1037-1200	1223-1335	
Sampling Time	θ	minutes	60	60	60	60
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.80	29.80	29.80	29.80
Stack Static Pressure	P_g	in. H_2O	-0.74	-0.78	-0.75	-0.76
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.986	0.986	0.986	0.986
Meter Delta H @	$\Delta H@$	in. H_2O	1.840	1.840	1.840	1.840
Nozzle Diameter	D_n	inches	0.250	0.250	0.250	0.250
Meter Volume	V_m	dcf	58.072	58.742	58.516	58.443
Meter Temperature	t_m	°F	91.7	90.8	89.1	90.5
Avg. Orifice Delta H	ΔH	in. H_2O	3.04	3.09	3.08	3.07
Impingers Weight Gain (Moisture)	W_{imp}	grams	309.9	323.5	337.3	323.6
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	11.2	10.9	13.1	11.7
Oxygen Concentration, dry basis	O_2	%	1.58	1.61	1.61	1.60
Carbon Dioxide Concentration, dry basis	CO_2	%	14.17	14.14	14.10	14.14
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_2O)^{1/2}$	1.099	1.109	1.106	1.105
Stack Temperature	t_s	°F	143.6	143.9	144.5	144.0
Analytical Lab Data Input						
Total Formaldehyde Collected	CH_2O	ug	1.2	738.0	1.0	246.7
Total Acetaldehyde Collected	CH_3CHO	ug	43.7	40.5	36.3	40.2
Total Propanal (propionaldehyde) Collected	CH_3CH_2CHO	ug	2.0	1.8	1.7	1.8
*Denotes a non-detect or analytical result below the MDL =						

ENTEC Services, Inc.

30 Monroe Drive, Pelham AL 35124

CALCULATED TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/17/11	06/17/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	825-1012	1037-1200	1223-1335	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	In. Hg	29.75	29.74	29.74	29.74
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	In. Hg	30.02	30.03	30.03	30.03
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	54.967	55.699	55.660	55.442
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	1.556	1.577	1.576	1.570
4a. Standard Volume of Water Vapor Condensed	$=0.04706 * W_{imp}$	$V_{wc(std)}$	scf	14.584	15.224	15.873	15.227
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715 * W_{sg}$	$V_{wsg(std)}$	scf	0.528	0.514	0.618	0.553
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2156	0.2203	0.2286	0.2215
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[8.37-(2627/(ts+460-66.2))]}/P_s$	TB_{ws}	fraction	0.2168	0.2184	0.2215	0.2189
7. Standard Water Volume @ Saturation (Theoretical)	$=Vm(std) * (TBws)/(1-TBws)$	$TV_{w(std)}$	scf	15.213	15.567	15.832	15.537
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	323.2	330.7	336.4	330.1
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.330	30.327	30.320	30.326
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.671	27.634	27.592	27.633
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*SQRT((T_s) / (P_s*M_w))$	v_s	ft/s	67.58	68.24	68.18	68.000
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_a	acfm	385,332	389,117	388,752	387,734
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	334,971	338,060	337,460	336,830
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	262,737	264,217	262,728	263.227
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	80.621	82.033	82.363	81.672
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	97.21	97.95	98.44	97.87
Analytical Lab Data Calculated							
Formaldehyde Concentrations @ Standard Conditions	$=0.01543*(m_{n/1000}/V_{m(std)})$	c_s	gr/dscf	3.42E-07	2.04E-04	2.80E-07	6.84E-05
Acetaldehyde Concentractions @ Standard Conditions	$=0.01543*(m_{n/1000}/V_{m(std)})$	c_s	gr/dscf	1.23E-05	1.12E-05	1.01E-05	1.12E-05
Propanal Concentractions @ Standard Conditions	$=0.01543*(m_{n/1000}/V_{m(std)})$	c_s	gr/dscf	5.59E-07	4.99E-07	4.57E-07	5.05E-07
Formaldehyde Emissions	$= (60/7000)*c_s*Q_{std}$	c_s	lb/hr	0.0008	0.4630	0.0006	0.1548
Acetaldehyde Emissions	$= (60/7000)*c_s*Q_{std}$	c_s	lb/hr	0.0276	0.0254	0.0227	0.0252
Propanal Emissions	$= (60/7000)*c_s*Q_{std}$	c_s	lb/hr	0.0013	0.0011	0.0010	0.0011
Analytical Lab Data Calculated (Metric)							
Formaldehyde Concentrations	$= c_s*V_{m(std)}$	c_s	ug/dscm	7.84E-01	4.68E+02	6.41E-01	1.56E+02
Acetaldehyde Concentrations	$= cs*V_{m(std)}$	c_s	ug/dscm	2.81E+01	2.57E+01	2.30E+01	2.56E+01
Propanal Concentractions	$= cs*V_{m(std)}$	c_s	ug/dscm	1.28E+00	1.14E+00	1.05E+00	1.16E+00
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		y_{qa}		0.9938	0.9903	0.9909	0.9917
% Difference, (Calibration must be within 5% of original Y-factor)							-0.58%

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/17/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

ALDEHYDES - METHOD 0011

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.50	143	86
1-2	1.40	1.1832	3.50	143	86
1-3	1.20	1.0954	3.00	143	88
1-4	1.10	1.0488	2.75	144	90
1-5	0.90	0.9487	2.25	143	91
2-1	1.40	1.1832	3.50	144	91
2-2	1.40	1.1832	3.50	144	92
2-3	1.30	1.1402	3.25	144	92
2-4	1.20	1.0954	3.00	143	93
2-5	1.00	1.0000	2.50	144	93
3-1	1.40	1.1832	3.50	144	92
3-2	1.30	1.1402	3.25	144	92
3-3	1.30	1.1402	3.25	143	93
3-4	1.00	1.0000	2.50	144	94
3-5	0.80	0.8944	2.00	143	94
4-1	1.30	1.1402	3.25	144	92
4-2	1.40	1.1832	3.50	144	93
4-3	1.30	1.1402	3.25	143	94
4-4	1.20	1.0954	3.00	144	94
4-5	1.00	1.0000	2.50	144	94
K-Factor					
2.50	**1.22**	**1.0989**	**3.04**	**143.6**	**91.7**

Entec Services, Inc.

Plant: Hovensa
Site: US VI / FCC
Date: 6-17-2011
Run No.: 1
Time: 0825 / 1012

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: KR
Assistant: AI

Orsat / Fyrite (Plant / ENTEC CEMS) Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.74
Stack Diameter: 132.0"
K Factor: 0.50

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Pitot Check Pre:	
Volume @	0.000	10"	Positive	3.2
			Negative	3.0
	Post-Test:	Vacuum	Pitot Check Post:	
Volume @	0.000	12"	Positive	6.3
			Negative	5.8

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	242.872			
Initial:	184.800			
Net:	58.072			

Total: 58.072 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC-M5-1
Delta H @: 1.840
Y - Factor: 0.986
Probe ID: 1105292
CP Value: 0.84
Liner Material: glass
Hot Box ID: —
Filter Exit ID: —
Impinger Outlet ID: GN-29
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
C / 1	3	187.83	1.4	3.5	143	244	NA	67	NA	86	5.0	
/ 2	6	190.90	1.4	3.5	143	243		67		86	5.0	
/ 3	9	193.80	1.2	3.0	143	245		65		88	5.0	
/ 4	12	196.63	1.1	2.8	144	246		64		90	5.0	
/ 5	15	199.168	0.90	2.3	143	246		63		91	4.0	
A / 1	18	202.18	1.4	3.5	144	244		67		91	6.0	
/ 2	21	205.28	1.4	3.5	144	245		64		92	6.0	
/ 3	24	208.31	1.3	3.3	144	245		64		92	6.0	
/ 4	27	211.20	1.2	3.0	143	244		65		93	5.0	
/ 5	30	213.929	1.0	2.5	144	244		68		93	6.0	
D / 1	33	217.03	1.4	3.5	144	224		67		92	6.0	
/ 2	36	220.06	1.3	3.3	144	224		65		92	6.0	
/ 3	39	223.04	1.3	3.3	143	224		65		93	6.0	
/ 4	42	225.77	1.0	2.5	144	224		66		94	5.0	
/ 5	45	228.187	0.8	2.0	143	224		68		94	4.0	
B / 1	48	231.14	1.3	3.3	144	224		67		92	7.0	
/ 2	51	234.24	1.4	3.5	144	223		64		93	7.0	
/ 3	54	237.28	1.3	3.3	143	224		63		94	7.0	
/ 4	57	240.30	1.2	3.0	144	224		64		94	6.0	
/ 5	60	242.872	1.0	2.5	144	224		64		94	5.0	
/												
/												
/												
/												
/												

Field Notes: 96 SCF

511150 Hovensa LLC

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/17/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

ALDEHYDES - METHOD 0011

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.50	144	91
1-2	1.30	1.1402	3.25	144	90
1-3	1.20	1.0954	3.00	143	91
1-4	1.10	1.0488	2.75	144	92
1-5	0.95	0.9747	2.38	143	92
2-1	1.40	1.1832	3.50	144	91
2-2	1.40	1.1832	3.50	144	92
2-3	1.40	1.1832	3.50	144	91
2-4	1.30	1.1402	3.25	144	92
2-5	1.00	1.0000	2.50	144	92
3-1	1.40	1.1832	3.50	144	89
3-2	1.40	1.1832	3.50	144	90
3-3	1.30	1.1402	3.25	144	90
3-4	1.10	1.0488	2.75	144	91
3-5	0.78	0.8832	1.95	144	91
4-1	1.40	1.1832	3.50	144	90
4-2	1.40	1.1832	3.50	144	90
4-3	1.30	1.1402	3.25	144	90
4-4	1.20	1.0954	3.00	144	90
4-5	1.00	1.0000	2.50	144	91
K-Factor					
2.50	**1.24**	**1.1086**	**3.09**	**143.9**	**90.8**

Entec Services, Inc.

511150 Hovensa LLC

Page 95 of 701

Plant: Hovensa
USVI
Site: FCC
Date: 6-17-2011
Run No.: D
Time: 1037 / 1200

Moisture: Initial / Final / Totals
Impinger No. 1
Impinger No. 2 — See Recovery Sheet
Impinger No. 3
Silica Gel

Analyst: KR
Assistant: AT

Orsat / Fyrite / ~~ENTEC~~ CEMS (Plant) - Analysis: / Average:
O2:
CO2:
CO:
N2:

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.70
Stack Diameter: 132.0"
K Factor: 2.50

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:
Pre-Test: Volume @ 0.000, Vacuum 14"
Post-Test: Volume @ 0.000, Vacuum 15"
Pitot Check Pre: Positive 6.3, Negative 5.8
Pitot Check Post: Positive 3.0, Negative 3.0

Equipment Checklist:
Meter Box ID: NC-MS-1
Delta H @: 1.840
Y - Factor: 0.986
Probe ID: 1105292
CP Value: 0.84
Liner Material: glass
Hot Box ID: —
Filter Exit ID: —
Impinger Outlet ID: GN-29
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	301.942			
Initial:	243.200			
Net:	58.742			

Total: 58.742 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
C / 1	3	246.62	1.4	3.5	144	224	NA	67	NA	91	6.0	
/ 2	6	249.49	1.3	3.3	144	224		68		90	6.0	
/ 3	9	252.18	1.2	3.0	143	226		67		91	6.0	
/ 4	12	255.02	1.1	2.8	144	225		68		92	5.0	
/ 5	15	257.638	0.95	2.4	143	223		67		92	4.0	
A / 1	18	260.68	1.4	3.5	144	223		67		91	7.0	
/ 2	21	263.78	1.4	3.5	144	223		63		92	7.0	
/ 3	24	266.88	1.4	3.5	144	224		61		91	7.0	
/ 4	27	269.92	1.3	3.3	144	224		62		92	7.0	
/ 5	30	272.763	1.0	2.5	144	224		62		92	7.0	
B / 1	33	275.83	1.4	3.5	144	224		67		89	7.0	
/ 2	36	278.93	1.4	3.5	144	223		67		90	7.0	
/ 3	39	281.96	1.3	3.3	144	223		65		90	7.0	
/ 4	42	284.80	1.1	2.8	144	224		66		91	6.0	
/ 5	45	287.176	0.98	2.0	144	225		67		91	4.0	
B / 1	48	290.24	1.4	3.5	144	225		67		90	7.0	
/ 2	51	293.33	1.4	3.5	144	226		67		90	7.0	
/ 3	54	296.37	1.3	3.3	144	223		65		90	7.0	
/ 4	57	299.29	1.2	3.0	144	224		65		90	7.0	
/ 5	60	301.942	1.0	2.5	144	223		65		91	6.0	
/												
/												
/												
/												
/												

Field Notes: Spill ID = 0611-35

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/17/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

ALDEHYDES - METHOD 0011

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.50	144	87
1-2	1.40	1.1832	3.50	144	87
1-3	1.30	1.1402	3.25	144	88
1-4	1.20	1.0954	3.00	144	89
1-5	1.00	1.0000	2.50	144	89
2-1	1.40	1.1832	3.50	143	88
2-2	1.30	1.1402	3.25	144	88
2-3	1.20	1.0954	3.00	144	89
2-4	1.10	1.0488	2.75	144	90
2-5	0.94	0.9695	2.35	144	90
3-1	1.40	1.1832	3.50	146	89
3-2	1.40	1.1832	3.50	144	89
3-3	1.30	1.1402	3.25	144	90
3-4	1.10	1.0488	2.75	145	89
3-5	0.76	0.8718	1.90	145	90
4-1	1.40	1.1832	3.50	144	89
4-2	1.40	1.1832	3.50	145	89
4-3	1.40	1.1832	3.50	146	90
4-4	1.30	1.1402	3.25	146	90
4-5	0.94	0.9695	2.35	145	91
K-Factor					
2.50	**1.23**	**1.1063**	**3.08**	**144.5**	**89.1**

Entec Services, Inc.

Plant

Plant:	Hovensa
	USVI
Site:	FCC
Date:	6-17-2011
Run No.:	3
Time:	1223
	1335

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See	Recovery	Sheet
Impinger No. 3			
Silica Gel			

Analyst: KR

Assistant: AI

Orsat / Fyrite / ~~ENTEC~~ CEMS - Analysis: Average:

O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barometric Pressure: 29.80

Stack Pressure: -0.75

Stack Diameter: 132.0"

K Factor: 2.50

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 12"

Post-Test: Volume @ 0.000 Vacuum 10"

Pitot Check Pre: Positive 3.0 Negative 3.0

Pitot Check Post: Positive 5.0 Negative 4.7

Equipment Checklist:

Meter Box ID:	NC-MS-1
Delta H @:	1.840
Y - Factor:	0.986
Probe ID:	1105292
CP Value:	0.84
Liner Material:	glass
Hot Box ID:	–
Filter Exit ID:	–
Impinger Outlet ID:	GN-29
Filter ID:	–
Fyrite ID:	–
Acetone Lot No:	–

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	360.718			
Initial:	302.202			
Net:	58.516			

Total: 58.516 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B 1 / 1	3	305.36	1.4	3.5	144	225	NA	67	NA	87	6.0	
/ 2	6	308.52	1.4	3.5	144	223		67		87	6.0	
/ 3	9	311.43	1.3	3.3	144	225		67		88	5.0	
/ 4	12	314.42	1.2	3.0	144	223		66		89	5.0	
/ 5	15	317.053	1.0	2.5	144	224		66		89	4.0	
C / 1	18	320.10	1.4	3.5	143	225		67		88	6.0	
/ 2	21	323.10	1.3	3.3	144	226		66		88	6.0	
/ 3	24	326.03	1.2	3.0	144	225		67		89	5.0	
/ 4	27	328.82	1.1	2.8	144	225		67		90	5.0	
/ 5	30	331.427	0.94	2.4	144	225		68		90	4.0	
D / 1	33	334.51	1.4	3.5	146	224		67		89	6.0	
/ 2	36	337.62	1.4	3.5	144	223		67		89	6.0	
/ 3	39	340.65	1.3	3.3	144	224		67		90	6.0	
/ 4	42	343.44	1.1	2.8	145	225		67		89	5.0	
/ 5	45	345.898	0.76	1.9	145	225		67		90	4.0	
A / 1	48	348.90	1.4	3.5	144	223		67		89	7.0	
/ 2	51	352.00	1.4	3.5	145	223		65		89	7.0	
/ 3	54	355.12	1.4	3.5	146	223		65		90	7.0	
/ 4	57	358.11	1.3	3.3	146	224		66		90	7.0	
/ 5	60	360.718	0.94	2.4	145	222		67		91	5.0	
/												
/												
/												
/												
/												

Field Notes:

Method 0011 Field Data Sheet

APPENDIX A.6

METHOD 23

DIOXINS AND FURANS

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	Acetone, Methylene Chloride, Toluene
TEST PERFORMED:	Dioxins & Furans
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 106 DSCF (180 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Dioxins & Furans	EPA Method	23

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Kevin Rosenberg
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Chuck Duncan IV
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/16/11 06/17/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended	-	Military Time	1013-1330	1418-1736	843-1213	
Sampling Time	θ	minutes	180	180	180	180
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.74	29.74	29.80	29.76
Stack Static Pressure	P_g	in. H_2O	-0.69	-0.65	-0.49	-0.61
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	1.010	1.010	1.010	1.010
Meter Delta H @	ΔH@	in. H_2O	1.905	1.905	1.905	1.905
Nozzle Diameter	D_n	inches	0.218	0.218	0.218	0.218
Meter Volume	V_m	dcf	128.170	129.650	135.668	131.163
Meter Temperature	t_m	°F	90.9	91.2	90.1	90.7
Avg. Orifice Delta H	ΔH	in. H_2O	1.73	1.74	1.98	1.81
Impingers Weight Gain (Moisture)	W_{imp}	grams	716.3	716.4	764.1	732.3
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	32.1	33.3	22.2	29.2
Oxygen Concentration, dry basis	O_2	%	1.71	1.55	1.60	1.62
Carbon Dioxide Concentration, dry basis	CO_2	%	13.94	14.09	14.14	14.06
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_2O)^{1/2}$	1.067	1.071	1.142	1.093
Stack Temperature	t_s	°F	141.3	141.0	141.6	141.3
Analytical Lab Data Input						
Total Target Analytes Dibenzo-p-dioxins		pg	32.9	28.9	42.6	34.8
Total Target Analytes Dibenzofurans		pg	31.8	30.2	37.8	33.3
Total Target Analytes Dibenzo-p-dioxins and Dibenzofurans		pg	64.7	59.1	80.4	68.1
PCB-77 33'44'-TeCB		pg	7.41	73.1	5.02	28.5
PCB-81 344'5-TeCB		pg	1.47	5.05	2.00	2.8
PCB-105 233'44'-PeCB		pg	18.3	45.3	10.9	24.8
PCB-114 2344'5-PeCB		pg	1.51	3.43	1.46	2.1
PCB-118 23'44'5-PeCB		pg	42.6	102	27.6	57.4
PCB-123 2'344'5-PeCB		pg	2.88	4.7	1.36	3.0
PCB-126 33'44'5-PeCB		pg	2.01	2.25	1.97	2.1
PCB-156 233'44'5-HxCB		pg	4.09	2.47	2.53	3.0
PCB-157 233'44'5'-HxCB		pg	1.17	1.19	1.07	1.1
PCB-167 23'44'55'-HxCB		pg	2.18	1.52	1.03	1.6
PCB-169 33'44'55'-HxCB		pg	1.54	1.63	1.46	1.5
PCB-189 233'44'55'-HpCB		pg	2.17	1.76	1.75	1.9

0 = DL DL = detection limit.

[1] = EMPC, EPMC = estimated maximum possible concentration.

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: Lynn Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/16/11	06/16/11	06/17/11	
Emission Test Run Time Began - Ended		-	Military Time	1013-1330	1418-1736	843-1213	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.69	29.69	29.76	29.72
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	29.87	29.87	29.95	29.89
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	123.801	125.178	131.590	126.856
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	3.506	3.545	3.726	3.592
4a. Standard Volume of Water Vapor Condensed	$=0.04706*W_{vpc}$	$V_{wc(std)}$	scf	33.709	33.714	35.959	34.460
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715*W_{sg}$	$V_{wsg(std)}$	scf	1.514	1.570	1.047	1.377
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2215	0.2199	0.2195	0.2203
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[6.37-(2827/(Ts+460-85.2))]}/P_s$	TB_{ws}	fraction	0.2046	0.2033	0.2057	0.2046
7. Standard Water Volume @ Saturation (Theoretical)	=Vm(std) * (TBws)/(1-TBws)	$TV_{W(std)}$	scf	31.854	31.948	34.076	32.626
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	676.7	678.7	723.9	693.1
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.299	30.316	30.326	30.314
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.782	27.812	27.791	27.795
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt }\Delta P)_{ave}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	65.39	65.60	69.95	66.982
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_n$	Q_a	acfm	372,859	374,067	398,868	381,932
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	324,779	325,999	348,134	332,971
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	258,315	259,715	276,527	264,852
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	178.707	180.302	189.818	182.942
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	97.62	98.18	96.93	97.58
Analytical Lab Data Calculated							
25a. Dioxin (Target PCDDs) Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	4.11E-12	3.60E-12	5.31E-12	4.34E-12
25b. Furan (Target PCDFs) Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	3.96E-12	3.76E-12	4.72E-12	4.15E-12
25c. Combined Target DD/DF Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	8.07E-12	7.36E-12	1.00E-11	8.48E-12
25d. PCB-77 33'44'-TeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	9.24E-13	9.11E-12	6.26E-13	3.55E-12
25e. PCB-81 344'5-TeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	1.83E-13	6.29E-13	2.49E-13	3.54E-13
25f. PCB-105 233'44'-PeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	2.28E-12	5.65E-12	1.36E-12	3.10E-12
25g. PCB-114 2344'5-PeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	1.88E-13	4.27E-13	1.82E-13	2.66E-13
25h. PCB-118 23'44'5-PeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	5.31E-12	1.27E-11	3.44E-12	7.15E-12
25i. PCB-123 2'344'5-PeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	3.59E-13	5.86E-13	1.70E-13	3.71E-13
25j. PCB-126 33'44'5-PeCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	2.51E-13	2.80E-13	2.46E-13	2.59E-13
25k. PCB-156 233'44'5-HxCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	5.10E-13	3.08E-13	3.15E-13	3.78E-13
25l. PCB-157 233'44'5'-HxCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	1.46E-13	1.48E-13	1.33E-13	1.42E-13
25m. PCB-167 23'44'55'-HxCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	2.72E-13	1.89E-13	1.28E-13	1.97E-13
25n. PCB-169 33'44'55'-HxCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	1.92E-13	2.03E-13	1.82E-13	1.92E-13
25o. PCB-189 233'44'55'-HpCB Conc. @ STP	=0.01543*mn/1000000000/Vm(std)	cs	gr / dscf	2.70E-13	2.19E-13	2.18E-13	2.36E-13

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: Lynn Beane

Description	Formulas	Symbol	Units	Calculated Data			
26a. Dioxin (Target PCDDs) Mass Emissions	= (60/7000)*cs*Qsd	PMR_{DD}	lb / hr	9.09E-09	7.97E-09	1.17E-08	7.20E-09
26b. Furan (Target PCDFs) Mass Emissions	= (60/7000)*cs*Qsd	PMR_{DF}	lb / hr	8.78E-09	8.33E-09	1.04E-08	6.89E-09
26c. Combined Target DD/DF Mass Emissions	= (60/7000)*cs*Qsd	$PMR_{D/F}$	lb / hr	1.79E-08	1.63E-08	2.22E-08	1.41E-08
26d. PCB-77 33'44'-TeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	2.04E-09	2.02E-08	1.39E-09	5.90E-09
26e. PCB-81 344'5-TeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	4.06E-10	1.39E-09	5.52E-10	5.88E-10
26f. PCB-105 233'44'-PeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	5.05E-09	1.25E-08	3.01E-09	5.14E-09
26g. PCB-114 2344'5-PeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	4.17E-10	9.47E-10	4.03E-10	4.42E-10
26h. PCB-118 23'44'5-PeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	1.18E-08	2.81E-08	7.62E-09	1.19E-08
26i. PCB-123 2'344'5-PeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	7.95E-10	1.30E-09	3.75E-10	6.17E-10
26j. PCB-126 33'44'5-PeCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	5.55E-10	6.21E-10	5.44E-10	4.30E-10
26k. PCB-156 233'44'5-HxCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	1.13E-09	6.82E-10	6.98E-10	6.27E-10
26l. PCB-157 233'44'5'-HxCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	3.23E-10	3.28E-10	2.95E-10	2.37E-10
26m. PCB-167 23'44'55'-HxCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	6.02E-10	4.19E-10	2.84E-10	3.26E-10
26n. PCB-169 33'44'55'-HxCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	4.25E-10	4.50E-10	4.03E-10	3.19E-10
26o. PCB-189 233'44'55'-HpCB Mass Emissions	= (60/7000)*cs*Qsd	PMR_{PCB}	lb / hr	5.99E-10	4.86E-10	4.83E-10	3.92E-10
Analytical Lab Data Calculated (Metric)							
15a. Dioxin (Target PCDDs) Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	9.40E+00	8.24E+00	1.21E+01	7.44E+00
15b. Furan (Target PCDFs) Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	9.07E+00	8.61E+00	1.08E+01	7.12E+00
15c. Combined Target DD/DF Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	1.85E+01	1.68E+01	2.29E+01	1.46E+01
15d. PCB-77 33'44'-TeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	2.11E+00	2.09E+01	1.43E+00	6.10E+00
15e. PCB-81 344'5-TeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	4.19E-01	1.44E+00	5.71E-01	6.08E-01
15f. PCB-105 233'44'-PeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	5.22E+00	1.29E+01	3.11E+00	5.31E+00
15g. PCB-114 2344'5-PeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	4.31E-01	9.78E-01	4.16E-01	4.56E-01
15h. PCB-118 23'44'5-PeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	1.22E+01	2.91E+01	7.87E+00	1.23E+01
15i. PCB-123 2'344'5-PeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	8.22E-01	1.34E+00	3.88E-01	6.38E-01
15j. PCB-126 33'44'5-PeCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	5.73E-01	6.42E-01	5.62E-01	4.44E-01
15k. PCB-156 233'44'5-HxCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	1.17E+00	7.05E-01	7.22E-01	6.48E-01
15l. PCB-157 233'44'5'-HxCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	3.34E-01	3.39E-01	3.05E-01	2.45E-01
15m. PCB-167 23'44'55'-HxCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	6.22E-01	4.34E-01	2.94E-01	3.37E-01
15n. PCB-169 33'44'55'-HxCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	4.39E-01	4.65E-01	4.16E-01	3.30E-01
15o. PCB-189 233'44'55'-HpCB Conc. @ STP	=pg/Vm(std)	c_s	pg / dscm	6.19E-01	5.02E-01	4.99E-01	4.05E-01
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		1.0035	0.9957	1.0114	1.0035
% Difference, (Calibration must be within 5% of original Y-factor)							0.64%

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC**

Source: **Fluid Catalytic Cracking Unit (FCCU)**

Test Date: **6/16/2011**

Run Number: **1**

DIOXINS & FURANS - METHOD 23

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.10	141	83
1-2	1.40	1.1832	2.10	141	86
1-3	1.30	1.1402	1.95	142	88
1-4	1.10	1.0488	1.65	141	90
1-5	0.74	0.8602	1.11	141	91
2-1	1.40	1.1832	2.10	141	90
2-2	1.30	1.1402	1.95	142	91
2-3	1.30	1.1402	1.95	141	92
2-4	1.20	1.0954	1.80	141	93
2-5	0.95	0.9747	1.43	141	93
3-1	1.40	1.1832	2.10	141	92
3-2	1.30	1.1402	1.95	142	92
3-3	1.10	1.0488	1.65	141	93
3-4	1.00	1.0000	1.50	142	93
3-5	0.67	0.8185	1.01	141	92
4-1	1.40	1.1832	2.10	142	91
4-2	1.30	1.1402	1.95	141	91
4-3	1.10	1.0488	1.65	141	92
4-4	1.00	1.0000	1.50	141	92
4-5	0.67	0.8185	1.01	141	93
K-Factor					
1.50	**1.15**	**1.0665**	**1.73**	**141.3**	**90.9**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa

~~FCC ST~~ US VI

Site: FCC Stack

Date: 6-16-2011

Run No.: 1

Time: 1013 / 1330

Job No.: 511150

Barametric Pressure: 29.74

Stack Pressure: -0.69

Stack Diameter: 11.0 = 95.033

K Factor: 1.5

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See	Recovery	Sheet
Silica Gel			

Analyst: KR

Assistant: AF, CDW

Orsat / Fyrite / (CEMS) Gas Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

Pre-Test:	Volume @	Vacuum
	0.010	10"

Post-Test:	Volume @	Vacuum
	0.001	9"

Pitot Check Pre: Positive 5.2 / Negative 5.2

Pitot Check Post: Positive 6.4 / Negative 4.4

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	1060.675			
Initial:	932.505			
Net:	128.170			

Total: 128.170 Cubic Ft.

Equipment Checklist:

Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 1105291
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-14
Filter Exit ID: TCG-003
Impinger Outlet ID: GN-26
Filter ID: Run 1
Fyrite ID: —
Acetone Lot No: C039920

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	~~Filter~~ Cyclone Outlet	Meter Avg.	Vacuum	Other
A 1 / 1	9	935.45	1.4	2.1	141	235	230	65	67	83	5.0	
/ 2	18	946.42	1.4	2.1	141	235	230	58	57	86	6.0	
/ 3	27	953.38	1.3	2.0	142	234	231	59	56	88	6.0	
/ 4	36	959.81	1.1	1.7	141	235	234	54	55	90	5.0	
/ 5	45	964.872	0.74	1.1	141	234	230	51	48	91	3.0	
D A / 1	54	971.82	1.4	2.1	141	233	234	57	48	90	6.0	
/ 2	63	978.69	1.3	2.0	142	229	231	56	57	91	6.0	
/ 3	72	986.26	1.3	2.0	141	230	227	59	52	92	6.0	
/ 4	81	992.22	1.2	1.8	141	231	232	65	59	93	6.0	
/ 5	90	998.71	0.95	1.4	141	230	226	54	50	93	4.0	
C 3 / 1	99	1005.00	1.4	2.1	141	234	233	59	50	92	6.0	
/ 2	108	1011.92	1.3	2.0	142	236	233	58	50	92	6.0	
/ 3	117	1018.43	1.1	1.7	141	236	232	59	53	93	6.0	
/ 4	126	1024.40	1.0	1.5	142	236	232	60	56	93	5.0	
/ 5	135	1029.213	0.67	1.0	141	236	232	63	61	92	4.0	
D B 4 / 1	144	1036.29	1.4	2.1	142	228	232	67	64	91	7.0	
/ 2	153	1043.33	1.3	2.0	141	229	226	64	56	91	7.0	
/ 3	162	1049.80	1.1	1.7	141	230	228	64	57	92	6.0	
/ 4	171	1055.88	1.0	1.5	141	230	227	63	59	92	5.0	
/ 5	180	1060.675	0.67	1.0	141	232	226	62	61	93	4.0	
/												
/												
/												
/												
/												

Field Notes:

Method 23 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/16/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

DIOXINS & FURANS - METHOD 23

Traverse Point	Delta P	P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.10	142	86
1-2	1.30	1.1402	1.95	141	87
1-3	1.10	1.0488	1.65	141	89
1-4	1.00	1.0000	1.50	141	90
1-5	0.70	0.8367	1.05	141	91
2-1	1.40	1.1832	2.10	142	90
2-2	1.30	1.1402	1.95	141	91
2-3	1.20	1.0954	1.80	141	92
2-4	1.00	1.0000	1.50	141	92
2-5	0.75	0.8660	1.13	140	92
3-1	1.40	1.1832	2.10	141	90
3-2	1.40	1.1832	2.10	141	91
3-3	1.40	1.1832	2.10	141	92
3-4	1.20	1.0954	1.80	141	93
3-5	0.85	0.9220	1.28	140	93
4-1	1.40	1.1832	2.10	141	92
4-2	1.40	1.1832	2.10	141	93
4-3	1.20	1.0954	1.80	141	93
4-4	1.00	1.0000	1.50	141	93
4-5	0.80	0.8944	1.20	141	93
K-Factor					
1.50	**1.16**	**1.0709**	**1.74**	**141.0**	**91.2**

Entec Services, Inc.

511150 Hovensa LLC

Page 106 of 701

Plant: Hovensa

OSVI

Site: FCC Stack

Date: 6-16-2011

Run No.: 2

Time: 1418 / 1736

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: KR

Assistant: AL

Orsat / Fyrite (CEMS) Gas Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barametric Pressure: 29.74

Stack Pressure: -0.65

Stack Diameter: 132"

K Factor: 1.5

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum
Volume @	0.001	20"
	Post-Test:	Vacuum
Volume @	0.001	11"

Pitot Check Pre: Positive 6.4 / Negative 4.4

Pitot Check Post: Positive 5.3 / Negative 6.1

Equipment Checklist:

Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 1105291
CP Value: 0.84
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: TCG-003
Impinger Outlet ID: GN-26
Filter ID: Run-2
Fyrite ID: —
Acetone Lot No: C039920

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	190.562			
Initial:	60.912			
Net:	129.650			

Total: 129.650 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Condenser Filter Outlet	Meter Avg.	Vacuum	Other
D / 1	9	67.80	1.4	2.1	142	228	228	67	68	86	5.0	
/ 2	18	74.86	1.3	2.0	141	228	232	57	54	87	5.0	
/ 3	27	81.39	1.1	1.7	141	229	228	56	51	89	5.0	
/ 4	36	87.34	1.0	1.5	141	226	224	58	52	90	4.0	
/ 5	45	92.628	0.70	1.1	141	227	228	62	62	91	3.0	
C / 1	54	100.45	1.4	2.1	142	236	234	67	65	90	6.0	
/ 2	63	106.68	1.3	2.0	148	242	234	59	58	91	6.0	
/ 3	72	113.32	1.2	1.8	141	241	235	62	58	92	6.0	
/ 4	81	119.43	1.0	1.5	141	235	234	61	59	92	5.0	
/ 5	90	124.651	0.75	1.1	140	235	235	65	63	92	4.0	
B / 1	99	131.71	1.4	2.1	141	233	231	67	67	90	7.0	
/ 2	108	138.85	1.4	2.1	141	233	235	56	57	91	7.0	
/ 3	117	145.89	1.4	2.1	141	232	233	56	52	92	7.0	
/ 4	126	152.57	1.2	1.8	141	230	232	56	51	93	6.0	
/ 5	135	158.282	0.85	1.3	140	231	232	55	53	93	4.0	
A / 1	144	165.30	1.4	2.1	141	235	233	65	59	92	7.0	
/ 2	153	172.34	1.4	2.1	141	234	233	60	57	93	7.0	
/ 3	162	179.13	1.2	1.8	141	234	229	65	63	93	7.0	
/ 4	171	185.25	1.0	1.5	141	235	230	67	67	93	6.0	
/ 5	180	190.562	0.80	1.2	141	235	232	55	57	93	4.0	
/												
/												
/												
/												
/												

Field Notes:

Method 23 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/16/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

DIOXINS & FURANS - METHOD 23

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.50	1.2247	2.25	143	83
1-2	1.50	1.2247	2.25	142	84
1-3	1.40	1.1832	2.10	141	86
1-4	1.10	1.0488	1.65	141	88
1-5	0.72	0.8485	1.08	140	89
2-1	1.50	1.2247	2.25	142	90
2-2	1.50	1.2247	2.25	141	90
2-3	1.30	1.1402	1.95	141	91
2-4	1.20	1.0954	1.80	142	92
2-5	1.20	1.0954	1.80	141	92
3-1	1.50	1.2247	2.25	142	90
3-2	1.50	1.2247	2.25	142	91
3-3	1.50	1.2247	2.25	141	92
3-4	1.30	1.1402	1.95	142	92
3-5	0.99	0.9950	1.49	141	92
4-1	1.50	1.2247	2.25	142	91
4-2	1.50	1.2247	2.25	142	92
4-3	1.50	1.2247	2.25	143	92
4-4	1.30	1.1402	1.95	141	92
4-5	0.83	0.9110	1.25	141	92
K-Factor					
1.50	**1.32**	**1.1423**	**1.98**	**141.6**	**90.1**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa
US VI.
Site: FCC

Date: 6-17-2011

Run No.: 3

Time: 0843 / 1213

Moisture | Initial | Final | Totals
Impinger No. 1
Impinger No. 2 — See Recovery Sheet
Impinger No. 3
Silica Gel

Analyst: KB/BR
Assistant: AI

Orsat / Fyrite / CEMS Gas Analysis: | Average:
O2:
CO2:
CO:
N2:

Job No.: S11150

Barametric Pressure: 29.80

Stack Pressure: -0.49

Stack Diameter: 132"

K Factor: 1.50

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.001 | Vacuum 10"
Post-Test: Volume @ 0.001 | Vacuum 10"

Pitot Check Pre: Positive 5.1 / Negative 4.7
Pitot Check Post: Positive 4.3 / Negative 6.2

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	326.550			
Initial:	190.882			
Net:	135.668			

Total: 135.668 Cubic Ft.

Equipment Checklist:
Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 11052291
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-14
Filter Exit ID: TCG-203
Impinger Outlet ID: GN26
Filter ID: Run 2
Fyrite ID: —
Acetone Lot No: C039920

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Condenser Filter Outlet	Meter Avg.	Vacuum	Other
D / 1	9	198.04	1.50	2.25	143	230	225	50	62	83	5	
/ 2	18	205.28	1.50	2.25	142	234	228	51	62	84	6	
/ 3	27	213.08	1.40	2.10	141	234	233	54	62	86	6	
/ 4	36	218.61	1.10	1.65	141	237	239	51	63	88	5	
/ 5	45	223.55	0.72	1.08	140	236	233	52	63	89	3	
C / 1	54	230.81	1.50	2.25	142	239	237	52	64	90	7	
/ 2	63 1:03	238.07	1.50	2.25	141	239	239	48	59	90	7	
/ 3	72 1:12	244.91	1.30	1.95	141	239	240	48	58	91	6	
/ 4	81 1:21	251.54	1.20	1.80	142	238	237	50	59	92	5	
/ 5	90 1:30	257.97	1.20	1.80	141	239	236	51	59	92	5	
B / 1	99 1:39	265.240	1.50	2.25	142	233	245	56	62	90	7	
/ 2	108 1:48	272.48	1.50	2.25	142	235	237	58	63	91	7	
/ 3	117 1:57	279.73	1.50	2.25	141	237	238	54	63	92	7	
/ 4	126 2:06	286.54	1.30	1.95	142	235	244	55	63	92	6	
/ 5	135 2:15	292.50	0.99	1.48	141	238	231	56	63	92	5	
A / 1	144 2:24	299.78	1.50	2.25	142	236	238	58	60	91	7	
/ 2	153 2:33	307.05	1.50	2.25	142	241	234	53	58	92	7	
/ 3	162 2:42	314.28	1.50	2.25	143	241	232	53	59	92	7	
/ 4	171 2:51	321.05	1.30	1.95	141	239	239	54	61	92	6	
/ 5	180 3:00	326.550	0.83	1.24	141	240	235	53	58	92	5	
/												
/												
/												
/												
/												

Field Notes:

Method 23 Field Data Sheet

APPENDIX A.7

METHOD 5 / 202

TOTAL PARTICULATE

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	Acetone / DI Water / Hexane
TEST PERFORMED:	Total Particulate w/ Condensibles (Dry Impinger)
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 71 DSCF (150 minutes) / Elevated Filter Temperature

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Filterable PM	EPA Method	5
Condensable PM (Dry Impinger)	EPA Method	202

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Tim Draheim
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Ben Rogers
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/18/11 06/19/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended	-	Military Time	750-1148	1244-1547	746-1049	
Sampling Time	θ	minutes	150	150	150	150
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	In. Hg	29.80	29.80	29.80	29.80
Stack Static Pressure	P_g	in. H_20	-0.49	-0.49	-0.49	-0.49
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	1.010	1.010	1.010	1.010
Meter Delta H @	$\Delta H@$	in. H_20	1.905	1.905	1.905	1.905
Nozzle Diameter	D_n	inches	0.225	0.225	0.225	0.225
Meter Volume	V_m	dcf	114.239	112.222	115.565	114.009
Meter Temperature	t_m	°F	91.8	92.1	91.2	91.7
Avg. Orifice Delta H	ΔH	in. H_20	1.93	1.95	2.07	1.98
Impingers Weight Gain (Moisture)	W_{imp}	grams	633.1	627.8	655.4	638.8
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	34.2	34.3	30.1	32.9
Oxygen Concentration, dry basis	O_2	%	1.76	1.72	1.86	1.78
Carbon Dioxide Concentration, dry basis	CO_2	%	14.11	14.12	13.97	14.07
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_2O)^{1/2}$	1.063	1.068	1.100	1.077
Stack Temperature	t_s	°F	140.9	141.0	141.7	141.2
Analytical Lab Data Input						
Filterable Particulate Collected	m_n	mg	39.2	52.7	55.6	49.2
Condensible Particulate Collected	$m_o + m_l - m_b$	mg_{cond}	52.9	64.5	100.3	72.6
Total Particulate Collected	$m_n + m_o + m_l - m_b$	mg_{total}	92.1	117.2	155.9	91.3

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: Lynn Beane

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended		-	Military Time	750-1148	1244-1547	746-1049	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.76	29.76	29.76	29.76
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	29.94	29.94	29.95	29.95
3. Standard Meter Volume	$= 17.64^* Y^* (V_m/T_m)^* (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	110.452	108.448	111.894	110.265
3A. (Metric) Standard Meter Volume	$=V_{m(std)}{}^* 0.0283168465921$	$V_{m(std)}$	dscm	3.128	3.071	3.168	3.122
4a. Standard Volume of Water Vapor Condensed	$=0.04706^*W_{imp}$	$V_{wc(std)}$	scf	29.794	29.544	30.843	30.060
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715^*W_{sg}$	$V_{wsg(std)}$	scf	1.613	1.617	1.419	1.550
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2214	0.2232	0.2238	0.2228
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[8.37-12927/(ts+460-96.2)]}/P_s$	TB_{ws}	fraction	0.2021	0.2026	0.2062	0.2036
7. Standard Water Volume @ Saturation (Theoretical)	$=Vm(std)^* (TBws)/(1-TBws)$	$TV_{w(std)}$	scf	27.970	27.550	29.068	28 196
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	594.2	585.3	617.6	599.0
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32^*(O_2)+ 0.44^*(CO_2)+0.28^*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.328	30.328	30.310	30.322
10. Molecular Weight Of Stack Gas, wet basis	$= M_d^*(1-B_{ws})+18.0^*(B_{ws})$	M_s	g/g-mole	27.837	27.831	27.771	27.813
11. Average Stack Gas Velocity	$= 85.49^*C_p^*(\text{sqrt } \Delta P)_{avg}{}^*SQRT((T_s) / (P_s{}^*M_w))$	v_s	ft/s	65.02	65.32	67.40	65.913
12. Stack Gas Flow @ Actual Conditions	$= 60^*v_s{}^*A_s$	Q_a	acfm	370,735	372,459	384,309	375,834
13. Stack Gas Flow @ Standard Conditions	$= Q_a{}^*(T_{std}/T_s)^*(P_s/P_{std})$	Q_s	scfm	323,957	325,409	335,372	328,246
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s{}^*(1-B_{ws})^*(T_{std}/T_s)^*(P_s/P_{std})$	Q_{std}	dscfm	258,497	259,488	266,214	261,400
15a. Filterable Particulate Concentration @ Std. Conditions	$=0.01543^*m_n/V_{m(std)}$	c_s	gr/dscf	0.0055	0.0075	0.0077	0.0069
15b. Condensible Particulate Concentration @ Std. Conditions	$=0.01543^*m_n/V_{m(std)}$	c_{scond}	gr/dscf	0.0074	0.0092	0.0138	0.0101
15c. Total Particulate Concentration @ Std. Conditions	$=0.01543^*m_n/V_{m(std)}$	c_{scomb}	gr/dscf	0.0129	0.0167	0.0215	0.0170
21a. Filterable Particulate Emissions	$= (60/7000)^*c_s{}^*Q_{std}$	PMR	lb/hr	12.13	16.68	17.50	15.44
21b. Condensible Particulate Emissions	$= (60/7000)^*c_{s\,cond}{}^*Q_{std}$	PMR_{cond}	lb/hr	16.37	20.41	31.56	22.78
21c. Total Particulate Emissions	$= (60/7000)^*c_{s\,total}{}^*Q_{std}$	PMR_{comb}	lb/hr	28.51	37.09	49.06	38.22
22. Volume collected through nozzle	$=T_s/P_s{}^*[0.002669^*V_{lc}+ V_m{}^*Y^*P_m/T_m]$	V_n	acf	158.416	155.669	161.540	158.542
23. Particulate concentration, @ actual conditions	$=0.01543^*m_n/V_n$	c_a	gr/acf	0.0038	0.0116	0.0149	0.0101
24. Isokinetic Sampling Rate, Percent	$= 100^*Vn / (60^*v_s{}^*A_n{}^*0)$	I	%	98.05	95.90	96.45	96.80
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		0.9910	1.0145	1.0146	1.0067
% Difference, (Calibration must be within 5% of original Y-factor)							0.33%

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

TOTAL PARTICULATE - METHODS 5/202

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.30	1.1402	2.20	141	84
1-2	1.30	1.1402	2.20	141	86
1-3	1.20	1.0954	2.03	141	89
1-4	0.92	0.9592	1.56	141	90
1-5	0.74	0.8602	1.25	140	91
2-1	1.30	1.1402	2.20	141	92
2-2	1.20	1.0954	2.03	141	93
2-3	1.20	1.0954	2.03	140	94
2-4	0.95	0.9747	1.61	140	94
2-5	0.80	0.8944	1.36	141	94
3-1	1.30	1.1402	2.20	141	93
3-2	1.30	1.1402	2.20	141	92
3-3	1.20	1.0954	2.03	141	92
3-4	1.20	1.0954	2.03	141	93
3-5	0.89	0.9434	1.51	141	93
4-1	1.30	1.1402	2.20	141	91
4-2	1.30	1.1402	2.20	141	92
4-3	1.30	1.1402	2.20	141	93
4-4	1.20	1.0954	2.03	141	94
4-5	0.88	0.9381	1.49	141	95
K-Factor					
1.69	**1.14**	**1.0632**	**1.93**	**140.9**	**91.8**

Entec Services, Inc.

Plant: Hovensa
Christiansted, St. Croix
Site: FCC stack

Date: 6/18/11

Run No.: 1

Time: 0750 1148

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: BR

Assistant: AI, CDIV, TD

Orsat / Fyrite / ~~CEMS~~ Plant - Gas Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barametric Pressure: 29.80"

Stack Pressure: -0.49

Stack Diameter: 152"

K Factor: 1.69 ~~1.49~~ ~~1.69~~

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.225	0.225
	0.225	0.225
	0.225	0.225
Average:	0.225	0.225

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum	Pitot Check Pre:	
0.003	15"	Positive	4.4
		Negative	5.2

Post-Test: Volume @	Vacuum	Pitot Check Post:	
0.001	15"	Positive	5.5
		Negative	5.3

Equipment Checklist:
Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 1105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: TC-7
Impinger Outlet ID: GN-3
Filter ID: 3643
Fyrite ID: —
Acetone Lot No: C039920

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	392.215	444.955		
Initial:	329.040	393.891		
Net:	63.175	51.064		

Total: 114.239 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet ±220	Meter Avg.	Vacuum	CPM <85 ~~Other~~ (Aux)
D / 1	0	329.040	1.30	2.19	141	300	280	55	299	84	5	82
/ 2	7.5	334.37	1.30	2.19	141	306	288	52	319	86	13	81
/ 3	15	340.60	1.20	2.02	141	289	284	52	329	89	13	82
/ 4	22.5	346.39	0.92	1.55	141	308	292	54	331	90	8	82
/ 5	30	351.41	0.74	1.25	140	303	284	53	322	91	6	74
C / 1	37.5	355.99	1.30	2.19	141	310	303	60	326	92	6	76
/ 2	45	361.94	1.20	2.02	141	310	303	56	327	93	7	74
/ 3	52.5	367.69	1.20	2.02	140	311	305	60	324	94	8	80
/ 4	60	373.36	0.95	1.60	140	306	304	64	320	94	13	70
/ 5	67.5 (1:07)	378.22	0.80	1.35	141	308	305	64	319	94	11	68
B / 1	75 (1:15)	383.42	1.30	2.19	141	310	303	59	324	93	6	71
/ 2	82.5 (1:22)5	389.02	1.30	2.19	141	301	281	56	299	92	5	78
/ 3	90 (1:30)	396.93	1.20	2.02	141	304	290	57	304	92	4	76
/ 4	97.5 (1:37)5	402.69	1.20	2.02	141	276	223	53	318	93	4.0	76
/ 5	105 (1:45)	408.44	0.89	1.50	141	294	235	58	324	93	3.0	77
* A / 1	112.5 (1:52)5	413.41	1.30	2.60	141	310	273	64	317	91	5	80
/ 2	120 (2:00)	419.90	1.30	2.60	141	312	279	54	322	92	6	79
/ 3	127.5 (2:07)5	426.43	1.30	2.60	141	311	279	58	315	93	6	80
/ 4	135 (2:15)	432.45	1.20	2.40	141	312	275	61	310	94	6	81
/ 5	142.5 (2:22)5	439.38	0.88	1.76	141	312	270	60	304	95	6	78
/	150 (2:30)	444.955										
/												
/												
/												
/												

Field Notes: * ▲ K factor to 200

Method 5/202 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

TOTAL PARTICULATE - METHODS 5/202

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.37	142	88
1-2	1.40	1.1832	2.37	141	89
1-3	1.40	1.1832	2.37	141	90
1-4	1.20	1.0954	2.03	141	91
1-5	0.77	0.8775	1.30	141	92
2-1	1.30	1.1402	2.20	141	91
2-2	1.30	1.1402	2.20	141	92
2-3	1.30	1.1402	2.20	141	93
2-4	1.20	1.0954	2.03	141	93
2-5	0.98	0.9899	1.66	141	94
3-1	1.30	1.1402	2.20	141	92
3-2	1.20	1.0954	2.03	141	93
3-3	1.00	1.0000	1.69	141	93
3-4	1.00	1.0000	1.69	141	93
3-5	0.74	0.8602	1.25	141	93
4-1	1.40	1.1832	2.37	141	92
4-2	1.20	1.0954	2.03	141	93
4-3	1.20	1.0954	2.03	141	93
4-4	1.00	1.0000	1.69	140	93
4-5	0.74	0.8602	1.25	140	93
K-Factor					
1.69	**1.15**	**1.0679**	**1.95**	**141.0**	**92.1**

Entec Services, Inc.

511150 Hovensa LLC

Page 116 of 701

Plant: Hovensa
Christiansted, St. Croix
Site: FCC Stack

Date: 6/18/11

Run No.: 2

Time:
1244
1547

Moisture | Initial | Final | Totals
Impinger No. 1
Impinger No. 2
Impinger No. 3 — See Recovery Sheet
Silica Gel

Analyst: BL
Assistant: MC, CDS, TD

Orsat / Fyrite / CEMS - Gas Analysis: | Average:
O2:
CO2:
CO: Plant Cems
N2:

Job No.: 511150

Barametric Pressure: 29.80"

Stack Pressure: -0.49

Stack Diameter: 132"

K Factor: 1.69

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.225	0.225
	0.225	0.225
	0.225	0.225
Average:	0.225	0.225

Probe & Pitot Leak Checks:

	Volume @	Vacuum
Pre-Test:	0.002	15"
Post-Test:	0.002	15"

Pitot Check Pre: Positive 5.5 / Negative 5.3
Pitot Check Post: Positive 4.7 / Negative 6.1

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	557.626			
Initial:	445.404			
Net:	112.222			

Total: 112.222 Cubic Ft.

Equipment Checklist:
Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: FC-7
Impinger Outlet ID: CN-3
Filter ID: 3644
Fyrite ID: —
Acetone Lot No: CD8990

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet (320 ±25)	Meter Avg.	Vacuum	CPM Other
A / 1	0	445.404	1.40	2.36	142	306	240	62	299	88	5	72
/ 2	7.5	451.61	1.40	2.36	141	309	251	63	302	89	5	71
/ 3	15	457.84	1.40	2.36	141	309	254	64	307	90	5	73
/ 4	22.5	464.05	1.20	2.02	141	312	271	65	306	91	5	78
/ 5	30	469.83	0.77	1.30	141	310	257	51	309	92	4	74
B / 1	37.5	474.49	1.30	2.19	141	311	293	48	315	91	5	77
/ 2	45	480.46	1.30	2.19	141	308	304	49	330	92	5	76
/ 3	52.5	486.41	1.30	2.19	141	301	295	50	331	93	5	77
/ 4	60	492.37	1.20	2.02	141	289	295	51	326	95	5	79
/ 5	67.5 (1:07)[5]	498.05	0.98	1.65	141	292	250	54	321	94	5	81
C / 1	75 (1:15)	503.26	1.30	2.19	141	314	299	46	318	92	6	80
/ 2	82.5 (1:22)[5]	509.39	1.20	2.02	141	312	304	46	326	93	5	75
/ 3	90 (1:30)	515.15	1.00	1.69	141	310	300	48	320	95	5	71
/ 4	97.5 (1:37)[5]	520.45	1.00	1.69	141	309	297	49	312	93	5	75
/ 5	105 (1:45)	525.71	0.74	1.25	141	311	300	50	310	93	4	76
D / 1	112.5 (1:52)[5]	530.22	1.40	2.36	141	300	280	47	326	92	6	73
/ 2	120 (2:00)	536.37	1.20	2.02	141	305	296	50	328	93	5	73
/ 3	127.5 (2:07)[5]	542.13	1.20	2.02	141	306	291	53	326	93	5	76
/ 4	135 (2:15)	547.86	1.00	1.69	140	304	293	56	320	93	5	77
/ 5	142.5 (2:22)[5]	553.13	0.74	1.25	140	304	297	56	320	93	5	78
/	150 (2:30)	557.626										
/												
/												
/												
/												

Field Notes:

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

TOTAL PARTICULATE - METHODS 5/202

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.37	141	83
1-2	1.40	1.1832	2.37	141	84
1-3	1.20	1.0954	2.03	141	86
1-4	1.10	1.0488	1.86	141	88
1-5	0.65	0.8062	1.10	141	89
2-1	1.40	1.1832	2.37	141	90
2-2	1.40	1.1832	2.37	142	92
2-3	1.20	1.0954	2.03	142	92
2-4	1.10	1.0488	1.86	142	93
2-5	0.78	0.8832	1.32	141	93
3-1	1.40	1.1832	2.37	142	92
3-2	1.40	1.1832	2.37	142	93
3-3	1.40	1.1832	2.37	142	93
3-4	1.30	1.1402	2.20	142	93
3-5	0.84	0.9165	1.42	142	94
4-1	1.40	1.1832	2.37	142	93
4-2	1.40	1.1832	2.37	142	93
4-3	1.40	1.1832	2.37	142	94
4-4	1.30	1.1402	2.20	142	94
4-5	0.99	0.9950	1.68	142	94
K-Factor					
1.69	**1.22**	**1.1001**	**2.07**	**141.7**	**91.2**

Entec Services, Inc.

Plant: Hovensa
Site: Christiansted, St Croix FCL Stack
Date: 6/19/11
Run No.: 3
Time: 0746 / 1049

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	Silica Recovery		Sheet
Silica Gel			

Analyst: BR
Assistant: AI, CDOI, TD

Orsat / Fyrite / CEMS - Gas Analysis: Plant CEMS

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barametric Pressure: 29.80"
Stack Pressure: -0.49
Stack Diameter: 132"
K Factor: 1.69

Nozzle Calibrations:

Pre-Test:	Post-Test:
0.225	0.225
0.225	0.225
0.225	0.225
Average: 0.225	0.225

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum
0.001	15"

Post-Test: Volume @ 0.001 Vacuum 15"

Pitot Check Pre: Positive 5.2 Negative 4.5
Pitot Check Post: Positive 5.8 Negative 6.1

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	587.013	675.002		
Initial:	559.261	587.189		
Net:	27.752	87.813		

Total: 115.565 Cubic Ft.

Equipment Checklist:
Meter Box ID: Apex C
Delta H @: 1.905
Y - Factor: 1.010
Probe ID: 1105290
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-10
Filter Exit ID: FE-7
Impinger Outlet ID: EN-3
Filter ID: 3645
Fyrite ID: —
Acetone Lot No: CL099WS

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet (320 ± 25)	Meter Avg.	Vacuum	CPM Other
D 1	0	559.261	1.40	2.36	141	290	260	60	298	93	4	79
2	7.5	565.36	1.40	2.36	141	304	271	53	316	84	4	79
3	15	571.56	1.20	2.02	141	306	270	51	326	86	4	78
4	22.5	577.31	1.10	1.85	141	303	282	52	325	88	3	81
5	30	582.83	0.65	1.09	141	304	278	51	326	89	3	81
C 1	37.5	587.013	1.40	2.34	141	315	299	49	312	90	4	82
2	45	593.37	1.40	2.34	142	314	299	45	327	92	4	81
3	52.5	599.61	1.20	2.02	142	310	295	46	330	92	4	80
4	60	605.37	1.16	1.85	142	305	289	50	321	95	3	81
5	67.5 (1:07)[5]	610.92	0.78	1.31	141	303	289	51	318	93	3	79
B 1	75 (1:15)	615.54	1.40	2.36	142	300	272	49	318	92	4	78
2	82.5 (1:22)[5]	621.73	1.40	2.36	142	304	266	51	325	93	4	77
3	90 (1:30)	627.94	1.40	2.36	142	300	276	53	327	93	4	78
4	97.5 (1:37)[5]	634.15	1.30	2.19	142	281	265	55	327	93	4	81
5	105 (1:45)	640.16	0.84	1.41	142	282	247	58	322	94	3	82
A 1	112.5 (1:52)[5]	645.01	1.40	2.36	142	306	273	55	309	93	4	81
2	120 (2:00)	651.24	1.40	2.36	142	304	271	52	318	93	4	77
3	127.5 (2:07)[5]	657.45	1.40	2.36	142	306	274	55	310	94	4	77
4	135 (2:15)	663.45	1.30	2.19	142	304	283	58	312	94	4	79
5	142.5 (2:22)[5]	669.58	0.99	1.67	142	307	285	59	315	94	3	81
1	150 (2:30)	675.002										
1												
1												
1												
1												

Field Notes:

511150 Hovensa LLC

APPENDIX A.8

METHOD 29

METALS

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	Acetone & Nitric Acid
TEST PERFORMED:	Metals
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 106 DSCF (150 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Metals	EPA Method	29

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Ben Rogers
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Chuck Duncan IV
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/18/11 06/19/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, AL 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended	-	Military Time	752-1145	1244-1547	746-1049	
Sampling Time	θ	minutes	150	150	150	150
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.80	29.80	29.80	29.80
Stack Static Pressure	P_g	in. H_20	-0.49	-0.49	-0.49	-0.49
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.996	0.996	0.996	0.996
Meter Delta H @	$\Delta H@$	in. H_20	1.825	1.825	1.825	1.825
Nozzle Diameter	D_n	inches	0.250	0.250	0.250	0.250
Meter Volume	V_m	dcf	140.060	138.829	138.873	139.254
Meter Temperature	t_m	°F	89.7	88.8	89.0	89.2
Avg. Orifice Delta H	ΔH	in. H_20	3.11	3.05	3.07	3.08
Impingers Weight Gain (Moisture)	W_{imp}	grams	790.0	783.3	790.9	788.1
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	27.6	28.3	20.0	25.3
Oxygen Concentration, dry basis	O_2	%	1.75	1.72	1.86	1.78
Carbon Dioxide Concentration, dry basis	CO_2	%	14.11	14.12	13.97	14.07
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_20)^{1/2}$	1.117	1.105	1.108	1.110
Stack Temperature	t_s	°F	144.5	144.3	144.6	144.5
Analytical Lab Data Input						
Total Antimony collected	Sb	mg	0.0085	0.0071	0.0068	0.0075
Total Arsenic collected	As	mg	0.0009	0.0010	0.0007	0.001
Total Berylium collected	Be	mg	0.0001	0.0001	0.0001	0.00
Total Cadmium collected	Cd	mg	0.0011	0.0006	0.0004	0.001
Total Chromium collected	Cr	mg	0.0061	0.0033	0.0064	0.01
Total Colbalt collected	Co	mg	0.0081	0.0019	0.0019	0.00
Total Lead collected	Pb	mg	0.0099	0.0046	0.0069	0.01
Total Manganese collected	Mn	mg	0.0462	0.0125	0.0136	0.0
Total Nickel collected	Ni	mg	0.0227	0.0186	0.0191	0.0
Total Selenium collected	Se	mg	0.0055	0.0054	0.0047	0.01

*Denotes a value less than Detection Limit =

ENTEC Services, Inc.

30 Monroe Drive - Pelham, AL 35124

CALCULATED TEST DATA

Client: Hovensa, LLC — Job No.: 511150

Source: Fluid Catalytic Cracking Unit (FCCU) — Data Input By: L. Beane

Description	Formulas	Symbol	Units	Calculated Data			
				1	2	3	AVERAGE
Run Number		-	-				
Test Date		-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended		-	Military Time	752-1145	1244-1547	746-1049	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.76	29.76	29.76	29.76
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	30.03	30.02	30.03	30.03
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	134.427	133.442	133.444	133.771
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168466921$	$V_{m(std)}$	dscm	3.807	3.779	3.779	3.788
4a. Standard Volume of Water Vapor Condensed	$=0.04706*W_{lc}$	$V_{wc(std)}$	scf	37.177	36.862	37.220	37.086
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715*W_{sg}$	$V_{wsg(std)}$	scf	1.301	1.334	0.943	1.193
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2225	0.2225	0.2224	0.2225
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{(8.27-(2627.6/(t_m+459.6+0.2t_m)))}/P_s$	TB_{ws}	fraction	0.2216	0.2205	0.2219	0.2213
7. Standard Water Volume @ Saturation (Theoretical)	$=Vm(std) * (TBws)/(1-TBws)$	$TV_{w(std)}$	scf	38.268	37.743	38.049	38.020
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_w	ml	813.0	801.9	808.4	807.7
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.328	30.328	30.310	30.322
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.596	27.610	27.578	27.595
11. Average Stack Gas Velocity	$= 85.49*C_p*(sqrt\ \Delta P)_{avg}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	68.84	68.06	68.29	68.397
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_s	acfm	392,535	388,069	389,400	390,001
13. Stack Gas Flow @ Standard Conditions	$= Q_s*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	340,935	337,168	338,184	338,762
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	265,386	262,828	263,151	263,789
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	196.842	197.039	197.475	197.785
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	94.15	94.37	94.25	94.26
Analytical Lab Data Calculated							
Antimony Concentration @ Standard Conditions	$=(0.01543*Sb_{mg})/V_{m(std)}$	c_s	gr/dscf	9.76E-07	8.20E-07	7.77E-07	8.43E-07
Arsenic Concentration @ Standard Conditions	$=(0.01543*As_{mg})/V_{m(std)}$	c_a	gr/dscf	1.08E-07	1.13E-07	7.55E-08	9.87E-08
Beryllium Concentration @ Standard Conditions	$=(0.01543*Be_{mg})/V_{m(std)}$	c_e	gr/dscf	5.74E-09	5.74E-09	5.74E-09	5.74E-09
Cadmium Concentration @ Standard Conditions	$=(0.01543*Cd_{mg})/V_{m(std)}$	c_c	gr/dscf	1.29E-07	6.46E-08	4.74E-08	8.02E-08
Chromium Concentration @ Standard Conditions	$=(0.01543*Cr_{mg})/V_{m(std)}$	c_c	gr/dscf	7.04E-07	3.76E-07	7.31E-07	6.04E-07
Colbalt Concentration @ Standard Conditions	$=(0.01543*Co_{mg})/V_{m(std)}$	c_c	gr/dscf	9.33E-07	2.12E-07	2.12E-07	4.53E-07
Lead Concentration @ Standard Conditions	$=(0.01543*Pb_{mg})/V_{m(std)}$	c_e	gr/dscf	1.13E-06	5.31E-07	7.92E-07	8.19E-07
Manganese Concentration @ Standard Conditions	$=(0.01543*Mn_{mg})/V_{m(std)}$	c_m	gr/dscf	5.30E-06	1.43E-06	1.56E-06	2.77E-06
Nickel Concentration @ Standard Conditions	$=(0.01543*Ni_{mg})/V_{m(std)}$	c_n	gr/dscf	2.61E-06	2.13E-06	2.19E-06	2.31E-06
Selenium Concentration @ Standard Conditions	$=(0.01543*Se_{mg})/V_{m(std)}$	c_s	gr/dscf	6.29E-07	6.16E-07	5.39E-07	5.95E-07
Antimony Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.0022	0.0019	0.0018	0.0020
Arsenic Emissions	$= (60/7000)*c_a*Q_{std}$	-	lb/hr	0.0002	0.0003	0.0002	0.0002
Beryllium Emissions	$= (60/7000)*c_e*Q_{std}$	-	lb/hr	0.0000	0.0000	0.0000	0.0000
Cadmium Emissions	$= (60/7000)*c_c*Q_{std}$	-	lb/hr	0.0003	0.0001	0.0001	0.0002
Chromium Emissions	$= (60/7000)*c_c*Q_{std}$	-	lb/hr	0.0016	0.0009	0.0017	0.0014
Colbalt Emissions	$= (60/7000)*c_c*Q_{std}$	-	lb/hr	0.0021	0.0005	0.0005	0.0010
Lead Emissions	$= (60/7000)*c_e*Q_{std}$	-	lb/hr	0.0026	0.0012	0.0018	0.0019
Manganese Emissions	$= (60/7000)*c_m*Q_{std}$	-	lb/hr	0.0121	0.0033	0.0036	0.0063
Nickel Emissions	$= (60/7000)*c_n*Q_{std}$	-	lb/hr	0.0059	0.0049	0.0050	0.0053
Selenium Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.0014	0.0014	0.0012	0.0014
Analytical Lab Data Calculated (Metric)							
Antimony Emissions	$= c_s*V_{m(std)}$	c_s	mg/dscm	2.23E-03	1.88E-03	1.78E-03	1.96E-03
Arsenic Emissions	$= c_a*V_{m(std)}$	c_a	mg/dscm	2.46E-04	2.59E-04	1.73E-04	2.26E-04
Beryllium Emissions	$= c_e*V_{m(std)}$	c_e	mg/dscm	1.31E-05	1.31E-05	1.31E-05	1.31E-05
Cadmium Emissions	$= c_c*V_{m(std)}$	c_c	mg/dscm	2.94E-04	1.48E-04	1.08E-04	1.84E-04
Chromium Emissions	$= c_c*V_{m(std)}$	c_c	mg/dscm	1.61E-03	8.62E-04	1.67E-03	1.38E-03
Colbalt Emissions	$= c_c*V_{m(std)}$	c_c	mg/dscm	2.14E-03	4.86E-04	4.86E-04	1.04E-03
Lead Emissions	$= c_e*V_{m(std)}$	c_e	mg/dscm	2.60E-03	1.22E-03	1.81E-03	1.87E-03
Manganese Emissions	$= c_m*V_{m(std)}$	c_m	mg/dscm	1.21E-02	3.28E-03	3.57E-03	6.33E-03
Nickel Emissions	$= c_n*V_{m(std)}$	c_n	mg/dscm	5.96E-03	4.89E-03	5.02E-03	5.29E-03
Selenium Emissions	$= c_s*V_{m(std)}$	c_s	mg/dscm	1.44E-03	1.41E-03	1.23E-03	1.36E-03
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		Y_{qa}		1.0452	1.0423	1.0467	1.0447
% Difference, (Calibration must be within 5% of original Y-factor)							-4.69%

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

SPECIATED METALS - METHOD 29

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.50	1.2247	3.71	144	85
1-2	1.40	1.1832	3.46	144	88
1-3	1.10	1.0488	2.72	144	89
1-4	0.97	0.9849	2.40	144	90
1-5	0.97	0.9849	2.40	143	88
2-1	1.40	1.1832	3.46	145	89
2-2	1.50	1.2247	3.71	145	89
2-3	1.50	1.2247	3.71	145	91
2-4	1.30	1.1402	3.22	145	90
2-5	0.93	0.9644	2.30	144	91
3-1	1.50	1.2247	3.71	145	89
3-2	1.50	1.2247	3.71	145	91
3-3	1.30	1.1402	3.22	145	92
3-4	1.30	1.1402	3.22	145	91
3-5	1.00	1.0000	2.47	144	91
4-1	1.40	1.1832	3.46	145	89
4-2	1.40	1.1832	3.46	145	89
4-3	1.30	1.1402	3.22	145	91
4-4	1.00	1.0000	2.47	144	90
4-5	0.90	0.9487	2.23	144	91
K-Factor					
2.47	**1.26**	**1.1174**	**3.11**	**144.5**	**89.7**

Entec Services, Inc.

Plant: Hovensa
Christiansted, St. Croix
Site: FCC stack

Date: 6/18/11

Run No.: 1

Time: 0752 1145

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See	Recovery	
Silica Gel		Sheet	

Analyst: BR

Assistant: AI, CDI, TD

Orsat / Fyrite / ~~ENTEC CEMS~~ Plant - Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barometric Pressure: 29.80"

Stack Pressure: -0.49

Stack Diameter: 132"

K Factor: 2.47

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum
0.000	10"

Post-Test: Volume @	Vacuum
0.000	10"

Pitot Check Pre: Positive 5.2 / Negative 5.8

Pitot Check Post: Positive 4.9 / Negative 5.6

Equipment Checklist:
Meter Box ID: NC-M5-2
Delta H @: 1.825
Y - Factor: 0.996
Probe ID: ESP-51B
CP Value: 0.84
Liner Material: Glass
Hot Box ID: ~~HB~~ NCHC1
Filter Exit ID: —
Impinger Outlet ID: GN-8
Filter ID: ~~Q1~~ Q132
Fyrite ID: —
Acetone Lot No: CCO29920

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	607.731			
Initial:	467.671			
Net:	140.060			

Total: 140.060 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
C / 1	0	467.671	1.50	3.70	144	244	245	64	N/A	85	7	
/ 2	7.5	475.33	1.40	3.45	144	245	244	59		88	7	
/ 3	15	482.69	1.10	2.71	144	245	246	59		89	6	
/ 4	22.5	489.29	0.97	2.39	144	246	248	59		90	6	
/ 5	30	495.44	0.97	2.39	143	244	244	61		88	6	
B / 1	37.5	501.62	1.40	3.45	145	245	244	63		89	7	
/ 2	45	508.95	1.50	3.70	145	244	249	63		89	7	
/ 3	52.5	516.60	1.50	3.70	145	246	250	64		91	7	
/ 4	60	524.27	1.30	3.21	145	244	248	55		90	8	
/ 5	67.5 (1:07)	530.93	0.93	2.29	144	246	252	56		91	6	
A / 1	75 (1:15)	537.43	1.50	3.70	145	245	248	60		89	6	
/ 2	82.5 (1:22)	545.07	1.50	3.70	145	245	247	61		91	8	
/ 3	90 (1:30)	552.75	1.30	3.21	145	245	248	62		92	8	
/ 4	97.5 (1:37)	559.96	1.30	3.21	145	245	242	64		91	8.0	
/ 5	105 (1:45)	567.12	1.00	2.47	144	245	240	65		91	7	
D / 1	112.5 (1:52)	573.44	1.40	3.45	145	247	251	56		89	8	
/ 2	120 (2:00)	580.86	1.40	3.45	145	245	238	59		89	8	
/ 3	127.5 (2:07)	588.31	1.30	3.21	145	245	239	59		91	8	
/ 4	135 (2:15)	595.46	1.00	2.47	144	245	251	61		90	8	
/ 5	142.5 (2:22)	601.78	0.90	2.22	144	245	247	63		91	8	
/	150 (2:30)	607.731										
/												
/												
/												
/												

Field Notes:

Method 29 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

SPECIATED METALS - METHOD 29

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.46	144	85
1-2	1.50	1.2247	3.71	145	88
1-3	1.40	1.1832	3.46	144	88
1-4	1.10	1.0488	2.72	144	88
1-5	0.74	0.8602	1.83	142	90
2-1	1.40	1.1832	3.46	144	87
2-2	1.40	1.1832	3.46	145	89
2-3	1.40	1.1832	3.46	145	88
2-4	1.30	1.1402	3.22	145	91
2-5	1.10	1.0488	2.72	144	90
3-1	1.40	1.1832	3.46	145	89
3-2	1.40	1.1832	3.46	145	88
3-3	1.40	1.1832	3.46	145	90
3-4	1.30	1.1402	3.22	145	90
3-5	1.00	1.0000	2.47	144	89
4-1	1.30	1.1402	3.22	144	88
4-2	1.20	1.0954	2.97	144	90
4-3	1.10	1.0488	2.72	144	89
4-4	0.96	0.9798	2.37	144	89
4-5	0.83	0.9110	2.05	144	90
K-Factor					
2.47	**1.23**	**1.1052**	**3.05**	**144.3**	**88.8**

Entec Services, Inc.

Plant: Hovensa
Christiansted, St. Croix
Site: FCC Stack

Date: 6/18/11

Run No.: 2

Time: 1244 1547

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: BR

Assistant: AI, CD, TD

Orsat / Fyrite / ~~ENTEC~~ Plant CEMS - Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150

Barometric Pressure: 29.80"

Stack Pressure: -0.49

Stack Diameter: 132"

K Factor: 2.47

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.250	0.250
	0.250	0.250
	0.250	0.250
Average:	0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @	Vacuum
0.003	15"

Post-Test: Volume @	Vacuum
0.001	15"

Pitot Check Pre: Positive 4.9 / Negative 5.6

Pitot Check Post: Positive 5.2 / Negative 5.3

Equipment Checklist:
Meter Box ID: NC-M5-2
Delta H @: 1.825
Y - Factor: 0.996
Probe ID: ESP-81B
CP Value: 0.84
Liner Material: Glass
Hot Box ID: NC AC 1
Filter Exit ID: —
Impinger Outlet ID: GN-8
Filter ID: Q148
Fyrite ID: —
Acetone Lot No: C6833920

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:	746.836			
Initial:	608.007			
Net:	138.829			

Total: 138.829 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
D / 1	0	608.007	1.40	3.45	144	246	245	63	N/A	85	7	
/ 2	7.5	615.41	1.50	3.70	145	244	240	60		88	7	
/ 3	15	623.04	1.40	3.45	144	244	240	62		88	7	
/ 4	22.5	630.45	1.10	2.71	144	249	251	63		88	7	
/ 5	30	637.13	0.74	1.82	142	244	240	63		90	5	
A / 1	37.5	642.54	1.40	3.45	144	246	247	56		87	7	
/ 2	45	649.93	1.40	3.45	145	245	245	58		89	7	
/ 3	52.5	657.35	1.40	3.45	145	244	246	61		88	7	
/ 4	60	664.75	1.30	3.21	145	245	251	64		91	7	
/ 5	67.5(1:07)5	671.92	1.10	2.71	144	245	245	63		90	7	
B / 1	75(1:15)	678.55	1.40	3.45	145	244	242	57		89	7	
/ 2	82.5(1:22)5	685.97	1.40	3.45	145	245	244	59		88	7	
/ 3	90(1:30)	693.41	1.40	3.45	145	244	247	61		90	8	
/ 4	97.5(1:37)5	700.82	1.30	3.21	145	245	252	63		90	8	
/ 5	105(1:45)	707.97	1.00	2.47	144	246	248	64		89	7	
C / 1	112.5(1:52)5	714.32	1.30	3.21	144	245	244	63		88	8	
/ 2	120(2:00)	721.46	1.20	2.96	144	245	245	58		90	8	
/ 3	127.5(2:07)2	728.37	1.10	2.71	144	245	243	58		89	8	
/ 4	135(2:15)	734.94	0.96	2.37	144	244	249	61		89	8	
/ 5	142.5(2:22)5	741.15	0.83	2.05	144	247	246	63		90	7	
/	150(2:30)	746.836										
/												
/												
/												
/												

Field Notes:

Method 29 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

SPECIATED METALS - METHOD 29

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.46	144	82
1-2	1.40	1.1832	3.46	144	85
1-3	1.30	1.1402	3.22	144	88
1-4	0.95	0.9747	2.35	144	88
1-5	0.83	0.9110	2.05	143	89
2-1	1.40	1.1832	3.46	145	89
2-2	1.50	1.2247	3.71	145	90
2-3	1.50	1.2247	3.71	145	90
2-4	1.30	1.1402	3.22	145	91
2-5	0.92	0.9592	2.28	143	90
3-1	1.40	1.1832	3.46	145	89
3-2	1.40	1.1832	3.46	145	89
3-3	1.40	1.1832	3.46	145	91
3-4	1.30	1.1402	3.22	145	90
3-5	1.00	1.0000	2.47	145	91
4-1	1.30	1.1402	3.22	145	88
4-2	1.40	1.1832	3.46	145	91
4-3	1.50	1.2247	3.71	145	89
4-4	0.94	0.9695	2.33	145	91
4-5	0.69	0.8307	1.71	144	89
K-Factor					
2.47	**1.24**	**1.1081**	**3.07**	**144.6**	**89.0**

Entec Services, Inc.

511150 Hovensa LLC

Plant: Hovensa
Site: Christansted, St. Croix FCC Stack
Date: 6/19/11
Run No.: 3
Time: 0746 / 1049

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	gel	Recovery	sweet
Silica Gel			

Analyst: BR
Assistant: AI, CD II, TD

Orsat / Fyrite / ENTEC CEMS - Analysis: Plant

			Average
O2:			
CO2:			
CO:			
N2:			

Job No.: 511150
Barometric Pressure: 29.80"
Stack Pressure: -0.49
Stack Diameter: 132"
K Factor: 2.47

Nozzle Calibrations:

Pre-Test:	Post-Test:
0.250	0.250
0.250	0.250
0.250	0.250
Average: 0.250	0.250

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 10"
Post-Test: Volume @ 0.000 Vacuum 10"

Pitot Check Pre: Positive 4.6 / Negative 4.9
Pitot Check Post: Positive 6.1 / Negative 4.4

Equipment Checklist:
Meter Box ID: NC-MS-2
Delta H @: 1.825
Y - Factor: 0.996
Probe ID: ESP-518
CP Value: 0.84
Liner Material: Glass
Hot Box ID: NCAC1
Filter Exit ID: —
Impinger Outlet ID: AN-8
Filter ID: Q146
Fyrite ID: —
Acetone Lot No: CO39910

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	886.057			
Initial:	747.184			
Net:	138.873			

Total: 138.873 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
C 1	0	747.184	1.40	3.45	144	245	245	60	N/A	82	7	
2	7.5	754.51	1.40	3.49	144	244	245	60		85	7	
3	15	761.89	1.30	3.21	144	245	244	61		88	7	
4	22.5	769.04	0.95	2.34	144	245	250	62		89	6	
5	30	775.18	0.83	2.05	143	245	245	65		87	5	
B 1	37.5	780.91	1.40	3.45	145	244	243	57		89	7	
2	45	788.28	1.50	3.70	145	244	246	54		90	7	
3	52.5	795.94	1.50	3.70	145	246	248	56		98	7	
4	60	803.61	1.30	3.21	145	245	240	57		91	7	
5	67.5 (1:07)[5]	810.76	0.92	2.27	143	245	248	56		90	6	
A 1	75 (1:15)	816.92	1.40	3.45	145	246	249	58		89	7	
2	82.5 (1:22)[5]	824.21	1.40	3.45	145	245	239	59		89	7	
3	90 (1:30)	831.64	1.40	3.45	145	245	255	57		2391	7	
4	97.5 (1:37)[5]	839.03	1.30	3.21	145	245	245	61		90	7	
5	105 (1:45)	846.17	1.00	2.47	145	245	252	55		91	7	
D 1	112.5 (1:52)[5]	852.67	1.30	3.21	146	241	231	54		88	7	
2	120 (2:00)	859.78	1.40	3.45	145	247	245	53		91	8	
3	127.5 (2:07)[5]	867.15	1.50	3.70	145	246	246	54		89	8	
4	135 (2:15)	874.79	0.94	2.32	145	247	252	57		91	9	
5	142.5 (2:22)[5]	880.88	0.69	1.70	144	244	238	58		89	7	
	150 (2:30)	886.057										

Field Notes:

Method 24 Field Data Sheet

APPENDIX A.9

METHOD 0061

HEXAVALENT CHROMIUM

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC		
PLANT LOCATION:	US Virgin Island - St. Criox		
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)		
SOURCE CONDITION:	Petroleum Refinery ICR		
SOURCE SHAPE:	Circular		
PROBE WASH CHEMICAL(S):	3N NaOH, 6N NaOH		
TEST PERFORMED:	Hexavalent Chromium		
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 106 DSCF (150 minutes)		
REFERENCE TEST METHODS:	Sample Location	EPA Method	1
	Volumetric Flow	EPA Method	2
	Molecular Weight	EPA Method	3A
	Moisture Content	EPA Method	4
	Hexavalent Chromium	EPA Method	0061
PROJECT MANAGER	Mr. Chuck Duncan		
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Tim Draheim		
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Kevin Rosenberg and Mr. Andrew Imes		
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS		
RULING AGENCY :	Environmental Protection Agency (EPA)		
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers		
DATES TESTS CONDUCTED:	06/18/11 06/19/11		
ENTEC PROJECT NUMBER:	511150		

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended	-	Military Time	750-1104	1244-1533	746-1049	
Sampling Time	θ	minutes	114.3	127.5	150	131
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.80	29.80	29.80	29.80
Stack Static Pressure	P_g	in. H_20	-0.48	-0.59	-0.47	-0.51
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.986	0.986	0.986	0.986
Meter Delta H @	$\Delta H@$	in. H_20	1.840	1.840	1.840	1.840
Nozzle Diameter	D_n	inches	0.248	0.248	0.248	0.248
Meter Volume	V_m	dcf	109.764	123.711	145.754	126.410
Meter Temperature	t_m	°F	94.0	88.7	90.4	91.0
Avg. Orifice Delta H	ΔH	in. H_20	3.03	3.07	3.09	3.06
Impingers Weight Gain (Moisture)	W_{imp}	grams	633.1	627.8	655.4	638.8
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	34.2	34.3	30.1	32.9
Oxygen Concentration, dry basis	O_2	%	1.77	1.72	1.86	1.78
Carbon Dioxide Concentration, dry basis	CO_2	%	14.11	14.12	13.97	14.07
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_20)^{1/2}$	1.109	1.117	1.119	1.115
Stack Temperature	t_s	°F	144.0	144.1	144.2	144.1
Analytical Lab Data Input						
Total Hexavalent Chromium Collected	-	ug	3.30	0.53	5.32	3.05

*Denotes a value less than Detection Limit =

Lab Note: Please note Element One - Analytical QA/QC section for additional information in regards to sample analysis

Test Note - Moisture Determinatin was based on the Method 5/ 202 sampling train

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **Lynn Beane**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended		-	Military Time	750-1104	1244-1533	746-1049	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.76	29.76	29.77	29.76
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	30.02	30.03	30.03	30.03
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	103.461	117.744	138.315	119.840
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	2.930	3.334	3.917	3.393
4a. Standard Volume of Water Vapor Condensed	$=0.04706 * W_{imp}$	$V_{wc(std)}$	scf	29.794	29.544	30.843	30.060
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715 * W_{sg}$	$V_{wsg(std)}$	scf	1.613	1.617	1.419	1.550
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2329	0.2093	0.1891	0.2104
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[6.37-(2627/(ts+460-85.2))]/P_s}$	TB_{ws}	fraction	0.2188	0.2195	0.2196	0.2193
7. Standard Water Volume @ Saturation (Theoretical)	#NAME?	$TV_{w(std)}$	scf	28.981	33.118	38.930	33.677
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	615.7	703.6	827.1	715.5
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2) + 0.44*(CO_2) + 0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.328	30.328	30.310	30.322
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws}) + 18.0*(B_{ws})$	M_s	g/g-mole	27.631	27.748	27.981	27.787
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	68.28	68.60	68.43	68.436
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_a	acfm	389,319	391,159	390,189	390,222
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	338,430	339,871	339,110	339,137
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_a*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	264,375	268,746	274,972	269,364
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc} + V_m*Y*P_m/T_m]$	V_n	acf	152.366	171.388	196.284	173.346
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	97.03	97.36	95.01	96.46
Analytical Lab Data Calculated							
Hexavalent Chromium Concentration @ Standard Conditions	$=0.01543*(m_{tv1009}/V_{m(std)})$	c_s	gr/dscf	4.92E-07	6.92E-08	5.93E-07	3.85E-07
Hexavalent Chromium Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	0.0011	0.0002	0.0014	0.0009
Analytical Lab Data Calculated (Metric)							
Hexavalent Chromium Emissions	$= c_s*V_{m(std)}$	c_s	ug/dscm	1.13	0.16	1.36	0.88
Post Meter Orifice Cal. (EMC ALT-009 Yqa)		y_{qa}		1.0026	0.9939	0.9970	0.9978
% Difference, (Calibration must be within 5% of original Y-factor)							-1.20%

ENTEC Services, Inc.

30 Monroe Drive - Pelham Alabama 3512430 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

HEXAVALENT CHROMIUM - METHOD 0061

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.50	1.2247	3.68	144	87
1-2	1.40	1.1832	3.43	144	92
1-3	1.40	1.1832	3.43	144	94
1-4	1.20	1.0954	2.94	144	94
1-5	1.00	1.0000	2.45	144	95
2-1	1.40	1.1832	3.43	144	92
2-2	1.30	1.1402	3.19	144	95
2-3	1.30	1.1402	3.19	144	96
2-4	1.10	1.0488	2.70	144	96
2-5	1.00	1.0000	2.45	144	96
3-1	1.30	1.1402	3.19	144	93
3-2	1.30	1.1402	3.19	144	95
3-3	1.30	1.1402	3.19	144	95
3-4	1.00	1.0000	2.45	144	96
3-5	0.90	0.9487	2.21	144	96
4-1	1.40	1.1832	3.43	144	92
4-2					
4-3					
4-4					
4-5					
K-Factor					
2.45	**1.24**	**1.1095**	**3.03**	**144.0**	**94.0**

Entec Services, Inc.

Plant: Hovensa
US V.I.
Site: FCC
Date: 6-10-2011
Run No.: 1
Time: 0750 1104

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See	Recovery	Sheet
Impinger No. 3			
Silica Gel			

Analyst: KR
Assistant: AT

Orsat / Fyrite / ~~ENTEC~~ Plat CEMS - Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.48
Stack Diameter: 132.0"
K Factor: KR ~~2.53~~ 2.45

Nozzle Calibrations:

	Pre-Test:	Post-Test:
0.248	~~0.250~~	0.248
0.248	~~0.250~~	0.248
0.248	~~0.250~~	0.248
Average: 0.248	~~0.250~~ KR	0.248

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 15"
Post-Test: Volume @ 0.000 Vacuum 15"

Pitot Check Pre: Positive 3.2 Negative 3.4
Pitot Check Post: Positive 3.0 Negative 3.0

Equipment Checklist:
Meter Box ID: NC-MS-1
Delta H @: 1.840
Y - Factor: 0.986
Probe ID: 1105292
CP Value: 0.84
Liner Material: Glass refl
Hot Box ID: —
Filter Exit ID: —
Impinger Outlet ID: GN-26
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:		469.430	471.868	
Initial:	KR ~~361.100~~	361.469	470.065	
Net:		107.961	1.803	

Total: 109.764 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	7.5	369.62	1.5	3.7	144	NA	NA	67	NA	87	4.0	
/ 2	15	377.14	1.4	3.4	144			67		92	4.0	
/ 3	22.5	384.84	1.4	3.4	144			67		94	4.0	
/ 4	30	392.02	1.2	2.9	144			67		94	3.0	
/ 5	37.5	398.610	1.0	2.5	144			67		95	3.0	
D / 1	45	406.22	1.4	3.4	144			67		92	4.0	
/ 2	52.5	413.72	1.3	3.2	144			62		95	4.0	
/ 3	60	421.14	1.3	3.2	144			67		96	4.0	
/ 4	67.5	427.97	1.1	2.7	144			67		96	4.0	
/ 5	75	434.568	1.0	2.5	144			67		96	4.0	
C / 1	82.5	441.93	1.3	3.2	144			66		93	4.0	
/ 2	90	449.26	1.3	3.2	144			57		95	4.0	
/ 3	97.5	456.61	1.3	3.2	144			58		95	4.0	
/ 4	105	463.20	1.0	2.45	144			66		96	4.0	
/ 5	112.5	469.430	0.90	2.2	144			62		96	4.0	
B / 1	120	471.868	1.4	3.4	144			67		92	5.0	
/ 2	127.5											
/ 3	135											
/ 4	142.5											
/ 5	150											
/												
/												
/												
/												
/												

Field Notes: Stopped 1 hour, 54 minutes, 16 seconds

Method 5061 Field Data Sheet

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC**

Source: **Fluid Catalytic Cracking Unit (FCCU)**

Test Date: **6/18/2011**

Run Number: **2**

HEXAVALENT CHROMIUM - METHOD 0061

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.43	144	86
1-2	1.40	1.1832	3.43	145	88
1-3	1.40	1.1832	3.43	144	89
1-4	1.30	1.1402	3.19	144	90
1-5	1.00	1.0000	2.45	144	90
2-1	1.40	1.1832	3.43	144	87
2-2	1.30	1.1402	3.19	144	89
2-3	1.10	1.0488	2.70	144	88
2-4	1.00	1.0000	2.45	144	90
2-5	1.00	1.0000	2.45	144	90
3-1	1.40	1.1832	3.43	144	88
3-2	1.40	1.1832	3.43	145	88
3-3	1.20	1.0954	2.94	144	89
3-4	1.20	1.0954	2.94	144	90
3-5	1.00	1.0000	2.45	144	90
4-1	1.40	1.1832	3.43	144	87
4-2	1.40	1.1832	3.43	144	89
4-3					
4-4					
4-5					
K-Factor					
2.45	**1.25**	**1.1168**	**3.07**	**144.1**	**88.7**

Entec Services, Inc.

511150 Hovensa LLC

Page 136 of 701

Plant: Hovensa

Site: US VI FCC

Date: 6-18-2011

Run No.: 2

Time: 1244 1533

Job No.: 511150

Barometric Pressure: 29.80

Stack Pressure: -0.59

Stack Diameter: 132.0"

K Factor: 0.45

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	See Recovery Sheet		
Silica Gel			

Analyst: KR

Assistant: AT

Orsat / Fyrite / ENTEC CEMS - Analysis: Average:

O2:
CO2:
CO:
N2:

Nozzle Calibrations:

Pre-Test:	Post-Test:
0.248	0.248
0.248	0.248
0.248	0.248
Average: 0.248	0.248

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 1.001 Vacuum 10"

Post-Test: Volume @ 0.000 Vacuum 15"

Pitot Check Pre: Positive 5.0 Negative 5.0

Pitot Check Post: Positive 3.2 Negative 3.3

Equipment Checklist:

Meter Box ID: NC-M5-1
Delta H @: 1.840
Y - Factor: 0.986
Probe ID: 1105292
CP Value: 0.84
Liner Material: glass tef
Hot Box ID: 2 KR
Filter Exit ID: —
Impinger Outlet ID: GN-2L
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	595.832			
Initial:	472.121			
Net:	123.711			

Total: 123.711 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B / 1	7.5	479.81	1.4	3.4	144	NA	NA	67	NA	86	5.0	
/ 2	15	487.26	1.4	3.4	145			67		88	5.0	
/ 3	22.5	494.94	1.4	3.4	144			67		89	6.0	
/ 4	30	502.39	1.3	3.2	144			67		90	5.0	
/ 5	37.5	509.050	1.0	2.45	144			67		90	4.0	
C / 1	45	516.58	1.4	3.4	144			66		87	6.0	
/ 2	52.5	523.96	1.3	3.2	144			60		89	6.0	
/ 3	60	530.88	1.1	2.7	144			65		88	5.0	
/ 4	67.5	537.57	1.0	2.5	144			67		90	5.0	
/ 5	75	544.214	1.0	2.5	144			67		90	5.0	
D / 1	82.5	551.89	1.4	3.4	144			67		88	6.0	
/ 2	90	559.40	1.4	3.4	145			62		88	7.0	
/ 3	97.5	566.78	1.3	2.9	144			64		89	7.0	
/ 4	105	573.82	1.2	2.9	144			65		90	7.0	
/ 5	112.5	580.521	1.0	2.5	144			65		90	7.0	
A / 1	120	588.22	1.4	3.4	144			65		87	8.0	
/ 2	127.5	595.832	1.4	3.4	144			57		89	8.0	
/ 3	135											
/ 4	142.5											
/ 5	150											
/												
/												
/												
/												
/												

Field Notes: Stopped at 127.5 minutes.

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC**

Source: **Fluid Catalytic Cracking Unit (FCCU)**

Test Date: **6/18/2011**

Run Number: **3**

HEXAVALENT CHROMIUM - METHOD 0061

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	3.43	144	85
1-2	1.40	1.1832	3.43	144	88
1-3	1.50	1.2247	3.68	145	90
1-4	1.40	1.1832	3.43	144	90
1-5	1.20	1.0954	2.94	144	92
2-1	1.40	1.1832	3.43	144	89
2-2	1.40	1.1832	3.43	145	90
2-3	1.30	1.1402	3.19	144	92
2-4	1.20	1.0954	2.94	144	92
2-5	1.00	1.0000	2.45	144	91
3-1	1.40	1.1832	3.43	144	89
3-2	1.40	1.1832	3.43	144	91
3-3	1.10	1.0488	2.70	144	92
3-4	1.00	1.0000	2.45	144	92
3-5	0.80	0.8944	1.96	144	91
4-1	1.40	1.1832	3.43	144	88
4-2	1.40	1.1832	3.43	144	91
4-3	1.30	1.1402	3.19	144	91
4-4	1.30	1.1402	3.19	144	91
4-5	0.90	0.9487	2.21	145	92
K-Factor					
2.45	**1.26**	**1.1189**	**3.09**	**144.2**	**90.4**

Entec Services, Inc.

511150 Hovensa LLC

Page 138 of 701

Plant: Hovensa USVI

Site: FCC

Date: 6-19-2011

Run No.: 3

Time: 0746 1049

Moisture | Initial | Final | Totals | Analyst: KR

Impinger No. 1
Impinger No. 2
Impinger No. 3 — see Recovery Sheet
Silica Gel

Assistant: AI

Orsat / Fyrite / ENTEC CEMS - Analysis: Plant | Average:

O2:
CO2:
CO:
N2:

Job No.: 511150

Barometric Pressure: 29.80

Stack Pressure: -0.47

Stack Diameter: 132.0"

K Factor: 2.45

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.248	0.248
	0.248	0.248
	0.248	0.248
Average:	0.248	0.248

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.002 | Vacuum 10

Post-Test: Volume @ 0.002 | Vacuum 10"

Pitot Check Pre: Positive 3.2 | Negative 3.2

Pitot Check Post: Positive 4.8 | Negative 5.1

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	742.409			
Initial:	596.655			
Net:	145.754			

Total: 145.754 Cubic Ft.

Equipment Checklist:

Meter Box ID: NC-MS-1
Delta H @: 1.840
Y - Factor: 0.986
Probe ID: 1105292
CP Value: 0.84
Liner Material: teflon
Hot Box ID: —
Filter Exit ID: —
Impinger Outlet ID: C-N-26
Filter ID: —
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
A / 1	7.5	604.27	1.4	3.4	144	NA		67	NA	85	4.0	
/ 2	15	611.89	1.4	3.4	144			67		88	4.0	
/ 3	22.5	619.80	1.5	3.7	145			63		90	5.0	
/ 4	30	627.65	1.4	3.4	144			196		90	5.0	
/ 5	37.5	634.832	1.2	2.9	144			68		92	4.0	
B / 1	45	642.50	1.4	3.4	144			67		89	4.0	
/ 2	52.5	650.13	1.4	3.4	145			65		90	4.0	
/ 3	60	656.58	1.3	3.2	144			67		92	4.0	
/ 4	67.5	664.62	1.2	2.9	144			67		92	4.0	
/ 5	75	671.149	1.0	2.45	144			62		91	4.0	
C / 1	82.5	678.79	1.4	3.4	144			67		89	5.0	
/ 2	90	686.41	1.4	3.4	144			60		91	5.0	
/ 3	97.5	693.41	1.1	2.7	144			63		92	5.0	
/ 4	105	699.80	1.0 0.81	2.45	144			65		92	4.0	
/ 5	112.5	706.08	0.80	2.0	144			67		91	4.0	
D / 1	120	713.72	1.4	3.4	144			67		88	5.0	
/ 2	127.5	721.33	1.4	3.4	144			65		91	5.0	
/ 3	135	728.78	1.3	3.2	144			63		91	5.0	
/ 4	1425	736.19	1.3	3.2	144			64		91	5.0	
/ 5	150	742.409	0.90	2.2	145			67		92	4.0	
/												
/												
/												
/												
/												

Field Notes:

APPENDIX A.10

METHOD CTM 027

AMMONIA

Entec Services, Inc.

SOURCE OVERVIEW

SOURCE OWNER:	Hovensa, LLC
PLANT LOCATION:	US Virgin Island - St. Criox
SOURCE NAME:	Fluid Catalytic Cracking Unit (FCCU)
SOURCE CONDITION:	Petroleum Refinery ICR
SOURCE SHAPE:	Circular
PROBE WASH CHEMICAL(S):	Needed
TEST PERFORMED:	Ammonia
ADDITIONAL TEST REQUIREMENTS:	MACT Requirements - 71 DSCF (150 minutes)

REFERENCE TEST METHODS:

Sample Location	EPA Method	1
Volumetric Flow	EPA Method	2
Molecular Weight	EPA Method	3A
Moisture Content	EPA Method	4
Ammonia	EPA Method	CTM027

PROJECT MANAGER	Mr. Chuck Duncan
ENVIRONMENTAL ANALYST - PROJECT LEADER	Mr. Kevin Rosenberg
ENVIRONMENTAL ANALYST - ASSISTANT	Mr. Tim Draheim
OWNER'S REPRESENTATIVE:	Mr. Bernd Haneke - Senior Environmental Specialist - CEMS
RULING AGENCY :	Environmental Protection Agency (EPA)
RULING AGENCY REPRESENTATIVE:	Mr. Ron Myers
DATES TESTS CONDUCTED:	06/18/11 06/19/11
ENTEC PROJECT NUMBER:	511150

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

INPUT TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Field Data	Symbol	Units	Test Data			
Run Number	-	-	1	2	3	AVERAGE
Test Date	-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended	-	Military Time	752-1140	1245-1547	753-1049	
Sampling Time	θ	minutes	150	150	150	150
Stack Area	A_s	Ft^2	95.033	95.033	95.033	
Barometric Pressure	P_{bar}	in. Hg	29.80	29.80	29.80	29.80
Stack Static Pressure	P_g	in. H_20	-0.48	-0.59	-0.47	-0.51
Pitot Tube Correction factor	C_p	-	0.84	0.84	0.84	0.84
Meter Correction Factor	Y	-	0.985	0.985	0.985	0.985
Meter Delta H @	ΔH@	in. H_20	1.894	1.894	1.894	1.894
Nozzle Diameter	D_n	inches	0.218	0.218	0.218	0.218
Meter Volume	V_m	dcf	104.680	105.092	103.820	104.531
Meter Temperature	t_m	°F	94.5	91.8	93.3	93.2
Avg. Orifice Delta H	ΔH	in. H_20	1.77	1.77	1.76	1.77
Impingers Weight Gain (Moisture)	W_{imp}	grams	582.4	572.6	594.8	583.3
Silica Gel Impinger Weight Gain (Moisture)	W_{sg}	grams	29.8	33.3	26.8	30.0
Oxygen Concentration, dry basis	O_2	%	1.76	1.72	1.86	1.78
Carbon Dioxide Concentration, dry basis	CO_2	%	14.11	14.12	13.98	14.07
Avg. Sq. Rt. of Delta P	$(sqrt\ \Delta P)_{avg}$	$(in.\ H_2O)^{1/2}$	1.086	1.086	1.080	1.084
Stack Temperature	t_s	°F	145.0	144.4	144.7	144.7
Analytical Lab Data Input						
Ammonia Collected	NH3	ug	36,699	29,596	19,119	28,471

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client: **Hovensa, LLC** Job No.: **511150**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Data Input By: **L. Beane**

Description	Formulas	Symbol	Units	Calculated Data			
Run Number		-	-	1	2	3	AVERAGE
Test Date		-	-	06/18/11	06/18/11	06/19/11	
Emission Test Run Time Began - Ended		-	Military Time	752-1140	1245-1547	753-1049	
1. Stack Pressure	$= P_{bar} + P_g / 13.6$	P_s	in. Hg	29.76	29.76	29.77	29.76
2. Meter Pressure	$= P_{bar} + \Delta H / 13.6$	P_m	in. Hg	29.93	29.93	29.93	29.93
3. Standard Meter Volume	$= 17.64 * Y * (V_m/T_m) * (P_{bar} + \Delta H / 13.6)$	$V_{m(std)}$	dscf	98.186	99.046	97.587	98.273
3A. (Metric) Standard Meter Volume	$=V_{m(std)} * 0.0283168465921$	$V_{m(std)}$	dscm	2.780	2.805	2.763	2.783
4a. Standard Volume of Water Vapor Condensed	$=0.04706*W_{wc}$	$V_{wc(std)}$	scf	27.408	26.947	27.991	27.449
4b. Standard Volume of Water Collected in Silica Gel	$=0.04715*W_{sg}$	$V_{wsg(std)}$	scf	1.405	1.570	1.264	1.413
5. Moisture Fraction	$=(V_{wc(std)} + V_{wsg(std)})/(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})$	B_{ws}	fraction	0.2269	0.2236	0.2306	0.2270
6. Moisture Fraction @ Saturation (Theoretical)	$=10^{[8.37-(2827/(ts+460-95.2))]}/P_s$	TB_{ws}	fraction	0.2241	0.2208	0.2224	0.2224
7. Standard Water Volume @ Saturation (Theoretical)	#NAME?	$TV_{w(std)}$	scf	28.359	28.069	27.913	28.114
8. Volume of Water @ Saturation (Theoretical)	$=TV_{w(std)}/0.04707$	TV_{lc}	ml	602.5	596.3	593.0	597.3
9. Molecular Weight Of Stack Gas, dry basis	$= 0.32*(O_2)+ 0.44*(CO_2)+0.28*(100-(O_2)-(CO_2))$	M_d	g/g-mole	30.328	30.328	30.311	30.322
10. Molecular Weight Of Stack Gas, wet basis	$= M_d*(1-B_{ws})+18.0*(B_{ws})$	M_s	g/g-mole	27.565	27.606	27.573	27.581
11. Average Stack Gas Velocity	$= 85.49*C_p*(\text{sqrt } \Delta P)_{avg}*SQRT((T_s) / (P_s*M_s))$	v_s	ft/s	66.99	66.89	66.55	66.811
12. Stack Gas Flow @ Actual Conditions	$= 60*v_s*A_s$	Q_a	acfm	381,998	381,403	379,469	380,956
13. Stack Gas Flow @ Standard Conditions	$= Q_a*(T_{std}/T_s)*(P_s/P_{std})$	Q_s	scfm	331,544	331,267	329,521	330,777
14. Stack Gas Flow @ Dry Standard Conditions	$= Q_s*(1-B_{ws})*(T_{std}/T_s)*(P_s/P_{std})$	Q_{std}	dscfm	257,245	258,119	256,230	257,198
22. Volume collected through nozzle	$=T_s/P_s*[0.002669*V_{lc}+ V_m*Y*P_m/T_m]$	V_n	acf	145.809	146.360	144.531	145.567
24. Isokinetic Sampling Rate, Percent	$= 100*Vn / (60*v_s*A_n*\theta)$	I	%	93.30	93.80	93.10	93.40
Analytical Lab Data Calculated							
Ammonia Concentration @ Standard Conditions	$=0.01543*(m_{n/1000}/V_{m(std)}$	c_s	gr/dscf	5.77E-03	4.61E-03	3.02E-03	4.47E-03
Ammonia Emissions	$= (60/7000)*c_s*Q_{std}$	-	lb/hr	12.72	10.20	6.64	9.85
Ammonia Emissions	$= ug/dscf*(0.84948/17.03)$	c_s	ppmvd	18.644	1.49E+01	9.77E+00	1.44E+01
Post Meter Orifice Cal. **(EMC ALT-009 Yqa)**		Y_{qa}		1.0421	1.0359	1.0463	1.0415
% Difference, **(Calibration must be within 5% of original Y-factor)**							-5.73%

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **1**

AMMONIA - CTM 027

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.09	145	88
1-2	1.30	1.1402	1.94	146	91
1-3	1.30	1.1402	1.94	145	94
1-4	1.20	1.0954	1.79	145	94
1-5	0.94	0.9695	1.40	145	95
2-1	1.40	1.1832	2.09	145	91
2-2	1.40	1.1832	2.09	145	94
2-3	1.30	1.1402	1.94	145	94
2-4	1.20	1.0954	1.79	145	95
2-5	0.87	0.9327	1.30	145	95
3-1	1.40	1.1832	2.09	144	93
3-2	1.30	1.1402	1.94	146	95
3-3	1.30	1.1402	1.94	145	97
3-4	1.10	1.0488	1.64	145	96
3-5	0.78	0.8832	1.16	144	97
4-1	1.30	1.1402	1.94	144	95
4-2	1.30	1.1402	1.94	145	94
4-3	1.20	1.0954	1.79	145	97
4-4	1.00	1.0000	1.49	145	97
4-5	0.80	0.8944	1.19	145	97
K-Factor					
1.49	**1.19**	**1.0865**	**1.77**	**145.0**	**94.5**

Entec Services, Inc.

511150 Hovensa LLC

Page 144 of 701

Plant: Hovensa
US V.I.
Site: FCC

Date: 6-18-2011

Run No.: 1

Time:
0752
1140

Moisture | Initial | Final | Totals
Impinger No. 1
Impinger No. 2
Impinger No. 3 — See Recovery Sheet
Silica Gel

Analyst: KR
Assistant: TD

Orsat / Fyrite / ~~ENTEC~~ CEMS - Analysis: Ant

			Average:
O2:			
CO2:		1	
CO:			
N2:			

Job No.: 511150

Barometric Pressure: 29.80

Stack Pressure: -0.48

Stack Diameter: 132.0"

K Factor: 1.49

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Pitot Check Pre:	
Volume @	0.000	15"	Positive	3.1
			Negative	3.2

	Post-Test:	Vacuum	Pitot Check Post:	
Volume @	0.000	15 11	Positive	5.2
			Negative	6.1

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:		121.336		
Initial:	~~16.902~~	16.656		
Net:		104.680		

Total: 104.680 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC-M5-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105241
CP Value: 0.84
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: —
Impinger Outlet ID: GN-29
Filter ID: Q-133
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B/1	7.5	22.42	1.4	2.1	145	250	244	67	NA	88	4.0	
/2	15	27.83	1.3	1.9	146	248	244	65		91	4.0	
/3	22.5	33.22	1.3	1.9	145	245	243	64		94	4.0	
/4	30	38.54	1.2	1.8	145	249	250	67		94	4.0	
/5	37.5	43.277	0.94	1.4	145	242	246	65		95	3.0	
A/1	45	48.88	1.4	2.1	145	228	229	67		91	4.0	
/2	52.5	54.53	1.4	2.1	145	248	242	67		94	4.0	
/3	60	60.05	1.3	1.9	145	249	245	67		94	4.0	
/4	67.5	63.35	1.2	1.8	145	273	264	67		95	4.0	
/5	75	69.987	0.87	1.3	145	275	270	66		95	3.0	
D/1	82.5	75.54	1.4	2.1	144	267	258	67		93	4.0	
/2	90	81.02	1.3	1.9	146	258	274	65		95	4.0	
/3	97.5	86.12	1.3	1.9	145	275	254	67		97	4.0	
/4	105	91.15	1.1	1.6	145	269	253	66		96	4.0	
/5	112.5	95.614	0.78	1.2	144	267	248	67		97	4.0	
C/1	120	101.13	1.3	1.9	144	273	268	67		95	5.0	
/2	127.5	106.62	1.3	1.9	145	274	268	66		94	5.0	
/3	135	111.95	1.2	1.8	145	274	267	65		97	5.0	
/4	142.5	116.92	1.0	1.5	145	273	266	65		97	5.0	
/5	150	121.336	0.80	1.2	145	272	267	65		97	4.0	
/												
/												
/												
/												
/												

Field Notes: CTM-027 71 dscf

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **2**

AMMONIA - CTM 027

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.09	145	92
1-2	1.30	1.1402	1.94	145	92
1-3	1.30	1.1402	1.94	145	94
1-4	1.30	1.1402	1.94	144	93
1-5	0.79	0.8888	1.18	144	93
2-1	1.40	1.1832	2.09	144	91
2-2	1.30	1.1402	1.94	144	91
2-3	1.20	1.0954	1.79	144	92
2-4	1.00	1.0000	1.49	145	94
2-5	0.74	0.8602	1.10	143	93
3-1	1.40	1.1832	2.09	145	91
3-2	1.40	1.1832	2.09	145	92
3-3	1.30	1.1402	1.94	144	92
3-4	1.20	1.0954	1.79	145	92
3-5	0.85	0.9220	1.27	144	92
4-1	1.40	1.1832	2.09	144	91
4-2	1.30	1.1402	1.94	145	91
4-3	1.30	1.1402	1.94	144	91
4-4	1.10	1.0488	1.64	144	90
4-5	0.83	0.9110	1.24	144	89
K-Factor					
1.49	**1.19**	**1.0860**	**1.77**	**144.4**	**91.8**

Entec Services, Inc.

511150 Hovensa LLC

Page 146 of 701

Plant: Hovense USVI
Site: FCC
Date: 6-18-2011
Run No.: 2
Time: 1245 / 1547

Moisture — Initial / Final / Totals
Impinger No. 1
Impinger No. 2: See Recovery / Sheet
Impinger No. 3
Silica Gel

Analyst: LR
Assistant: AI

Orsat / Fyrite (ENTEC CEMS) — Analysis: — Average:
O2:
CO2:
CO:
N2:

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.59
Stack Diameter: 132.0"
K Factor: 1.49

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

	Pre-Test:	Vacuum	Post-Test:	Vacuum
Volume @	0.001	15"	0.001	15"

Pitot Check Pre: Positive 5.2 / Negative 6.1
Pitot Check Post: Positive 3.6 / Negative 3.8

Dry Gas Meter Readings:

	#1	#2	#3	#4
Final:	227.092			
Initial:	122.000			
Net:	105.092			

Total: 105.092 Cubic Ft.

Equipment Checklist:
Meter Box ID: NC-MS-3
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105291
CP Value: 0.84
Liner Material: Glass
Hot Box ID: HB-14
Filter Exit ID: —
Impinger Outlet ID: GN-29
Filter ID: Q-153
Fyrite ID: —
Acetone Lot No: —

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
C / 1	7.5	127.74	1.4	2.1	145	273	262	60	NA	92	5.0	
/ 2	15	133.25	1.3	1.9	145	274	265	61		92	6.0	
/ 3	22.5	138.52	1.3	1.9	145	270	264	63		94	6.0	
/ 4	30	143.88	1.3	1.9	144	272	267	64		93	6.0	
/ 5	37.5	148.486	0.79	1.2	144	267	259	66		93	5.0	
D / 1	45	154.10	1.4	2.1	144	267	254	67		91	8.0	
/ 2	52.5	159.51	1.3	1.9	144	275	266	67		91	8.0	
/ 3	60	164.78	1.2	1.8	144	269	254	67		92	8.0	
/ 4	67.5	169.79	1.0	1.5	145	268	249	67		94	8.0	
/ 5	75	174.160	0.74	1.1	143	263	248	67		93	7.0	
A / 1	82.5	179.74	1.4	2.1	145	272	267	67		91	10.0	
/ 2	90	185.34	1.4	2.1	145	273	266	65		90	11.0	
/ 3	97.5	190.78	1.3	1.9	144	272	266	67		91	11.0	
/ 4	85 105	196.10	1.2	1.8	145	270	266	66		92	12.0	
/ 5	102.5 112.5	200.758	0.85	1.3	144	272	270	65		90	11.0	
B / 1	110 120	206.38	1.4	2.1	144	267	276	67		91	13.0	
/ 2	117.5 127.5	211.95	1.3	1.9	145	270	267	66		91	13.0	
/ 3	125	217.36	1.3	1.9	144	271	258	66		91	13.0	
/ 4	142.5	222.58	1.1	1.6	144	262	263	67		90	13.0	
/ 5	150	227.092	0.83	1.2	144	268	264	66		89	13.0	
/												
/												
/												
/												
/												

Field Notes: CTM-027

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Client: **Hovensa, LLC** Test Date: **6/18/2011**

Source: **Fluid Catalytic Cracking Unit (FCCU)** Run Number: **3**

AMMONIA - CTM 027

Traverse Point	Delta P	Sq. Rt. Delta P	Delta H	Stack Temp. (°F)	Meter Temp. (°F)
1-1	1.40	1.1832	2.09	145	86
1-2	1.40	1.1832	2.09	146	90
1-3	1.40	1.1832	2.09	146	91
1-4	1.20	1.0954	1.79	146	93
1-5	0.81	0.9000	1.21	145	93
2-1	1.50	1.2247	2.24	145	92
2-2	1.50	1.2247	2.24	145	93
2-3	1.30	1.1402	1.94	144	94
2-4	1.20	1.0954	1.79	145	94
2-5	0.72	0.8485	1.07	144	95
3-1	1.30	1.1402	1.94	145	94
3-2	1.30	1.1402	1.94	145	94
3-3	1.20	1.0954	1.79	144	94
3-4	1.00	1.0000	1.49	144	95
3-5	0.59	0.7681	0.88	144	95
4-1	1.30	1.1402	1.94	144	94
4-2	1.30	1.1402	1.94	144	93
4-3	1.20	1.0954	1.79	144	95
4-4	1.20	1.0954	1.79	144	95
4-5	0.81	0.9000	1.21	144	95
K-Factor					
1.49	**1.18**	**1.0797**	**1.76**	**144.7**	**93.3**

Entec Services, Inc.

Plant: Hovensa US V.I.
Site: FCC
Date: 6-19-2011
Run No.: 3
Time: 0753 1049

Moisture	Initial	Final	Totals
Impinger No. 1			
Impinger No. 2	See Recovery Sheet		
Impinger No. 3			
Silica Gel			

Analyst: KR
Assistant: AT

Orsat / Fyrite / ~~ENTEC~~ plant CEMS - Analysis:

				Average:
O2:				
CO2:				
CO:				
N2:				

Job No.: 511150
Barometric Pressure: 29.80
Stack Pressure: -0.47
Stack Diameter: 132.0"
K Factor: 1.49

Nozzle Calibrations:

	Pre-Test:	Post-Test:
	0.218	0.218
	0.218	0.218
	0.218	0.218
Average:	0.218	0.218

Probe & Pitot Leak Checks:

Pre-Test: Volume @ 0.000 Vacuum 15"
Post-Test: Volume @ 0.000 Vacuum 10"

Pitot Check Pre: Positive 3.2 Negative 3.3
Pitot Check Post: Positive 5.3 Negative 5.9

Equipment Checklist:
Meter Box ID: NC-MS-J
Delta H @: 1.894
Y - Factor: 0.985
Probe ID: 1105291
CP Value: 0.84
Liner Material: glass
Hot Box ID: HB-14
Filter Exit ID: —
Impinger Outlet ID: GN-29
Filter ID: Q-137
Fyrite ID: —
Acetone Lot No: —

Dry Gas Meter Readings:

	# 1	# 2	# 3	# 4
Final:		332.720		
Initial:	KR ~~227.548~~	228.900		
Net:		103.820		

Total: 103.820 Cubic Ft.

Port / Point	Time	Meter Reading	Delta P	Delta H	Stack	Probe	Oven	Impinger	Filter Outlet	Meter Avg.	Vacuum	Other
B / 1	7.5	234.62	1.4	2.1	145	273	248	67	NA	86	3.0	
/ 2	15	240.28	1.4	2.1	146	269	267	66		90	3.0	
/ 3	22.5	246.02	1.4	2.1	146	273	264	66		91	3.0	
/ 4	30	251.32	1.2	1.8	146	267	263	67		93	3.0	
/ 5	37.5	255.761	0.81	1.2	145	269	266	67		93	3.0	
A / 1	45	261.54	1.5	2.2	145	273	249	67		92	3.0	
/ 2	52.5	267.34	1.5	2.2	145	276	268	66		93	3.0	
/ 3	60	272.79	1.3	1.9	144	273	275	68		94	3.0	
/ 4	67.5	278.04	1.2	1.8	145	275	273	67		94	3.0	
/ 5	75	282.208	0.72	1.1	144	275	258	66		95	3.0	
D / 1	82.5	287.58	1.3	1.9	145	259	248	67		94	3.0	
/ 2	90	292.91	1.3	1.9	145	267	259	67		94	3.0	
/ 3	97.5	298.16	1.2	1.8	144	267	249	66		94	3.0	
/ 4	105	303.00	1.0	1.5	144	266	256	67		95	3.0	
/ 5	112.5	306.754	0.59	0.88	144	266	251	66		95	2.8	
C / 1	120	312.24	1.3	1.9	144	274	266	65		94	3.0	
/ 2	127.5	317.74	1.3	1.9	144	273	266	64		93	4.0	
/ 3	135	323.02	1.2	1.8	144	273	266	65		95	3.0	
/ 4	142.5	328.26	1.2	1.8	144	273	266	67		95	3.0	
/ 5	150	332.720	0.81	1.2	144	272	266	67		95	3.0	
/												
/												
/												
/												
/												

Field Notes: CTM-027

Method CTM-027 Field Data Sheet

APPENDIX A.11

METHOD 18

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

CALCULATED TEST DATA

Client:	Hovensa, LLC	Job No.:	511150	Test Date:	6/15/2011
Source:	Fluid Catalytic Cracking Unit (FCCU)	Data Input By:	K. Poole	US EPA Method:	18

Compound	Molecular Weight	Detection limit (ppmv wet)	Concentration (ppmv dry)	Concentration (lb/scf)	Lab Note	Concentration (ug/m^3)	Mass Rate (lbs/hr)
Acetone	58.08	0.53	0.68	1.03E-07	ND	1645.6	1.57
Acetonitrile	41.05	0.92	1.18	1.26E-07	ND	2018.9	1.93
Acrylonitrile	53.06	0.51	0.66	9.03E-08	ND	1446.6	1.38
Benzene	78.12	0.11	0.14	2.87E-08	ND	459.4	0.44
1,3 Butadiene	54.09	0.31	0.40	5.59E-08	ND	896.4	0.86
Chlorobenzene	112.56	0.15	0.19	5.63E-08	ND	902.6	0.86
Cumene	120.19	0.30	0.39	1.20E-07	ND	1927.6	1.84
1,2 Dibromomethane	173.85	0.45	0.58	2.61E-07	ND	4182.2	4.00
Ethylbenzene	106.17	0.10	0.13	3.54E-08	ND	567.6	0.54
Hexane	86.18	0.50	0.64	1.44E-07	ND	2303.5	2.20
Methanol	32.04	0.11	0.14	1.18E-08	ND	188.4	0.18
Methyl isobutyl ketone	100.16	0.28	0.36	9.36E-08	ND	1499.2	1.43
Methyl t-butyl ether	88.50	0.30	0.39	8.86E-08	ND	1419.3	1.36
Methylene chloride	84.93	0.60	0.77	1.70E-07	ND	2724.2	2.60
2-Nitropropane	89.09	0.70	0.90	2.08E-07	ND	3333.9	3.19
Pentane	72.15	0.50	0.64	1.20E-07	ND	1928.5	1.84
Styrene	104.16	0.34	0.44	1.18E-07	ND	1893.2	1.81
Tetrachloroethene	165.83	0.28	0.36	1.55E-07	ND	2482.2	2.37
Toluene	92.15	0.51	0.66	1.57E-07	ND	2512.4	2.40
Trichloroethene	131.29	0.10	0.13	4.38E-08	ND	701.9	0.67
2,2,4 Trimethylpentane	114.23	0.35	0.45	1.33E-07	ND	2137.3	2.04
Xylenes	106.16	0.10	0.13	3.54E-08	ND	567.5	0.54
Methane	16.04	0.50	0.64	2.68E-08	ND	428.7	0.41
Ethane	30.07	0.50	0.64	5.02E-08	ND	803.8	0.77

**No compounds were detected. These are the estimated emission rates based on calculated detection limits.

Pertinent Data from 0010 Sampling Train

Description	Value	
Moisture fraction	0.2224	(In excess of saturation point. Theoretical moisture used)
Stack Gas Flow @ Dry Standard Conditions	255,382	
Conversion from ppm to lb/scf	2.5939E-09	

APPENDIX A.12

METHOD 3A / 25A – GAS EMISSION TESTING

O_2 / CO_2 / Run Averages

Test Date	26A Run Averages		30B Run Averages		OTM029 Run Averages	
6/15/2011	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2
	13.77	1.96	13.79	1.95	13.80	1.94
6/15/2011	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2
	13.77	1.96	13.80	1.95	13.80	1.95
6/15/2011	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2
	13.75	2.00	13.82	1.89	13.83	1.84

	0010 Run Averages		23 Run Averages	
6/16/2011	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2
	13.94	1.71	13.94	1.71
6/16/2011	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2
	14.09	1.55	14.09	1.55

	0010 Run Averages		0011 Run Averages		23 Run Averages	
6/17/2011	Run 1		Run 1 CO2	Run 1 O2	Run 1	
	See 6-16 -11 Data		14.17	1.58	See 6-16 -11 Data	
6/17/2011	Run 2		Run 2 CO2	Run 2 O2	Run 2	
	See 6-16 -11 Data		14.14	1.61	See 6-16 -11 Data	
6/17/2011	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2
	14.14	1.60	14.10	1.61	14.14	1.60

	5/202 Run Averages		29 Run Averages		0061 Run Averages		CTM027 Run Averages	
6/18/2011	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2	Run 1 CO2	Run 1 O2
	14.11	1.76	14.11	1.75	14.11	1.77	14.11	1.76
6/18/2011	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2	Run 2 CO2	Run 2 O2
	14.12	1.72	14.12	1.72	14.12	1.72	14.12	1.72

	5/202 Run Averages		29 Run Averages		0061 Run Averages		CTM027 Run Averages	
6/19/2011	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2	Run 3 CO2	Run 3 O2
	13.97	1.86	13.97	1.86	13.97	1.86	13.98	1.86

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	1.0 ppm	1.4 ppm	1.20
30.1 ppm THC	31.9 ppm	31.9 ppm	31.90

Mean Reference Values:	Corrected Results:	Basis:
22.7 ppm THC	**22.7** ppm THC	WET

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
1	16/06/11 10:22:00	10.4
1	16/06/11 10:23:00	11.9
1	16/06/11 10:24:00	11.3
1	16/06/11 10:25:00	11.8
1	16/06/11 10:26:00	12.3
1	16/06/11 10:27:00	12.8
1	16/06/11 10:28:00	13.0
1	16/06/11 10:29:00	12.7
1	16/06/11 10:30:00	13.0
1	16/06/11 10:31:00	12.6
1	16/06/11 10:32:00	12.3
1	16/06/11 10:33:00	12.6
1	16/06/11 10:34:00	12.1
1	16/06/11 10:35:00	10.6
1	16/06/11 10:36:00	11.2
1	16/06/11 10:37:00	10.7
1	16/06/11 10:38:00	11.7
1	16/06/11 10:39:00	11.5
1	16/06/11 10:40:00	11.5
1	16/06/11 10:41:00	11.7
1	16/06/11 10:42:00	11.6
1	16/06/11 10:43:00	12.7
1	16/06/11 10:44:00	16.1
1	16/06/11 10:45:00	20.1
1	16/06/11 10:46:00	24.6
1	16/06/11 10:47:00	26.5
1	16/06/11 10:48:00	26.5
1	16/06/11 10:49:00	8.2
1	16/06/11 10:50:00	2.7
1	16/06/11 10:51:00	25.6
1	16/06/11 10:52:00	30.1
1	16/06/11 10:53:00	23.1
1	16/06/11 10:54:00	8.4
1	16/06/11 10:55:00	20.1
1	16/06/11 10:56:00	23.5
1	16/06/11 10:57:00	24.2
1	16/06/11 10:58:00	25.0
1	16/06/11 10:59:00	25.3
1	16/06/11 11:00:00	25.1
1	16/06/11 11:01:00	24.8
1	16/06/11 11:02:00	25.4
1	16/06/11 11:03:00	25.4
1	16/06/11 11:04:00	25.5
1	16/06/11 11:05:00	25.5
1	16/06/11 11:06:00	24.9
1	16/06/11 11:07:00	25.1
1	16/06/11 11:08:00	26.2

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
1	16/06/11 11:09:00	24.6
1	16/06/11 11:10:00	25.2
1	16/06/11 11:11:00	25.7
1	16/06/11 11:12:00	27.1
1	16/06/11 11:13:00	26.9
1	16/06/11 11:14:00	27.3
1	16/06/11 11:15:00	27.8
1	16/06/11 11:16:00	27.2
1	16/06/11 11:17:00	27.1
1	16/06/11 11:18:00	27.4
1	16/06/11 11:19:00	26.9
1	16/06/11 11:20:00	27.2
1	16/06/11 11:21:00	27.0
1	16/06/11 11:22:00	28.0
1	16/06/11 11:23:00	28.9
1	16/06/11 11:24:00	29.3
1	16/06/11 11:25:00	28.7
1	16/06/11 11:26:00	27.8
1	16/06/11 11:27:00	27.9
1	16/06/11 11:28:00	28.1
1	16/06/11 11:29:00	27.7
1	16/06/11 11:30:00	27.4
1	16/06/11 11:31:00	28.8
1	16/06/11 11:32:00	28.4
1	16/06/11 11:33:00	28.5
1	16/06/11 11:34:00	27.2
1	16/06/11 11:35:00	28.1
1	16/06/11 11:36:00	27.9
1	16/06/11 11:37:00	28.5
1	16/06/11 11:38:00	27.8
1	16/06/11 11:39:00	26.7
1	16/06/11 11:40:00	26.8
1	16/06/11 11:41:00	28.4
1	16/06/11 11:42:00	27.9
1	16/06/11 11:43:00	29.1
1	16/06/11 11:44:00	29.0
1	16/06/11 11:45:00	28.0
1	16/06/11 11:46:00	27.9
1	16/06/11 11:47:00	28.7
1	16/06/11 11:48:00	28.5
1	16/06/11 11:49:00	29.2
1	16/06/11 11:50:00	29.2
1	16/06/11 11:51:00	29.9
1	16/06/11 11:52:00	30.1
1	16/06/11 11:53:00	29.8
1	16/06/11 11:54:00	28.2
1	16/06/11 11:55:00	28.1
	Average	**22.7**

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 2

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	1.4 ppm	-1.0 ppm	0.20
30.1 ppm THC	31.9 ppm	29.5 ppm	30.70

Mean Reference Values:	**Corrected Results:**	**Basis:**
22.1 ppm THC	**22.1** ppm THC	WET

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
2	16/06/11 12:20:00	24.2
2	16/06/11 12:21:00	23.9
2	16/06/11 12:22:00	23.2
2	16/06/11 12:23:00	23.7
2	16/06/11 12:24:00	24.1
2	16/06/11 12:25:00	23.4
2	16/06/11 12:26:00	23.6
2	16/06/11 12:27:00	23.5
2	16/06/11 12:28:00	23.4
2	16/06/11 12:29:00	23.8
2	16/06/11 12:30:00	24.2
2	16/06/11 12:31:00	23.5
2	16/06/11 12:32:00	22.7
2	16/06/11 12:33:00	22.8
2	16/06/11 12:34:00	22.5
2	16/06/11 12:35:00	21.9
2	16/06/11 12:36:00	23.1
2	16/06/11 12:37:00	23.6
2	16/06/11 12:38:00	23.2
2	16/06/11 12:39:00	23.8
2	16/06/11 12:40:00	23.4
2	16/06/11 12:41:00	22.9
2	16/06/11 12:42:00	22.4
2	16/06/11 12:43:00	22.1
2	16/06/11 12:44:00	21.9
2	16/06/11 12:45:00	22.0
2	16/06/11 12:46:00	21.9
2	16/06/11 12:47:00	22.1
2	16/06/11 12:48:00	23.2
2	16/06/11 12:49:00	22.9
2	16/06/11 12:50:00	22.3
2	16/06/11 12:51:00	22.1
2	16/06/11 12:52:00	22.6
2	16/06/11 12:53:00	22.1
2	16/06/11 12:54:00	22.0
2	16/06/11 12:55:00	22.6
2	16/06/11 12:56:00	22.6
2	16/06/11 12:57:00	22.1
2	16/06/11 12:58:00	23.5

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
2	16/06/11 12:59:00	23.0
2	16/06/11 13:00:00	22.3
2	16/06/11 13:01:00	22.5
2	16/06/11 13:02:00	21.5
2	16/06/11 13:03:00	22.4
2	16/06/11 13:04:00	22.0
2	16/06/11 13:05:00	22.1
2	16/06/11 13:06:00	22.4
2	16/06/11 13:07:00	22.1
2	16/06/11 13:08:00	23.0
2	16/06/11 13:09:00	23.3
2	16/06/11 13:10:00	21.1
2	16/06/11 13:11:00	21.5
2	16/06/11 13:12:00	21.6
2	16/06/11 13:13:00	22.4
2	16/06/11 13:14:00	21.9
2	16/06/11 13:15:00	21.2
2	16/06/11 13:16:00	21.6
2	16/06/11 13:17:00	21.7
2	16/06/11 13:18:00	21.3
2	16/06/11 13:19:00	21.2
2	16/06/11 13:20:00	20.2
2	16/06/11 13:21:00	19.0
2	16/06/11 13:22:00	19.4
2	16/06/11 13:23:00	20.3
2	16/06/11 13:24:00	19.3
2	16/06/11 13:25:00	19.1
2	16/06/11 13:26:00	19.5
2	16/06/11 13:27:00	19.6
2	16/06/11 13:28:00	20.3
2	16/06/11 13:29:00	20.2
2	16/06/11 13:30:00	20.6
2	16/06/11 13:31:00	21.1
2	16/06/11 13:32:00	20.9
2	16/06/11 13:33:00	21.2
2	16/06/11 13:34:00	21.4
2	16/06/11 13:35:00	21.5
2	16/06/11 13:36:00	21.7
2	16/06/11 13:37:00	20.6
	Average	22.1

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 3

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	-1.0 ppm	-2.4 ppm	-1.70
30.1 ppm THC	29.5 ppm	29.2 ppm	29.35

Mean Reference Values:	**Corrected Results:**	**Basis:**
19.0 ppm THC	**19.0** ppm THC	WET

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
3	16/06/11 13:52:00	21.1
3	16/06/11 13:53:00	21.8
3	16/06/11 13:54:00	20.2
3	16/06/11 13:55:00	19.9
3	16/06/11 13:56:00	20.3
3	16/06/11 13:57:00	19.7
3	16/06/11 13:58:00	19.7
3	16/06/11 13:59:00	18.2
3	16/06/11 14:00:00	18.0
3	16/06/11 14:01:00	19.0
3	16/06/11 14:02:00	18.9
3	16/06/11 14:03:00	17.9
3	16/06/11 14:04:00	18.3
3	16/06/11 14:05:00	19.0
3	16/06/11 14:06:00	19.4
3	16/06/11 14:07:00	19.0
3	16/06/11 14:08:00	20.1
3	16/06/11 14:09:00	19.0
3	16/06/11 14:10:00	18.8
3	16/06/11 14:11:00	19.1
3	16/06/11 14:12:00	19.6
3	16/06/11 14:13:00	19.8
3	16/06/11 14:14:00	19.9
3	16/06/11 14:15:00	19.8
3	16/06/11 14:16:00	19.7
3	16/06/11 14:17:00	19.9
3	16/06/11 14:18:00	20.6
3	16/06/11 14:19:00	19.3
3	16/06/11 14:20:00	19.6
3	16/06/11 14:21:00	19.3
3	16/06/11 14:22:00	19.5
3	16/06/11 14:23:00	19.0
3	16/06/11 14:24:00	18.4
3	16/06/11 14:25:00	18.8
3	16/06/11 14:26:00	19.2
3	16/06/11 14:27:00	19.2

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
3	16/06/11 14:28:00	18.8
3	16/06/11 14:29:00	18.9
3	16/06/11 14:30:00	19.6
3	16/06/11 14:31:00	19.3
3	16/06/11 14:32:00	19.8
3	16/06/11 14:33:00	19.7
3	16/06/11 14:34:00	18.6
3	16/06/11 14:35:00	18.8
3	16/06/11 14:36:00	19.4
3	16/06/11 14:37:00	18.8
3	16/06/11 14:38:00	19.7
3	16/06/11 14:39:00	18.2
3	16/06/11 14:40:00	18.8
3	16/06/11 14:41:00	19.2
3	16/06/11 14:42:00	18.8
3	16/06/11 14:43:00	19.0
3	16/06/11 14:44:00	18.5
3	16/06/11 14:45:00	19.1
3	16/06/11 14:46:00	18.6
3	16/06/11 14:47:00	18.3
3	16/06/11 14:48:00	18.3
3	16/06/11 14:49:00	17.7
3	16/06/11 14:50:00	17.3
3	16/06/11 14:51:00	18.3
3	16/06/11 14:52:00	18.4
3	16/06/11 14:53:00	17.9
3	16/06/11 14:54:00	17.9
3	16/06/11 14:55:00	17.5
3	16/06/11 14:56:00	17.0
3	16/06/11 14:57:00	17.4
3	16/06/11 14:58:00	18.5
3	16/06/11 14:59:00	17.5
3	16/06/11 15:00:00	17.4
3	16/06/11 15:01:00	18.2
3	16/06/11 15:02:00	18.1
3	16/06/11 15:03:00	18.3
	Average	**19.0**

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 4

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	-2.4 ppm	-0.2 ppm	-1.30
30.1 ppm THC	29.2 ppm	31.1 ppm	30.15

Mean Reference Values:	**Corrected Results:**	**Basis:**
20.2 ppm THC	**20.2** ppm THC	WET

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
4	16/06/11 15:23:00	22.8
4	16/06/11 15:24:00	21.6
4	16/06/11 15:25:00	21.2
4	16/06/11 15:26:00	21.2
4	16/06/11 15:27:00	20.7
4	16/06/11 15:28:00	21.5
4	16/06/11 15:29:00	21.8
4	16/06/11 15:30:00	21.8
4	16/06/11 15:31:00	20.8
4	16/06/11 15:32:00	20.7
4	16/06/11 15:33:00	22.1
4	16/06/11 15:34:00	20.7
4	16/06/11 15:35:00	20.2
4	16/06/11 15:36:00	20.7
4	16/06/11 15:37:00	20.7
4	16/06/11 15:38:00	20.8
4	16/06/11 15:39:00	20.9
4	16/06/11 15:40:00	20.8
4	16/06/11 15:41:00	20.3
4	16/06/11 15:42:00	20.6
4	16/06/11 15:43:00	20.9
4	16/06/11 15:44:00	20.2
4	16/06/11 15:45:00	20.4
4	16/06/11 15:46:00	19.7
4	16/06/11 15:47:00	20.0
4	16/06/11 15:48:00	20.0
4	16/06/11 15:49:00	19.1
4	16/06/11 15:50:00	18.8
4	16/06/11 15:51:00	18.4
4	16/06/11 15:52:00	19.1
4	16/06/11 15:53:00	18.9

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 16, 2011

Run Number	Date & Time	Inlet THC
4	16/06/11 15:54:00	19.4
4	16/06/11 15:55:00	19.4
4	16/06/11 15:56:00	19.6
4	16/06/11 15:57:00	18.3
4	16/06/11 15:58:00	19.4
4	16/06/11 15:59:00	18.8
4	16/06/11 16:00:00	19.0
4	16/06/11 16:01:00	19.6
4	16/06/11 16:02:00	20.0
4	16/06/11 16:03:00	20.2
4	16/06/11 16:04:00	20.1
4	16/06/11 16:05:00	19.4
4	16/06/11 16:06:00	19.9
4	16/06/11 16:07:00	20.3
4	16/06/11 16:08:00	20.7
4	16/06/11 16:09:00	19.9
4	16/06/11 16:10:00	19.9
4	16/06/11 16:11:00	20.4
4	16/06/11 16:12:00	19.4
4	16/06/11 16:13:00	20.1
4	16/06/11 16:14:00	21.2
4	16/06/11 16:15:00	20.4
4	16/06/11 16:16:00	20.2
4	16/06/11 16:17:00	19.9
4	16/06/11 16:18:00	20.1
4	16/06/11 16:19:00	19.4
4	16/06/11 16:20:00	19.1
4	16/06/11 16:21:00	19.7
4	16/06/11 16:22:00	20.9
4	16/06/11 16:23:00	20.6
	Average	**20.2**

Analyzer Calibration Error

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Total Hydrocarbon Monitor **Method 25A** Analyzer Model: CAI 300 HFID
Calibration Span: 100.0 ppm Serial Number: SN T11019

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
UN1066A/cg10	0.0 ppm	0.0 ppm	0.0 ppm	0.00 %
CC100936/cg11	30.1 ppm	30.9 ppm	0.8 ppm	0.81 %
CC21245/cg9	50.8 ppm	50.9 ppm	0.1 ppm	0.07 %
SG9141968/cg8	85.0 ppm	85.0 ppm	0.0 ppm	0.20 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Hydrocarbon Analyzer
Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	1.0 ppm	1.00 %	1.4 ppm	1.40 %	0.40 %
Upscale THC	30.1 ppm	31.9 ppm	1.81 %	31.9 ppm	1.81 %	0.00 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 2

Hydrocarbon Analyzer

Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	1.4 ppm	1.40 %	-1.0 ppm	-1.00 %	2.40 %
Upscale THC	30.1 ppm	31.9 ppm	1.81 %	29.5 ppm	-0.59 %	2.40 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 3

Hydrocarbon Analyzer

Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	-1.0 ppm	-1.00 %	-2.4 ppm	-2.40 %	1.40 %
Upscale THC	30.1 ppm	29.5 ppm	-0.59 %	29.2 ppm	-0.89 %	0.30 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/16/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 4

Hydrocarbon Analyzer

Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	-2.4 ppm	-2.40 %	-0.2 ppm	-0.20 %	2.20 %
Upscale THC	30.1 ppm	29.2 ppm	-0.89 %	31.1 ppm	1.01 %	1.90 %

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/17/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	0.0 ppm	1.2 ppm	0.60
30.1 ppm THC	30.2 ppm	32.0 ppm	31.10

Mean Reference Values:	**Corrected Results:**	**Basis:**
28.5 ppm THC	**28.5** ppm THC	WET

Entec Services Inc.
Hovensa
US Vigin Island - St. Croix
FCCU Stack
High Load
June 17, 2011

Run Number	Date & Time	Inlet THC
1	17/06/11 08:43:00	23.0
1	17/06/11 08:44:00	25.3
1	17/06/11 08:45:00	26.1
1	17/06/11 08:46:00	26.2
1	17/06/11 08:47:00	27.2
1	17/06/11 08:48:00	27.7
1	17/06/11 08:49:00	27.6
1	17/06/11 08:50:00	27.5
1	17/06/11 08:51:00	27.5
1	17/06/11 08:52:00	27.5
1	17/06/11 08:53:00	28.4
1	17/06/11 08:54:00	28.5
1	17/06/11 08:55:00	27.7
1	17/06/11 08:56:00	28.3
1	17/06/11 08:57:00	28.4
1	17/06/11 08:58:00	29.4
1	17/06/11 08:59:00	28.6
1	17/06/11 09:00:00	28.1
1	17/06/11 09:01:00	28.5
1	17/06/11 09:02:00	28.1
1	17/06/11 09:03:00	28.5
1	17/06/11 09:04:00	28.8
1	17/06/11 09:05:00	28.0
1	17/06/11 09:06:00	28.6
1	17/06/11 09:07:00	29.0
1	17/06/11 09:08:00	28.4
1	17/06/11 09:09:00	27.7
1	17/06/11 09:10:00	27.9
1	17/06/11 09:11:00	29.0
1	17/06/11 09:12:00	28.4
1	17/06/11 09:13:00	29.2
1	17/06/11 09:14:00	28.9
1	17/06/11 09:15:00	29.1
1	17/06/11 09:16:00	28.9
1	17/06/11 09:17:00	28.4
1	17/06/11 09:18:00	29.7
1	17/06/11 09:19:00	28.7
1	17/06/11 09:20:00	28.5
1	17/06/11 09:21:00	28.2
1	17/06/11 09:22:00	28.6
1	17/06/11 09:23:00	28.7
1	17/06/11 09:24:00	28.1

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 17, 2011

Run Number	Date & Time	Inlet THC
1	17/06/11 09:25:00	28.5
1	17/06/11 09:26:00	28.8
1	17/06/11 09:27:00	29.0
1	17/06/11 09:28:00	29.6
1	17/06/11 09:29:00	29.8
1	17/06/11 09:30:00	29.1
1	17/06/11 09:31:00	28.8
1	17/06/11 09:32:00	28.9
1	17/06/11 09:33:00	28.9
1	17/06/11 09:34:00	27.9
1	17/06/11 09:35:00	28.1
1	17/06/11 09:36:00	29.2
1	17/06/11 09:37:00	29.0
1	17/06/11 09:38:00	29.5
1	17/06/11 09:39:00	29.0
1	17/06/11 09:40:00	29.2
1	17/06/11 09:41:00	29.2
1	17/06/11 09:42:00	28.4
1	17/06/11 09:43:00	29.0
1	17/06/11 09:44:00	28.8
1	17/06/11 09:45:00	29.1
1	17/06/11 09:46:00	28.9
1	17/06/11 09:47:00	28.4
1	17/06/11 09:48:00	29.4
1	17/06/11 09:49:00	28.2
1	17/06/11 09:50:00	28.6
1	17/06/11 09:51:00	28.9
1	17/06/11 09:52:00	28.8
1	17/06/11 09:53:00	30.0
1	17/06/11 09:54:00	29.0
1	17/06/11 09:55:00	28.9
1	17/06/11 09:56:00	28.8
1	17/06/11 09:57:00	28.8
1	17/06/11 09:58:00	29.2
1	17/06/11 09:59:00	29.3
1	17/06/11 10:00:00	29.1
1	17/06/11 10:01:00	29.4
1	17/06/11 10:02:00	29.8
1	17/06/11 10:03:00	29.9
1	17/06/11 10:04:00	29.0
1	17/06/11 10:05:00	28.6
1	17/06/11 10:06:00	29.4
	Average	**28.5**

Calculation of Average Emissions

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/17/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 2

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.0 ppm THC	1.2 ppm	-0.8 ppm	0.20
30.1 ppm THC	32.0 ppm	29.5 ppm	30.75

Mean Reference Values:	**Corrected Results:**	**Basis:**
26.8 ppm THC	**26.8** ppm THC	WET

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 17, 2011

Run Number	Date & Time	Inlet THC
2	17/06/11 10:15:00	26.3
2	17/06/11 10:16:00	28.1
2	17/06/11 10:17:00	27.4
2	17/06/11 10:18:00	28.6
2	17/06/11 10:19:00	28.4
2	17/06/11 10:20:00	27.5
2	17/06/11 10:21:00	27.7
2	17/06/11 10:22:00	28.4
2	17/06/11 10:23:00	28.3
2	17/06/11 10:24:00	29.3
2	17/06/11 10:25:00	28.4
2	17/06/11 10:26:00	27.8
2	17/06/11 10:27:00	27.9
2	17/06/11 10:28:00	28.4
2	17/06/11 10:29:00	28.1
2	17/06/11 10:30:00	28.3
2	17/06/11 10:31:00	28.4
2	17/06/11 10:32:00	28.2
2	17/06/11 10:33:00	28.1
2	17/06/11 10:34:00	27.9
2	17/06/11 10:35:00	27.7
2	17/06/11 10:36:00	27.1
2	17/06/11 10:37:00	27.3
2	17/06/11 10:38:00	27.2
2	17/06/11 10:39:00	27.7
2	17/06/11 10:40:00	27.4
2	17/06/11 10:41:00	26.7
2	17/06/11 10:42:00	26.3
2	17/06/11 10:43:00	26.4
2	17/06/11 10:44:00	26.4
2	17/06/11 10:45:00	26.8

Entec Services Inc.

Hovensa

US Vigin Island - St. Croix

FCCU Stack

High Load

June 17, 2011

Run Number	Date & Time	Inlet THC
2	17/06/11 10:46:00	27.1
2	17/06/11 10:47:00	26.5
2	17/06/11 10:48:00	26.4
2	17/06/11 10:49:00	26.7
2	17/06/11 10:50:00	26.7
2	17/06/11 10:51:00	26.3
2	17/06/11 10:52:00	26.0
2	17/06/11 10:53:00	26.5
2	17/06/11 10:54:00	26.1
2	17/06/11 10:55:00	25.5
2	17/06/11 10:56:00	25.0
2	17/06/11 10:57:00	24.4
2	17/06/11 10:58:00	26.1
2	17/06/11 10:59:00	25.0
2	17/06/11 11:00:00	24.4
2	17/06/11 11:01:00	25.2
2	17/06/11 11:02:00	25.2
2	17/06/11 11:03:00	26.2
2	17/06/11 11:04:00	26.3
2	17/06/11 11:05:00	25.5
2	17/06/11 11:06:00	25.6
2	17/06/11 11:07:00	25.9
2	17/06/11 11:08:00	26.1
2	17/06/11 11:09:00	25.6
2	17/06/11 11:10:00	25.6
2	17/06/11 11:11:00	25.6
2	17/06/11 11:12:00	25.8
2	17/06/11 11:13:00	25.6
2	17/06/11 11:14:00	25.8
2	17/06/11 11:15:00	25.7
	Average	**26.8**

Analyzer Calibration Error

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/17/11

Test Performed By:
ENTEC Services, Inc
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Total Hydrocarbon Monitor **Method 25A** Analyzer Model: CAI 300 HFID
Calibration Span: 100.0 ppm Serial Number: SN T11019

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
UN1066A/cg10	0.0 ppm	0.0 ppm	0.0 ppm	0.00 %
CC100936/cg11	30.1 ppm	30.2 ppm	0.1 ppm	0.11 %
CC21245/cg9	50.8 ppm	51.0 ppm	0.2 ppm	0.17 %
SG9141968/cg8	85.0 ppm	85.0 ppm	0.0 ppm	0.20 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/17/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 1

Hydrocarbon Analyzer
Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	0.0 ppm	0.00 %	1.2 ppm	1.20 %	1.20 %
Upscale THC	30.1 ppm	30.2 ppm	0.11 %	32.0 ppm	1.91 %	1.80 %

Sampling System Bias and Drift

Test Performed For:
Hovensa
FCCU Stack
St. Croix, USVI
THC Test
Date:6/17/11

Test Performed By:
ENTEC Services, Inc.
Raleigh, NC Division
Mobile Test Rack
Tim Draheim
Run 2

Hydrocarbon Analyzer

Calibration Span: 100.0 ppm

Analyzer Model: CAI 300 HFID
Serial Number: SN T11019

Gas Level	Calibration Gas Value	Initial Response	Initial Bias	Final Response	Final Bias	Total Run Drift
Low THC	0.0 ppm	1.2 ppm	1.20 %	-0.8 ppm	-0.80 %	2.00 %
Upscale THC	30.1 ppm	32.0 ppm	1.91 %	29.5 ppm	-0.59 %	2.50 %

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
Phone (919) 544-3773
Fax (919) 544-3774
www.airgas.com

Part Number:	E02AI99E15A0705	Reference Number:	122-124218301-1
Cylinder Number:	CC100936	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	May 04, 2010	Valve Outlet:	590

Expiration Date: May 04, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	30.00 PPM	30.09 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	000601	XC019320B	48.1PPM PROPANE/AIR	Oct 02, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 #1 C3H8	FTIR	Apr 05, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
Phone (919) 544-3773
Fax (919) 544-3774
www.airgas.com

Part Number:	E02AI99E15A0456	Reference Number:	122-124218301-2
Cylinder Number:	CC21245	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	May 04, 2010	Valve Outlet:	590

Expiration Date: May 04, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	50.00 PPM	50.83 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	000601	XC019320B	48.1PPM PROPANE/AIR	Oct 02, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 #1 C3H8	FTIR	Apr 05, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Part Number:	E02AI99E15A0565	Reference Number:	83-124217688-1
Cylinder Number:	-SG9141968	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	May 05, 2010	Valve Outlet:	590

Expiration Date: May 05, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	90.00 PPM	85.03 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080610	CC262361	49.62PPM PROPANE/AIR	Jul 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR2PROPANE (50-500 ppm)	FTIR	Apr 08, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
Phone (919) 544-3773
Fax (919) 544-3774
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI55E15A48Q4	Reference Number:	122-124236689-6
Cylinder Number:	CC340632	Cylinder Volume:	162 Cu.Ft.
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 07, 2010	Valve Outlet:	590

Expiration Date: Oct 07, 2013

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	22.50 %	22.54 %	G2	+/- 1% NIST Traceable
OXYGEN	22.50 %	22.44 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	060608	CC207906	22.51% OXYGEN/NITROGEN	May 01, 2016
NTRM	970512	SG9161078BAL	15.862% CARBON DIOXIDE/NITROGEN	May 01, 2016

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 CO2	Infrared	Sep 09, 2010
Horiba MPA-510 O2 (0-25%)	Paramagnetic	Sep 09, 2010

Triad Data Available Upon Request

Notes:

Amber Mains

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Part Number:	E03NI76E15A0295	Reference Number:	83-124261261-1
Cylinder Number:	SG9173687	Cylinder Volume.	153 Cu.Ft.
Laboratory:	ASG - Port Allen - LA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Apr 12, 2011	Valve Outlet:	590

Expiration Date: Apr 12, 2014

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	12.00 %	12.48 %	G1	+/- 1% NIST Traceable
OXYGEN	12.00 %	11.66 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	09060630	CC262441	9.921% CARBON DIOXIDE/NITROGEN	Apr 10, 2013
NTRM	09060223	cc263073	9.961% OXYGEN/NITROGEN	Jan 15, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SCO2GM	NonDispersive Infrared	Apr 12, 2011
HO2GM	PMO2	Mar 17, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

AIR LIQUIDE SPECIALTY GASES | Scott

Close Window | Save As | Print

6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

RATA CLASS

Dual-Analyzed Calibration Standard

CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A12011
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
6141 EASTON ROAD, BLDG 1
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 4500694284
Project No.: 01-08064-001

Customer
HOVENSA L.L.C.

1 ESTATE HOPE
CHRISTIANSTED 00820
US VIRGIN ISLANDS

ANALYTICAL INFORMATION

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

Cylinder Number: AAL19979 **Certification Date:** 28Jul2009 **Exp. Date:** 28Jul2011
Cylinder Pressure*: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON MONOXIDE	553 PPM	+/- 1%	Direct NIST and VSL
NITRIC OXIDE	55.1 PPM	+/- 1%	Direct NIST and VSL
SULFUR DIOXIDE *	111 PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	55.1 PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1680	02Oct2011	KAL003909	499.8 PPM	CARBON MONOXIDE
NTRM 1683	02Oct2009	KAL003389	46.90 PPM	NITRIC OXIDE
NTRM 1694	02Oct2011	ALM029962	98.10 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000928781	17Jul2009	FTIR
FTIR//000928781	10Jul2009	FTIR
FTIR//000928781	23Jul2009	FTIR

ANALYZER READINGS

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

First Triad Analysis
CARBON MONOXIDE
Date: 21Jul2009 Response Unit: PPM
Z1=0.01881 R1=501.5412 T1=554.5550
R2=501.9655 Z2=0.06142 T2=554.6942
Z3=0.23050 T3=554.8135 R3=502.1639
Avg. Concentration: 552.4 PPM

NITRIC OXIDE
Date: 21Jul2009 Response Unit: PPM
Z1=-0.06371 R1=46.77965 T1=55.15423
R2=46.93671 Z2=0.00177 T2=55.21286
Z3=0.05220 T3=55.22810 R3=46.97792
Avg. Concentration: 55.20 PPM

SULFUR DIOXIDE *
Date: 21Jul2009 Response Unit: PPM
Z1=-0.01710 R1=98.12571 T1=110.6684
R2=98.24570 Z2=0.02831 T2=110.6892
Z3=0.08186 T3=110.6933 R3=98.29018
Avg Concentration: 110.5 PPM

Second Triad Analysis

Date: 28Jul2009 Response Unit: PPM
Z1=-0.04397 R1=500.1764 T1=553.3411
R2=500.2470 Z2=0.01655 T2=553.6348
Z3=0.13870 T3=553.8109 R3=500.3633
Avg. Concentration: 553.1 PPM

Date: 28Jul2009 Response Unit: PPM
Z1=-0.08085 R1=46.88480 T1=54.95895
R2=46.94659 Z2=-0.02719 T2=55.01892
Z3=0.02478 T3=55.06973 R3=47.05224
Avg. Concentration: 54.94 PPM

Date: 28Jul2009 Response Unit: PPM
Z1=-0.01474 R1=98.39477 T1=110.9863
R2=98.43878 Z2=-0.00999 T2=110.9670
Z3=0.00394 T3=110.9924 R3=98.45433
Avg. Concentration: 110.6 PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99999E-1
Constants: A=0.00000E+0
B=2.63183E-1 C=2.64000E-4
D=0.00000E+0 E=0.00000E+0

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99996E-1
Constants: A=0.00000E+0
B=9.54029E-1 C=1.68000E-4
D=0.00000E+0 E=0.00000E+0

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99996E-1
Constants: A=0.00000E+0
B=9.96325E-1 C=7.00000E-6
D=0.00000E+0 E=0.00000E+0

Special Notes:
Carbon Monoxide - 0.0553% Nitric Oxide - 0.00590%
Sulfer Dioxide - 0.0254% Nitrogen - 0.99913432%

AIR LIQUIDE SPECIALTY GASES Scott

Close Window | Save As | Print

6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

RATA CLASS

Dual-Analyzed Calibration Standard

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A12011
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
6141 EASTON ROAD, BLDG 1
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 4500725632
Document # : 40462127-001

Customer
HOVENSA L.L.C.

1 ESTATE HOPE
CHRISTIANSTED 00820-5652 00000
U.S. VIRGIN ISLANDS

ANALYTICAL INFORMATION

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

Cylinder Number: ALM031153
Cylinder Pressure*:** 2000 PSIG

Certification Date: 30Sep2010

Exp. Date: 28Sep2013
Batch No: PLU0009255

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
OXYGEN	5.56 %	+/- 1%	Direct NIST and VSL
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
O2/N2 10%	01Feb2016	K001907	10.03 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
SIEMENS/OXYMAT 61/V1-0407	28Sep2010	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis
OXYGEN
Date: 29Sep2010 Response Unit: VOLTS
Z1=-0.00330 R1=4.91810 T1=2.72170
R2=4.91980 Z2=-0.00110 T2=2.72020
Z3=-0.00280 T3=2.72040 R3=4.92550
Avg. Concentration: 5.560 %

Second Triad Analysis

Calibration Curve
Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.99999581 2350
Constants: A=0.01781531
B=2.04048059 C=
D= E=

QUALITY ASSURANCE

APPROVED BY: DAVID ASHNOFF
(signature on file)

AIR LIQUIDE SPECIALTY GASES Scott

Close Window | Save As | Print

6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

RATA CLASS

Dual-Analyzed Calibration Standard

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A12011
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
6141 EASTON ROAD, BLDG 1
PLUMSTEADVILLE, PA 18949-0310

P.O. No.: 4500711439
Document # : 40119975-001

Customer
HOVENSA L.L.C.
1 ESTATE HOPE
00000 CHRISTIANSTED 00820-5652
U.S. VIRGIN ISLANDS

ANALYTICAL INFORMATION Gas Type : CO2

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

Cylinder Number: ALM063573
Cylinder Pressure***: 1989 PSIG
Certification Date: 30Dec2010
Exp. Date: 29Dec2013
Batch No: PLU0024525

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON DIOXIDE	10.02 %	+/- 1%	Direct NIST and VSL
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1675	15Dec2011	K021784	13.94 %	CARBON DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000926781	16Dec2010	FTIR

ANALYZER READINGS

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

First Triad Analysis
CARBON DIOXIDE
Date: 30Dec2010 Response Unit: %
Z1=-0.00070 R1=13.83364 T1=9.93708
R2=13.85746 Z2=0.00461 T2=9.95622
Z3=0.00487 T3=9.97365 R3=13.86650
Avg. Concentration: 10.02 %

Second Triad Analysis

Calibration Curve
Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99999E-1
Constants: A=0.00000E+0
B=9.01031E-1 C=8.78700E-3
D=7.00000E-5 E=-1.00000E-6

QUALITY ASSURANCE

APPROVED BY: Michael A. Kuhns
(signature on file)

APPENDIX B

OPERATIONAL AND PRODUCTION DATA

APPENDIX B.1

OPERATIONAL AND PRODUCTION DATA

CEMS HOURLY

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	12.7	ppm	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	11.4	ppm	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	10.1	ppm	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	10.6	ppm	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	10.0	ppm	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	10.0	ppm	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	10.2	ppm	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	9.5	ppm	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	8.9	ppm	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	7.7	ppm	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	6.8	ppm	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	8.4	ppm	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	8.7	ppm	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	8.8	ppm	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	9.3	ppm	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	9.2	ppm	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	9.6	ppm	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	10.2	ppm	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	11.0	ppm	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	11.0	ppm	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	11.3	ppm	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	10.9	ppm	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	11.3	ppm	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	11.4	ppm	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	11.7	ppm	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	11.7	ppm	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	11.4	ppm	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	11.7	ppm	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	11.6	ppm	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	11.6	ppm	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	11.3	ppm	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	10.4	ppm	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	10.5	ppm	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	10.1	ppm	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	10.1	ppm	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	10.4	ppm	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	10.5	ppm	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	9.9	ppm	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	10.2	ppm	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	10.5	ppm	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	13.1	ppm	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	12.6	ppm	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	12.6	ppm	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	12.9	ppm	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	11.8	ppm	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	12.9	ppm	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	11.7	ppm	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	11.2	ppm	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	11.3	ppm	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	10.7	ppm	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	11.2	ppm	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	9.3	ppm	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	9.0	ppm	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	9.5	ppm	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	9.5	ppm	1.31	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	7.9	ppm	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	6.8	ppm	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	7.9	ppm	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	8.7	ppm	1.19	Dry	No
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	9.6	ppm	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	9.1	ppm	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	9.4	ppm	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	9.6	ppm	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	9.2	ppm	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	9.4	ppm	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	9.8	ppm	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	10.1	ppm	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	11.3	ppm	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	11.1	ppm	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	11.5	ppm	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	11.5	ppm	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	11.9	ppm	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	12.8	ppm	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	11.7	ppm	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	10.6	ppm	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	11.6	ppm	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	12.2	ppm	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	12.2	ppm	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	12.1	ppm	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	11.8	ppm	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	11.2	ppm	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	10.6	ppm	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	11.8	ppm	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	10.0	ppm	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	10.3	ppm	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	11.3	ppm	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	11.4	ppm	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	11.6	ppm	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	11.5	ppm	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	12.5	ppm	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	12.4	ppm	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	12.9	ppm	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	12.8	ppm	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	12.5	ppm	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	12.4	ppm	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	12.6	ppm	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	12.7	ppm	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	12.5	ppm	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	12.4	ppm	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	11.9	ppm	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	12.2	ppm	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	12.0	ppm	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	12.0	ppm	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	11.3	ppm	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	11.6	ppm	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	11.7	ppm	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	11.0	ppm	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	10.9	ppm	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	10.5	ppm	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	10.7	ppm	1.34	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	10.3	ppm	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	11.0	ppm	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	11.0	ppm	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	11.8	ppm	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	12.4	ppm	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	12.4	ppm	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	12.4	ppm	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	12.3	ppm	1.56	Dry	No
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	12.3	ppm	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	12.1	ppm	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	11.7	ppm	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	10.1	ppm	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	9.1	ppm	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	9.9	ppm	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	9.5	ppm	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	9.2	ppm	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	9.3	ppm	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	8.8	ppm	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	8.5	ppm	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	8.3	ppm	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	8.1	ppm	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	8.9	ppm	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	8.1	ppm	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	8.3	ppm	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	8.6	ppm	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	9.6	ppm	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	8.9	ppm	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	7.7	ppm	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	8.4	ppm	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	8.9	ppm	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	11.4	ppm	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	10.8	ppm	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	10.7	ppm	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	11.6	ppm	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	11.7	ppm	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	11.3	ppm	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	10.5	ppm	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	10.5	ppm	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	10.4	ppm	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	10.6	ppm	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	9.7	ppm	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	9.1	ppm	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	9.0	ppm	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	6.8	ppm	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	7.3	ppm	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	7.7	ppm	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	7.5	ppm	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	6.7	ppm	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	8.6	ppm	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	9.9	ppm	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	11.9	ppm	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	11.1	ppm	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	11.7	ppm	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	13.1	ppm	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	15.8	ppm	2.03	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	16.1	ppm	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	20.4	ppm	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	19.4	ppm	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	19.9	ppm	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	18.7	ppm	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	18.6	ppm	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	18.0	ppm	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	17.7	ppm	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	17.9	ppm	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	17.4	ppm	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	18.1	ppm	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	18.1	ppm	2.37	Dry	No
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	17.9	ppm	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	18.0	ppm	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	18.4	ppm	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	17.0	ppm	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	17.0	ppm	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	16.6	ppm	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	16.5	ppm	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	17.1	ppm	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	17.0	ppm	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	17.1	ppm	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	17.7	ppm	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	22.8	ppm	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	22.0	ppm	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	21.2	ppm	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	18.9	ppm	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	18.9	ppm	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	19.0	ppm	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	18.9	ppm	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	19.3	ppm	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	19.5	ppm	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	18.8	ppm	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	18.1	ppm	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	18.3	ppm	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	17.6	ppm	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	17.5	ppm	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	18.4	ppm	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	21.0	ppm	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	21.2	ppm	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	21.9	ppm	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	19.7	ppm	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	17.5	ppm	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	12.7	ppm	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	17.4	ppm	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	17.4	ppm	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	18.0	ppm	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	17.8	ppm	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	18.4	ppm	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	16.5	ppm	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	15.6	ppm	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	17.7	ppm	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	16.5	ppm	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	15.9	ppm	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	16.2	ppm	1.46	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	17.4	ppm	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	16.9	ppm	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	19.6	ppm	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	19.3	ppm	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	16.4	ppm	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	17.1	ppm	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	17.1	ppm	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	16.8	ppm	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	12.5	ppm	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	12.0	ppm	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	16.1	ppm	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	14.1	ppm	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	13.5	ppm	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	13.9	ppm	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	13.6	ppm	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	14.6	ppm	1.12	Dry	No
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	14.8	ppm	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	14.7	ppm	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	15.6	ppm	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	16.1	ppm	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	18.2	ppm	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	18.0	ppm	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	17.6	ppm	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	16.9	ppm	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	16.7	ppm	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	16.6	ppm	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	16.4	ppm	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	15.9	ppm	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	15.3	ppm	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	13.2	ppm	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	13.3	ppm	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	12.9	ppm	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	12.5	ppm	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	13.2	ppm	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	13.0	ppm	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	12.8	ppm	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	13.3	ppm	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	12.9	ppm	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	13.5	ppm	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	12.9	ppm	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	12.8	ppm	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	12.5	ppm	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	12.1	ppm	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	12.3	ppm	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	12.8	ppm	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	12.4	ppm	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	12.1	ppm	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	11.8	ppm	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	12.1	ppm	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	12.5	ppm	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	12.2	ppm	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	11.3	ppm	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	10.8	ppm	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	11.0	ppm	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	15.1	ppm	1.44	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	16.2	ppm	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	14.5	ppm	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	13.5	ppm	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	13.1	ppm	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	13.8	ppm	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	14.0	ppm	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	13.8	ppm	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	13.3	ppm	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	13.6	ppm	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	13.4	ppm	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	13.3	ppm	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	13.3	ppm	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	13.7	ppm	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	13.9	ppm	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	13.7	ppm	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	13.3	ppm	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	12.5	ppm	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	12.9	ppm	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	13.1	ppm	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	12.9	ppm	1.19	Dry	No
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	12.8	ppm	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	12.4	ppm	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	11.9	ppm	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	12.5	ppm	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	11.9	ppm	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	14.0	ppm	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	13.3	ppm	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	12.5	ppm	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	12.2	ppm	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	12.6	ppm	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	8.2	ppm	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	11.5	ppm	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	16.8	ppm	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	15.4	ppm	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	15.5	ppm	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	15.9	ppm	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	16.0	ppm	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	15.5	ppm	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	13.1	ppm	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	13.1	ppm	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	13.1	ppm	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	12.6	ppm	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	12.3	ppm	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	12.4	ppm	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	16.3	ppm	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	17.9	ppm	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	16.3	ppm	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	15.4	ppm	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	15.2	ppm	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	14.9	ppm	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	15.5	ppm	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	13.4	ppm	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	14.4	ppm	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	12.8	ppm	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	17.3	ppm	2.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	17.1	ppm	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	16.9	ppm	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	16.9	ppm	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	15.2	ppm	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	13.1	ppm	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	13.5	ppm	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	13.0	ppm	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	13.3	ppm	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	13.3	ppm	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	14.1	ppm	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	15.1	ppm	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	14.7	ppm	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	14.6	ppm	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	13.3	ppm	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	12.4	ppm	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	12.7	ppm	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	15.4	ppm	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	16.4	ppm	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	16.6	ppm	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	16.4	ppm	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	16.5	ppm	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	16.2	ppm	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	16.2	ppm	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	17.0	ppm	2.01	Dry	No
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	18.1	ppm	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	16.7	ppm	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	12.6	ppm	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	11.7	ppm	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	9.9	ppm	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	12.3	ppm	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	11.1	ppm	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	11.6	ppm	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	9.8	ppm	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	10.2	ppm	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	9.5	ppm	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	11.8	ppm	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	15.7	ppm	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	15.4	ppm	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	15.2	ppm	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	14.3	ppm	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	14.3	ppm	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	13.8	ppm	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	12.8	ppm	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	13.5	ppm	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	13.8	ppm	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	13.1	ppm	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	12.8	ppm	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	13.1	ppm	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	13.2	ppm	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	11.0	ppm	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	7.3	ppm	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	6.6	ppm	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	8.2	ppm	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	7.1	ppm	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	8.1	ppm	0.99	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	9.3	ppm	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	9.7	ppm	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	11.8	ppm	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	10.5	ppm	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	8.2	ppm	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	8.2	ppm	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	11.2	ppm	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	12.0	ppm	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	12.5	ppm	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	13.0	ppm	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	12.9	ppm	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	12.9	ppm	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	14.2	ppm	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	14.2	ppm	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	13.8	ppm	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	14.2	ppm	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	14.4	ppm	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	14.3	ppm	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	14.1	ppm	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	10.3	ppm	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	7.6	ppm	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	8.3	ppm	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	8.3	ppm	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	8.9	ppm	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	8.4	ppm	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	8.4	ppm	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	8.2	ppm	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	9.2	ppm	1.15	Dry	No
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	9.8	ppm	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	10.5	ppm	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	13.9	ppm	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	13.8	ppm	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	13.9	ppm	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	13.9	ppm	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	13.5	ppm	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	13.8	ppm	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	13.6	ppm	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	13.8	ppm	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	13.8	ppm	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	13.7	ppm	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	14.2	ppm	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	14.3	ppm	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	12.4	ppm	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	9.1	ppm	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	9.7	ppm	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	9.9	ppm	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	9.7	ppm	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	10.0	ppm	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	9.7	ppm	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	9.8	ppm	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	10.2	ppm	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	10.3	ppm	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	10.6	ppm	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	14.2	ppm	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	14.6	ppm	1.94	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	14.5	ppm	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	14.2	ppm	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	14.5	ppm	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	14.4	ppm	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	16.8	ppm	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	22.4	ppm	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	23.4	ppm	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	12.9	ppm	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	9.5	ppm	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	12.6	ppm	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	9.6	ppm	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	10.1	ppm	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	10.7	ppm	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	11.2	ppm	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	11.2	ppm	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	11.0	ppm	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	11.6	ppm	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	10.5	ppm	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	10.7	ppm	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	10.6	ppm	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	10.3	ppm	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	9.9	ppm	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	10.5	ppm	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	9.1	ppm	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	8.9	ppm	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	7.8	ppm	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	6.8	ppm	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	9.9	ppm	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	12.5	ppm	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	12.4	ppm	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	11.9	ppm	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	12.2	ppm	1.75	Dry	No
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	12.3	ppm	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	12.3	ppm	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	12.6	ppm	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	16.6	ppm	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	19.4	ppm	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	21.5	ppm	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	21.0	ppm	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	21.0	ppm	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	20.4	ppm	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	20.4	ppm	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	20.8	ppm	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	20.6	ppm	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	19.9	ppm	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	18.6	ppm	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	17.8	ppm	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	17.2	ppm	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	12.9	ppm	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	11.6	ppm	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	11.7	ppm	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	11.4	ppm	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	8.7	ppm	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	8.7	ppm	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	9.5	ppm	1.44	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	11.7	ppm	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	17.9	ppm	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	15.1	ppm	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	17.3	ppm	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	17.6	ppm	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	19.0	ppm	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	18.8	ppm	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	18.3	ppm	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	17.7	ppm	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	17.5	ppm	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	17.0	ppm	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	16.7	ppm	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	17.3	ppm	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	17.3	ppm	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	17.8	ppm	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	17.4	ppm	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	17.3	ppm	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	16.7	ppm	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	17.0	ppm	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	16.9	ppm	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	13.7	ppm	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	11.9	ppm	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	10.4	ppm	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	10.4	ppm	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	12.0	ppm	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	17.4	ppm	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	18.8	ppm	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	21.9	ppm	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	23.1	ppm	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	22.3	ppm	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	22.3	ppm	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	20.0	ppm	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	20.2	ppm	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	20.3	ppm	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	18.3	ppm	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	17.1	ppm	2.78	Dry	No
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	16.1	ppm	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	17.2	ppm	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	17.6	ppm	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	15.6	ppm	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	12.4	ppm	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	12.4	ppm	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	11.5	ppm	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	11.4	ppm	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	11.7	ppm	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	12.9	ppm	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	10.3	ppm	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	9.4	ppm	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	9.7	ppm	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	11.8	ppm	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	9.9	ppm	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	7.7	ppm	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	10.2	ppm	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	10.8	ppm	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	10.7	ppm	2.08	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	11.2	ppm	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	10.7	ppm	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	10.3	ppm	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	10.9	ppm	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	11.7	ppm	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	11.2	ppm	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	11.5	ppm	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	11.8	ppm	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	11.2	ppm	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	11.2	ppm	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	11.2	ppm	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	11.8	ppm	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	11.2	ppm	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	12.1	ppm	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	12.3	ppm	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	12.5	ppm	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	14.3	ppm	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	14.8	ppm	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	15.0	ppm	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	14.1	ppm	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	11.4	ppm	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	13.4	ppm	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	12.3	ppm	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	11.8	ppm	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	12.5	ppm	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	11.6	ppm	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	10.8	ppm	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	10.8	ppm	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	13.3	ppm	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	13.4	ppm	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	13.5	ppm	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	13.9	ppm	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	14.5	ppm	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	13.8	ppm	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	13.9	ppm	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	14.7	ppm	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	14.7	ppm	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	14.3	ppm	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	14.0	ppm	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	15.0	ppm	1.57	Dry	No
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	17.9	ppm	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	17.7	ppm	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	17.8	ppm	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	18.5	ppm	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	17.9	ppm	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	18.2	ppm	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	18.2	ppm	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	18.2	ppm	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	18.6	ppm	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	19.2	ppm	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	16.4	ppm	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	14.2	ppm	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	12.3	ppm	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	12.8	ppm	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	13.2	ppm	1.40	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	13.1	ppm	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	12.5	ppm	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	12.6	ppm	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	15.4	ppm	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	15.3	ppm	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	15.1	ppm	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	14.1	ppm	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	14.9	ppm	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	15.2	ppm	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	15.4	ppm	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	14.8	ppm	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	15.3	ppm	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	15.2	ppm	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	15.5	ppm	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	15.8	ppm	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	15.0	ppm	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	15.2	ppm	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	15.3	ppm	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	15.2	ppm	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	15.3	ppm	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	15.3	ppm	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	14.6	ppm	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	14.7	ppm	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	14.5	ppm	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	18.3	ppm	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	13.0	ppm	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	15.4	ppm	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	13.5	ppm	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	12.4	ppm	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	14.5	ppm	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	12.4	ppm	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	11.7	ppm	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	10.4	ppm	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	13.3	ppm	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	16.4	ppm	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	14.7	ppm	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	16.7	ppm	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	16.1	ppm	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	16.9	ppm	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	13.2	ppm	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	11.9	ppm	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	14.9	ppm	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	16.6	ppm	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	14.4	ppm	1.85	Dry	No
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	14.4	ppm	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	16.1	ppm	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	15.2	ppm	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	14.9	ppm	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	15.1	ppm	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	16.0	ppm	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	17.7	ppm	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	15.9	ppm	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	17.4	ppm	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	17.6	ppm	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	19.3	ppm	2.11	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	16.7	ppm	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	22.8	ppm	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	21.3	ppm	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	17.1	ppm	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	21.5	ppm	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	13.3	ppm	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	17.8	ppm	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	12.6	ppm	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	24.0	ppm	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	13.9	ppm	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	16.0	ppm	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	12.4	ppm	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	16.3	ppm	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	12.5	ppm	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	12.2	ppm	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	13.7	ppm	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	10.9	ppm	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	10.8	ppm	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	15.0	ppm	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	14.9	ppm	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	16.1	ppm	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	17.8	ppm	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	12.7	ppm	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	15.7	ppm	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	14.2	ppm	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	12.9	ppm	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	12.0	ppm	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	11.9	ppm	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	13.1	ppm	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	12.7	ppm	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	11.9	ppm	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	13.7	ppm	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	13.4	ppm	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	15.1	ppm	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	14.1	ppm	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	13.5	ppm	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	9.0	ppm	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	15.0	ppm	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	11.8	ppm	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	12.3	ppm	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	12.0	ppm	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	13.5	ppm	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	12.4	ppm	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	11.0	ppm	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	8.0	ppm	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	10.5	ppm	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	8.9	ppm	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	12.3	ppm	1.95	Dry	No
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	16.1	ppm	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	12.2	ppm	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	14.9	ppm	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	14.3	ppm	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	12.6	ppm	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	12.9	ppm	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	13.9	ppm	2.00	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	Nox ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	17.7	ppm	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	17.2	ppm	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	16.3	ppm	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	15.5	ppm	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	13.1	ppm	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	0.5	ppm	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	0.6	ppm	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	0.7	ppm	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	0.7	ppm	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	0.8	ppm	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	0.9	ppm	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	1.1	ppm	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	1.0	ppm	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	1.3	ppm	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	1.3	ppm	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	1.1	ppm	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	0.8	ppm	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	0.8	ppm	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	0.8	ppm	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	0.9	ppm	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	1.1	ppm	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	1.3	ppm	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	1.6	ppm	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	2.2	ppm	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	2.9	ppm	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	3.7	ppm	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	4.4	ppm	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	5.2	ppm	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	6.5	ppm	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	7.1	ppm	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	8.0	ppm	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	8.7	ppm	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	9.3	ppm	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	9.9	ppm	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	10.4	ppm	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	10.0	ppm	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	10.0	ppm	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	9.9	ppm	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	9.0	ppm	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	8.9	ppm	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	10.4	ppm	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	11.3	ppm	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	11.7	ppm	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	12.5	ppm	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	12.4	ppm	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	13.5	ppm	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	16.0	ppm	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	15.5	ppm	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	10.0	ppm	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	6.3	ppm	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	4.0	ppm	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	2.9	ppm	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	2.0	ppm	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	1.3	ppm	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	1.0	ppm	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	0.8	ppm	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	0.6	ppm	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	0.4	ppm	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	0.4	ppm	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	0.6	ppm	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	0.4	ppm	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	0.4	ppm	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	0.4	ppm	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	0.4	ppm	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	0.4	ppm	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	0.4	ppm	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	0.4	ppm	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	0.4	ppm	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	0.4	ppm	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	0.4	ppm	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	0.4	ppm	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	0.4	ppm	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	0.4	ppm	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	0.4	ppm	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	0.4	ppm	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	0.5	ppm	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	0.5	ppm	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	0.6	ppm	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	0.7	ppm	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	1.1	ppm	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	1.6	ppm	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	1.9	ppm	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	2.0	ppm	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	1.8	ppm	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	2.2	ppm	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	2.5	ppm	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	2.7	ppm	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	3.0	ppm	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	3.2	ppm	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	3.5	ppm	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	3.8	ppm	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	4.3	ppm	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	4.6	ppm	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	5.0	ppm	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	5.0	ppm	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	5.2	ppm	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	5.6	ppm	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	5.4	ppm	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	5.5	ppm	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	5.0	ppm	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	4.9	ppm	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	4.5	ppm	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	4.1	ppm	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	3.9	ppm	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	3.5	ppm	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	3.5	ppm	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	3.0	ppm	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	2.8	ppm	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	2.4	ppm	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	1.9	ppm	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	1.5	ppm	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	1.4	ppm	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	1.4	ppm	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	1.3	ppm	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	1.3	ppm	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	0.9	ppm	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	1.3	ppm	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	1.6	ppm	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	1.9	ppm	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	2.2	ppm	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	2.0	ppm	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	1.5	ppm	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	1.4	ppm	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	1.1	ppm	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	0.7	ppm	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	0.5	ppm	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	0.4	ppm	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	0.6	ppm	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	0.4	ppm	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	0.4	ppm	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	0.4	ppm	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	0.4	ppm	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	0.4	ppm	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	0.4	ppm	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	0.4	ppm	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	0.4	ppm	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	0.4	ppm	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	0.4	ppm	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	0.4	ppm	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	0.4	ppm	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	0.4	ppm	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	0.4	ppm	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	0.4	ppm	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	0.4	ppm	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	0.4	ppm	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	0.4	ppm	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	0.4	ppm	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	0.4	ppm	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	0.5	ppm	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	0.4	ppm	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	0.4	ppm	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	0.4	ppm	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	0.4	ppm	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	0.4	ppm	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	0.4	ppm	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	0.4	ppm	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	0.4	ppm	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	0.4	ppm	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	0.4	ppm	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	0.5	ppm	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	1.7	ppm	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	4.5	ppm	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	8.1	ppm	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	13.3	ppm	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	7.1	ppm	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	1.0	ppm	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	0.4	ppm	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	0.4	ppm	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	0.5	ppm	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	1.6	ppm	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	1.1	ppm	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	0.5	ppm	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	0.7	ppm	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	0.4	ppm	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	0.4	ppm	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	0.4	ppm	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	0.4	ppm	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	0.4	ppm	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	0.4	ppm	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	0.4	ppm	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	0.4	ppm	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	0.4	ppm	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	0.4	ppm	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	0.4	ppm	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	0.4	ppm	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	0.4	ppm	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	0.4	ppm	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	0.4	ppm	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	0.6	ppm	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	0.9	ppm	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	1.3	ppm	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	1.9	ppm	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	2.2	ppm	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	1.2	ppm	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	0.8	ppm	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	0.4	ppm	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	0.4	ppm	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	0.4	ppm	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	1.3	ppm	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	4.2	ppm	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	6.2	ppm	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	15.7	ppm	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	14.3	ppm	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	2.7	ppm	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	0.6	ppm	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	0.4	ppm	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	0.4	ppm	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	0.4	ppm	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	0.4	ppm	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	0.4	ppm	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	0.4	ppm	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	0.4	ppm	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	0.4	ppm	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	0.4	ppm	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	0.4	ppm	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	0.4	ppm	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	0.5	ppm	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	0.4	ppm	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	0.4	ppm	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	0.5	ppm	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	0.5	ppm	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	0.4	ppm	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	0.6	ppm	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	0.7	ppm	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	1.0	ppm	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	1.2	ppm	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	1.7	ppm	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	2.6	ppm	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	3.2	ppm	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	3.9	ppm	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	2.7	ppm	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	0.7	ppm	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	0.4	ppm	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	0.3	ppm	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	0.3	ppm	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	0.3	ppm	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	0.5	ppm	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	0.4	ppm	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	0.3	ppm	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	0.3	ppm	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	0.3	ppm	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	0.3	ppm	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	0.3	ppm	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	0.3	ppm	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	0.3	ppm	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	0.3	ppm	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	0.3	ppm	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	0.3	ppm	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	0.3	ppm	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	0.3	ppm	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	0.3	ppm	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	0.3	ppm	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	0.3	ppm	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	0.3	ppm	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	0.3	ppm	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	0.3	ppm	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	0.3	ppm	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	0.3	ppm	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	0.3	ppm	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	0.3	ppm	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	N/A	ppm	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	N/A	ppm	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	N/A	ppm	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	N/A	ppm	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	N/A	ppm	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	N/A	ppm	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	N/A	ppm	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	N/A	ppm	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	N/A	ppm	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	N/A	ppm	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	N/A	ppm	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	N/A	ppm	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	N/A	ppm	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	N/A	ppm	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	N/A	ppm	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	N/A	ppm	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	N/A	ppm	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	N/A	ppm	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	N/A	ppm	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	N/A	ppm	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	N/A	ppm	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	N/A	ppm	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	N/A	ppm	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	N/A	ppm	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	N/A	ppm	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	N/A	ppm	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	N/A	ppm	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	N/A	ppm	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	N/A	ppm	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	N/A	ppm	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	N/A	ppm	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	1.0	ppm	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	0.5	ppm	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	0.5	ppm	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	0.5	ppm	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	0.4	ppm	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	0.5	ppm	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	0.5	ppm	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	0.5	ppm	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	0.5	ppm	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	0.4	ppm	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	0.4	ppm	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	0.4	ppm	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	0.4	ppm	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	0.4	ppm	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	0.4	ppm	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	0.4	ppm	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	0.4	ppm	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	0.6	ppm	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	0.5	ppm	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	0.4	ppm	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	0.7	ppm	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	0.5	ppm	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	0.4	ppm	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	0.4	ppm	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	0.4	ppm	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	0.4	ppm	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	0.4	ppm	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	0.4	ppm	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	0.4	ppm	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	0.4	ppm	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	0.4	ppm	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	0.4	ppm	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	0.4	ppm	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	0.4	ppm	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	0.4	ppm	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	0.4	ppm	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	0.4	ppm	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	0.4	ppm	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	0.4	ppm	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	0.5	ppm	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	0.5	ppm	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	0.4	ppm	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	0.4	ppm	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	0.4	ppm	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	0.4	ppm	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	0.4	ppm	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	0.4	ppm	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	0.4	ppm	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	0.4	ppm	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	0.4	ppm	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	0.4	ppm	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	0.4	ppm	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	0.4	ppm	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	0.4	ppm	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	0.4	ppm	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	0.4	ppm	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	0.4	ppm	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	0.4	ppm	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	0.4	ppm	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	0.6	ppm	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	0.5	ppm	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	0.4	ppm	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	0.4	ppm	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	0.4	ppm	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	0.4	ppm	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	0.4	ppm	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	0.4	ppm	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	0.4	ppm	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	0.4	ppm	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	0.4	ppm	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	0.4	ppm	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	0.4	ppm	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	0.4	ppm	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	0.4	ppm	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	0.4	ppm	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	0.4	ppm	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	0.4	ppm	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	0.4	ppm	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	0.4	ppm	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	0.4	ppm	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	0.4	ppm	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	0.6	ppm	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	0.5	ppm	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	0.4	ppm	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	0.4	ppm	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	0.4	ppm	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	0.4	ppm	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	0.4	ppm	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	0.4	ppm	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	0.4	ppm	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	0.4	ppm	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	0.4	ppm	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	0.4	ppm	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	0.4	ppm	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	0.4	ppm	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	0.4	ppm	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	0.4	ppm	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	0.4	ppm	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	0.4	ppm	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	0.4	ppm	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	0.5	ppm	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	0.4	ppm	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	0.4	ppm	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	0.4	ppm	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	0.4	ppm	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	0.4	ppm	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	0.4	ppm	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	0.4	ppm	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	0.4	ppm	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	0.4	ppm	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	0.4	ppm	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	0.4	ppm	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	0.4	ppm	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	0.4	ppm	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	0.4	ppm	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	0.4	ppm	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	0.4	ppm	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	0.4	ppm	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	0.4	ppm	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	0.4	ppm	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	0.4	ppm	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	0.6	ppm	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	0.4	ppm	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	0.4	ppm	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	0.5	ppm	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	0.6	ppm	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	0.9	ppm	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	1.0	ppm	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	1.0	ppm	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	1.0	ppm	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	0.8	ppm	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	0.5	ppm	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	0.4	ppm	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	0.4	ppm	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	0.4	ppm	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	0.4	ppm	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	0.4	ppm	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	0.4	ppm	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	0.4	ppm	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	0.4	ppm	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	0.4	ppm	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	0.4	ppm	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	0.4	ppm	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	0.4	ppm	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	0.5	ppm	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	0.4	ppm	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	0.4	ppm	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	0.4	ppm	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	0.4	ppm	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	0.4	ppm	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	0.4	ppm	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	0.4	ppm	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	0.4	ppm	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	0.4	ppm	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	0.4	ppm	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	0.4	ppm	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	0.4	ppm	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	0.4	ppm	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	0.4	ppm	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	0.4	ppm	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	0.4	ppm	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	0.4	ppm	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	0.4	ppm	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	0.4	ppm	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	0.4	ppm	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	0.5	ppm	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	0.4	ppm	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	0.4	ppm	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	0.4	ppm	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	0.4	ppm	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	0.4	ppm	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	0.4	ppm	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	0.4	ppm	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	0.4	ppm	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	0.4	ppm	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	0.4	ppm	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	0.4	ppm	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	0.4	ppm	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	0.4	ppm	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	0.4	ppm	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	0.4	ppm	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	0.4	ppm	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	0.4	ppm	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	0.4	ppm	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	0.4	ppm	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	0.4	ppm	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	0.4	ppm	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	0.5	ppm	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	0.4	ppm	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	0.4	ppm	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	0.4	ppm	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	0.4	ppm	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	0.4	ppm	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	0.4	ppm	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	0.4	ppm	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	0.4	ppm	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	0.4	ppm	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	0.4	ppm	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	0.4	ppm	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	0.4	ppm	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	0.4	ppm	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	0.4	ppm	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	0.4	ppm	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	0.4	ppm	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	0.4	ppm	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	0.4	ppm	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	0.4	ppm	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	0.4	ppm	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	0.6	ppm	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	0.4	ppm	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	0.4	ppm	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	0.4	ppm	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	0.4	ppm	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	0.4	ppm	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	0.4	ppm	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	0.4	ppm	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	0.4	ppm	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	0.4	ppm	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	0.4	ppm	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	0.4	ppm	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	0.4	ppm	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	0.4	ppm	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	0.4	ppm	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	0.4	ppm	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	0.4	ppm	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	0.4	ppm	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	0.4	ppm	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	0.4	ppm	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	0.4	ppm	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	0.4	ppm	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	0.4	ppm	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	0.4	ppm	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	0.5	ppm	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	0.4	ppm	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	0.4	ppm	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	1.1	ppm	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	0.5	ppm	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	0.7	ppm	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	1.0	ppm	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	1.6	ppm	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	2.9	ppm	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	3.7	ppm	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	4.4	ppm	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	4.7	ppm	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	3.3	ppm	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	2.0	ppm	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	1.5	ppm	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	1.2	ppm	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	0.9	ppm	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	0.6	ppm	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	0.4	ppm	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	0.4	ppm	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	0.4	ppm	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	0.6	ppm	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	1.4	ppm	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	1.8	ppm	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	2.0	ppm	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	1.7	ppm	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	1.6	ppm	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	1.7	ppm	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	1.6	ppm	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	1.6	ppm	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	1.6	ppm	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	1.9	ppm	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	2.1	ppm	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	2.3	ppm	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	2.3	ppm	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	2.3	ppm	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	2.2	ppm	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	1.9	ppm	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	1.6	ppm	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	1.4	ppm	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	0.9	ppm	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	0.6	ppm	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	0.5	ppm	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	0.4	ppm	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	0.4	ppm	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	0.7	ppm	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	0.5	ppm	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	0.4	ppm	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	0.4	ppm	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	0.4	ppm	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	0.4	ppm	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	0.4	ppm	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	0.4	ppm	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	0.4	ppm	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	0.4	ppm	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	0.4	ppm	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	0.4	ppm	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	0.4	ppm	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	0.4	ppm	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	0.4	ppm	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	0.4	ppm	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	0.4	ppm	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	0.4	ppm	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	0.4	ppm	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	0.7	ppm	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	0.5	ppm	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	0.4	ppm	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	0.4	ppm	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	0.4	ppm	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	0.4	ppm	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	0.4	ppm	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	0.4	ppm	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	0.4	ppm	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	0.4	ppm	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	0.4	ppm	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	0.4	ppm	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	0.4	ppm	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	0.5	ppm	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	0.4	ppm	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	0.4	ppm	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	0.4	ppm	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	0.4	ppm	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	0.4	ppm	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	0.5	ppm	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	0.6	ppm	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	0.7	ppm	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	0.5	ppm	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	0.8	ppm	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	0.5	ppm	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	0.4	ppm	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	0.4	ppm	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	0.4	ppm	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	0.4	ppm	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	0.4	ppm	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	0.5	ppm	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	0.4	ppm	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	0.4	ppm	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	0.4	ppm	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	0.4	ppm	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	0.4	ppm	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	0.4	ppm	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	0.5	ppm	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	0.4	ppm	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	0.4	ppm	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	0.4	ppm	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	0.4	ppm	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	0.4	ppm	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	0.4	ppm	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	0.4	ppm	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	0.4	ppm	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	0.4	ppm	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	0.6	ppm	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	0.5	ppm	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	0.5	ppm	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	0.4	ppm	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	0.4	ppm	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	0.4	ppm	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	0.4	ppm	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	0.4	ppm	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	0.4	ppm	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	0.4	ppm	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	0.4	ppm	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	0.4	ppm	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	0.4	ppm	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	0.4	ppm	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	0.4	ppm	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	0.4	ppm	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	0.4	ppm	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	0.4	ppm	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	0.4	ppm	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	0.4	ppm	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	0.4	ppm	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	0.4	ppm	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	0.4	ppm	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	0.6	ppm	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	0.5	ppm	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	0.4	ppm	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	0.4	ppm	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	0.4	ppm	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	0.4	ppm	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	0.4	ppm	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	0.4	ppm	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	0.4	ppm	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	0.4	ppm	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	0.4	ppm	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	0.4	ppm	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	0.4	ppm	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	0.4	ppm	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	0.4	ppm	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	0.4	ppm	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	0.4	ppm	1.90	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	26.1	ppm	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	32.4	ppm	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	34.8	ppm	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	33.9	ppm	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	34.8	ppm	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	34.6	ppm	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	33.1	ppm	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	34.6	ppm	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	35.8	ppm	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	41.9	ppm	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	54.7	ppm	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	35.4	ppm	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	35.2	ppm	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	35.0	ppm	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	34.4	ppm	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	34.9	ppm	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	33.5	ppm	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	32.4	ppm	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	30.0	ppm	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	30.7	ppm	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	29.7	ppm	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	30.7	ppm	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	30.1	ppm	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	29.6	ppm	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	28.7	ppm	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	29.5	ppm	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	29.9	ppm	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	28.4	ppm	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	29.4	ppm	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	29.6	ppm	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	31.5	ppm	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	32.5	ppm	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	33.2	ppm	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	33.9	ppm	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	34.4	ppm	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	34.0	ppm	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	33.4	ppm	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	34.7	ppm	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	34.9	ppm	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	33.6	ppm	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	27.0	ppm	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	28.3	ppm	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	28.1	ppm	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	25.1	ppm	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	29.1	ppm	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	22.5	ppm	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	28.8	ppm	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	29.9	ppm	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	30.9	ppm	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	32.2	ppm	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	30.5	ppm	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	36.1	ppm	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	35.2	ppm	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	35.7	ppm	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	36.1	ppm	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	41.5	ppm	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	53.6	ppm	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	40.0	ppm	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	36.5	ppm	1.19	Dry	No

Facility ID			
VI6A1530	FCCU	CO ppm	

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	34.9	ppm	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	36.7	ppm	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	34.2	ppm	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	34.2	ppm	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	36.0	ppm	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	35.6	ppm	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	33.9	ppm	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	34.3	ppm	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	30.6	ppm	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	32.0	ppm	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	31.6	ppm	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	31.4	ppm	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	30.8	ppm	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	28.3	ppm	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	31.4	ppm	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	30.3	ppm	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	28.4	ppm	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	29.2	ppm	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	29.8	ppm	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	29.6	ppm	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	29.8	ppm	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	30.0	ppm	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	29.3	ppm	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	27.0	ppm	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	32.8	ppm	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	30.7	ppm	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	28.5	ppm	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	28.8	ppm	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	29.1	ppm	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	29.0	ppm	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	28.9	ppm	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	28.7	ppm	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	27.7	ppm	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	27.4	ppm	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	28.2	ppm	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	28.6	ppm	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	28.0	ppm	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	27.5	ppm	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	28.0	ppm	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	27.9	ppm	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	28.2	ppm	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	28.2	ppm	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	28.3	ppm	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	28.2	ppm	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	30.4	ppm	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	28.9	ppm	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	29.2	ppm	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	29.9	ppm	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	29.7	ppm	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	30.6	ppm	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	28.9	ppm	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	29.9	ppm	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	28.9	ppm	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	30.1	ppm	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	28.3	ppm	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	28.4	ppm	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	28.6	ppm	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	28.9	ppm	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	28.4	ppm	1.56	Dry	No

Facility ID										
VI6A1530	FCCU	CO ppm								

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	28.3	ppm	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	27.7	ppm	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	28.5	ppm	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	33.1	ppm	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	36.6	ppm	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	32.6	ppm	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	32.5	ppm	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	33.1	ppm	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	31.6	ppm	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	30.3	ppm	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	30.2	ppm	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	31.9	ppm	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	35.0	ppm	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	33.8	ppm	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	40.3	ppm	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	40.2	ppm	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	40.6	ppm	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	38.9	ppm	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	47.2	ppm	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	60.0	ppm	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	51.5	ppm	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	42.7	ppm	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	36.8	ppm	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	41.1	ppm	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	39.6	ppm	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	35.2	ppm	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	35.5	ppm	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	38.3	ppm	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	40.8	ppm	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	42.0	ppm	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	41.4	ppm	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	40.0	ppm	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	43.7	ppm	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	45.2	ppm	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	50.8	ppm	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	85.6	ppm	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	65.0	ppm	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	59.1	ppm	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	58.3	ppm	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	79.0	ppm	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	64.2	ppm	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	65.6	ppm	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	34.9	ppm	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	39.1	ppm	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	35.6	ppm	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	30.5	ppm	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	21.1	ppm	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	22.3	ppm	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	10.7	ppm	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	14.0	ppm	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	12.6	ppm	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	12.1	ppm	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	13.1	ppm	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	13.8	ppm	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	15.6	ppm	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	15.4	ppm	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	16.8	ppm	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	14.6	ppm	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	15.2	ppm	2.37	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	14.1	ppm	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	12.6	ppm	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	11.2	ppm	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	14.5	ppm	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	14.1	ppm	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	15.6	ppm	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	16.7	ppm	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	14.8	ppm	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	15.5	ppm	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	14.6	ppm	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	13.4	ppm	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	7.6	ppm	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	7.9	ppm	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	11.2	ppm	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	15.4	ppm	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	17.5	ppm	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	17.2	ppm	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	17.5	ppm	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	16.3	ppm	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	15.1	ppm	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	17.1	ppm	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	17.1	ppm	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	15.9	ppm	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	20.1	ppm	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	20.9	ppm	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	23.3	ppm	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	21.4	ppm	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	23.2	ppm	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	25.5	ppm	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	25.6	ppm	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	23.7	ppm	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	18.0	ppm	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	23.2	ppm	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	22.7	ppm	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	22.0	ppm	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	22.2	ppm	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	23.3	ppm	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	23.6	ppm	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	19.8	ppm	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	18.7	ppm	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	22.6	ppm	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	21.9	ppm	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	19.1	ppm	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	18.1	ppm	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	16.7	ppm	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	14.0	ppm	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	17.8	ppm	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	19.3	ppm	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	19.7	ppm	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	22.1	ppm	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	21.3	ppm	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	20.8	ppm	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	19.9	ppm	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	21.9	ppm	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	21.4	ppm	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	19.8	ppm	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	20.0	ppm	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	20.2	ppm	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	21.5	ppm	1.12	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	21.7	ppm	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	21.0	ppm	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	22.2	ppm	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	23.1	ppm	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	23.8	ppm	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	25.9	ppm	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	24.6	ppm	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	25.3	ppm	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	24.1	ppm	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	24.9	ppm	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	25.2	ppm	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	25.0	ppm	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	25.6	ppm	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	21.6	ppm	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	21.7	ppm	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	21.4	ppm	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	20.3	ppm	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	22.2	ppm	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	22.4	ppm	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	20.8	ppm	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	22.3	ppm	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	22.4	ppm	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	24.4	ppm	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	22.4	ppm	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	23.3	ppm	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	22.6	ppm	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	21.1	ppm	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	21.8	ppm	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	23.9	ppm	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	23.8	ppm	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	22.1	ppm	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	23.3	ppm	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	22.8	ppm	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	23.9	ppm	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	23.3	ppm	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	21.4	ppm	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	20.4	ppm	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	19.5	ppm	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	23.4	ppm	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	23.4	ppm	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	27.6	ppm	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	30.8	ppm	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	31.3	ppm	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	32.2	ppm	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	32.6	ppm	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	33.2	ppm	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	32.3	ppm	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	32.0	ppm	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	32.2	ppm	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	31.3	ppm	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	31.2	ppm	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	31.6	ppm	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	32.0	ppm	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	31.9	ppm	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	32.2	ppm	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	30.9	ppm	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	31.3	ppm	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	32.0	ppm	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	31.7	ppm	1.19	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	32.5	ppm	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	30.6	ppm	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	30.5	ppm	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	29.9	ppm	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	25.4	ppm	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	25.1	ppm	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	23.7	ppm	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	23.0	ppm	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	21.0	ppm	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	22.6	ppm	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	32.9	ppm	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	60.7	ppm	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	23.1	ppm	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	27.9	ppm	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	30.3	ppm	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	30.9	ppm	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	30.9	ppm	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	34.1	ppm	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	35.0	ppm	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	34.0	ppm	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	32.4	ppm	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	32.2	ppm	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	30.1	ppm	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	29.8	ppm	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	25.0	ppm	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	16.5	ppm	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	22.5	ppm	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	28.5	ppm	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	29.0	ppm	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	27.6	ppm	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	26.5	ppm	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	26.5	ppm	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	28.6	ppm	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	49.5	ppm	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	23.3	ppm	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	24.3	ppm	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	26.5	ppm	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	25.9	ppm	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	30.2	ppm	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	35.6	ppm	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	33.0	ppm	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	34.4	ppm	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	33.9	ppm	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	32.9	ppm	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	31.0	ppm	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	25.7	ppm	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	27.9	ppm	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	30.0	ppm	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	34.2	ppm	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	34.1	ppm	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	32.4	ppm	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	26.2	ppm	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	24.2	ppm	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	26.6	ppm	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	28.9	ppm	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	28.5	ppm	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	29.6	ppm	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	28.4	ppm	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	26.4	ppm	2.01	Dry	No

Facility ID			
VI6A1530	FCCU	CO ppm	

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	20.6	ppm	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	26.6	ppm	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	32.2	ppm	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	36.5	ppm	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	48.7	ppm	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	31.8	ppm	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	35.9	ppm	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	34.7	ppm	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	38.1	ppm	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	35.4	ppm	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	37.0	ppm	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	32.2	ppm	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	20.3	ppm	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	25.5	ppm	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	26.9	ppm	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	28.9	ppm	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	28.7	ppm	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	29.2	ppm	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	27.6	ppm	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	26.9	ppm	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	27.2	ppm	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	26.9	ppm	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	25.4	ppm	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	26.6	ppm	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	27.4	ppm	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	29.9	ppm	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	51.5	ppm	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	154.7	ppm	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	40.8	ppm	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	45.1	ppm	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	38.3	ppm	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	37.4	ppm	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	81.5	ppm	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	29.6	ppm	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	32.3	ppm	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	39.2	ppm	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	38.9	ppm	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	30.6	ppm	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	32.0	ppm	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	30.3	ppm	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	30.6	ppm	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	31.3	ppm	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	32.1	ppm	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	31.3	ppm	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	32.5	ppm	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	32.2	ppm	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	30.5	ppm	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	30.9	ppm	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	30.9	ppm	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	29.8	ppm	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	36.7	ppm	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	51.1	ppm	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	41.7	ppm	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	42.3	ppm	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	40.6	ppm	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	45.8	ppm	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	44.6	ppm	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	45.3	ppm	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	39.1	ppm	1.15	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	37.9	ppm	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	36.0	ppm	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	28.1	ppm	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	29.6	ppm	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	29.8	ppm	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	30.2	ppm	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	31.0	ppm	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	30.2	ppm	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	30.8	ppm	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	30.8	ppm	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	29.6	ppm	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	30.0	ppm	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	29.4	ppm	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	27.9	ppm	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	33.2	ppm	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	42.1	ppm	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	39.2	ppm	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	39.2	ppm	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	40.1	ppm	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	38.4	ppm	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	39.5	ppm	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	39.4	ppm	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	37.7	ppm	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	37.1	ppm	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	35.9	ppm	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	21.9	ppm	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	23.1	ppm	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	24.3	ppm	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	27.3	ppm	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	26.9	ppm	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	28.0	ppm	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	19.7	ppm	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	8.7	ppm	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	8.8	ppm	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	28.3	ppm	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	26.7	ppm	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	27.1	ppm	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	25.5	ppm	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	23.9	ppm	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	25.4	ppm	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	26.2	ppm	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	27.8	ppm	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	23.7	ppm	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	28.7	ppm	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	26.9	ppm	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	26.2	ppm	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	26.0	ppm	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	24.8	ppm	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	23.1	ppm	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	24.8	ppm	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	22.5	ppm	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	23.2	ppm	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	23.2	ppm	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	63.5	ppm	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	22.1	ppm	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	25.4	ppm	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	25.5	ppm	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	24.6	ppm	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	24.2	ppm	1.75	Dry	No

Facility ID		
VI6A1530	FCCU	CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	24.8	ppm	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	25.5	ppm	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	25.0	ppm	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	14.9	ppm	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	7.5	ppm	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	6.5	ppm	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	7.2	ppm	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	8.0	ppm	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	8.3	ppm	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	8.1	ppm	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	7.9	ppm	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	8.5	ppm	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	9.2	ppm	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	12.2	ppm	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	13.2	ppm	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	14.8	ppm	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	20.3	ppm	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	20.2	ppm	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	20.6	ppm	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	20.7	ppm	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	20.8	ppm	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	20.0	ppm	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	21.6	ppm	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	21.4	ppm	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	15.9	ppm	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	18.3	ppm	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	10.3	ppm	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	11.5	ppm	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	9.8	ppm	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	11.0	ppm	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	11.6	ppm	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	12.5	ppm	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	13.7	ppm	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	14.7	ppm	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	15.7	ppm	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	14.2	ppm	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	14.2	ppm	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	12.3	ppm	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	14.0	ppm	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	12.8	ppm	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	12.9	ppm	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	12.8	ppm	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	12.5	ppm	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	20.8	ppm	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	26.3	ppm	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	26.6	ppm	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	27.7	ppm	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	22.8	ppm	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	9.2	ppm	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	8.8	ppm	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	7.0	ppm	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	6.8	ppm	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	7.2	ppm	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	7.2	ppm	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	8.1	ppm	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	7.9	ppm	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	7.8	ppm	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	7.9	ppm	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	8.8	ppm	2.78	Dry	No

Facility ID

VI6A1530 FCCU CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	10.2	ppm	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	8.7	ppm	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	8.6	ppm	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	12.0	ppm	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	24.5	ppm	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	23.1	ppm	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	25.4	ppm	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	25.9	ppm	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	22.4	ppm	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	22.2	ppm	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	30.5	ppm	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	33.0	ppm	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	30.8	ppm	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	20.9	ppm	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	31.1	ppm	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	91.1	ppm	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	24.9	ppm	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	22.4	ppm	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	26.8	ppm	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	19.4	ppm	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	21.5	ppm	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	27.7	ppm	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	22.4	ppm	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	18.3	ppm	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	22.7	ppm	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	23.6	ppm	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	18.6	ppm	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	24.7	ppm	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	26.4	ppm	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	24.5	ppm	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	27.8	ppm	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	31.4	ppm	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	28.1	ppm	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	27.2	ppm	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	28.5	ppm	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	26.1	ppm	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	25.3	ppm	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	27.9	ppm	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	28.7	ppm	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	36.9	ppm	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	27.5	ppm	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	32.1	ppm	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	33.3	ppm	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	31.4	ppm	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	33.3	ppm	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	33.3	ppm	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	34.0	ppm	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	23.3	ppm	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	23.6	ppm	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	24.7	ppm	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	23.6	ppm	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	22.6	ppm	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	27.9	ppm	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	27.1	ppm	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	25.5	ppm	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	25.0	ppm	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	28.1	ppm	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	29.4	ppm	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	24.5	ppm	1.57	Dry	No

Facility ID		
VI6A1530	FCCU	CO ppm

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	14.6	ppm	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	14.3	ppm	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	14.6	ppm	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	15.1	ppm	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	16.2	ppm	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	13.2	ppm	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	12.5	ppm	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	12.5	ppm	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	12.5	ppm	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	11.1	ppm	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	17.6	ppm	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	25.4	ppm	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	29.8	ppm	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	25.5	ppm	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	23.8	ppm	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	24.0	ppm	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	24.7	ppm	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	23.7	ppm	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	16.4	ppm	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	15.1	ppm	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	17.9	ppm	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	20.7	ppm	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	17.4	ppm	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	16.2	ppm	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	16.0	ppm	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	19.3	ppm	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	16.8	ppm	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	16.5	ppm	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	15.2	ppm	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	13.7	ppm	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	15.9	ppm	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	14.2	ppm	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	14.2	ppm	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	14.7	ppm	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	14.2	ppm	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	15.5	ppm	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	18.8	ppm	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	17.3	ppm	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	18.1	ppm	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	11.9	ppm	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	24.5	ppm	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	58.6	ppm	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	23.1	ppm	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	27.5	ppm	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	17.4	ppm	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	24.6	ppm	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	24.8	ppm	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	31.0	ppm	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	78.4	ppm	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	13.8	ppm	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	16.8	ppm	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	11.9	ppm	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	13.7	ppm	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	11.8	ppm	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	22.7	ppm	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	36.9	ppm	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	21.2	ppm	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	17.0	ppm	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	26.8	ppm	1.85	Dry	No

Facility ID										
VI6A1530	FCCU	CO ppm								

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	24.8	ppm	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	18.9	ppm	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	21.2	ppm	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	22.2	ppm	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	17.1	ppm	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	15.6	ppm	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	13.3	ppm	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	15.6	ppm	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	16.8	ppm	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	24.6	ppm	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	15.7	ppm	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	55.6	ppm	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	28.9	ppm	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	21.6	ppm	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	40.3	ppm	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	19.8	ppm	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	48.3	ppm	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	22.2	ppm	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	81.7	ppm	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	12.9	ppm	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	45.7	ppm	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	25.7	ppm	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	97.1	ppm	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	20.9	ppm	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	30.0	ppm	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	41.3	ppm	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	25.3	ppm	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	116.5	ppm	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	77.8	ppm	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	23.4	ppm	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	84.5	ppm	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	138.0	ppm	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	30.7	ppm	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	37.7	ppm	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	23.3	ppm	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	28.0	ppm	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	33.6	ppm	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	34.7	ppm	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	36.4	ppm	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	29.1	ppm	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	30.6	ppm	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	34.5	ppm	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	26.6	ppm	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	29.0	ppm	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	21.4	ppm	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	25.6	ppm	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	26.8	ppm	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	106.6	ppm	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	21.2	ppm	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	31.9	ppm	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	32.0	ppm	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	33.5	ppm	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	26.0	ppm	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	32.1	ppm	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	39.1	ppm	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	159.7	ppm	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	52.4	ppm	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	40.8	ppm	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	27.5	ppm	1.95	Dry	No

Facility ID										
Vi6A1530	FCCU	CO ppm								

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	**Hour 13**	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	16.6	ppm	2.37	Dry	No
Day30	**Hour 14**	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	29.9	ppm	1.79	Dry	No
Day30	**Hour 15**	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	22.2	ppm	2.18	Dry	No
Day30	**Hour 16**	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	22.0	ppm	2.11	Dry	No
Day30	**Hour 17**	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	28.6	ppm	1.85	Dry	No
Day30	**Hour 18**	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	26.7	ppm	1.85	Dry	No
Day30	**Hour 19**	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	24.6	ppm	2.00	Dry	No
Day30	**Hour 20**	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	12.9	ppm	2.61	Dry	No
Day30	**Hour 21**	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	14.2	ppm	2.53	Dry	No
Day30	**Hour 22**	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	16.9	ppm	2.38	Dry	No
Day30	**Hour 23**	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	19.5	ppm	2.28	Dry	No
Day30	**Hour 24**	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	26.9	ppm	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	13.70	%	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	13.94	%	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	14.01	%	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	13.96	%	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	14.01	%	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	13.96	%	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	14.02	%	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	14.03	%	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	14.02	%	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	14.15	%	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	14.13	%	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	14.08	%	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	14.05	%	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	13.97	%	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	14.02	%	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	13.96	%	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	13.91	%	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	13.90	%	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	13.87	%	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	13.92	%	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	13.87	%	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	13.90	%	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	13.88	%	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	13.90	%	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	13.82	%	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	13.79	%	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	13.82	%	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	13.78	%	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	13.80	%	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	13.76	%	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	13.78	%	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	13.90	%	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	13.89	%	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	13.90	%	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	13.94	%	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	13.88	%	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	13.89	%	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	13.91	%	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	13.98	%	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	13.96	%	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	13.71	%	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	13.80	%	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	13.80	%	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	13.78	%	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	13.91	%	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	13.73	%	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	13.87	%	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	13.88	%	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	13.89	%	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	13.93	%	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	13.83	%	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	14.03	%	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	14.03	%	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	13.95	%	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	13.96	%	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	14.05	%	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	14.12	%	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	14.06	%	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	13.89	%	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	13.99	%	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	14.05	%	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	13.99	%	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	13.98	%	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	14.03	%	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	14.02	%	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	13.97	%	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	13.93	%	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	13.83	%	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	13.91	%	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	13.88	%	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	13.93	%	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	13.88	%	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	13.80	%	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	13.86	%	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	13.93	%	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	13.92	%	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	13.81	%	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	13.78	%	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	13.86	%	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	13.87	%	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	13.88	%	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	13.98	%	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	13.82	%	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	13.96	%	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	13.98	%	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	13.88	%	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	13.87	%	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	13.87	%	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	13.82	%	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	13.82	%	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	13.82	%	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	13.80	%	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	13.88	%	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	13.89	%	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	13.87	%	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	13.90	%	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	13.85	%	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	13.91	%	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	13.89	%	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	13.85	%	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	13.84	%	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	13.85	%	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	13.84	%	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	13.88	%	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	13.81	%	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	13.82	%	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	13.84	%	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	13.80	%	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	13.88	%	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	13.86	%	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	13.87	%	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	13.79	%	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	13.80	%	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	13.71	%	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	13.74	%	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	13.74	%	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	13.78	%	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	13.82	%	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	13.80	%	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	13.81	%	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	13.77	%	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	13.90	%	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	14.02	%	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	13.86	%	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	13.93	%	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	13.91	%	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	13.98	%	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	13.95	%	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	13.96	%	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	13.93	%	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	13.92	%	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	13.88	%	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	13.85	%	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	13.90	%	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	13.88	%	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	13.75	%	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	13.78	%	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	13.90	%	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	13.79	%	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	13.92	%	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	13.70	%	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	13.75	%	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	13.75	%	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	13.73	%	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	13.79	%	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	13.77	%	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	13.83	%	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	13.82	%	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	13.82	%	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	13.78	%	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	13.80	%	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	13.86	%	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	13.81	%	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	14.06	%	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	13.98	%	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	13.93	%	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	13.95	%	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	13.91	%	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	13.83	%	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	13.76	%	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	13.54	%	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	13.70	%	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	13.64	%	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	13.55	%	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	13.36	%	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	13.38	%	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	12.97	%	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	13.08	%	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	12.99	%	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	13.10	%	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	13.04	%	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	13.11	%	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	13.12	%	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	13.06	%	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	13.11	%	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	12.98	%	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	12.92	%	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	12.91	%	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	12.81	%	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	12.88	%	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	13.06	%	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	12.97	%	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	13.07	%	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	13.02	%	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	12.90	%	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	12.97	%	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	12.94	%	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	12.86	%	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	12.60	%	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	12.55	%	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	12.58	%	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	12.73	%	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	12.69	%	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	12.74	%	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	12.73	%	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	12.61	%	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	12.64	%	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	12.63	%	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	12.63	%	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	12.65	%	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	12.70	%	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	12.74	%	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	12.87	%	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	4.14	%	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	0.94	%	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	9.62	%	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	14.26	%	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	14.47	%	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	14.73	%	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	14.37	%	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	14.35	%	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	14.33	%	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	14.33	%	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	14.20	%	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	14.46	%	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	14.61	%	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	14.37	%	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	14.49	%	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	14.58	%	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	14.59	%	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	14.41	%	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	14.50	%	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	14.17	%	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	14.23	%	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	14.59	%	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	14.49	%	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	14.30	%	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	14.32	%	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	14.68	%	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	14.69	%	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	14.31	%	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	14.42	%	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	14.49	%	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	14.50	%	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	14.49	%	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	14.44	%	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	14.56	%	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	14.54	%	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	14.50	%	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	14.43	%	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	14.12	%	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	14.14	%	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	14.08	%	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	14.16	%	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	14.12	%	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	14.14	%	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	14.09	%	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	14.13	%	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	14.20	%	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	14.42	%	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	14.39	%	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	14.42	%	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	14.48	%	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	14.43	%	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	14.38	%	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	14.48	%	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	14.43	%	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	14.47	%	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	14.42	%	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	14.50	%	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	14.58	%	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	14.62	%	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	14.63	%	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	14.63	%	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	14.52	%	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	14.55	%	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	14.53	%	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	14.50	%	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	14.54	%	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	14.47	%	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	14.46	%	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	14.56	%	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	14.56	%	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	14.48	%	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	14.28	%	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	14.16	%	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	14.25	%	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	14.43	%	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	14.42	%	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	14.26	%	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	14.31	%	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	14.32	%	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	14.37	%	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	14.42	%	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	14.40	%	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	14.46	%	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	14.44	%	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	14.36	%	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	14.40	%	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	14.38	%	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	14.33	%	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	14.48	%	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	14.39	%	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	14.27	%	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	14.34	%	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	14.38	%	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	14.38	%	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	14.45	%	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	14.35	%	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	14.43	%	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	14.27	%	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	14.21	%	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	14.41	%	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	14.42	%	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	14.40	%	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	14.74	%	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	14.34	%	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	13.91	%	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	14.09	%	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	14.02	%	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	14.02	%	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	13.95	%	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	14.03	%	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	14.29	%	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	14.28	%	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	14.28	%	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	14.29	%	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	14.31	%	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	14.30	%	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	13.81	%	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	13.62	%	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	13.77	%	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	13.90	%	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	13.98	%	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	14.03	%	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	13.94	%	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	14.22	%	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	14.07	%	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	14.19	%	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	13.72	%	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	13.73	%	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	13.78	%	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	13.87	%	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	14.08	%	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	14.20	%	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	14.18	%	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	14.17	%	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	14.05	%	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	14.11	%	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	14.00	%	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	13.80	%	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	13.87	%	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	13.87	%	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	14.01	%	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	14.17	%	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	14.16	%	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	13.85	%	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	13.70	%	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	13.74	%	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	13.80	%	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	13.82	%	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	13.84	%	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	13.82	%	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	13.76	%	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	13.60	%	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	13.88	%	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	14.29	%	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	14.26	%	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	14.43	%	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	14.29	%	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	14.26	%	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	14.16	%	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	14.33	%	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	14.29	%	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	14.36	%	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	14.06	%	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	13.63	%	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	13.67	%	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	13.70	%	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	13.87	%	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	13.89	%	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	13.94	%	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	14.11	%	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	14.03	%	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	13.99	%	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	14.09	%	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	14.16	%	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	14.09	%	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	14.11	%	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	14.28	%	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	14.53	%	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	14.55	%	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	14.44	%	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	14.55	%	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	14.49	%	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	14.31	%	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	14.27	%	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	14.13	%	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	14.28	%	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	14.49	%	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	14.45	%	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	14.29	%	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	14.19	%	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	14.17	%	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	14.14	%	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	14.11	%	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	14.14	%	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	14.04	%	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	14.20	%	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	14.16	%	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	14.23	%	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	14.20	%	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	14.14	%	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	14.26	%	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	14.56	%	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	14.75	%	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	14.64	%	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	14.57	%	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	14.54	%	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	14.61	%	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	14.58	%	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	14.56	%	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	14.45	%	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	14.50	%	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	14.45	%	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	14.12	%	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	14.14	%	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	14.15	%	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	14.08	%	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	14.08	%	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	14.09	%	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	14.13	%	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	14.12	%	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	14.12	%	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	14.10	%	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	14.10	%	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	14.04	%	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	14.24	%	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	14.52	%	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	14.47	%	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	14.42	%	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	14.44	%	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	14.38	%	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	14.41	%	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	14.38	%	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	14.34	%	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	14.35	%	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	14.32	%	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	13.94	%	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	13.94	%	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	13.94	%	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	14.01	%	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	13.98	%	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	14.00	%	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	13.75	%	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	13.27	%	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	13.17	%	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	14.17	%	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	14.43	%	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	14.12	%	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	14.38	%	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	14.37	%	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	14.29	%	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	14.24	%	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	14.22	%	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	14.22	%	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	14.17	%	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	14.25	%	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	14.23	%	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	14.25	%	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	14.23	%	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	14.32	%	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	14.21	%	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	14.35	%	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	14.36	%	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	14.40	%	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	14.47	%	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	14.29	%	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	13.98	%	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	14.01	%	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	14.06	%	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	14.01	%	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	14.03	%	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	14.01	%	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	13.99	%	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	13.56	%	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	13.33	%	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	13.21	%	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	13.23	%	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	13.28	%	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	13.29	%	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	13.26	%	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	13.22	%	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	13.22	%	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	13.22	%	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	13.38	%	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	13.39	%	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	13.40	%	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	13.84	%	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	13.95	%	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	13.93	%	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	13.90	%	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	14.09	%	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	14.15	%	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	14.11	%	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	13.91	%	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	13.27	%	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	13.52	%	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	13.15	%	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	13.15	%	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	13.02	%	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	13.13	%	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	13.12	%	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	13.23	%	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	13.18	%	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	13.20	%	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	13.29	%	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	13.20	%	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	13.23	%	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	13.13	%	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	13.14	%	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	13.23	%	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	13.26	%	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	13.17	%	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	13.23	%	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	13.51	%	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	13.70	%	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	13.88	%	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	13.80	%	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	13.66	%	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	13.02	%	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	12.90	%	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	12.60	%	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	12.69	%	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	12.71	%	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	12.70	%	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	12.86	%	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	12.80	%	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	12.80	%	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	12.95	%	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	12.95	%	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	13.07	%	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	12.96	%	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	12.89	%	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	13.06	%	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	13.41	%	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	13.39	%	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	13.49	%	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	13.44	%	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	13.38	%	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	13.18	%	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	13.53	%	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	13.47	%	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	13.44	%	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	13.23	%	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	13.40	%	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	13.57	%	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	13.31	%	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	13.20	%	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	13.25	%	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	13.19	%	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	13.21	%	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	13.26	%	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	13.11	%	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	12.99	%	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	13.05	%	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	13.06	%	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	13.03	%	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	13.10	%	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	13.14	%	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	13.01	%	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	13.90	%	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	14.33	%	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	14.26	%	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	14.23	%	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	14.10	%	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	14.05	%	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	14.08	%	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	14.11	%	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	14.23	%	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	14.44	%	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	14.28	%	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	14.40	%	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	14.46	%	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	14.35	%	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	14.46	%	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	14.49	%	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	14.46	%	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	14.16	%	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	14.14	%	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	14.14	%	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	14.13	%	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	14.04	%	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	14.15	%	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	14.13	%	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	14.04	%	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	14.02	%	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	14.10	%	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	14.14	%	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	13.99	%	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	13.64	%	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	13.70	%	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	13.69	%	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	13.67	%	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	13.76	%	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	13.71	%	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	13.71	%	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	13.76	%	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	13.76	%	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	13.76	%	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	13.98	%	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	14.17	%	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	14.33	%	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	14.25	%	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	14.22	%	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	14.25	%	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	14.25	%	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	14.27	%	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	13.93	%	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	13.94	%	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	14.02	%	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	14.09	%	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	13.99	%	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	13.89	%	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	13.81	%	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	13.90	%	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	13.83	%	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	13.84	%	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	13.80	%	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	13.76	%	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	13.87	%	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	13.88	%	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	13.87	%	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	13.86	%	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	13.83	%	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	13.81	%	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	13.87	%	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	13.81	%	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	13.83	%	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	13.40	%	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	14.12	%	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	13.77	%	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	13.97	%	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	14.15	%	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	13.77	%	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	13.99	%	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	14.13	%	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	14.25	%	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	13.92	%	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	13.45	%	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	13.56	%	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	13.34	%	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	13.42	%	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	13.31	%	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	13.68	%	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	13.97	%	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	13.61	%	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	13.38	%	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	13.69	%	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	13.65	%	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	13.40	%	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	13.47	%	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	13.58	%	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	13.50	%	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	13.40	%	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	13.24	%	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	13.37	%	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	13.41	%	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	13.37	%	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	13.39	%	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	13.86	%	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	13.53	%	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	13.48	%	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	13.62	%	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	13.28	%	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	13.74	%	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	13.41	%	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	13.84	%	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	13.06	%	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	13.73	%	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	13.56	%	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	13.86	%	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	13.55	%	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	13.83	%	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	13.82	%	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	13.69	%	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	13.87	%	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	13.88	%	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	13.56	%	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	13.54	%	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	13.84	%	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	13.60	%	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	13.75	%	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	13.40	%	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	13.45	%	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	13.52	%	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	13.60	%	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	13.55	%	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	13.43	%	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	13.42	%	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	13.61	%	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	13.47	%	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	13.51	%	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	13.33	%	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	13.43	%	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	13.44	%	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	13.75	%	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	13.31	%	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	13.58	%	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	13.55	%	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	13.53	%	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	13.40	%	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	13.48	%	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	13.57	%	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	13.83	%	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	13.68	%	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	13.50	%	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	13.29	%	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 %

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	13.07	%	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	13.50	%	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	13.22	%	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	13.27	%	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	13.40	%	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	13.42	%	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	13.29	%	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	12.85	%	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	12.97	%	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	13.13	%	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	13.15	%	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	13.37	%	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	23.3	lb/hr	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	20.5	lb/hr	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	18.1	lb/hr	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	19.0	lb/hr	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	17.9	lb/hr	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	18.0	lb/hr	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	18.2	lb/hr	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	17.0	lb/hr	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	15.8	lb/hr	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	13.7	lb/hr	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	12.0	lb/hr	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	15.0	lb/hr	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	15.6	lb/hr	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	15.8	lb/hr	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	16.6	lb/hr	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	16.5	lb/hr	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	17.3	lb/hr	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	18.4	lb/hr	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	19.9	lb/hr	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	19.9	lb/hr	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	20.6	lb/hr	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	19.9	lb/hr	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	20.6	lb/hr	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	20.9	lb/hr	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	21.4	lb/hr	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	21.3	lb/hr	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	20.8	lb/hr	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	21.4	lb/hr	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	21.2	lb/hr	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	21.2	lb/hr	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	20.5	lb/hr	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	19.0	lb/hr	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	19.0	lb/hr	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	18.2	lb/hr	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	18.1	lb/hr	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	18.8	lb/hr	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	18.9	lb/hr	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	17.8	lb/hr	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	18.4	lb/hr	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	18.8	lb/hr	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	23.6	lb/hr	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	22.7	lb/hr	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	22.8	lb/hr	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	23.3	lb/hr	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	21.3	lb/hr	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	23.4	lb/hr	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	21.2	lb/hr	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	20.3	lb/hr	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	20.4	lb/hr	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	19.4	lb/hr	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	20.2	lb/hr	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	16.6	lb/hr	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	16.0	lb/hr	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	17.0	lb/hr	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	16.9	lb/hr	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	14.0	lb/hr	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	12.0	lb/hr	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	14.1	lb/hr	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	15.5	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	17.0	lb/hr	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	16.2	lb/hr	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	16.7	lb/hr	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	17.0	lb/hr	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	16.4	lb/hr	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	16.7	lb/hr	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	17.4	lb/hr	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	18.1	lb/hr	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	20.3	lb/hr	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	19.9	lb/hr	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	20.8	lb/hr	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	20.9	lb/hr	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	21.6	lb/hr	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	23.2	lb/hr	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	21.3	lb/hr	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	19.2	lb/hr	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	20.9	lb/hr	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	22.2	lb/hr	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	22.1	lb/hr	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	22.0	lb/hr	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	21.3	lb/hr	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	20.1	lb/hr	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	18.9	lb/hr	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	21.1	lb/hr	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	18.0	lb/hr	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	18.5	lb/hr	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	20.3	lb/hr	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	20.5	lb/hr	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	20.7	lb/hr	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	20.6	lb/hr	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	22.4	lb/hr	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	22.5	lb/hr	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	23.3	lb/hr	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	23.3	lb/hr	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	22.8	lb/hr	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	22.6	lb/hr	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	22.9	lb/hr	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	23.1	lb/hr	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	22.8	lb/hr	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	22.7	lb/hr	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	21.6	lb/hr	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	22.2	lb/hr	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	21.8	lb/hr	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	21.8	lb/hr	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	20.4	lb/hr	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	20.8	lb/hr	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	20.9	lb/hr	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	19.7	lb/hr	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	19.6	lb/hr	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	18.8	lb/hr	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	19.2	lb/hr	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	18.4	lb/hr	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	19.7	lb/hr	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	19.8	lb/hr	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	21.6	lb/hr	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	22.8	lb/hr	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	22.7	lb/hr	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	22.6	lb/hr	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	22.5	lb/hr	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	22.5	lb/hr	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	22.1	lb/hr	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	21.2	lb/hr	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	18.4	lb/hr	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	16.4	lb/hr	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	17.9	lb/hr	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	17.1	lb/hr	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	16.6	lb/hr	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	16.7	lb/hr	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	15.8	lb/hr	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	15.3	lb/hr	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	14.7	lb/hr	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	14.4	lb/hr	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	15.7	lb/hr	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	14.2	lb/hr	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	14.5	lb/hr	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	15.2	lb/hr	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	16.9	lb/hr	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	15.7	lb/hr	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	13.7	lb/hr	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	14.8	lb/hr	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	15.8	lb/hr	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	20.2	lb/hr	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	19.0	lb/hr	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	18.9	lb/hr	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	20.9	lb/hr	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	21.1	lb/hr	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	20.1	lb/hr	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	18.6	lb/hr	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	18.6	lb/hr	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	18.6	lb/hr	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	18.8	lb/hr	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	17.2	lb/hr	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	16.0	lb/hr	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	15.9	lb/hr	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	12.0	lb/hr	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	12.8	lb/hr	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	13.6	lb/hr	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	13.2	lb/hr	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	11.7	lb/hr	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	15.0	lb/hr	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	17.6	lb/hr	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	21.1	lb/hr	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	19.7	lb/hr	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	20.9	lb/hr	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	23.3	lb/hr	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	28.3	lb/hr	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	28.8	lb/hr	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	36.6	lb/hr	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	34.7	lb/hr	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	35.6	lb/hr	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	33.5	lb/hr	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	33.3	lb/hr	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	32.3	lb/hr	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	31.4	lb/hr	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	31.7	lb/hr	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	30.7	lb/hr	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	32.1	lb/hr	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	32.0	lb/hr	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	31.9	lb/hr	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	32.2	lb/hr	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	33.3	lb/hr	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	30.4	lb/hr	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	30.4	lb/hr	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	29.6	lb/hr	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	29.3	lb/hr	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	30.3	lb/hr	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	30.1	lb/hr	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	30.5	lb/hr	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	31.3	lb/hr	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	39.9	lb/hr	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	38.0	lb/hr	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	36.3	lb/hr	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	31.9	lb/hr	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	31.8	lb/hr	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	32.2	lb/hr	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	32.0	lb/hr	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	32.5	lb/hr	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	33.0	lb/hr	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	31.6	lb/hr	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	30.5	lb/hr	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	30.8	lb/hr	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	29.5	lb/hr	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	29.3	lb/hr	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	30.7	lb/hr	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	31.7	lb/hr	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	30.8	lb/hr	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	35.1	lb/hr	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	31.8	lb/hr	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	27.9	lb/hr	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	20.4	lb/hr	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	28.2	lb/hr	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	28.6	lb/hr	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	29.8	lb/hr	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	29.8	lb/hr	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	30.8	lb/hr	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	26.6	lb/hr	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	24.3	lb/hr	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	27.9	lb/hr	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	26.1	lb/hr	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	25.0	lb/hr	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	26.3	lb/hr	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	28.4	lb/hr	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	27.5	lb/hr	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	32.4	lb/hr	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	31.5	lb/hr	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	26.3	lb/hr	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	27.0	lb/hr	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	26.8	lb/hr	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	26.2	lb/hr	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	18.8	lb/hr	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	18.3	lb/hr	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	24.9	lb/hr	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	21.7	lb/hr	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	20.8	lb/hr	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	21.5	lb/hr	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	21.2	lb/hr	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	22.9	lb/hr	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	23.2	lb/hr	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	23.0	lb/hr	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	24.4	lb/hr	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	25.2	lb/hr	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	29.1	lb/hr	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	29.0	lb/hr	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	28.2	lb/hr	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	27.1	lb/hr	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	26.8	lb/hr	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	26.5	lb/hr	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	26.3	lb/hr	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	25.3	lb/hr	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	24.3	lb/hr	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	20.6	lb/hr	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	20.6	lb/hr	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	20.0	lb/hr	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	19.4	lb/hr	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	20.5	lb/hr	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	20.2	lb/hr	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	19.9	lb/hr	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	20.6	lb/hr	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	20.1	lb/hr	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	21.1	lb/hr	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	20.1	lb/hr	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	20.0	lb/hr	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	19.5	lb/hr	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	18.8	lb/hr	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	19.2	lb/hr	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	19.9	lb/hr	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	19.4	lb/hr	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	18.8	lb/hr	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	18.3	lb/hr	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	18.9	lb/hr	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	19.5	lb/hr	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	19.0	lb/hr	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	17.5	lb/hr	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	16.5	lb/hr	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	16.8	lb/hr	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	24.4	lb/hr	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	27.4	lb/hr	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	24.3	lb/hr	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	22.4	lb/hr	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	21.7	lb/hr	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	22.9	lb/hr	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	23.3	lb/hr	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	22.9	lb/hr	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	22.1	lb/hr	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	22.8	lb/hr	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	22.4	lb/hr	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	22.2	lb/hr	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	22.3	lb/hr	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	22.9	lb/hr	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	23.3	lb/hr	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	23.0	lb/hr	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	22.2	lb/hr	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	20.7	lb/hr	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	21.4	lb/hr	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	21.7	lb/hr	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	21.4	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	21.1	lb/hr	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	20.4	lb/hr	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	19.6	lb/hr	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	20.4	lb/hr	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	18.5	lb/hr	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	21.2	lb/hr	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	20.1	lb/hr	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	18.9	lb/hr	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	18.4	lb/hr	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	19.2	lb/hr	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	12.7	lb/hr	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	19.4	lb/hr	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	28.4	lb/hr	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	25.8	lb/hr	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	25.7	lb/hr	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	26.5	lb/hr	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	26.5	lb/hr	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	25.6	lb/hr	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	21.1	lb/hr	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	21.1	lb/hr	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	21.1	lb/hr	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	20.3	lb/hr	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	19.7	lb/hr	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	19.9	lb/hr	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	25.6	lb/hr	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	27.8	lb/hr	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	25.1	lb/hr	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	23.7	lb/hr	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	23.4	lb/hr	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	22.9	lb/hr	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	23.9	lb/hr	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	20.6	lb/hr	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	22.2	lb/hr	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	20.8	lb/hr	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	28.9	lb/hr	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	28.6	lb/hr	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	28.4	lb/hr	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	28.9	lb/hr	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	26.3	lb/hr	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	22.7	lb/hr	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	23.4	lb/hr	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	22.5	lb/hr	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	23.1	lb/hr	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	23.1	lb/hr	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	24.4	lb/hr	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	26.1	lb/hr	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	25.5	lb/hr	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	25.3	lb/hr	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	22.7	lb/hr	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	20.9	lb/hr	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	21.5	lb/hr	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	26.0	lb/hr	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	27.9	lb/hr	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	28.1	lb/hr	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	27.8	lb/hr	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	27.8	lb/hr	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	27.2	lb/hr	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	27.2	lb/hr	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	28.7	lb/hr	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	31.0	lb/hr	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	28.7	lb/hr	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	21.5	lb/hr	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	20.0	lb/hr	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	17.1	lb/hr	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	21.8	lb/hr	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	19.6	lb/hr	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	20.4	lb/hr	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	17.0	lb/hr	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	17.8	lb/hr	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	16.4	lb/hr	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	20.5	lb/hr	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	27.3	lb/hr	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	26.0	lb/hr	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	25.6	lb/hr	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	24.2	lb/hr	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	24.0	lb/hr	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	23.1	lb/hr	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	21.5	lb/hr	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	22.8	lb/hr	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	23.2	lb/hr	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	22.0	lb/hr	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	21.5	lb/hr	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	22.1	lb/hr	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	22.3	lb/hr	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	18.6	lb/hr	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	12.4	lb/hr	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	11.3	lb/hr	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	14.1	lb/hr	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	12.4	lb/hr	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	14.1	lb/hr	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	16.2	lb/hr	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	19.4	lb/hr	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	20.6	lb/hr	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	18.3	lb/hr	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	14.3	lb/hr	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	14.2	lb/hr	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	19.6	lb/hr	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	21.0	lb/hr	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	21.8	lb/hr	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	22.7	lb/hr	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	22.6	lb/hr	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	22.6	lb/hr	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	24.9	lb/hr	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	24.9	lb/hr	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	24.1	lb/hr	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	25.0	lb/hr	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	25.3	lb/hr	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	25.2	lb/hr	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	25.0	lb/hr	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	18.2	lb/hr	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	13.5	lb/hr	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	14.6	lb/hr	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	14.7	lb/hr	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	15.8	lb/hr	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	14.8	lb/hr	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	14.8	lb/hr	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	14.5	lb/hr	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	16.3	lb/hr	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	17.4	lb/hr	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	18.6	lb/hr	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	24.6	lb/hr	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	24.4	lb/hr	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	24.5	lb/hr	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	24.4	lb/hr	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	23.7	lb/hr	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	24.2	lb/hr	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	23.8	lb/hr	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	24.2	lb/hr	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	24.2	lb/hr	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	24.1	lb/hr	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	25.0	lb/hr	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	25.3	lb/hr	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	21.9	lb/hr	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	16.1	lb/hr	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	17.2	lb/hr	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	17.6	lb/hr	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	17.2	lb/hr	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	17.7	lb/hr	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	17.1	lb/hr	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	17.4	lb/hr	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	18.1	lb/hr	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	18.3	lb/hr	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	18.9	lb/hr	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	25.2	lb/hr	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	25.8	lb/hr	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	25.5	lb/hr	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	24.9	lb/hr	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	25.5	lb/hr	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	25.2	lb/hr	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	29.6	lb/hr	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	39.5	lb/hr	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	41.1	lb/hr	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	21.0	lb/hr	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	15.2	lb/hr	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	20.1	lb/hr	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	15.3	lb/hr	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	16.1	lb/hr	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	17.1	lb/hr	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	17.9	lb/hr	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	18.0	lb/hr	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	17.7	lb/hr	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	18.6	lb/hr	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	16.8	lb/hr	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	17.2	lb/hr	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	17.0	lb/hr	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	16.5	lb/hr	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	15.9	lb/hr	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	16.8	lb/hr	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	14.4	lb/hr	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	14.1	lb/hr	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	12.3	lb/hr	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	10.8	lb/hr	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	16.1	lb/hr	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	20.7	lb/hr	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	20.5	lb/hr	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	19.7	lb/hr	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	20.2	lb/hr	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	20.4	lb/hr	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	20.5	lb/hr	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	21.0	lb/hr	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	27.9	lb/hr	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	32.7	lb/hr	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	36.3	lb/hr	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	35.4	lb/hr	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	35.4	lb/hr	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	34.4	lb/hr	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	34.4	lb/hr	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	35.1	lb/hr	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	34.7	lb/hr	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	33.6	lb/hr	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	30.7	lb/hr	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	29.3	lb/hr	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	27.9	lb/hr	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	19.7	lb/hr	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	17.6	lb/hr	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	17.7	lb/hr	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	17.3	lb/hr	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	13.1	lb/hr	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	13.1	lb/hr	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	14.5	lb/hr	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	17.9	lb/hr	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	27.4	lb/hr	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	23.2	lb/hr	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	26.4	lb/hr	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	26.9	lb/hr	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	29.0	lb/hr	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	28.9	lb/hr	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	28.1	lb/hr	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	27.2	lb/hr	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	26.8	lb/hr	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	26.0	lb/hr	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	25.5	lb/hr	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	26.5	lb/hr	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	26.6	lb/hr	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	27.3	lb/hr	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	26.6	lb/hr	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	26.5	lb/hr	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	25.4	lb/hr	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	25.8	lb/hr	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	25.8	lb/hr	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	20.7	lb/hr	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	17.7	lb/hr	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	15.5	lb/hr	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	15.6	lb/hr	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	17.9	lb/hr	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	26.0	lb/hr	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	28.3	lb/hr	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	33.1	lb/hr	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	35.0	lb/hr	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	33.7	lb/hr	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	33.7	lb/hr	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	30.4	lb/hr	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	30.7	lb/hr	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	30.7	lb/hr	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	27.3	lb/hr	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	25.4	lb/hr	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	23.9	lb/hr	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	25.6	lb/hr	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	26.2	lb/hr	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	23.1	lb/hr	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	18.3	lb/hr	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	18.1	lb/hr	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	16.8	lb/hr	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	16.7	lb/hr	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	17.1	lb/hr	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	18.9	lb/hr	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	15.3	lb/hr	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	14.0	lb/hr	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	14.5	lb/hr	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	17.7	lb/hr	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	14.8	lb/hr	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	12.0	lb/hr	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	16.1	lb/hr	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	17.1	lb/hr	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	16.8	lb/hr	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	17.7	lb/hr	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	16.9	lb/hr	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	16.2	lb/hr	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	17.2	lb/hr	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	18.5	lb/hr	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	17.8	lb/hr	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	18.1	lb/hr	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	18.7	lb/hr	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	17.7	lb/hr	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	17.5	lb/hr	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	17.5	lb/hr	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	18.4	lb/hr	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	17.5	lb/hr	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	18.9	lb/hr	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	19.3	lb/hr	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	19.6	lb/hr	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	22.4	lb/hr	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	23.3	lb/hr	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	23.7	lb/hr	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	22.2	lb/hr	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	18.2	lb/hr	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	21.5	lb/hr	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	19.7	lb/hr	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	19.0	lb/hr	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	20.0	lb/hr	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	18.5	lb/hr	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	17.4	lb/hr	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	17.6	lb/hr	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	22.5	lb/hr	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	22.6	lb/hr	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	22.8	lb/hr	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	23.5	lb/hr	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	24.5	lb/hr	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	23.2	lb/hr	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	23.2	lb/hr	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	24.7	lb/hr	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	24.5	lb/hr	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	23.9	lb/hr	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	23.4	lb/hr	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	25.1	lb/hr	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	29.8	lb/hr	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	29.7	lb/hr	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	29.8	lb/hr	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	31.1	lb/hr	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	30.1	lb/hr	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	30.9	lb/hr	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	31.2	lb/hr	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	31.2	lb/hr	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	31.9	lb/hr	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	32.8	lb/hr	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	27.3	lb/hr	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	22.9	lb/hr	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	19.6	lb/hr	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	20.3	lb/hr	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	21.1	lb/hr	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	20.8	lb/hr	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	19.9	lb/hr	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	20.3	lb/hr	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	25.1	lb/hr	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	24.8	lb/hr	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	24.4	lb/hr	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	22.8	lb/hr	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	24.3	lb/hr	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	24.5	lb/hr	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	24.9	lb/hr	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	24.0	lb/hr	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	24.7	lb/hr	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	24.6	lb/hr	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	25.2	lb/hr	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	25.7	lb/hr	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	24.4	lb/hr	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	24.8	lb/hr	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	24.9	lb/hr	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	24.8	lb/hr	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	25.0	lb/hr	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	24.9	lb/hr	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	23.8	lb/hr	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	24.0	lb/hr	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	23.7	lb/hr	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	30.3	lb/hr	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	21.5	lb/hr	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	26.5	lb/hr	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	21.8	lb/hr	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	20.1	lb/hr	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	23.4	lb/hr	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	20.1	lb/hr	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	19.1	lb/hr	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	16.9	lb/hr	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	23.2	lb/hr	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	28.7	lb/hr	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	25.6	lb/hr	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	29.0	lb/hr	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	28.0	lb/hr	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	29.3	lb/hr	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	22.4	lb/hr	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	20.4	lb/hr	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	25.8	lb/hr	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	28.7	lb/hr	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	24.8	lb/hr	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	24.8	lb/hr	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	27.8	lb/hr	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	26.3	lb/hr	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	25.6	lb/hr	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	26.1	lb/hr	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	27.5	lb/hr	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	30.5	lb/hr	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	27.2	lb/hr	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	29.7	lb/hr	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	30.1	lb/hr	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	32.2	lb/hr	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	27.6	lb/hr	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	38.0	lb/hr	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	35.4	lb/hr	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	28.7	lb/hr	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	35.7	lb/hr	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	21.7	lb/hr	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	29.0	lb/hr	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	21.1	lb/hr	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	41.3	lb/hr	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	22.3	lb/hr	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	27.1	lb/hr	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	20.7	lb/hr	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	27.8	lb/hr	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	21.1	lb/hr	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	20.7	lb/hr	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	23.3	lb/hr	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	18.4	lb/hr	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	18.3	lb/hr	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	25.4	lb/hr	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	29.6	lb/hr	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	27.0	lb/hr	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	29.9	lb/hr	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	21.3	lb/hr	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	26.9	lb/hr	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	24.3	lb/hr	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	22.0	lb/hr	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	20.4	lb/hr	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	20.3	lb/hr	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	22.5	lb/hr	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	21.8	lb/hr	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	20.6	lb/hr	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	23.6	lb/hr	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	23.2	lb/hr	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	26.2	lb/hr	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	24.4	lb/hr	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	23.4	lb/hr	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	15.6	lb/hr	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	25.9	lb/hr	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	20.2	lb/hr	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	21.0	lb/hr	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	20.5	lb/hr	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	23.2	lb/hr	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	21.3	lb/hr	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	18.7	lb/hr	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	14.7	lb/hr	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	18.7	lb/hr	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	22.3	lb/hr	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	28.8	lb/hr	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	NO_x lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	28.6	lb/hr	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	21.7	lb/hr	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	26.4	lb/hr	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	25.5	lb/hr	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	22.4	lb/hr	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	22.9	lb/hr	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	24.8	lb/hr	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	31.6	lb/hr	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	30.7	lb/hr	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	29.2	lb/hr	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	27.8	lb/hr	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	23.4	lb/hr	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	8.6	lb/hr	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	8.4	lb/hr	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	8.4	lb/hr	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	8.2	lb/hr	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	8.5	lb/hr	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	8.6	lb/hr	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	9.0	lb/hr	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	9.3	lb/hr	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	9.5	lb/hr	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	9.7	lb/hr	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	10.3	lb/hr	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	8.8	lb/hr	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	9.1	lb/hr	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	9.7	lb/hr	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	10.5	lb/hr	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	11.2	lb/hr	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	11.9	lb/hr	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	12.1	lb/hr	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	13.3	lb/hr	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	14.9	lb/hr	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	16.8	lb/hr	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	18.3	lb/hr	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	20.1	lb/hr	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	23.0	lb/hr	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	24.5	lb/hr	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	26.5	lb/hr	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	28.0	lb/hr	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	29.5	lb/hr	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	30.6	lb/hr	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	31.5	lb/hr	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	31.3	lb/hr	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	31.4	lb/hr	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	30.2	lb/hr	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	28.5	lb/hr	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	28.1	lb/hr	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	30.1	lb/hr	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	32.6	lb/hr	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	33.8	lb/hr	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	35.8	lb/hr	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	35.5	lb/hr	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	37.9	lb/hr	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	44.1	lb/hr	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	42.9	lb/hr	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	29.1	lb/hr	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	20.3	lb/hr	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	13.7	lb/hr	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	11.0	lb/hr	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	8.8	lb/hr	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	7.4	lb/hr	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	6.6	lb/hr	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	6.2	lb/hr	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	6.1	lb/hr	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	4.9	lb/hr	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	4.7	lb/hr	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	4.9	lb/hr	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	4.7	lb/hr	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	4.8	lb/hr	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	4.6	lb/hr	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	4.8	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	5.2	lb/hr	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	5.1	lb/hr	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	4.9	lb/hr	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	5.1	lb/hr	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	4.7	lb/hr	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	2.0	lb/hr	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	3.1	lb/hr	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	4.4	lb/hr	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	4.7	lb/hr	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	5.8	lb/hr	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	6.5	lb/hr	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	7.0	lb/hr	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	7.1	lb/hr	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	6.8	lb/hr	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	7.4	lb/hr	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	8.0	lb/hr	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	8.0	lb/hr	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	8.2	lb/hr	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	9.4	lb/hr	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	10.8	lb/hr	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	11.8	lb/hr	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	12.0	lb/hr	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	12.2	lb/hr	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	11.7	lb/hr	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	13.2	lb/hr	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	13.8	lb/hr	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	14.1	lb/hr	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	14.9	lb/hr	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	15.3	lb/hr	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	16.1	lb/hr	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	16.7	lb/hr	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	17.8	lb/hr	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	19.2	lb/hr	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	19.5	lb/hr	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	19.1	lb/hr	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	19.6	lb/hr	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	19.8	lb/hr	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	19.3	lb/hr	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	19.3	lb/hr	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	18.1	lb/hr	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	17.6	lb/hr	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	16.4	lb/hr	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	15.5	lb/hr	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	15.2	lb/hr	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	15.0	lb/hr	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	14.0	lb/hr	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	13.1	lb/hr	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	12.9	lb/hr	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	12.1	lb/hr	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	11.6	lb/hr	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	11.0	lb/hr	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	10.9	lb/hr	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	10.3	lb/hr	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	10.3	lb/hr	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	9.9	lb/hr	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	9.1	lb/hr	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	9.6	lb/hr	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	10.2	lb/hr	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	10.5	lb/hr	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	11.0	lb/hr	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	10.9	lb/hr	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	9.3	lb/hr	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	8.4	lb/hr	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	7.6	lb/hr	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	6.2	lb/hr	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	5.6	lb/hr	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	5.3	lb/hr	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	5.3	lb/hr	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	3.7	lb/hr	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	3.1	lb/hr	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	3.3	lb/hr	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	3.3	lb/hr	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	3.1	lb/hr	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	3.2	lb/hr	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	3.1	lb/hr	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	2.8	lb/hr	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	2.6	lb/hr	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	2.6	lb/hr	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	2.9	lb/hr	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	2.9	lb/hr	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	2.8	lb/hr	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	2.7	lb/hr	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	3.2	lb/hr	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	3.8	lb/hr	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	3.7	lb/hr	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	3.7	lb/hr	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	4.6	lb/hr	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	4.8	lb/hr	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	4.2	lb/hr	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	4.6	lb/hr	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	4.4	lb/hr	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	4.7	lb/hr	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	4.1	lb/hr	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	3.6	lb/hr	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	4.3	lb/hr	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	3.7	lb/hr	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	3.4	lb/hr	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	3.5	lb/hr	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	4.2	lb/hr	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	4.1	lb/hr	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	3.8	lb/hr	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	3.9	lb/hr	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	6.1	lb/hr	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	8.8	lb/hr	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	11.3	lb/hr	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	15.0	lb/hr	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	21.4	lb/hr	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	29.6	lb/hr	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	41.7	lb/hr	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	24.7	lb/hr	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	6.8	lb/hr	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	2.6	lb/hr	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	3.3	lb/hr	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	9.5	lb/hr	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	13.5	lb/hr	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	9.1	lb/hr	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	4.1	lb/hr	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	2.7	lb/hr	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	2.1	lb/hr	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	2.1	lb/hr	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	2.0	lb/hr	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	2.0	lb/hr	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	2.0	lb/hr	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	2.0	lb/hr	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	2.1	lb/hr	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	2.3	lb/hr	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	2.8	lb/hr	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	4.0	lb/hr	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	5.6	lb/hr	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	5.6	lb/hr	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	5.7	lb/hr	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	7.0	lb/hr	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	7.9	lb/hr	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	9.4	lb/hr	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	10.2	lb/hr	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	11.7	lb/hr	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	12.8	lb/hr	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	13.1	lb/hr	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	9.1	lb/hr	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	6.4	lb/hr	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	4.0	lb/hr	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	3.4	lb/hr	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	3.4	lb/hr	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	6.1	lb/hr	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	18.4	lb/hr	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	21.6	lb/hr	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	45.3	lb/hr	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	41.9	lb/hr	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	10.4	lb/hr	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	3.2	lb/hr	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	1.8	lb/hr	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	1.8	lb/hr	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	1.8	lb/hr	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	1.8	lb/hr	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	1.9	lb/hr	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	1.8	lb/hr	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	1.7	lb/hr	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	1.8	lb/hr	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	1.8	lb/hr	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	1.8	lb/hr	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	1.8	lb/hr	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	1.8	lb/hr	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	1.9	lb/hr	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	2.7	lb/hr	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	2.5	lb/hr	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	3.5	lb/hr	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	4.4	lb/hr	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	4.8	lb/hr	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	5.6	lb/hr	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	6.9	lb/hr	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	5.8	lb/hr	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	4.6	lb/hr	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	5.5	lb/hr	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	6.4	lb/hr	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	6.8	lb/hr	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	7.6	lb/hr	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	8.4	lb/hr	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	10.2	lb/hr	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	12.3	lb/hr	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	13.6	lb/hr	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	15.2	lb/hr	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	11.4	lb/hr	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	4.4	lb/hr	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	2.2	lb/hr	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	1.8	lb/hr	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	1.8	lb/hr	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	1.8	lb/hr	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	2.4	lb/hr	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	1.9	lb/hr	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	1.8	lb/hr	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	1.7	lb/hr	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	1.7	lb/hr	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	1.7	lb/hr	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	1.7	lb/hr	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	1.7	lb/hr	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	1.7	lb/hr	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	1.7	lb/hr	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	1.7	lb/hr	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	1.7	lb/hr	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	1.7	lb/hr	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	1.7	lb/hr	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	1.7	lb/hr	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	1.7	lb/hr	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	2.3	lb/hr	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	1.8	lb/hr	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	1.7	lb/hr	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	1.7	lb/hr	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	1.8	lb/hr	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	1.9	lb/hr	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	1.9	lb/hr	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	1.8	lb/hr	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	1.8	lb/hr	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	1.8	lb/hr	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	1.9	lb/hr	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	1.8	lb/hr	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	1.9	lb/hr	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	1.9	lb/hr	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	1.9	lb/hr	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	1.9	lb/hr	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	1.9	lb/hr	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	1.9	lb/hr	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	1.9	lb/hr	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	1.9	lb/hr	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	1.9	lb/hr	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	1.9	lb/hr	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	1.9	lb/hr	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	1.9	lb/hr	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	2.4	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	1.9	lb/hr	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	1.8	lb/hr	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	1.8	lb/hr	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	1.8	lb/hr	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	1.7	lb/hr	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	1.7	lb/hr	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	2.8	lb/hr	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	1.8	lb/hr	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	1.7	lb/hr	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	1.7	lb/hr	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	1.7	lb/hr	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	1.8	lb/hr	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	1.9	lb/hr	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	1.9	lb/hr	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	1.9	lb/hr	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	1.8	lb/hr	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	1.8	lb/hr	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	1.8	lb/hr	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	1.8	lb/hr	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	1.8	lb/hr	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	1.8	lb/hr	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	1.8	lb/hr	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	1.8	lb/hr	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	2.4	lb/hr	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	1.8	lb/hr	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	1.7	lb/hr	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	2.5	lb/hr	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	1.7	lb/hr	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	1.7	lb/hr	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	1.7	lb/hr	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	1.7	lb/hr	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	1.7	lb/hr	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	1.8	lb/hr	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	1.9	lb/hr	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	1.9	lb/hr	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	1.9	lb/hr	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	2.0	lb/hr	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	2.1	lb/hr	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	1.9	lb/hr	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	1.9	lb/hr	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	1.9	lb/hr	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	1.9	lb/hr	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	1.9	lb/hr	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	1.9	lb/hr	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	1.9	lb/hr	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	1.9	lb/hr	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	2.6	lb/hr	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	2.0	lb/hr	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	1.9	lb/hr	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	1.9	lb/hr	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	1.9	lb/hr	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	1.9	lb/hr	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	2.0	lb/hr	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	2.0	lb/hr	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	2.2	lb/hr	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	2.5	lb/hr	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	3.4	lb/hr	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	4.4	lb/hr	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	6.7	lb/hr	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	4.4	lb/hr	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	2.5	lb/hr	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	2.0	lb/hr	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	1.9	lb/hr	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	2.0	lb/hr	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	2.0	lb/hr	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	2.0	lb/hr	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	1.9	lb/hr	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	1.9	lb/hr	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	1.9	lb/hr	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	1.9	lb/hr	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	2.6	lb/hr	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	2.0	lb/hr	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	1.9	lb/hr	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	1.9	lb/hr	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	1.9	lb/hr	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	1.9	lb/hr	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	1.9	lb/hr	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	2.0	lb/hr	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	2.0	lb/hr	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	2.0	lb/hr	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	2.0	lb/hr	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	2.0	lb/hr	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	2.0	lb/hr	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	2.0	lb/hr	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	2.5	lb/hr	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	2.6	lb/hr	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	2.4	lb/hr	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	2.4	lb/hr	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	2.2	lb/hr	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	2.1	lb/hr	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	2.2	lb/hr	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	2.0	lb/hr	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	2.1	lb/hr	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	2.4	lb/hr	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	3.0	lb/hr	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	2.4	lb/hr	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	2.2	lb/hr	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	2.7	lb/hr	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	3.3	lb/hr	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	4.2	lb/hr	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	4.3	lb/hr	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	4.4	lb/hr	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	4.4	lb/hr	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	3.2	lb/hr	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	2.6	lb/hr	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	2.4	lb/hr	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	2.2	lb/hr	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	2.2	lb/hr	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	2.4	lb/hr	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	2.6	lb/hr	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	2.2	lb/hr	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	2.1	lb/hr	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	2.0	lb/hr	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	2.0	lb/hr	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	2.0	lb/hr	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	2.0	lb/hr	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	2.0	lb/hr	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	2.0	lb/hr	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	2.7	lb/hr	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	2.2	lb/hr	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	2.0	lb/hr	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	2.1	lb/hr	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	2.1	lb/hr	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	2.2	lb/hr	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	2.3	lb/hr	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	2.3	lb/hr	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	2.3	lb/hr	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	2.4	lb/hr	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	2.4	lb/hr	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	2.3	lb/hr	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	2.4	lb/hr	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	2.5	lb/hr	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	2.8	lb/hr	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	2.5	lb/hr	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	2.4	lb/hr	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	2.5	lb/hr	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	2.5	lb/hr	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	2.6	lb/hr	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	2.7	lb/hr	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	2.7	lb/hr	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	2.9	lb/hr	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	3.3	lb/hr	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	4.1	lb/hr	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	5.4	lb/hr	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	7.0	lb/hr	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	7.9	lb/hr	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	8.2	lb/hr	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	8.9	lb/hr	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	8.9	lb/hr	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	8.5	lb/hr	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	8.5	lb/hr	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	7.0	lb/hr	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	5.0	lb/hr	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	2.8	lb/hr	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	2.5	lb/hr	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	2.1	lb/hr	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	1.9	lb/hr	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	1.8	lb/hr	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	1.8	lb/hr	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	1.8	lb/hr	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	1.8	lb/hr	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	1.8	lb/hr	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	1.8	lb/hr	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	1.8	lb/hr	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	1.8	lb/hr	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	1.7	lb/hr	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	2.3	lb/hr	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	1.9	lb/hr	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	1.7	lb/hr	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	1.8	lb/hr	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	1.7	lb/hr	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	1.8	lb/hr	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	1.8	lb/hr	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	1.8	lb/hr	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	1.8	lb/hr	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	1.8	lb/hr	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	1.8	lb/hr	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	1.9	lb/hr	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	1.9	lb/hr	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	1.8	lb/hr	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	1.9	lb/hr	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	1.9	lb/hr	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	1.9	lb/hr	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	1.9	lb/hr	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	1.9	lb/hr	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	1.9	lb/hr	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	1.9	lb/hr	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	1.9	lb/hr	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	1.9	lb/hr	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	1.8	lb/hr	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	2.4	lb/hr	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	1.9	lb/hr	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	1.7	lb/hr	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	1.7	lb/hr	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	1.7	lb/hr	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	1.7	lb/hr	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	1.7	lb/hr	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	1.7	lb/hr	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	1.7	lb/hr	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	1.7	lb/hr	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	1.7	lb/hr	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	1.7	lb/hr	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	1.7	lb/hr	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	1.7	lb/hr	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	1.7	lb/hr	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	1.7	lb/hr	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	1.7	lb/hr	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	1.7	lb/hr	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	1.7	lb/hr	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	1.7	lb/hr	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	1.7	lb/hr	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	1.7	lb/hr	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	2.2	lb/hr	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	1.8	lb/hr	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	1.7	lb/hr	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	1.7	lb/hr	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	1.7	lb/hr	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	1.7	lb/hr	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	1.7	lb/hr	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	1.7	lb/hr	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	1.7	lb/hr	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	1.7	lb/hr	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	1.7	lb/hr	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	1.7	lb/hr	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	1.7	lb/hr	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	1.7	lb/hr	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	1.7	lb/hr	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	1.7	lb/hr	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	1.7	lb/hr	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	1.7	lb/hr	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	1.7	lb/hr	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	1.7	lb/hr	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	1.7	lb/hr	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	1.7	lb/hr	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	1.7	lb/hr	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	1.7	lb/hr	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	2.2	lb/hr	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	1.7	lb/hr	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	1.6	lb/hr	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	1.6	lb/hr	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	1.6	lb/hr	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	1.6	lb/hr	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	1.6	lb/hr	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	1.7	lb/hr	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	1.7	lb/hr	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	1.7	lb/hr	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	1.7	lb/hr	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	1.7	lb/hr	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	1.7	lb/hr	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	1.7	lb/hr	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	1.8	lb/hr	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	1.8	lb/hr	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	1.8	lb/hr	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	1.8	lb/hr	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	1.7	lb/hr	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	1.8	lb/hr	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	1.8	lb/hr	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	1.8	lb/hr	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	1.8	lb/hr	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	1.8	lb/hr	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	2.4	lb/hr	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	2.4	lb/hr	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	3.5	lb/hr	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	6.0	lb/hr	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	5.3	lb/hr	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	6.1	lb/hr	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	7.4	lb/hr	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	9.1	lb/hr	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	12.2	lb/hr	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	14.2	lb/hr	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	15.8	lb/hr	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	15.4	lb/hr	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	12.3	lb/hr	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	8.8	lb/hr	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	7.2	lb/hr	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	5.9	lb/hr	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	4.8	lb/hr	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	4.1	lb/hr	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	3.2	lb/hr	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	2.7	lb/hr	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	3.5	lb/hr	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	4.3	lb/hr	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	5.1	lb/hr	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	6.9	lb/hr	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	9.1	lb/hr	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	10.2	lb/hr	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	10.1	lb/hr	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	9.5	lb/hr	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	9.5	lb/hr	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	9.9	lb/hr	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	9.7	lb/hr	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	9.1	lb/hr	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	9.0	lb/hr	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	10.1	lb/hr	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	10.8	lb/hr	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	11.2	lb/hr	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	11.2	lb/hr	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	11.1	lb/hr	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	11.0	lb/hr	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	9.9	lb/hr	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	8.7	lb/hr	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	8.0	lb/hr	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	5.8	lb/hr	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	4.2	lb/hr	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	3.5	lb/hr	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	2.6	lb/hr	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	2.2	lb/hr	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	2.0	lb/hr	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	2.5	lb/hr	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	2.1	lb/hr	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	1.9	lb/hr	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	1.9	lb/hr	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	1.9	lb/hr	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	1.9	lb/hr	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	1.9	lb/hr	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	1.8	lb/hr	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	1.8	lb/hr	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	1.8	lb/hr	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	1.9	lb/hr	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	1.8	lb/hr	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	1.8	lb/hr	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	1.8	lb/hr	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	1.8	lb/hr	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	1.8	lb/hr	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	1.8	lb/hr	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	1.8	lb/hr	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	1.8	lb/hr	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	1.8	lb/hr	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	1.8	lb/hr	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	1.8	lb/hr	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	1.8	lb/hr	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	1.8	lb/hr	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	2.5	lb/hr	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	2.1	lb/hr	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	1.8	lb/hr	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	1.8	lb/hr	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	1.8	lb/hr	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	1.8	lb/hr	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	1.7	lb/hr	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	1.8	lb/hr	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	1.9	lb/hr	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	2.0	lb/hr	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	1.9	lb/hr	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	2.0	lb/hr	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	2.0	lb/hr	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	2.0	lb/hr	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	2.0	lb/hr	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	2.2	lb/hr	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	2.4	lb/hr	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	3.1	lb/hr	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	4.6	lb/hr	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	5.9	lb/hr	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	7.0	lb/hr	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	7.7	lb/hr	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	7.3	lb/hr	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	5.7	lb/hr	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	4.8	lb/hr	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	3.5	lb/hr	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	3.5	lb/hr	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	3.0	lb/hr	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	3.7	lb/hr	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	1.9	lb/hr	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	2.2	lb/hr	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	2.1	lb/hr	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	2.1	lb/hr	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	2.1	lb/hr	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	2.0	lb/hr	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	1.9	lb/hr	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	1.8	lb/hr	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	1.8	lb/hr	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	2.0	lb/hr	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	1.8	lb/hr	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	1.9	lb/hr	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	1.9	lb/hr	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	1.9	lb/hr	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	1.9	lb/hr	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	1.9	lb/hr	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	1.9	lb/hr	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	1.9	lb/hr	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	1.9	lb/hr	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	2.5	lb/hr	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	2.0	lb/hr	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	2.6	lb/hr	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	2.0	lb/hr	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	1.9	lb/hr	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	1.9	lb/hr	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	1.9	lb/hr	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	1.9	lb/hr	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	1.9	lb/hr	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	1.9	lb/hr	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	1.9	lb/hr	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	1.9	lb/hr	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	1.9	lb/hr	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	1.9	lb/hr	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	1.9	lb/hr	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	1.9	lb/hr	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	1.9	lb/hr	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	1.8	lb/hr	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	1.8	lb/hr	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	1.9	lb/hr	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	1.9	lb/hr	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	1.9	lb/hr	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	1.9	lb/hr	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	1.9	lb/hr	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	2.4	lb/hr	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	2.0	lb/hr	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	2.0	lb/hr	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	2.0	lb/hr	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	2.0	lb/hr	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	2.0	lb/hr	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	SO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	2.0	lb/hr	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	2.0	lb/hr	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	2.0	lb/hr	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	2.0	lb/hr	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	2.0	lb/hr	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	2.0	lb/hr	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	2.0	lb/hr	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	2.0	lb/hr	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	2.0	lb/hr	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	2.0	lb/hr	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	2.0	lb/hr	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	2.0	lb/hr	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	26.1	ppm	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	32.4	ppm	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	34.8	ppm	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	33.9	ppm	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	34.8	ppm	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	34.6	ppm	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	33.1	ppm	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	34.6	ppm	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	35.8	ppm	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	41.9	ppm	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	54.7	ppm	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	35.4	ppm	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	35.2	ppm	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	35.0	ppm	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	34.4	ppm	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	34.9	ppm	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	33.5	ppm	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	32.4	ppm	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	30.0	ppm	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	30.7	ppm	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	29.7	ppm	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	30.7	ppm	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	30.1	ppm	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	29.6	ppm	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	28.7	ppm	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	29.5	ppm	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	29.9	ppm	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	28.4	ppm	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	29.4	ppm	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	29.6	ppm	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	31.5	ppm	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	32.5	ppm	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	33.2	ppm	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	33.9	ppm	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	34.4	ppm	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	34.0	ppm	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	33.4	ppm	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	34.7	ppm	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	34.9	ppm	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	33.6	ppm	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	27.0	ppm	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	28.3	ppm	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	28.1	ppm	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	25.1	ppm	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	29.1	ppm	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	22.5	ppm	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	28.8	ppm	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	29.9	ppm	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	30.9	ppm	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	32.2	ppm	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	30.5	ppm	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	36.1	ppm	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	35.2	ppm	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	35.7	ppm	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	36.1	ppm	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	41.5	ppm	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	53.6	ppm	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	40.0	ppm	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	36.5	ppm	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	34.9	ppm	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	36.7	ppm	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	34.2	ppm	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	34.2	ppm	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	36.0	ppm	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	35.6	ppm	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	33.9	ppm	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	34.3	ppm	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	30.6	ppm	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	32.0	ppm	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	31.6	ppm	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	31.4	ppm	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	30.8	ppm	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	28.3	ppm	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	31.4	ppm	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	30.3	ppm	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	28.4	ppm	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	29.2	ppm	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	29.8	ppm	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	29.6	ppm	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	29.8	ppm	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	30.0	ppm	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	29.3	ppm	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	27.0	ppm	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	32.8	ppm	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	30.7	ppm	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	28.5	ppm	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	28.8	ppm	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	29.1	ppm	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	29.0	ppm	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	28.9	ppm	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	28.7	ppm	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	27.7	ppm	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	27.4	ppm	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	28.2	ppm	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	28.6	ppm	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	28.0	ppm	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	27.5	ppm	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	28.0	ppm	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	27.9	ppm	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	28.2	ppm	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	28.2	ppm	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	28.3	ppm	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	28.2	ppm	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	30.4	ppm	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	28.9	ppm	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	29.2	ppm	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	29.9	ppm	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	29.7	ppm	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	30.6	ppm	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	28.9	ppm	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	29.9	ppm	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	28.9	ppm	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	30.1	ppm	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	28.3	ppm	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	28.4	ppm	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	28.6	ppm	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	28.9	ppm	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	28.4	ppm	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	28.3	ppm	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	27.7	ppm	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	28.5	ppm	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	33.1	ppm	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	36.6	ppm	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	32.6	ppm	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	32.5	ppm	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	33.1	ppm	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	31.6	ppm	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	30.3	ppm	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	30.2	ppm	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	31.9	ppm	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	35.0	ppm	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	33.8	ppm	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	40.3	ppm	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	40.2	ppm	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	40.6	ppm	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	38.9	ppm	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	47.2	ppm	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	60.0	ppm	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	51.5	ppm	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	42.7	ppm	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	36.8	ppm	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	41.1	ppm	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	39.6	ppm	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	35.2	ppm	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	35.5	ppm	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	38.3	ppm	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	40.8	ppm	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	42.0	ppm	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	41.4	ppm	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	40.0	ppm	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	43.7	ppm	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	45.2	ppm	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	50.8	ppm	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	85.6	ppm	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	65.0	ppm	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	59.1	ppm	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	58.3	ppm	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	79.0	ppm	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	64.2	ppm	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	65.6	ppm	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	34.9	ppm	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	39.1	ppm	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	35.6	ppm	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	30.5	ppm	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	21.1	ppm	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	22.3	ppm	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	10.7	ppm	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	14.0	ppm	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	12.6	ppm	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	12.1	ppm	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	13.1	ppm	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	13.8	ppm	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	15.6	ppm	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	15.4	ppm	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	16.8	ppm	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	14.6	ppm	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	15.2	ppm	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	14.1	ppm	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	12.6	ppm	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	11.2	ppm	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	14.5	ppm	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	14.1	ppm	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	15.6	ppm	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	16.7	ppm	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	14.8	ppm	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	15.5	ppm	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	14.6	ppm	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	13.4	ppm	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	7.6	ppm	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	7.9	ppm	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	11.2	ppm	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	15.4	ppm	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	17.5	ppm	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	17.2	ppm	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	17.5	ppm	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	16.3	ppm	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	15.1	ppm	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	17.1	ppm	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	17.1	ppm	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	15.9	ppm	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	20.1	ppm	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	20.9	ppm	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	23.3	ppm	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	21.4	ppm	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	23.2	ppm	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	25.5	ppm	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	25.6	ppm	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	23.7	ppm	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	18.0	ppm	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	23.2	ppm	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	22.7	ppm	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	22.0	ppm	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	22.2	ppm	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	23.3	ppm	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	23.6	ppm	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	19.8	ppm	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	18.7	ppm	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	22.6	ppm	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	21.9	ppm	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	19.1	ppm	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	18.1	ppm	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	16.7	ppm	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	14.0	ppm	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	17.8	ppm	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	19.3	ppm	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	19.7	ppm	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	22.1	ppm	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	21.3	ppm	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	20.8	ppm	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	19.9	ppm	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	21.9	ppm	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	21.4	ppm	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	19.8	ppm	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	20.0	ppm	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	20.2	ppm	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	21.5	ppm	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	21.7	ppm	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	21.0	ppm	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	22.2	ppm	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	23.1	ppm	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	23.8	ppm	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	25.9	ppm	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	24.6	ppm	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	25.3	ppm	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	24.1	ppm	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	24.9	ppm	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	25.2	ppm	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	25.0	ppm	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	25.6	ppm	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	21.6	ppm	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	21.7	ppm	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	21.4	ppm	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	20.3	ppm	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	22.2	ppm	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	22.4	ppm	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	20.8	ppm	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	22.3	ppm	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	22.4	ppm	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	24.4	ppm	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	22.4	ppm	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	23.3	ppm	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	22.6	ppm	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	21.1	ppm	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	21.8	ppm	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	23.9	ppm	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	23.8	ppm	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	22.1	ppm	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	23.3	ppm	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	22.8	ppm	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	23.9	ppm	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	23.3	ppm	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	21.4	ppm	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	20.4	ppm	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	19.5	ppm	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	23.4	ppm	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	23.4	ppm	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	27.6	ppm	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	30.8	ppm	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	31.3	ppm	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	32.2	ppm	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	32.6	ppm	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	33.2	ppm	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	32.3	ppm	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	32.0	ppm	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	32.2	ppm	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	31.3	ppm	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	31.2	ppm	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	31.6	ppm	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	32.0	ppm	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	31.9	ppm	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	32.2	ppm	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	30.9	ppm	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	31.3	ppm	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	32.0	ppm	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	31.7	ppm	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	32.5	ppm	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	30.6	ppm	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	30.5	ppm	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	29.9	ppm	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	25.4	ppm	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	25.1	ppm	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	23.7	ppm	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	23.0	ppm	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	21.0	ppm	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	22.6	ppm	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	32.9	ppm	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	60.7	ppm	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	23.1	ppm	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	27.9	ppm	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	30.3	ppm	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	30.9	ppm	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	30.9	ppm	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	34.1	ppm	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	35.0	ppm	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	34.0	ppm	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	32.4	ppm	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	32.2	ppm	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	30.1	ppm	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	29.8	ppm	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	25.0	ppm	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	16.5	ppm	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	22.5	ppm	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	28.5	ppm	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	29.0	ppm	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	27.6	ppm	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	26.5	ppm	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	26.5	ppm	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	28.6	ppm	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	49.5	ppm	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	23.3	ppm	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	24.3	ppm	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	26.5	ppm	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	25.9	ppm	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	30.2	ppm	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	35.6	ppm	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	33.0	ppm	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	34.4	ppm	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	33.9	ppm	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	32.9	ppm	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	31.0	ppm	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	25.7	ppm	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	27.9	ppm	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	30.0	ppm	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	34.2	ppm	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	34.1	ppm	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	32.4	ppm	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	26.2	ppm	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	24.2	ppm	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	26.6	ppm	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	28.9	ppm	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	28.5	ppm	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	29.6	ppm	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	28.4	ppm	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	26.4	ppm	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	20.6	ppm	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	26.6	ppm	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	32.2	ppm	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	36.5	ppm	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	48.7	ppm	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	31.8	ppm	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	35.9	ppm	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	34.7	ppm	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	38.1	ppm	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	35.4	ppm	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	37.0	ppm	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	32.2	ppm	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	20.3	ppm	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	25.5	ppm	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	26.9	ppm	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	28.9	ppm	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	28.7	ppm	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	29.2	ppm	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	27.6	ppm	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	26.9	ppm	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	27.2	ppm	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	26.9	ppm	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	25.4	ppm	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	26.6	ppm	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	27.4	ppm	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	29.9	ppm	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	51.5	ppm	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	154.7	ppm	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	40.8	ppm	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	45.1	ppm	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	38.3	ppm	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	37.4	ppm	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	81.5	ppm	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	29.6	ppm	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	32.3	ppm	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	39.2	ppm	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	38.9	ppm	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	30.6	ppm	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	32.0	ppm	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	30.3	ppm	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	30.6	ppm	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	31.3	ppm	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	32.1	ppm	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	31.3	ppm	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	32.5	ppm	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	32.2	ppm	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	30.5	ppm	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	30.9	ppm	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	30.9	ppm	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	29.8	ppm	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	36.7	ppm	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	51.1	ppm	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	41.7	ppm	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	42.3	ppm	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	40.6	ppm	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	45.8	ppm	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	44.6	ppm	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	45.3	ppm	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	39.1	ppm	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	37.9	ppm	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	36.0	ppm	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	28.1	ppm	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	29.6	ppm	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	29.8	ppm	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	30.2	ppm	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	31.0	ppm	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	30.2	ppm	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	30.8	ppm	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	30.8	ppm	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	29.6	ppm	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	30.0	ppm	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	29.4	ppm	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	27.9	ppm	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	33.2	ppm	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	42.1	ppm	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	39.2	ppm	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	39.2	ppm	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	40.1	ppm	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	38.4	ppm	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	39.5	ppm	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	39.4	ppm	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	37.7	ppm	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	37.1	ppm	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	35.9	ppm	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	21.9	ppm	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	23.1	ppm	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	24.3	ppm	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	27.3	ppm	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	26.9	ppm	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	28.0	ppm	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	19.7	ppm	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	8.7	ppm	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	8.8	ppm	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	28.3	ppm	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	26.7	ppm	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	27.1	ppm	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	25.5	ppm	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	23.9	ppm	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	25.4	ppm	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	26.2	ppm	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	27.8	ppm	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	23.7	ppm	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	28.7	ppm	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	26.9	ppm	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	26.2	ppm	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	26.0	ppm	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	24.8	ppm	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	23.1	ppm	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	24.8	ppm	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	22.5	ppm	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	23.2	ppm	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	23.2	ppm	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	63.5	ppm	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	22.1	ppm	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	25.4	ppm	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	25.5	ppm	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	24.6	ppm	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	24.2	ppm	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	24.8	ppm	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	25.5	ppm	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	25.0	ppm	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	14.9	ppm	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	7.5	ppm	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	6.5	ppm	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	7.2	ppm	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	8.0	ppm	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	8.3	ppm	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	8.1	ppm	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	7.9	ppm	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	8.5	ppm	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	9.2	ppm	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	12.2	ppm	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	13.2	ppm	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	14.8	ppm	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	20.3	ppm	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	20.2	ppm	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	20.6	ppm	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	20.7	ppm	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	20.8	ppm	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	20.0	ppm	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	21.6	ppm	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	21.4	ppm	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	15.9	ppm	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	18.3	ppm	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	10.3	ppm	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	11.5	ppm	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	9.8	ppm	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	11.0	ppm	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	11.6	ppm	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	12.5	ppm	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	13.7	ppm	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	14.7	ppm	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	15.7	ppm	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	14.2	ppm	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	14.2	ppm	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	12.3	ppm	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	14.0	ppm	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	12.8	ppm	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	12.9	ppm	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	12.8	ppm	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	12.5	ppm	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	20.8	ppm	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	26.3	ppm	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	26.6	ppm	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	27.7	ppm	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	22.8	ppm	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	9.2	ppm	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	8.8	ppm	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	7.0	ppm	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	6.8	ppm	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	7.2	ppm	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	7.2	ppm	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	8.1	ppm	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	7.9	ppm	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	7.8	ppm	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	7.9	ppm	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	8.8	ppm	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	10.2	ppm	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	8.7	ppm	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	8.6	ppm	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	12.0	ppm	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	24.5	ppm	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	23.1	ppm	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	25.4	ppm	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	25.9	ppm	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	22.4	ppm	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	22.2	ppm	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	30.5	ppm	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	33.0	ppm	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	30.8	ppm	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	20.9	ppm	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	31.1	ppm	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	91.1	ppm	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	24.9	ppm	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	22.4	ppm	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	26.8	ppm	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	19.4	ppm	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	21.5	ppm	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	27.7	ppm	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	22.4	ppm	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	18.3	ppm	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	22.7	ppm	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	23.6	ppm	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	18.6	ppm	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	24.7	ppm	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	26.4	ppm	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	24.5	ppm	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	27.8	ppm	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	31.4	ppm	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	28.1	ppm	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	27.2	ppm	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	28.5	ppm	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	26.1	ppm	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	25.3	ppm	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	27.9	ppm	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	28.7	ppm	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	36.9	ppm	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	27.5	ppm	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	32.1	ppm	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	33.3	ppm	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	31.4	ppm	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	33.3	ppm	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	33.3	ppm	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	34.0	ppm	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	23.3	ppm	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	23.6	ppm	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	24.7	ppm	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	23.6	ppm	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	22.6	ppm	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	27.9	ppm	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	27.1	ppm	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	25.5	ppm	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	25.0	ppm	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	28.1	ppm	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	29.4	ppm	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	24.5	ppm	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	14.6	ppm	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	14.3	ppm	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	14.6	ppm	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	15.1	ppm	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	16.2	ppm	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	13.2	ppm	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	12.5	ppm	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	12.5	ppm	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	12.5	ppm	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	11.1	ppm	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	17.6	ppm	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	25.4	ppm	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	29.8	ppm	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	25.5	ppm	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	23.8	ppm	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	24.0	ppm	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	24.7	ppm	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	23.7	ppm	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	16.4	ppm	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	15.1	ppm	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	17.9	ppm	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	20.7	ppm	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	17.4	ppm	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	16.2	ppm	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	16.0	ppm	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	19.3	ppm	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	16.8	ppm	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	16.5	ppm	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	15.2	ppm	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	13.7	ppm	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	15.9	ppm	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	14.2	ppm	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	14.2	ppm	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	14.7	ppm	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	14.2	ppm	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	15.5	ppm	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	18.8	ppm	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	17.3	ppm	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	18.1	ppm	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	11.9	ppm	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	24.5	ppm	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	58.6	ppm	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	23.1	ppm	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	27.5	ppm	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	17.4	ppm	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	24.6	ppm	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	24.8	ppm	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	31.0	ppm	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	78.4	ppm	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	13.8	ppm	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	16.8	ppm	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	11.9	ppm	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	13.7	ppm	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	11.8	ppm	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	22.7	ppm	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	36.9	ppm	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	21.2	ppm	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	17.0	ppm	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	26.8	ppm	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	24.8	ppm	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	18.9	ppm	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	21.2	ppm	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	22.2	ppm	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	17.1	ppm	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	15.6	ppm	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	13.3	ppm	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	15.6	ppm	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	16.8	ppm	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	24.6	ppm	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	15.7	ppm	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	55.6	ppm	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	28.9	ppm	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	21.6	ppm	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	40.3	ppm	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	19.8	ppm	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	48.3	ppm	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	22.2	ppm	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	81.7	ppm	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	12.9	ppm	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	45.7	ppm	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	25.7	ppm	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	97.1	ppm	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	20.9	ppm	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	30.0	ppm	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	41.3	ppm	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	25.3	ppm	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	116.5	ppm	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	77.8	ppm	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	23.4	ppm	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	84.5	ppm	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	138.0	ppm	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	30.7	ppm	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	37.7	ppm	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	23.3	ppm	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	28.0	ppm	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	33.6	ppm	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	34.7	ppm	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	36.4	ppm	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	29.1	ppm	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	30.6	ppm	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	34.5	ppm	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	26.6	ppm	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	29.0	ppm	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	21.4	ppm	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	25.6	ppm	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	26.8	ppm	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	106.6	ppm	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	21.2	ppm	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	31.9	ppm	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	32.0	ppm	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	33.5	ppm	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	26.0	ppm	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	32.1	ppm	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	39.1	ppm	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	159.7	ppm	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	52.4	ppm	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	40.8	ppm	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	27.5	ppm	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	16.6	ppm	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	29.9	ppm	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	22.2	ppm	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	22.0	ppm	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	28.6	ppm	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	26.7	ppm	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	24.6	ppm	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	12.9	ppm	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	14.2	ppm	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	16.9	ppm	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	19.5	ppm	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	26.9	ppm	1.90	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day1	Hour 1	06/01/2011 00:00	0:00	125.02	1,000 barrels/hr	24.0	lb/hr	1.63	Dry	No
Day1	Hour 2	06/01/2011 01:00	1:00	125.05	1,000 barrels/hr	24.0	lb/hr	1.44	Dry	No
Day1	Hour 3	06/01/2011 02:00	2:00	125.11	1,000 barrels/hr	24.1	lb/hr	1.28	Dry	No
Day1	Hour 4	06/01/2011 03:00	3:00	125.06	1,000 barrels/hr	24.0	lb/hr	1.33	Dry	No
Day1	Hour 5	06/01/2011 04:00	4:00	125.10	1,000 barrels/hr	24.0	lb/hr	1.28	Dry	No
Day1	Hour 6	06/01/2011 05:00	5:00	125.09	1,000 barrels/hr	23.9	lb/hr	1.28	Dry	No
Day1	Hour 7	06/01/2011 06:00	6:00	125.08	1,000 barrels/hr	24.0	lb/hr	1.31	Dry	No
Day1	Hour 8	06/01/2011 07:00	7:00	125.03	1,000 barrels/hr	23.9	lb/hr	1.23	Dry	No
Day1	Hour 9	06/01/2011 08:00	8:00	125.03	1,000 barrels/hr	23.8	lb/hr	1.16	Dry	No
Day1	Hour 10	06/01/2011 09:00	9:00	125.05	1,000 barrels/hr	24.0	lb/hr	1.04	Dry	No
Day1	Hour 11	06/01/2011 10:00	10:00	125.01	1,000 barrels/hr	23.9	lb/hr	0.95	Dry	No
Day1	Hour 12	06/01/2011 11:00	11:00	124.95	1,000 barrels/hr	24.1	lb/hr	1.14	Dry	No
Day1	Hour 13	06/01/2011 12:00	12:00	125.00	1,000 barrels/hr	24.1	lb/hr	1.17	Dry	No
Day1	Hour 14	06/01/2011 13:00	13:00	125.00	1,000 barrels/hr	23.9	lb/hr	1.17	Dry	No
Day1	Hour 15	06/01/2011 14:00	14:00	125.00	1,000 barrels/hr	24.0	lb/hr	1.22	Dry	No
Day1	Hour 16	06/01/2011 15:00	15:00	125.00	1,000 barrels/hr	23.9	lb/hr	1.22	Dry	No
Day1	Hour 17	06/01/2011 16:00	16:00	125.00	1,000 barrels/hr	23.9	lb/hr	1.26	Dry	No
Day1	Hour 18	06/01/2011 17:00	17:00	125.00	1,000 barrels/hr	24.0	lb/hr	1.31	Dry	No
Day1	Hour 19	06/01/2011 18:00	18:00	124.98	1,000 barrels/hr	24.1	lb/hr	1.40	Dry	No
Day1	Hour 20	06/01/2011 19:00	19:00	125.07	1,000 barrels/hr	24.2	lb/hr	1.40	Dry	No
Day1	Hour 21	06/01/2011 20:00	20:00	125.03	1,000 barrels/hr	24.2	lb/hr	1.44	Dry	No
Day1	Hour 22	06/01/2011 21:00	21:00	125.12	1,000 barrels/hr	24.2	lb/hr	1.40	Dry	No
Day1	Hour 23	06/01/2011 22:00	22:00	125.05	1,000 barrels/hr	24.2	lb/hr	1.44	Dry	No
Day1	Hour 24	06/01/2011 23:00	23:00	125.07	1,000 barrels/hr	24.3	lb/hr	1.46	Dry	No
Day2	Hour 1	06/02/2011 00:00	0:00	125.08	1,000 barrels/hr	24.1	lb/hr	1.51	Dry	No
Day2	Hour 2	06/02/2011 01:00	1:00	124.99	1,000 barrels/hr	24.1	lb/hr	1.51	Dry	No
Day2	Hour 3	06/02/2011 02:00	2:00	125.03	1,000 barrels/hr	24.1	lb/hr	1.47	Dry	No
Day2	Hour 4	06/02/2011 03:00	3:00	125.02	1,000 barrels/hr	24.1	lb/hr	1.54	Dry	No
Day2	Hour 5	06/02/2011 04:00	4:00	125.04	1,000 barrels/hr	24.1	lb/hr	1.50	Dry	No
Day2	Hour 6	06/02/2011 05:00	5:00	125.08	1,000 barrels/hr	24.0	lb/hr	1.51	Dry	No
Day2	Hour 7	06/02/2011 06:00	6:00	125.10	1,000 barrels/hr	24.0	lb/hr	1.44	Dry	No
Day2	Hour 8	06/02/2011 07:00	7:00	125.06	1,000 barrels/hr	24.2	lb/hr	1.36	Dry	No
Day2	Hour 9	06/02/2011 08:00	8:00	125.07	1,000 barrels/hr	24.1	lb/hr	1.35	Dry	No
Day2	Hour 10	06/02/2011 09:00	9:00	125.05	1,000 barrels/hr	24.0	lb/hr	1.32	Dry	No
Day2	Hour 11	06/02/2011 10:00	10:00	125.04	1,000 barrels/hr	24.0	lb/hr	1.30	Dry	No
Day2	Hour 12	06/02/2011 11:00	11:00	125.07	1,000 barrels/hr	23.9	lb/hr	1.34	Dry	No
Day2	Hour 13	06/02/2011 12:00	12:00	125.09	1,000 barrels/hr	23.9	lb/hr	1.35	Dry	No
Day2	Hour 14	06/02/2011 13:00	13:00	125.11	1,000 barrels/hr	23.9	lb/hr	1.28	Dry	No
Day2	Hour 15	06/02/2011 14:00	14:00	125.05	1,000 barrels/hr	24.0	lb/hr	1.26	Dry	No
Day2	Hour 16	06/02/2011 15:00	15:00	124.99	1,000 barrels/hr	24.0	lb/hr	1.28	Dry	No
Day2	Hour 17	06/02/2011 16:00	16:00	124.74	1,000 barrels/hr	23.6	lb/hr	1.61	Dry	No
Day2	Hour 18	06/02/2011 17:00	17:00	125.02	1,000 barrels/hr	23.8	lb/hr	1.53	Dry	No
Day2	Hour 19	06/02/2011 18:00	18:00	125.05	1,000 barrels/hr	23.8	lb/hr	1.53	Dry	No
Day2	Hour 20	06/02/2011 19:00	19:00	125.10	1,000 barrels/hr	23.9	lb/hr	1.60	Dry	No
Day2	Hour 21	06/02/2011 20:00	20:00	124.93	1,000 barrels/hr	24.1	lb/hr	1.46	Dry	No
Day2	Hour 22	06/02/2011 21:00	21:00	124.91	1,000 barrels/hr	23.8	lb/hr	1.69	Dry	No
Day2	Hour 23	06/02/2011 22:00	22:00	125.02	1,000 barrels/hr	24.0	lb/hr	1.51	Dry	No
Day2	Hour 24	06/02/2011 23:00	23:00	125.04	1,000 barrels/hr	24.0	lb/hr	1.46	Dry	No
Day3	Hour 1	06/03/2011 00:00	0:00	125.11	1,000 barrels/hr	24.0	lb/hr	1.47	Dry	No
Day3	Hour 2	06/03/2011 01:00	1:00	125.07	1,000 barrels/hr	24.0	lb/hr	1.40	Dry	No
Day3	Hour 3	06/03/2011 02:00	2:00	125.01	1,000 barrels/hr	23.8	lb/hr	1.49	Dry	No
Day3	Hour 4	06/03/2011 03:00	3:00	125.11	1,000 barrels/hr	23.9	lb/hr	1.25	Dry	No
Day3	Hour 5	06/03/2011 04:00	4:00	125.05	1,000 barrels/hr	23.9	lb/hr	1.24	Dry	No
Day3	Hour 6	06/03/2011 05:00	5:00	125.00	1,000 barrels/hr	23.8	lb/hr	1.32	Dry	No
Day3	Hour 7	06/03/2011 06:00	6:00	125.04	1,000 barrels/hr	23.8	lb/hr	1.31	Dry	No
Day3	Hour 8	06/03/2011 07:00	7:00	125.05	1,000 barrels/hr	23.7	lb/hr	1.13	Dry	No
Day3	Hour 9	06/03/2011 08:00	8:00	125.09	1,000 barrels/hr	23.8	lb/hr	1.04	Dry	No
Day3	Hour 10	06/03/2011 09:00	9:00	125.04	1,000 barrels/hr	24.0	lb/hr	1.14	Dry	No
Day3	Hour 11	06/03/2011 10:00	10:00	125.05	1,000 barrels/hr	23.6	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day3	Hour 12	06/03/2011 11:00	11:00	125.03	1,000 barrels/hr	23.8	lb/hr	1.21	Dry	No
Day3	Hour 13	06/03/2011 12:00	12:00	125.03	1,000 barrels/hr	23.9	lb/hr	1.18	Dry	No
Day3	Hour 14	06/03/2011 13:00	13:00	124.97	1,000 barrels/hr	23.8	lb/hr	1.21	Dry	No
Day3	Hour 15	06/03/2011 14:00	14:00	125.00	1,000 barrels/hr	23.8	lb/hr	1.23	Dry	No
Day3	Hour 16	06/03/2011 15:00	15:00	125.02	1,000 barrels/hr	23.9	lb/hr	1.18	Dry	No
Day3	Hour 17	06/03/2011 16:00	16:00	125.02	1,000 barrels/hr	23.9	lb/hr	1.18	Dry	No
Day3	Hour 18	06/03/2011 17:00	17:00	125.04	1,000 barrels/hr	23.8	lb/hr	1.22	Dry	No
Day3	Hour 19	06/03/2011 18:00	18:00	125.07	1,000 barrels/hr	23.8	lb/hr	1.25	Dry	No
Day3	Hour 20	06/03/2011 19:00	19:00	125.05	1,000 barrels/hr	23.7	lb/hr	1.38	Dry	No
Day3	Hour 21	06/03/2011 20:00	20:00	125.07	1,000 barrels/hr	24.0	lb/hr	1.36	Dry	No
Day3	Hour 22	06/03/2011 21:00	21:00	125.06	1,000 barrels/hr	23.9	lb/hr	1.40	Dry	No
Day3	Hour 23	06/03/2011 22:00	22:00	125.03	1,000 barrels/hr	24.1	lb/hr	1.39	Dry	No
Day3	Hour 24	06/03/2011 23:00	23:00	125.07	1,000 barrels/hr	24.1	lb/hr	1.43	Dry	No
Day4	Hour 1	06/04/2011 00:00	0:00	125.06	1,000 barrels/hr	23.9	lb/hr	1.53	Dry	No
Day4	Hour 2	06/04/2011 01:00	1:00	125.07	1,000 barrels/hr	24.0	lb/hr	1.41	Dry	No
Day4	Hour 3	06/04/2011 02:00	2:00	125.03	1,000 barrels/hr	24.1	lb/hr	1.31	Dry	No
Day4	Hour 4	06/04/2011 03:00	3:00	125.01	1,000 barrels/hr	24.1	lb/hr	1.41	Dry	No
Day4	Hour 5	06/04/2011 04:00	4:00	125.03	1,000 barrels/hr	23.9	lb/hr	1.48	Dry	No
Day4	Hour 6	06/04/2011 05:00	5:00	125.04	1,000 barrels/hr	23.9	lb/hr	1.48	Dry	No
Day4	Hour 7	06/04/2011 06:00	6:00	125.03	1,000 barrels/hr	24.0	lb/hr	1.47	Dry	No
Day4	Hour 8	06/04/2011 07:00	7:00	125.04	1,000 barrels/hr	23.9	lb/hr	1.42	Dry	No
Day4	Hour 9	06/04/2011 08:00	8:00	125.07	1,000 barrels/hr	23.8	lb/hr	1.36	Dry	No
Day4	Hour 10	06/04/2011 09:00	9:00	125.04	1,000 barrels/hr	24.0	lb/hr	1.31	Dry	No
Day4	Hour 11	06/04/2011 10:00	10:00	124.96	1,000 barrels/hr	23.7	lb/hr	1.44	Dry	No
Day4	Hour 12	06/04/2011 11:00	11:00	125.05	1,000 barrels/hr	23.9	lb/hr	1.22	Dry	No
Day4	Hour 13	06/04/2011 12:00	12:00	125.00	1,000 barrels/hr	24.0	lb/hr	1.26	Dry	No
Day4	Hour 14	06/04/2011 13:00	13:00	124.99	1,000 barrels/hr	23.8	lb/hr	1.35	Dry	No
Day4	Hour 15	06/04/2011 14:00	14:00	125.01	1,000 barrels/hr	23.8	lb/hr	1.37	Dry	No
Day4	Hour 16	06/04/2011 15:00	15:00	125.00	1,000 barrels/hr	23.7	lb/hr	1.38	Dry	No
Day4	Hour 17	06/04/2011 16:00	16:00	125.03	1,000 barrels/hr	23.7	lb/hr	1.37	Dry	No
Day4	Hour 18	06/04/2011 17:00	17:00	125.00	1,000 barrels/hr	23.8	lb/hr	1.48	Dry	No
Day4	Hour 19	06/04/2011 18:00	18:00	125.03	1,000 barrels/hr	23.9	lb/hr	1.47	Dry	No
Day4	Hour 20	06/04/2011 19:00	19:00	125.08	1,000 barrels/hr	23.9	lb/hr	1.51	Dry	No
Day4	Hour 21	06/04/2011 20:00	20:00	125.07	1,000 barrels/hr	24.1	lb/hr	1.49	Dry	No
Day4	Hour 22	06/04/2011 21:00	21:00	125.07	1,000 barrels/hr	24.2	lb/hr	1.47	Dry	No
Day4	Hour 23	06/04/2011 22:00	22:00	125.06	1,000 barrels/hr	24.2	lb/hr	1.44	Dry	No
Day4	Hour 24	06/04/2011 23:00	23:00	125.06	1,000 barrels/hr	24.2	lb/hr	1.47	Dry	No
Day5	Hour 1	06/05/2011 00:00	0:00	125.04	1,000 barrels/hr	24.2	lb/hr	1.51	Dry	No
Day5	Hour 2	06/05/2011 01:00	1:00	125.05	1,000 barrels/hr	24.3	lb/hr	1.48	Dry	No
Day5	Hour 3	06/05/2011 02:00	2:00	125.01	1,000 barrels/hr	24.2	lb/hr	1.47	Dry	No
Day5	Hour 4	06/05/2011 03:00	3:00	125.00	1,000 barrels/hr	24.1	lb/hr	1.42	Dry	No
Day5	Hour 5	06/05/2011 04:00	4:00	125.02	1,000 barrels/hr	24.0	lb/hr	1.46	Dry	No
Day5	Hour 6	06/05/2011 05:00	5:00	125.03	1,000 barrels/hr	24.1	lb/hr	1.44	Dry	No
Day5	Hour 7	06/05/2011 06:00	6:00	125.01	1,000 barrels/hr	24.0	lb/hr	1.43	Dry	No
Day5	Hour 8	06/05/2011 07:00	7:00	125.06	1,000 barrels/hr	24.0	lb/hr	1.37	Dry	No
Day5	Hour 9	06/05/2011 08:00	8:00	125.01	1,000 barrels/hr	23.8	lb/hr	1.40	Dry	No
Day5	Hour 10	06/05/2011 09:00	9:00	125.04	1,000 barrels/hr	23.7	lb/hr	1.42	Dry	No
Day5	Hour 11	06/05/2011 10:00	10:00	125.05	1,000 barrels/hr	23.8	lb/hr	1.35	Dry	No
Day5	Hour 12	06/05/2011 11:00	11:00	125.02	1,000 barrels/hr	23.6	lb/hr	1.35	Dry	No
Day5	Hour 13	06/05/2011 12:00	12:00	125.00	1,000 barrels/hr	23.8	lb/hr	1.32	Dry	No
Day5	Hour 14	06/05/2011 13:00	13:00	124.99	1,000 barrels/hr	23.8	lb/hr	1.34	Dry	No
Day5	Hour 15	06/05/2011 14:00	14:00	125.03	1,000 barrels/hr	23.8	lb/hr	1.31	Dry	No
Day5	Hour 16	06/05/2011 15:00	15:00	125.02	1,000 barrels/hr	23.7	lb/hr	1.39	Dry	No
Day5	Hour 17	06/05/2011 16:00	16:00	125.03	1,000 barrels/hr	23.8	lb/hr	1.38	Dry	No
Day5	Hour 18	06/05/2011 17:00	17:00	125.03	1,000 barrels/hr	23.9	lb/hr	1.51	Dry	No
Day5	Hour 19	06/05/2011 18:00	18:00	125.07	1,000 barrels/hr	24.1	lb/hr	1.60	Dry	No
Day5	Hour 20	06/05/2011 19:00	19:00	125.09	1,000 barrels/hr	24.1	lb/hr	1.59	Dry	No
Day5	Hour 21	06/05/2011 20:00	20:00	125.03	1,000 barrels/hr	24.2	lb/hr	1.57	Dry	No
Day5	Hour 22	06/05/2011 21:00	21:00	125.01	1,000 barrels/hr	24.2	lb/hr	1.56	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day5	Hour 23	06/05/2011 22:00	22:00	125.01	1,000 barrels/hr	24.2	lb/hr	1.55	Dry	No
Day5	Hour 24	06/05/2011 23:00	23:00	125.01	1,000 barrels/hr	24.1	lb/hr	1.55	Dry	No
Day6	Hour 1	06/06/2011 00:00	0:00	124.98	1,000 barrels/hr	23.9	lb/hr	1.53	Dry	No
Day6	Hour 2	06/06/2011 01:00	1:00	125.05	1,000 barrels/hr	24.1	lb/hr	1.34	Dry	No
Day6	Hour 3	06/06/2011 02:00	2:00	125.08	1,000 barrels/hr	24.3	lb/hr	1.25	Dry	No
Day6	Hour 4	06/06/2011 03:00	3:00	125.02	1,000 barrels/hr	24.0	lb/hr	1.34	Dry	No
Day6	Hour 5	06/06/2011 04:00	4:00	125.04	1,000 barrels/hr	24.1	lb/hr	1.30	Dry	No
Day6	Hour 6	06/06/2011 05:00	5:00	124.96	1,000 barrels/hr	24.0	lb/hr	1.29	Dry	No
Day6	Hour 7	06/06/2011 06:00	6:00	125.00	1,000 barrels/hr	24.1	lb/hr	1.28	Dry	No
Day6	Hour 8	06/06/2011 07:00	7:00	125.00	1,000 barrels/hr	23.9	lb/hr	1.26	Dry	No
Day6	Hour 9	06/06/2011 08:00	8:00	125.00	1,000 barrels/hr	23.8	lb/hr	1.25	Dry	No
Day6	Hour 10	06/06/2011 09:00	9:00	125.03	1,000 barrels/hr	23.7	lb/hr	1.23	Dry	No
Day6	Hour 11	06/06/2011 10:00	10:00	125.07	1,000 barrels/hr	23.6	lb/hr	1.20	Dry	No
Day6	Hour 12	06/06/2011 11:00	11:00	125.03	1,000 barrels/hr	23.5	lb/hr	1.30	Dry	No
Day6	Hour 13	06/06/2011 12:00	12:00	125.00	1,000 barrels/hr	23.4	lb/hr	1.20	Dry	No
Day6	Hour 14	06/06/2011 13:00	13:00	125.03	1,000 barrels/hr	23.4	lb/hr	1.18	Dry	No
Day6	Hour 15	06/06/2011 14:00	14:00	125.02	1,000 barrels/hr	23.4	lb/hr	1.21	Dry	No
Day6	Hour 16	06/06/2011 15:00	15:00	125.02	1,000 barrels/hr	23.2	lb/hr	1.30	Dry	No
Day6	Hour 17	06/06/2011 16:00	16:00	125.07	1,000 barrels/hr	23.2	lb/hr	1.23	Dry	No
Day6	Hour 18	06/06/2011 17:00	17:00	125.06	1,000 barrels/hr	23.5	lb/hr	1.10	Dry	No
Day6	Hour 19	06/06/2011 18:00	18:00	125.04	1,000 barrels/hr	23.3	lb/hr	1.17	Dry	No
Day6	Hour 20	06/06/2011 19:00	19:00	124.99	1,000 barrels/hr	23.6	lb/hr	1.22	Dry	No
Day6	Hour 21	06/06/2011 20:00	20:00	125.02	1,000 barrels/hr	23.2	lb/hr	1.46	Dry	No
Day6	Hour 22	06/06/2011 21:00	21:00	125.03	1,000 barrels/hr	23.3	lb/hr	1.38	Dry	No
Day6	Hour 23	06/06/2011 22:00	22:00	125.00	1,000 barrels/hr	23.4	lb/hr	1.36	Dry	No
Day6	Hour 24	06/06/2011 23:00	23:00	125.01	1,000 barrels/hr	23.6	lb/hr	1.47	Dry	No
Day7	Hour 1	06/07/2011 00:00	0:00	125.09	1,000 barrels/hr	23.7	lb/hr	1.51	Dry	No
Day7	Hour 2	06/07/2011 01:00	1:00	125.10	1,000 barrels/hr	23.6	lb/hr	1.45	Dry	No
Day7	Hour 3	06/07/2011 02:00	2:00	125.02	1,000 barrels/hr	23.6	lb/hr	1.35	Dry	No
Day7	Hour 4	06/07/2011 03:00	3:00	124.97	1,000 barrels/hr	23.5	lb/hr	1.35	Dry	No
Day7	Hour 5	06/07/2011 04:00	4:00	125.07	1,000 barrels/hr	23.6	lb/hr	1.35	Dry	No
Day7	Hour 6	06/07/2011 05:00	5:00	125.09	1,000 barrels/hr	23.4	lb/hr	1.39	Dry	No
Day7	Hour 7	06/07/2011 06:00	6:00	125.01	1,000 barrels/hr	23.3	lb/hr	1.31	Dry	No
Day7	Hour 8	06/07/2011 07:00	7:00	124.99	1,000 barrels/hr	23.4	lb/hr	1.24	Dry	No
Day7	Hour 9	06/07/2011 08:00	8:00	124.99	1,000 barrels/hr	23.3	lb/hr	1.25	Dry	No
Day7	Hour 10	06/07/2011 09:00	9:00	124.97	1,000 barrels/hr	23.8	lb/hr	1.05	Dry	No
Day7	Hour 11	06/07/2011 10:00	10:00	124.98	1,000 barrels/hr	23.5	lb/hr	1.12	Dry	No
Day7	Hour 12	06/07/2011 11:00	11:00	124.99	1,000 barrels/hr	23.4	lb/hr	1.16	Dry	No
Day7	Hour 13	06/07/2011 12:00	12:00	125.00	1,000 barrels/hr	23.3	lb/hr	1.13	Dry	No
Day7	Hour 14	06/07/2011 13:00	13:00	125.00	1,000 barrels/hr	23.2	lb/hr	1.04	Dry	No
Day7	Hour 15	06/07/2011 14:00	14:00	124.82	1,000 barrels/hr	23.0	lb/hr	1.23	Dry	No
Day7	Hour 16	06/07/2011 15:00	15:00	124.95	1,000 barrels/hr	23.2	lb/hr	1.37	Dry	No
Day7	Hour 17	06/07/2011 16:00	16:00	125.06	1,000 barrels/hr	23.1	lb/hr	1.56	Dry	No
Day7	Hour 18	06/07/2011 17:00	17:00	125.12	1,000 barrels/hr	23.4	lb/hr	1.45	Dry	No
Day7	Hour 19	06/07/2011 18:00	18:00	125.03	1,000 barrels/hr	23.3	lb/hr	1.51	Dry	No
Day7	Hour 20	06/07/2011 19:00	19:00	123.23	1,000 barrels/hr	23.1	lb/hr	1.67	Dry	No
Day7	Hour 21	06/07/2011 20:00	20:00	120.36	1,000 barrels/hr	22.9	lb/hr	2.03	Dry	No
Day7	Hour 22	06/07/2011 21:00	21:00	119.55	1,000 barrels/hr	22.9	lb/hr	2.01	Dry	No
Day7	Hour 23	06/07/2011 22:00	22:00	115.28	1,000 barrels/hr	22.3	lb/hr	2.59	Dry	No
Day7	Hour 24	06/07/2011 23:00	23:00	114.91	1,000 barrels/hr	22.4	lb/hr	2.42	Dry	No
Day8	Hour 1	06/08/2011 00:00	0:00	114.90	1,000 barrels/hr	22.2	lb/hr	2.48	Dry	No
Day8	Hour 2	06/08/2011 01:00	1:00	114.98	1,000 barrels/hr	22.4	lb/hr	2.43	Dry	No
Day8	Hour 3	06/08/2011 02:00	2:00	114.96	1,000 barrels/hr	22.3	lb/hr	2.45	Dry	No
Day8	Hour 4	06/08/2011 03:00	3:00	115.01	1,000 barrels/hr	22.4	lb/hr	2.37	Dry	No
Day8	Hour 5	06/08/2011 04:00	4:00	115.04	1,000 barrels/hr	22.3	lb/hr	2.30	Dry	No
Day8	Hour 6	06/08/2011 05:00	5:00	115.06	1,000 barrels/hr	22.1	lb/hr	2.29	Dry	No
Day8	Hour 7	06/08/2011 06:00	6:00	115.04	1,000 barrels/hr	22.1	lb/hr	2.24	Dry	No
Day8	Hour 8	06/08/2011 07:00	7:00	115.02	1,000 barrels/hr	22.0	lb/hr	2.41	Dry	No
Day8	Hour 9	06/08/2011 08:00	8:00	115.01	1,000 barrels/hr	21.8	lb/hr	2.37	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day8	Hour 10	06/08/2011 09:00	9:00	115.02	1,000 barrels/hr	22.0	lb/hr	2.38	Dry	No
Day8	Hour 11	06/08/2011 10:00	10:00	115.06	1,000 barrels/hr	21.9	lb/hr	2.51	Dry	No
Day8	Hour 12	06/08/2011 11:00	11:00	115.03	1,000 barrels/hr	22.3	lb/hr	2.61	Dry	No
Day8	Hour 13	06/08/2011 12:00	12:00	115.05	1,000 barrels/hr	22.4	lb/hr	2.45	Dry	No
Day8	Hour 14	06/08/2011 13:00	13:00	115.07	1,000 barrels/hr	22.2	lb/hr	2.47	Dry	No
Day8	Hour 15	06/08/2011 14:00	14:00	115.13	1,000 barrels/hr	22.3	lb/hr	2.41	Dry	No
Day8	Hour 16	06/08/2011 15:00	15:00	115.11	1,000 barrels/hr	22.1	lb/hr	2.40	Dry	No
Day8	Hour 17	06/08/2011 16:00	16:00	115.08	1,000 barrels/hr	21.9	lb/hr	2.46	Dry	No
Day8	Hour 18	06/08/2011 17:00	17:00	115.08	1,000 barrels/hr	22.0	lb/hr	2.45	Dry	No
Day8	Hour 19	06/08/2011 18:00	18:00	115.03	1,000 barrels/hr	22.0	lb/hr	2.46	Dry	No
Day8	Hour 20	06/08/2011 19:00	19:00	114.06	1,000 barrels/hr	21.8	lb/hr	2.51	Dry	No
Day8	Hour 21	06/08/2011 20:00	20:00	106.83	1,000 barrels/hr	21.1	lb/hr	3.08	Dry	No
Day8	Hour 22	06/08/2011 21:00	21:00	104.96	1,000 barrels/hr	20.8	lb/hr	3.07	Dry	No
Day8	Hour 23	06/08/2011 22:00	22:00	104.91	1,000 barrels/hr	20.6	lb/hr	3.04	Dry	No
Day8	Hour 24	06/08/2011 23:00	23:00	104.93	1,000 barrels/hr	20.6	lb/hr	2.76	Dry	No
Day9	Hour 1	06/09/2011 00:00	0:00	105.01	1,000 barrels/hr	20.5	lb/hr	2.74	Dry	No
Day9	Hour 2	06/09/2011 01:00	1:00	105.05	1,000 barrels/hr	20.6	lb/hr	2.75	Dry	No
Day9	Hour 3	06/09/2011 02:00	2:00	105.07	1,000 barrels/hr	20.6	lb/hr	2.73	Dry	No
Day9	Hour 4	06/09/2011 03:00	3:00	105.04	1,000 barrels/hr	20.4	lb/hr	2.75	Dry	No
Day9	Hour 5	06/09/2011 04:00	4:00	104.97	1,000 barrels/hr	20.4	lb/hr	2.81	Dry	No
Day9	Hour 6	06/09/2011 05:00	5:00	105.06	1,000 barrels/hr	20.4	lb/hr	2.74	Dry	No
Day9	Hour 7	06/09/2011 06:00	6:00	105.00	1,000 barrels/hr	20.3	lb/hr	2.73	Dry	No
Day9	Hour 8	06/09/2011 07:00	7:00	105.00	1,000 barrels/hr	20.4	lb/hr	2.75	Dry	No
Day9	Hour 9	06/09/2011 08:00	8:00	105.03	1,000 barrels/hr	20.3	lb/hr	2.66	Dry	No
Day9	Hour 10	06/09/2011 09:00	9:00	105.03	1,000 barrels/hr	20.3	lb/hr	2.66	Dry	No
Day9	Hour 11	06/09/2011 10:00	10:00	105.05	1,000 barrels/hr	20.5	lb/hr	2.44	Dry	No
Day9	Hour 12	06/09/2011 11:00	11:00	105.08	1,000 barrels/hr	6.5	lb/hr	2.05	Dry	No
Day9	Hour 13	06/09/2011 12:00	12:00	105.06	1,000 barrels/hr	1.3	lb/hr	2.03	Dry	No
Day9	Hour 14	06/09/2011 13:00	13:00	105.07	1,000 barrels/hr	15.3	lb/hr	2.15	Dry	No
Day9	Hour 15	06/09/2011 14:00	14:00	105.11	1,000 barrels/hr	22.0	lb/hr	1.58	Dry	No
Day9	Hour 16	06/09/2011 15:00	15:00	105.11	1,000 barrels/hr	22.1	lb/hr	1.32	Dry	No
Day9	Hour 17	06/09/2011 16:00	16:00	105.00	1,000 barrels/hr	22.6	lb/hr	0.89	Dry	No
Day9	Hour 18	06/09/2011 17:00	17:00	104.96	1,000 barrels/hr	22.3	lb/hr	1.49	Dry	No
Day9	Hour 19	06/09/2011 18:00	18:00	104.99	1,000 barrels/hr	22.5	lb/hr	1.54	Dry	No
Day9	Hour 20	06/09/2011 19:00	19:00	105.03	1,000 barrels/hr	22.7	lb/hr	1.68	Dry	No
Day9	Hour 21	06/09/2011 20:00	20:00	104.91	1,000 barrels/hr	22.9	lb/hr	1.73	Dry	No
Day9	Hour 22	06/09/2011 21:00	21:00	104.94	1,000 barrels/hr	22.7	lb/hr	1.85	Dry	No
Day9	Hour 23	06/09/2011 22:00	22:00	103.44	1,000 barrels/hr	22.2	lb/hr	1.47	Dry	No
Day9	Hour 24	06/09/2011 23:00	23:00	101.00	1,000 barrels/hr	21.8	lb/hr	1.28	Dry	No
Day10	Hour 1	06/10/2011 00:00	0:00	99.99	1,000 barrels/hr	21.6	lb/hr	1.74	Dry	No
Day10	Hour 2	06/10/2011 01:00	1:00	99.96	1,000 barrels/hr	21.9	lb/hr	1.51	Dry	No
Day10	Hour 3	06/10/2011 02:00	2:00	99.97	1,000 barrels/hr	22.0	lb/hr	1.34	Dry	No
Day10	Hour 4	06/10/2011 03:00	3:00	100.12	1,000 barrels/hr	22.5	lb/hr	1.46	Dry	No
Day10	Hour 5	06/10/2011 04:00	4:00	100.04	1,000 barrels/hr	22.4	lb/hr	1.68	Dry	No
Day10	Hour 6	06/10/2011 05:00	5:00	100.10	1,000 barrels/hr	22.6	lb/hr	1.54	Dry	No
Day10	Hour 7	06/10/2011 06:00	6:00	99.99	1,000 barrels/hr	22.4	lb/hr	2.00	Dry	No
Day10	Hour 8	06/10/2011 07:00	7:00	100.00	1,000 barrels/hr	22.2	lb/hr	1.83	Dry	No
Day10	Hour 9	06/10/2011 08:00	8:00	100.07	1,000 barrels/hr	22.3	lb/hr	1.28	Dry	No
Day10	Hour 10	06/10/2011 09:00	9:00	100.04	1,000 barrels/hr	22.0	lb/hr	1.40	Dry	No
Day10	Hour 11	06/10/2011 10:00	10:00	100.09	1,000 barrels/hr	21.4	lb/hr	1.40	Dry	No
Day10	Hour 12	06/10/2011 11:00	11:00	100.11	1,000 barrels/hr	21.4	lb/hr	1.38	Dry	No
Day10	Hour 13	06/10/2011 12:00	12:00	100.02	1,000 barrels/hr	21.2	lb/hr	0.83	Dry	No
Day10	Hour 14	06/10/2011 13:00	13:00	100.00	1,000 barrels/hr	21.5	lb/hr	0.80	Dry	No
Day10	Hour 15	06/10/2011 14:00	14:00	99.96	1,000 barrels/hr	21.2	lb/hr	1.31	Dry	No
Day10	Hour 16	06/10/2011 15:00	15:00	100.00	1,000 barrels/hr	21.3	lb/hr	1.04	Dry	No
Day10	Hour 17	06/10/2011 16:00	16:00	100.05	1,000 barrels/hr	21.4	lb/hr	0.99	Dry	No
Day10	Hour 18	06/10/2011 17:00	17:00	100.07	1,000 barrels/hr	21.4	lb/hr	1.04	Dry	No
Day10	Hour 19	06/10/2011 18:00	18:00	100.08	1,000 barrels/hr	21.6	lb/hr	1.00	Dry	No
Day10	Hour 20	06/10/2011 19:00	19:00	100.05	1,000 barrels/hr	21.6	lb/hr	1.12	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day10	Hour 21	06/10/2011 20:00	20:00	100.08	1,000 barrels/hr	21.9	lb/hr	1.10	Dry	No
Day10	Hour 22	06/10/2011 21:00	21:00	100.08	1,000 barrels/hr	21.8	lb/hr	1.07	Dry	No
Day10	Hour 23	06/10/2011 22:00	22:00	100.05	1,000 barrels/hr	21.8	lb/hr	1.18	Dry	No
Day10	Hour 24	06/10/2011 23:00	23:00	99.98	1,000 barrels/hr	21.7	lb/hr	1.24	Dry	No
Day11	Hour 1	06/11/2011 00:00	0:00	100.01	1,000 barrels/hr	21.6	lb/hr	1.61	Dry	No
Day11	Hour 2	06/11/2011 01:00	1:00	99.97	1,000 barrels/hr	21.7	lb/hr	1.62	Dry	No
Day11	Hour 3	06/11/2011 02:00	2:00	99.99	1,000 barrels/hr	21.6	lb/hr	1.63	Dry	No
Day11	Hour 4	06/11/2011 03:00	3:00	100.01	1,000 barrels/hr	21.7	lb/hr	1.54	Dry	No
Day11	Hour 5	06/11/2011 04:00	4:00	100.04	1,000 barrels/hr	21.6	lb/hr	1.55	Dry	No
Day11	Hour 6	06/11/2011 05:00	5:00	100.01	1,000 barrels/hr	21.7	lb/hr	1.57	Dry	No
Day11	Hour 7	06/11/2011 06:00	6:00	100.02	1,000 barrels/hr	21.6	lb/hr	1.58	Dry	No
Day11	Hour 8	06/11/2011 07:00	7:00	100.03	1,000 barrels/hr	21.6	lb/hr	1.52	Dry	No
Day11	Hour 9	06/11/2011 08:00	8:00	100.02	1,000 barrels/hr	21.5	lb/hr	1.45	Dry	No
Day11	Hour 10	06/11/2011 09:00	9:00	100.07	1,000 barrels/hr	21.4	lb/hr	1.06	Dry	No
Day11	Hour 11	06/11/2011 10:00	10:00	100.01	1,000 barrels/hr	21.3	lb/hr	1.09	Dry	No
Day11	Hour 12	06/11/2011 11:00	11:00	100.02	1,000 barrels/hr	21.4	lb/hr	1.05	Dry	No
Day11	Hour 13	06/11/2011 12:00	12:00	100.04	1,000 barrels/hr	21.5	lb/hr	1.02	Dry	No
Day11	Hour 14	06/11/2011 13:00	13:00	100.03	1,000 barrels/hr	21.4	lb/hr	1.12	Dry	No
Day11	Hour 15	06/11/2011 14:00	14:00	100.03	1,000 barrels/hr	21.3	lb/hr	1.11	Dry	No
Day11	Hour 16	06/11/2011 15:00	15:00	100.06	1,000 barrels/hr	21.5	lb/hr	1.07	Dry	No
Day11	Hour 17	06/11/2011 16:00	16:00	100.04	1,000 barrels/hr	21.4	lb/hr	1.15	Dry	No
Day11	Hour 18	06/11/2011 17:00	17:00	100.03	1,000 barrels/hr	21.6	lb/hr	1.13	Dry	No
Day11	Hour 19	06/11/2011 18:00	18:00	100.03	1,000 barrels/hr	21.5	lb/hr	1.22	Dry	No
Day11	Hour 20	06/11/2011 19:00	19:00	100.07	1,000 barrels/hr	21.6	lb/hr	1.13	Dry	No
Day11	Hour 21	06/11/2011 20:00	20:00	100.02	1,000 barrels/hr	21.8	lb/hr	1.14	Dry	No
Day11	Hour 22	06/11/2011 21:00	21:00	100.01	1,000 barrels/hr	21.8	lb/hr	1.10	Dry	No
Day11	Hour 23	06/11/2011 22:00	22:00	100.06	1,000 barrels/hr	21.8	lb/hr	1.04	Dry	No
Day11	Hour 24	06/11/2011 23:00	23:00	100.02	1,000 barrels/hr	21.9	lb/hr	1.08	Dry	No
Day12	Hour 1	06/12/2011 00:00	0:00	100.02	1,000 barrels/hr	21.7	lb/hr	1.16	Dry	No
Day12	Hour 2	06/12/2011 01:00	1:00	100.04	1,000 barrels/hr	21.7	lb/hr	1.10	Dry	No
Day12	Hour 3	06/12/2011 02:00	2:00	100.05	1,000 barrels/hr	21.6	lb/hr	1.09	Dry	No
Day12	Hour 4	06/12/2011 03:00	3:00	100.05	1,000 barrels/hr	21.6	lb/hr	1.02	Dry	No
Day12	Hour 5	06/12/2011 04:00	4:00	100.04	1,000 barrels/hr	21.7	lb/hr	1.07	Dry	No
Day12	Hour 6	06/12/2011 05:00	5:00	100.01	1,000 barrels/hr	21.6	lb/hr	1.16	Dry	No
Day12	Hour 7	06/12/2011 06:00	6:00	100.05	1,000 barrels/hr	21.5	lb/hr	1.11	Dry	No
Day12	Hour 8	06/12/2011 07:00	7:00	100.05	1,000 barrels/hr	21.5	lb/hr	0.97	Dry	No
Day12	Hour 9	06/12/2011 08:00	8:00	100.02	1,000 barrels/hr	21.4	lb/hr	0.90	Dry	No
Day12	Hour 10	06/12/2011 09:00	9:00	100.05	1,000 barrels/hr	21.2	lb/hr	0.85	Dry	No
Day12	Hour 11	06/12/2011 10:00	10:00	101.90	1,000 barrels/hr	22.0	lb/hr	1.44	Dry	No
Day12	Hour 12	06/12/2011 11:00	11:00	106.79	1,000 barrels/hr	22.9	lb/hr	1.59	Dry	No
Day12	Hour 13	06/12/2011 12:00	12:00	109.22	1,000 barrels/hr	22.8	lb/hr	1.30	Dry	No
Day12	Hour 14	06/12/2011 13:00	13:00	109.93	1,000 barrels/hr	22.9	lb/hr	1.13	Dry	No
Day12	Hour 15	06/12/2011 14:00	14:00	110.13	1,000 barrels/hr	22.9	lb/hr	1.09	Dry	No
Day12	Hour 16	06/12/2011 15:00	15:00	110.15	1,000 barrels/hr	22.6	lb/hr	1.21	Dry	No
Day12	Hour 17	06/12/2011 16:00	16:00	110.12	1,000 barrels/hr	22.8	lb/hr	1.23	Dry	No
Day12	Hour 18	06/12/2011 17:00	17:00	110.15	1,000 barrels/hr	22.7	lb/hr	1.21	Dry	No
Day12	Hour 19	06/12/2011 18:00	18:00	110.14	1,000 barrels/hr	22.9	lb/hr	1.14	Dry	No
Day12	Hour 20	06/12/2011 19:00	19:00	110.14	1,000 barrels/hr	23.0	lb/hr	1.20	Dry	No
Day12	Hour 21	06/12/2011 20:00	20:00	110.13	1,000 barrels/hr	23.0	lb/hr	1.17	Dry	No
Day12	Hour 22	06/12/2011 21:00	21:00	110.14	1,000 barrels/hr	23.2	lb/hr	1.16	Dry	No
Day12	Hour 23	06/12/2011 22:00	22:00	110.13	1,000 barrels/hr	23.2	lb/hr	1.18	Dry	No
Day12	Hour 24	06/12/2011 23:00	23:00	110.13	1,000 barrels/hr	23.0	lb/hr	1.23	Dry	No
Day13	Hour 1	06/13/2011 00:00	0:00	110.13	1,000 barrels/hr	23.1	lb/hr	1.27	Dry	No
Day13	Hour 2	06/13/2011 01:00	1:00	110.15	1,000 barrels/hr	23.1	lb/hr	1.25	Dry	No
Day13	Hour 3	06/13/2011 02:00	2:00	110.11	1,000 barrels/hr	22.9	lb/hr	1.22	Dry	No
Day13	Hour 4	06/13/2011 03:00	3:00	110.15	1,000 barrels/hr	23.1	lb/hr	1.12	Dry	No
Day13	Hour 5	06/13/2011 04:00	4:00	110.13	1,000 barrels/hr	22.9	lb/hr	1.21	Dry	No
Day13	Hour 6	06/13/2011 05:00	5:00	110.11	1,000 barrels/hr	22.7	lb/hr	1.23	Dry	No
Day13	Hour 7	06/13/2011 06:00	6:00	110.14	1,000 barrels/hr	22.8	lb/hr	1.19	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day13	Hour 8	06/13/2011 07:00	7:00	110.12	1,000 barrels/hr	22.7	lb/hr	1.17	Dry	No
Day13	Hour 9	06/13/2011 08:00	8:00	110.14	1,000 barrels/hr	22.6	lb/hr	1.12	Dry	No
Day13	Hour 10	06/13/2011 09:00	9:00	110.14	1,000 barrels/hr	22.7	lb/hr	1.05	Dry	No
Day13	Hour 11	06/13/2011 10:00	10:00	108.69	1,000 barrels/hr	22.4	lb/hr	1.13	Dry	No
Day13	Hour 12	06/13/2011 11:00	11:00	103.79	1,000 barrels/hr	21.5	lb/hr	1.05	Dry	No
Day13	Hour 13	06/13/2011 12:00	12:00	99.92	1,000 barrels/hr	20.7	lb/hr	1.34	Dry	No
Day13	Hour 14	06/13/2011 13:00	13:00	100.00	1,000 barrels/hr	20.6	lb/hr	1.29	Dry	No
Day13	Hour 15	06/13/2011 14:00	14:00	100.04	1,000 barrels/hr	20.9	lb/hr	1.23	Dry	No
Day13	Hour 16	06/13/2011 15:00	15:00	100.05	1,000 barrels/hr	20.9	lb/hr	1.18	Dry	No
Day13	Hour 17	06/13/2011 16:00	16:00	100.30	1,000 barrels/hr	21.0	lb/hr	1.26	Dry	No
Day13	Hour 18	06/13/2011 17:00	17:00	103.44	1,000 barrels/hr	21.9	lb/hr	0.81	Dry	No
Day13	Hour 19	06/13/2011 18:00	18:00	104.76	1,000 barrels/hr	22.3	lb/hr	1.30	Dry	No
Day13	Hour 20	06/13/2011 19:00	19:00	104.90	1,000 barrels/hr	22.5	lb/hr	2.08	Dry	No
Day13	Hour 21	06/13/2011 20:00	20:00	105.03	1,000 barrels/hr	22.5	lb/hr	1.85	Dry	No
Day13	Hour 22	06/13/2011 21:00	21:00	105.03	1,000 barrels/hr	22.3	lb/hr	1.89	Dry	No
Day13	Hour 23	06/13/2011 22:00	22:00	105.03	1,000 barrels/hr	22.3	lb/hr	1.98	Dry	No
Day13	Hour 24	06/13/2011 23:00	23:00	105.03	1,000 barrels/hr	22.2	lb/hr	1.98	Dry	No
Day14	Hour 1	06/14/2011 00:00	0:00	105.02	1,000 barrels/hr	22.1	lb/hr	1.87	Dry	No
Day14	Hour 2	06/14/2011 01:00	1:00	105.06	1,000 barrels/hr	22.0	lb/hr	1.42	Dry	No
Day14	Hour 3	06/14/2011 02:00	2:00	105.02	1,000 barrels/hr	22.0	lb/hr	1.42	Dry	No
Day14	Hour 4	06/14/2011 03:00	3:00	105.02	1,000 barrels/hr	22.0	lb/hr	1.43	Dry	No
Day14	Hour 5	06/14/2011 04:00	4:00	105.04	1,000 barrels/hr	22.0	lb/hr	1.37	Dry	No
Day14	Hour 6	06/14/2011 05:00	5:00	105.04	1,000 barrels/hr	22.0	lb/hr	1.34	Dry	No
Day14	Hour 7	06/14/2011 06:00	6:00	104.90	1,000 barrels/hr	22.0	lb/hr	1.34	Dry	No
Day14	Hour 8	06/14/2011 07:00	7:00	98.59	1,000 barrels/hr	20.8	lb/hr	2.02	Dry	No
Day14	Hour 9	06/14/2011 08:00	8:00	95.15	1,000 barrels/hr	20.2	lb/hr	2.34	Dry	No
Day14	Hour 10	06/14/2011 09:00	9:00	96.46	1,000 barrels/hr	20.3	lb/hr	2.00	Dry	No
Day14	Hour 11	06/14/2011 10:00	10:00	98.02	1,000 barrels/hr	20.5	lb/hr	1.80	Dry	No
Day14	Hour 12	06/14/2011 11:00	11:00	98.04	1,000 barrels/hr	20.6	lb/hr	1.75	Dry	No
Day14	Hour 13	06/14/2011 12:00	12:00	98.08	1,000 barrels/hr	20.6	lb/hr	1.69	Dry	No
Day14	Hour 14	06/14/2011 13:00	13:00	98.03	1,000 barrels/hr	20.5	lb/hr	1.84	Dry	No
Day14	Hour 15	06/14/2011 14:00	14:00	99.79	1,000 barrels/hr	20.9	lb/hr	1.44	Dry	No
Day14	Hour 16	06/14/2011 15:00	15:00	100.02	1,000 barrels/hr	20.8	lb/hr	1.64	Dry	No
Day14	Hour 17	06/14/2011 16:00	16:00	102.09	1,000 barrels/hr	21.6	lb/hr	1.47	Dry	No
Day14	Hour 18	06/14/2011 17:00	17:00	103.99	1,000 barrels/hr	21.9	lb/hr	2.15	Dry	No
Day14	Hour 19	06/14/2011 18:00	18:00	104.82	1,000 barrels/hr	22.0	lb/hr	2.11	Dry	No
Day14	Hour 20	06/14/2011 19:00	19:00	105.32	1,000 barrels/hr	22.1	lb/hr	2.05	Dry	No
Day14	Hour 21	06/14/2011 20:00	20:00	109.49	1,000 barrels/hr	22.7	lb/hr	1.97	Dry	No
Day14	Hour 22	06/14/2011 21:00	21:00	114.75	1,000 barrels/hr	23.3	lb/hr	1.67	Dry	No
Day14	Hour 23	06/14/2011 22:00	22:00	118.21	1,000 barrels/hr	23.5	lb/hr	1.38	Dry	No
Day14	Hour 24	06/14/2011 23:00	23:00	118.25	1,000 barrels/hr	23.5	lb/hr	1.47	Dry	No
Day15	Hour 1	06/15/2011 00:00	0:00	118.10	1,000 barrels/hr	23.5	lb/hr	1.42	Dry	No
Day15	Hour 2	06/15/2011 01:00	1:00	118.02	1,000 barrels/hr	23.4	lb/hr	1.50	Dry	No
Day15	Hour 3	06/15/2011 02:00	2:00	117.51	1,000 barrels/hr	23.5	lb/hr	1.53	Dry	No
Day15	Hour 4	06/15/2011 03:00	3:00	115.92	1,000 barrels/hr	23.3	lb/hr	1.66	Dry	No
Day15	Hour 5	06/15/2011 04:00	4:00	115.00	1,000 barrels/hr	22.9	lb/hr	1.87	Dry	No
Day15	Hour 6	06/15/2011 05:00	5:00	115.03	1,000 barrels/hr	23.0	lb/hr	1.84	Dry	No
Day15	Hour 7	06/15/2011 06:00	6:00	115.03	1,000 barrels/hr	22.9	lb/hr	1.77	Dry	No
Day15	Hour 8	06/15/2011 07:00	7:00	115.04	1,000 barrels/hr	22.8	lb/hr	1.52	Dry	No
Day15	Hour 9	06/15/2011 08:00	8:00	115.01	1,000 barrels/hr	22.9	lb/hr	1.39	Dry	No
Day15	Hour 10	06/15/2011 09:00	9:00	114.52	1,000 barrels/hr	23.0	lb/hr	1.43	Dry	No
Day15	Hour 11	06/15/2011 10:00	10:00	110.14	1,000 barrels/hr	22.4	lb/hr	1.89	Dry	No
Day15	Hour 12	06/15/2011 11:00	11:00	110.04	1,000 barrels/hr	22.2	lb/hr	2.04	Dry	No
Day15	Hour 13	06/15/2011 12:00	12:00	110.02	1,000 barrels/hr	22.3	lb/hr	2.01	Dry	No
Day15	Hour 14	06/15/2011 13:00	13:00	110.07	1,000 barrels/hr	22.3	lb/hr	1.94	Dry	No
Day15	Hour 15	06/15/2011 14:00	14:00	110.04	1,000 barrels/hr	22.3	lb/hr	1.95	Dry	No
Day15	Hour 16	06/15/2011 15:00	15:00	110.04	1,000 barrels/hr	22.2	lb/hr	1.85	Dry	No
Day15	Hour 17	06/15/2011 16:00	16:00	110.03	1,000 barrels/hr	22.2	lb/hr	1.85	Dry	No
Day15	Hour 18	06/15/2011 17:00	17:00	110.04	1,000 barrels/hr	22.2	lb/hr	2.01	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day15	Hour 19	06/15/2011 18:00	18:00	110.18	1,000 barrels/hr	22.3	lb/hr	2.26	Dry	No
Day15	Hour 20	06/15/2011 19:00	19:00	111.43	1,000 barrels/hr	22.8	lb/hr	1.99	Dry	No
Day15	Hour 21	06/15/2011 20:00	20:00	114.95	1,000 barrels/hr	23.3	lb/hr	1.38	Dry	No
Day15	Hour 22	06/15/2011 21:00	21:00	117.37	1,000 barrels/hr	23.3	lb/hr	1.29	Dry	No
Day15	Hour 23	06/15/2011 22:00	22:00	119.96	1,000 barrels/hr	24.0	lb/hr	1.10	Dry	No
Day15	Hour 24	06/15/2011 23:00	23:00	120.15	1,000 barrels/hr	24.3	lb/hr	1.49	Dry	No
Day16	Hour 1	06/16/2011 00:00	0:00	120.14	1,000 barrels/hr	24.1	lb/hr	1.33	Dry	No
Day16	Hour 2	06/16/2011 01:00	1:00	120.13	1,000 barrels/hr	23.8	lb/hr	1.39	Dry	No
Day16	Hour 3	06/16/2011 02:00	2:00	120.14	1,000 barrels/hr	23.9	lb/hr	1.15	Dry	No
Day16	Hour 4	06/16/2011 03:00	3:00	120.15	1,000 barrels/hr	23.9	lb/hr	1.23	Dry	No
Day16	Hour 5	06/16/2011 04:00	4:00	120.14	1,000 barrels/hr	23.8	lb/hr	1.12	Dry	No
Day16	Hour 6	06/16/2011 05:00	5:00	117.27	1,000 barrels/hr	23.3	lb/hr	1.48	Dry	No
Day16	Hour 7	06/16/2011 06:00	6:00	111.34	1,000 barrels/hr	22.6	lb/hr	2.13	Dry	No
Day16	Hour 8	06/16/2011 07:00	7:00	110.09	1,000 barrels/hr	22.1	lb/hr	2.08	Dry	No
Day16	Hour 9	06/16/2011 08:00	8:00	110.05	1,000 barrels/hr	22.1	lb/hr	2.01	Dry	No
Day16	Hour 10	06/16/2011 09:00	9:00	110.05	1,000 barrels/hr	22.3	lb/hr	1.81	Dry	No
Day16	Hour 11	06/16/2011 10:00	10:00	110.02	1,000 barrels/hr	22.3	lb/hr	1.79	Dry	No
Day16	Hour 12	06/16/2011 11:00	11:00	110.02	1,000 barrels/hr	22.3	lb/hr	1.68	Dry	No
Day16	Hour 13	06/16/2011 12:00	12:00	110.04	1,000 barrels/hr	22.6	lb/hr	1.50	Dry	No
Day16	Hour 14	06/16/2011 13:00	13:00	110.05	1,000 barrels/hr	22.6	lb/hr	1.60	Dry	No
Day16	Hour 15	06/16/2011 14:00	14:00	110.01	1,000 barrels/hr	22.5	lb/hr	1.64	Dry	No
Day16	Hour 16	06/16/2011 15:00	15:00	110.08	1,000 barrels/hr	22.7	lb/hr	1.53	Dry	No
Day16	Hour 17	06/16/2011 16:00	16:00	110.08	1,000 barrels/hr	22.8	lb/hr	1.51	Dry	No
Day16	Hour 18	06/16/2011 17:00	17:00	110.03	1,000 barrels/hr	22.7	lb/hr	1.55	Dry	No
Day16	Hour 19	06/16/2011 18:00	18:00	110.04	1,000 barrels/hr	22.8	lb/hr	1.61	Dry	No
Day16	Hour 20	06/16/2011 19:00	19:00	112.71	1,000 barrels/hr	23.0	lb/hr	1.31	Dry	No
Day16	Hour 21	06/16/2011 20:00	20:00	115.25	1,000 barrels/hr	23.5	lb/hr	0.90	Dry	No
Day16	Hour 22	06/16/2011 21:00	21:00	118.96	1,000 barrels/hr	24.0	lb/hr	0.83	Dry	No
Day16	Hour 23	06/16/2011 22:00	22:00	118.65	1,000 barrels/hr	23.9	lb/hr	0.98	Dry	No
Day16	Hour 24	06/16/2011 23:00	23:00	119.69	1,000 barrels/hr	24.1	lb/hr	0.87	Dry	No
Day17	Hour 1	06/17/2011 00:00	0:00	119.95	1,000 barrels/hr	24.1	lb/hr	0.99	Dry	No
Day17	Hour 2	06/17/2011 01:00	1:00	120.12	1,000 barrels/hr	23.8	lb/hr	1.17	Dry	No
Day17	Hour 3	06/17/2011 02:00	2:00	116.49	1,000 barrels/hr	23.6	lb/hr	1.35	Dry	No
Day17	Hour 4	06/17/2011 03:00	3:00	116.54	1,000 barrels/hr	23.5	lb/hr	1.50	Dry	No
Day17	Hour 5	06/17/2011 04:00	4:00	118.34	1,000 barrels/hr	23.8	lb/hr	1.30	Dry	No
Day17	Hour 6	06/17/2011 05:00	5:00	119.67	1,000 barrels/hr	24.1	lb/hr	1.01	Dry	No
Day17	Hour 7	06/17/2011 06:00	6:00	119.97	1,000 barrels/hr	24.0	lb/hr	1.01	Dry	No
Day17	Hour 8	06/17/2011 07:00	7:00	119.91	1,000 barrels/hr	23.9	lb/hr	1.45	Dry	No
Day17	Hour 9	06/17/2011 08:00	8:00	120.11	1,000 barrels/hr	23.7	lb/hr	1.52	Dry	No
Day17	Hour 10	06/17/2011 09:00	9:00	120.06	1,000 barrels/hr	23.7	lb/hr	1.57	Dry	No
Day17	Hour 11	06/17/2011 10:00	10:00	120.03	1,000 barrels/hr	23.6	lb/hr	1.64	Dry	No
Day17	Hour 12	06/17/2011 11:00	11:00	120.01	1,000 barrels/hr	23.6	lb/hr	1.61	Dry	No
Day17	Hour 13	06/17/2011 12:00	12:00	120.02	1,000 barrels/hr	23.6	lb/hr	1.58	Dry	No
Day17	Hour 14	06/17/2011 13:00	13:00	120.07	1,000 barrels/hr	23.4	lb/hr	1.64	Dry	No
Day17	Hour 15	06/17/2011 14:00	14:00	120.24	1,000 barrels/hr	23.8	lb/hr	1.58	Dry	No
Day17	Hour 16	06/17/2011 15:00	15:00	120.11	1,000 barrels/hr	23.7	lb/hr	1.54	Dry	No
Day17	Hour 17	06/17/2011 16:00	16:00	120.02	1,000 barrels/hr	23.9	lb/hr	1.62	Dry	No
Day17	Hour 18	06/17/2011 17:00	17:00	120.05	1,000 barrels/hr	23.9	lb/hr	1.65	Dry	No
Day17	Hour 19	06/17/2011 18:00	18:00	120.06	1,000 barrels/hr	23.8	lb/hr	1.65	Dry	No
Day17	Hour 20	06/17/2011 19:00	19:00	120.40	1,000 barrels/hr	24.1	lb/hr	1.65	Dry	No
Day17	Hour 21	06/17/2011 20:00	20:00	123.48	1,000 barrels/hr	24.6	lb/hr	1.17	Dry	No
Day17	Hour 22	06/17/2011 21:00	21:00	124.74	1,000 barrels/hr	24.9	lb/hr	0.91	Dry	No
Day17	Hour 23	06/17/2011 22:00	22:00	125.15	1,000 barrels/hr	24.7	lb/hr	0.99	Dry	No
Day17	Hour 24	06/17/2011 23:00	23:00	125.26	1,000 barrels/hr	24.6	lb/hr	1.02	Dry	No
Day18	Hour 1	06/18/2011 00:00	0:00	125.28	1,000 barrels/hr	24.6	lb/hr	1.09	Dry	No
Day18	Hour 2	06/18/2011 01:00	1:00	125.27	1,000 barrels/hr	24.7	lb/hr	1.04	Dry	No
Day18	Hour 3	06/18/2011 02:00	2:00	125.25	1,000 barrels/hr	24.6	lb/hr	1.04	Dry	No
Day18	Hour 4	06/18/2011 03:00	3:00	125.26	1,000 barrels/hr	24.6	lb/hr	1.04	Dry	No
Day18	Hour 5	06/18/2011 04:00	4:00	125.27	1,000 barrels/hr	24.5	lb/hr	1.15	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day18	Hour 6	06/18/2011 05:00	5:00	125.19	1,000 barrels/hr	24.6	lb/hr	1.22	Dry	No
Day18	Hour 7	06/18/2011 06:00	6:00	124.38	1,000 barrels/hr	24.5	lb/hr	1.31	Dry	No
Day18	Hour 8	06/18/2011 07:00	7:00	120.06	1,000 barrels/hr	23.9	lb/hr	1.80	Dry	No
Day18	Hour 9	06/18/2011 08:00	8:00	120.04	1,000 barrels/hr	23.9	lb/hr	1.76	Dry	No
Day18	Hour 10	06/18/2011 09:00	9:00	120.02	1,000 barrels/hr	23.8	lb/hr	1.76	Dry	No
Day18	Hour 11	06/18/2011 10:00	10:00	120.03	1,000 barrels/hr	23.7	lb/hr	1.77	Dry	No
Day18	Hour 12	06/18/2011 11:00	11:00	120.10	1,000 barrels/hr	23.6	lb/hr	1.70	Dry	No
Day18	Hour 13	06/18/2011 12:00	12:00	120.10	1,000 barrels/hr	23.7	lb/hr	1.74	Dry	No
Day18	Hour 14	06/18/2011 13:00	13:00	120.09	1,000 barrels/hr	23.7	lb/hr	1.69	Dry	No
Day18	Hour 15	06/18/2011 14:00	14:00	120.14	1,000 barrels/hr	23.7	lb/hr	1.73	Dry	No
Day18	Hour 16	06/18/2011 15:00	15:00	120.09	1,000 barrels/hr	23.7	lb/hr	1.74	Dry	No
Day18	Hour 17	06/18/2011 16:00	16:00	120.06	1,000 barrels/hr	23.7	lb/hr	1.73	Dry	No
Day18	Hour 18	06/18/2011 17:00	17:00	120.02	1,000 barrels/hr	23.8	lb/hr	1.77	Dry	No
Day18	Hour 19	06/18/2011 18:00	18:00	120.08	1,000 barrels/hr	23.7	lb/hr	1.82	Dry	No
Day18	Hour 20	06/18/2011 19:00	19:00	122.73	1,000 barrels/hr	24.1	lb/hr	1.53	Dry	No
Day18	Hour 21	06/18/2011 20:00	20:00	124.69	1,000 barrels/hr	24.5	lb/hr	1.12	Dry	No
Day18	Hour 22	06/18/2011 21:00	21:00	125.17	1,000 barrels/hr	24.5	lb/hr	1.21	Dry	No
Day18	Hour 23	06/18/2011 22:00	22:00	125.24	1,000 barrels/hr	24.4	lb/hr	1.23	Dry	No
Day18	Hour 24	06/18/2011 23:00	23:00	125.24	1,000 barrels/hr	24.4	lb/hr	1.22	Dry	No
Day19	Hour 1	06/19/2011 00:00	0:00	125.28	1,000 barrels/hr	24.3	lb/hr	1.27	Dry	No
Day19	Hour 2	06/19/2011 01:00	1:00	125.25	1,000 barrels/hr	24.4	lb/hr	1.23	Dry	No
Day19	Hour 3	06/19/2011 02:00	2:00	125.28	1,000 barrels/hr	24.4	lb/hr	1.25	Dry	No
Day19	Hour 4	06/19/2011 03:00	3:00	125.29	1,000 barrels/hr	24.3	lb/hr	1.28	Dry	No
Day19	Hour 5	06/19/2011 04:00	4:00	125.30	1,000 barrels/hr	24.3	lb/hr	1.29	Dry	No
Day19	Hour 6	06/19/2011 05:00	5:00	124.86	1,000 barrels/hr	24.3	lb/hr	1.34	Dry	No
Day19	Hour 7	06/19/2011 06:00	6:00	120.36	1,000 barrels/hr	23.7	lb/hr	1.90	Dry	No
Day19	Hour 8	06/19/2011 07:00	7:00	120.03	1,000 barrels/hr	23.5	lb/hr	1.94	Dry	No
Day19	Hour 9	06/19/2011 08:00	8:00	119.99	1,000 barrels/hr	23.5	lb/hr	1.90	Dry	No
Day19	Hour 10	06/19/2011 09:00	9:00	120.04	1,000 barrels/hr	23.5	lb/hr	1.82	Dry	No
Day19	Hour 11	06/19/2011 10:00	10:00	120.05	1,000 barrels/hr	23.5	lb/hr	1.85	Dry	No
Day19	Hour 12	06/19/2011 11:00	11:00	120.02	1,000 barrels/hr	23.5	lb/hr	1.79	Dry	No
Day19	Hour 13	06/19/2011 12:00	12:00	115.95	1,000 barrels/hr	23.1	lb/hr	2.22	Dry	No
Day19	Hour 14	06/19/2011 13:00	13:00	110.47	1,000 barrels/hr	22.3	lb/hr	2.99	Dry	No
Day19	Hour 15	06/19/2011 14:00	14:00	110.00	1,000 barrels/hr	22.1	lb/hr	3.10	Dry	No
Day19	Hour 16	06/19/2011 15:00	15:00	109.99	1,000 barrels/hr	21.9	lb/hr	1.62	Dry	No
Day19	Hour 17	06/19/2011 16:00	16:00	109.96	1,000 barrels/hr	22.0	lb/hr	1.21	Dry	No
Day19	Hour 18	06/19/2011 17:00	17:00	109.96	1,000 barrels/hr	21.5	lb/hr	1.62	Dry	No
Day19	Hour 19	06/19/2011 18:00	18:00	110.23	1,000 barrels/hr	21.9	lb/hr	1.26	Dry	No
Day19	Hour 20	06/19/2011 19:00	19:00	110.11	1,000 barrels/hr	21.9	lb/hr	1.33	Dry	No
Day19	Hour 21	06/19/2011 20:00	20:00	110.04	1,000 barrels/hr	21.8	lb/hr	1.44	Dry	No
Day19	Hour 22	06/19/2011 21:00	21:00	110.01	1,000 barrels/hr	21.8	lb/hr	1.54	Dry	No
Day19	Hour 23	06/19/2011 22:00	22:00	109.91	1,000 barrels/hr	21.8	lb/hr	1.55	Dry	No
Day19	Hour 24	06/19/2011 23:00	23:00	109.97	1,000 barrels/hr	21.8	lb/hr	1.56	Dry	No
Day20	Hour 1	06/20/2011 00:00	0:00	109.99	1,000 barrels/hr	21.7	lb/hr	1.60	Dry	No
Day20	Hour 2	06/20/2011 01:00	1:00	110.30	1,000 barrels/hr	21.8	lb/hr	1.44	Dry	No
Day20	Hour 3	06/20/2011 02:00	2:00	110.12	1,000 barrels/hr	21.7	lb/hr	1.49	Dry	No
Day20	Hour 4	06/20/2011 03:00	3:00	110.03	1,000 barrels/hr	21.8	lb/hr	1.49	Dry	No
Day20	Hour 5	06/20/2011 04:00	4:00	110.02	1,000 barrels/hr	21.8	lb/hr	1.45	Dry	No
Day20	Hour 6	06/20/2011 05:00	5:00	110.05	1,000 barrels/hr	21.9	lb/hr	1.40	Dry	No
Day20	Hour 7	06/20/2011 06:00	6:00	109.95	1,000 barrels/hr	21.7	lb/hr	1.50	Dry	No
Day20	Hour 8	06/20/2011 07:00	7:00	109.89	1,000 barrels/hr	21.8	lb/hr	1.32	Dry	No
Day20	Hour 9	06/20/2011 08:00	8:00	109.89	1,000 barrels/hr	21.7	lb/hr	1.30	Dry	No
Day20	Hour 10	06/20/2011 09:00	9:00	109.98	1,000 barrels/hr	21.8	lb/hr	1.15	Dry	No
Day20	Hour 11	06/20/2011 10:00	10:00	110.08	1,000 barrels/hr	22.0	lb/hr	1.06	Dry	No
Day20	Hour 12	06/20/2011 11:00	11:00	110.02	1,000 barrels/hr	22.2	lb/hr	1.44	Dry	No
Day20	Hour 13	06/20/2011 12:00	12:00	110.01	1,000 barrels/hr	22.2	lb/hr	1.85	Dry	No
Day20	Hour 14	06/20/2011 13:00	13:00	110.05	1,000 barrels/hr	22.3	lb/hr	1.80	Dry	No
Day20	Hour 15	06/20/2011 14:00	14:00	110.02	1,000 barrels/hr	22.3	lb/hr	1.73	Dry	No
Day20	Hour 16	06/20/2011 15:00	15:00	110.04	1,000 barrels/hr	22.2	lb/hr	1.75	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day20	Hour 17	06/20/2011 16:00	16:00	110.09	1,000 barrels/hr	22.3	lb/hr	1.78	Dry	No
Day20	Hour 18	06/20/2011 17:00	17:00	110.04	1,000 barrels/hr	22.3	lb/hr	1.80	Dry	No
Day20	Hour 19	06/20/2011 18:00	18:00	110.04	1,000 barrels/hr	22.4	lb/hr	1.85	Dry	No
Day20	Hour 20	06/20/2011 19:00	19:00	103.54	1,000 barrels/hr	21.8	lb/hr	2.58	Dry	No
Day20	Hour 21	06/20/2011 20:00	20:00	100.18	1,000 barrels/hr	21.5	lb/hr	2.95	Dry	No
Day20	Hour 22	06/20/2011 21:00	21:00	99.99	1,000 barrels/hr	21.4	lb/hr	3.16	Dry	No
Day20	Hour 23	06/20/2011 22:00	22:00	100.03	1,000 barrels/hr	21.3	lb/hr	3.10	Dry	No
Day20	Hour 24	06/20/2011 23:00	23:00	100.04	1,000 barrels/hr	21.4	lb/hr	3.05	Dry	No
Day21	Hour 1	06/21/2011 00:00	0:00	100.03	1,000 barrels/hr	21.4	lb/hr	3.00	Dry	No
Day21	Hour 2	06/21/2011 01:00	1:00	99.95	1,000 barrels/hr	21.4	lb/hr	3.00	Dry	No
Day21	Hour 3	06/21/2011 02:00	2:00	100.01	1,000 barrels/hr	21.3	lb/hr	3.06	Dry	No
Day21	Hour 4	06/21/2011 03:00	3:00	100.01	1,000 barrels/hr	21.3	lb/hr	3.04	Dry	No
Day21	Hour 5	06/21/2011 04:00	4:00	100.04	1,000 barrels/hr	21.3	lb/hr	2.96	Dry	No
Day21	Hour 6	06/21/2011 05:00	5:00	100.02	1,000 barrels/hr	21.2	lb/hr	2.78	Dry	No
Day21	Hour 7	06/21/2011 06:00	6:00	100.02	1,000 barrels/hr	21.1	lb/hr	2.70	Dry	No
Day21	Hour 8	06/21/2011 07:00	7:00	100.04	1,000 barrels/hr	20.7	lb/hr	2.58	Dry	No
Day21	Hour 9	06/21/2011 08:00	8:00	100.03	1,000 barrels/hr	20.2	lb/hr	1.81	Dry	No
Day21	Hour 10	06/21/2011 09:00	9:00	100.04	1,000 barrels/hr	20.3	lb/hr	1.61	Dry	No
Day21	Hour 11	06/21/2011 10:00	10:00	100.03	1,000 barrels/hr	20.2	lb/hr	1.64	Dry	No
Day21	Hour 12	06/21/2011 11:00	11:00	100.02	1,000 barrels/hr	20.1	lb/hr	1.64	Dry	No
Day21	Hour 13	06/21/2011 12:00	12:00	100.02	1,000 barrels/hr	20.4	lb/hr	1.31	Dry	No
Day21	Hour 14	06/21/2011 13:00	13:00	99.95	1,000 barrels/hr	20.5	lb/hr	1.31	Dry	No
Day21	Hour 15	06/21/2011 14:00	14:00	100.00	1,000 barrels/hr	20.5	lb/hr	1.44	Dry	No
Day21	Hour 16	06/21/2011 15:00	15:00	100.08	1,000 barrels/hr	20.4	lb/hr	1.74	Dry	No
Day21	Hour 17	06/21/2011 16:00	16:00	100.13	1,000 barrels/hr	19.4	lb/hr	2.69	Dry	No
Day21	Hour 18	06/21/2011 17:00	17:00	98.49	1,000 barrels/hr	19.9	lb/hr	2.36	Dry	No
Day21	Hour 19	06/21/2011 18:00	18:00	95.06	1,000 barrels/hr	19.2	lb/hr	2.72	Dry	No
Day21	Hour 20	06/21/2011 19:00	19:00	95.18	1,000 barrels/hr	19.3	lb/hr	2.77	Dry	No
Day21	Hour 21	06/21/2011 20:00	20:00	95.11	1,000 barrels/hr	19.1	lb/hr	2.90	Dry	No
Day21	Hour 22	06/21/2011 21:00	21:00	95.08	1,000 barrels/hr	19.3	lb/hr	2.82	Dry	No
Day21	Hour 23	06/21/2011 22:00	22:00	95.04	1,000 barrels/hr	19.3	lb/hr	2.79	Dry	No
Day21	Hour 24	06/21/2011 23:00	23:00	95.01	1,000 barrels/hr	19.4	lb/hr	2.74	Dry	No
Day22	Hour 1	06/22/2011 00:00	0:00	95.02	1,000 barrels/hr	19.3	lb/hr	2.72	Dry	No
Day22	Hour 2	06/22/2011 01:00	1:00	95.09	1,000 barrels/hr	19.4	lb/hr	2.64	Dry	No
Day22	Hour 3	06/22/2011 02:00	2:00	95.03	1,000 barrels/hr	19.5	lb/hr	2.59	Dry	No
Day22	Hour 4	06/22/2011 03:00	3:00	95.27	1,000 barrels/hr	19.4	lb/hr	2.66	Dry	No
Day22	Hour 5	06/22/2011 04:00	4:00	95.18	1,000 barrels/hr	19.4	lb/hr	2.71	Dry	No
Day22	Hour 6	06/22/2011 05:00	5:00	95.13	1,000 barrels/hr	19.3	lb/hr	2.79	Dry	No
Day22	Hour 7	06/22/2011 06:00	6:00	95.12	1,000 barrels/hr	19.3	lb/hr	2.74	Dry	No
Day22	Hour 8	06/22/2011 07:00	7:00	95.12	1,000 barrels/hr	19.4	lb/hr	2.69	Dry	No
Day22	Hour 9	06/22/2011 08:00	8:00	95.17	1,000 barrels/hr	19.3	lb/hr	2.61	Dry	No
Day22	Hour 10	06/22/2011 09:00	9:00	95.11	1,000 barrels/hr	19.2	lb/hr	2.67	Dry	No
Day22	Hour 11	06/22/2011 10:00	10:00	95.14	1,000 barrels/hr	19.3	lb/hr	2.66	Dry	No
Day22	Hour 12	06/22/2011 11:00	11:00	95.05	1,000 barrels/hr	19.4	lb/hr	2.14	Dry	No
Day22	Hour 13	06/22/2011 12:00	12:00	94.56	1,000 barrels/hr	19.5	lb/hr	1.82	Dry	No
Day22	Hour 14	06/22/2011 13:00	13:00	94.99	1,000 barrels/hr	19.8	lb/hr	1.61	Dry	No
Day22	Hour 15	06/22/2011 14:00	14:00	95.07	1,000 barrels/hr	19.7	lb/hr	1.61	Dry	No
Day22	Hour 16	06/22/2011 15:00	15:00	93.29	1,000 barrels/hr	19.5	lb/hr	1.93	Dry	No
Day22	Hour 17	06/22/2011 16:00	16:00	90.04	1,000 barrels/hr	18.7	lb/hr	2.83	Dry	No
Day22	Hour 18	06/22/2011 17:00	17:00	90.04	1,000 barrels/hr	18.5	lb/hr	2.98	Dry	No
Day22	Hour 19	06/22/2011 18:00	18:00	90.23	1,000 barrels/hr	18.2	lb/hr	3.29	Dry	No
Day22	Hour 20	06/22/2011 19:00	19:00	90.10	1,000 barrels/hr	18.4	lb/hr	3.34	Dry	No
Day22	Hour 21	06/22/2011 20:00	20:00	90.07	1,000 barrels/hr	18.4	lb/hr	3.27	Dry	No
Day22	Hour 22	06/22/2011 21:00	21:00	90.07	1,000 barrels/hr	18.4	lb/hr	3.27	Dry	No
Day22	Hour 23	06/22/2011 22:00	22:00	90.09	1,000 barrels/hr	18.7	lb/hr	3.08	Dry	No
Day22	Hour 24	06/22/2011 23:00	23:00	90.01	1,000 barrels/hr	18.6	lb/hr	3.09	Dry	No
Day23	Hour 1	06/23/2011 00:00	0:00	90.01	1,000 barrels/hr	18.5	lb/hr	3.10	Dry	No
Day23	Hour 2	06/23/2011 01:00	1:00	90.00	1,000 barrels/hr	18.4	lb/hr	2.89	Dry	No
Day23	Hour 3	06/23/2011 02:00	2:00	90.04	1,000 barrels/hr	18.4	lb/hr	2.78	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day23	Hour 4	06/23/2011 03:00	3:00	90.13	1,000 barrels/hr	18.6	lb/hr	2.68	Dry	No
Day23	Hour 5	06/23/2011 04:00	4:00	90.14	1,000 barrels/hr	18.4	lb/hr	2.81	Dry	No
Day23	Hour 6	06/23/2011 05:00	5:00	90.17	1,000 barrels/hr	18.3	lb/hr	2.86	Dry	No
Day23	Hour 7	06/23/2011 06:00	6:00	91.19	1,000 barrels/hr	18.5	lb/hr	2.65	Dry	No
Day23	Hour 8	06/23/2011 07:00	7:00	94.04	1,000 barrels/hr	18.9	lb/hr	2.09	Dry	No
Day23	Hour 9	06/23/2011 08:00	8:00	94.84	1,000 barrels/hr	18.8	lb/hr	2.12	Dry	No
Day23	Hour 10	06/23/2011 09:00	9:00	94.99	1,000 barrels/hr	18.9	lb/hr	2.02	Dry	No
Day23	Hour 11	06/23/2011 10:00	10:00	95.19	1,000 barrels/hr	18.9	lb/hr	2.03	Dry	No
Day23	Hour 12	06/23/2011 11:00	11:00	95.05	1,000 barrels/hr	18.8	lb/hr	2.13	Dry	No
Day23	Hour 13	06/23/2011 12:00	12:00	94.69	1,000 barrels/hr	18.5	lb/hr	2.32	Dry	No
Day23	Hour 14	06/23/2011 13:00	13:00	97.46	1,000 barrels/hr	19.3	lb/hr	1.84	Dry	No
Day23	Hour 15	06/23/2011 14:00	14:00	99.39	1,000 barrels/hr	19.2	lb/hr	1.76	Dry	No
Day23	Hour 16	06/23/2011 15:00	15:00	99.62	1,000 barrels/hr	19.2	lb/hr	1.76	Dry	No
Day23	Hour 17	06/23/2011 16:00	16:00	96.92	1,000 barrels/hr	19.0	lb/hr	2.22	Dry	No
Day23	Hour 18	06/23/2011 17:00	17:00	99.82	1,000 barrels/hr	19.2	lb/hr	1.89	Dry	No
Day23	Hour 19	06/23/2011 18:00	18:00	105.11	1,000 barrels/hr	20.1	lb/hr	1.53	Dry	No
Day23	Hour 20	06/23/2011 19:00	19:00	105.15	1,000 barrels/hr	20.0	lb/hr	1.97	Dry	No
Day23	Hour 21	06/23/2011 20:00	20:00	105.13	1,000 barrels/hr	19.9	lb/hr	2.10	Dry	No
Day23	Hour 22	06/23/2011 21:00	21:00	105.11	1,000 barrels/hr	20.0	lb/hr	2.08	Dry	No
Day23	Hour 23	06/23/2011 22:00	22:00	105.14	1,000 barrels/hr	20.0	lb/hr	2.22	Dry	No
Day23	Hour 24	06/23/2011 23:00	23:00	105.13	1,000 barrels/hr	19.9	lb/hr	2.16	Dry	No
Day24	Hour 1	06/24/2011 00:00	0:00	105.13	1,000 barrels/hr	20.0	lb/hr	2.07	Dry	No
Day24	Hour 2	06/24/2011 01:00	1:00	105.13	1,000 barrels/hr	19.8	lb/hr	2.20	Dry	No
Day24	Hour 3	06/24/2011 02:00	2:00	105.02	1,000 barrels/hr	19.6	lb/hr	2.38	Dry	No
Day24	Hour 4	06/24/2011 03:00	3:00	105.17	1,000 barrels/hr	19.8	lb/hr	2.28	Dry	No
Day24	Hour 5	06/24/2011 04:00	4:00	105.21	1,000 barrels/hr	19.8	lb/hr	2.29	Dry	No
Day24	Hour 6	06/24/2011 05:00	5:00	105.15	1,000 barrels/hr	19.7	lb/hr	2.34	Dry	No
Day24	Hour 7	06/24/2011 06:00	6:00	105.05	1,000 barrels/hr	19.8	lb/hr	2.22	Dry	No
Day24	Hour 8	06/24/2011 07:00	7:00	105.05	1,000 barrels/hr	19.7	lb/hr	2.13	Dry	No
Day24	Hour 9	06/24/2011 08:00	8:00	105.08	1,000 barrels/hr	19.4	lb/hr	2.12	Dry	No
Day24	Hour 10	06/24/2011 09:00	9:00	105.01	1,000 barrels/hr	20.8	lb/hr	1.41	Dry	No
Day24	Hour 11	06/24/2011 10:00	10:00	105.04	1,000 barrels/hr	21.5	lb/hr	1.19	Dry	No
Day24	Hour 12	06/24/2011 11:00	11:00	104.90	1,000 barrels/hr	21.4	lb/hr	1.40	Dry	No
Day24	Hour 13	06/24/2011 12:00	12:00	104.96	1,000 barrels/hr	21.4	lb/hr	1.46	Dry	No
Day24	Hour 14	06/24/2011 13:00	13:00	105.07	1,000 barrels/hr	21.1	lb/hr	1.42	Dry	No
Day24	Hour 15	06/24/2011 14:00	14:00	105.02	1,000 barrels/hr	21.0	lb/hr	1.51	Dry	No
Day24	Hour 16	06/24/2011 15:00	15:00	105.05	1,000 barrels/hr	21.2	lb/hr	1.55	Dry	No
Day24	Hour 17	06/24/2011 16:00	16:00	105.08	1,000 barrels/hr	21.4	lb/hr	1.52	Dry	No
Day24	Hour 18	06/24/2011 17:00	17:00	106.50	1,000 barrels/hr	21.4	lb/hr	1.35	Dry	No
Day24	Hour 19	06/24/2011 18:00	18:00	109.95	1,000 barrels/hr	21.9	lb/hr	0.96	Dry	No
Day24	Hour 20	06/24/2011 19:00	19:00	109.90	1,000 barrels/hr	22.0	lb/hr	1.26	Dry	No
Day24	Hour 21	06/24/2011 20:00	20:00	110.01	1,000 barrels/hr	22.1	lb/hr	1.11	Dry	No
Day24	Hour 22	06/24/2011 21:00	21:00	110.06	1,000 barrels/hr	22.2	lb/hr	1.05	Dry	No
Day24	Hour 23	06/24/2011 22:00	22:00	110.02	1,000 barrels/hr	22.0	lb/hr	1.15	Dry	No
Day24	Hour 24	06/24/2011 23:00	23:00	111.00	1,000 barrels/hr	22.2	lb/hr	1.02	Dry	No
Day25	Hour 1	06/25/2011 00:00	0:00	111.85	1,000 barrels/hr	22.3	lb/hr	0.96	Dry	No
Day25	Hour 2	06/25/2011 01:00	1:00	113.46	1,000 barrels/hr	22.7	lb/hr	0.98	Dry	No
Day25	Hour 3	06/25/2011 02:00	2:00	114.47	1,000 barrels/hr	22.9	lb/hr	1.40	Dry	No
Day25	Hour 4	06/25/2011 03:00	3:00	114.94	1,000 barrels/hr	22.9	lb/hr	1.40	Dry	No
Day25	Hour 5	06/25/2011 04:00	4:00	115.02	1,000 barrels/hr	22.9	lb/hr	1.39	Dry	No
Day25	Hour 6	06/25/2011 05:00	5:00	115.06	1,000 barrels/hr	22.9	lb/hr	1.42	Dry	No
Day25	Hour 7	06/25/2011 06:00	6:00	115.07	1,000 barrels/hr	22.8	lb/hr	1.49	Dry	No
Day25	Hour 8	06/25/2011 07:00	7:00	115.05	1,000 barrels/hr	22.8	lb/hr	1.35	Dry	No
Day25	Hour 9	06/25/2011 08:00	8:00	114.82	1,000 barrels/hr	22.6	lb/hr	1.36	Dry	No
Day25	Hour 10	06/25/2011 09:00	9:00	113.04	1,000 barrels/hr	22.5	lb/hr	1.50	Dry	No
Day25	Hour 11	06/25/2011 10:00	10:00	112.97	1,000 barrels/hr	22.4	lb/hr	1.49	Dry	No
Day25	Hour 12	06/25/2011 11:00	11:00	113.04	1,000 barrels/hr	22.5	lb/hr	1.41	Dry	No
Day25	Hour 13	06/25/2011 12:00	12:00	113.03	1,000 barrels/hr	22.5	lb/hr	1.36	Dry	No
Day25	Hour 14	06/25/2011 13:00	13:00	111.41	1,000 barrels/hr	22.3	lb/hr	1.57	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day25	Hour 15	06/25/2011 14:00	14:00	108.04	1,000 barrels/hr	21.8	lb/hr	2.10	Dry	No
Day25	Hour 16	06/25/2011 15:00	15:00	107.96	1,000 barrels/hr	21.9	lb/hr	2.06	Dry	No
Day25	Hour 17	06/25/2011 16:00	16:00	107.98	1,000 barrels/hr	21.9	lb/hr	2.05	Dry	No
Day25	Hour 18	06/25/2011 17:00	17:00	107.98	1,000 barrels/hr	22.0	lb/hr	2.11	Dry	No
Day25	Hour 19	06/25/2011 18:00	18:00	108.05	1,000 barrels/hr	22.2	lb/hr	2.01	Dry	No
Day25	Hour 20	06/25/2011 19:00	19:00	109.03	1,000 barrels/hr	22.3	lb/hr	2.07	Dry	No
Day25	Hour 21	06/25/2011 20:00	20:00	109.94	1,000 barrels/hr	22.4	lb/hr	2.13	Dry	No
Day25	Hour 22	06/25/2011 21:00	21:00	110.08	1,000 barrels/hr	22.5	lb/hr	2.09	Dry	No
Day25	Hour 23	06/25/2011 22:00	22:00	110.07	1,000 barrels/hr	22.5	lb/hr	2.10	Dry	No
Day25	Hour 24	06/25/2011 23:00	23:00	110.04	1,000 barrels/hr	22.6	lb/hr	2.13	Dry	No
Day26	Hour 1	06/26/2011 00:00	0:00	110.04	1,000 barrels/hr	22.2	lb/hr	1.78	Dry	No
Day26	Hour 2	06/26/2011 01:00	1:00	108.87	1,000 barrels/hr	21.8	lb/hr	1.48	Dry	No
Day26	Hour 3	06/26/2011 02:00	2:00	108.22	1,000 barrels/hr	21.8	lb/hr	1.21	Dry	No
Day26	Hour 4	06/26/2011 03:00	3:00	108.02	1,000 barrels/hr	21.7	lb/hr	1.35	Dry	No
Day26	Hour 5	06/26/2011 04:00	4:00	107.98	1,000 barrels/hr	21.7	lb/hr	1.40	Dry	No
Day26	Hour 6	06/26/2011 05:00	5:00	108.03	1,000 barrels/hr	21.7	lb/hr	1.40	Dry	No
Day26	Hour 7	06/26/2011 06:00	6:00	108.04	1,000 barrels/hr	21.7	lb/hr	1.32	Dry	No
Day26	Hour 8	06/26/2011 07:00	7:00	107.95	1,000 barrels/hr	21.9	lb/hr	1.34	Dry	No
Day26	Hour 9	06/26/2011 08:00	8:00	107.86	1,000 barrels/hr	21.6	lb/hr	1.78	Dry	No
Day26	Hour 10	06/26/2011 09:00	9:00	107.93	1,000 barrels/hr	21.6	lb/hr	1.76	Dry	No
Day26	Hour 11	06/26/2011 10:00	10:00	108.08	1,000 barrels/hr	21.7	lb/hr	1.71	Dry	No
Day26	Hour 12	06/26/2011 11:00	11:00	108.06	1,000 barrels/hr	21.8	lb/hr	1.61	Dry	No
Day26	Hour 13	06/26/2011 12:00	12:00	107.96	1,000 barrels/hr	21.8	lb/hr	1.73	Dry	No
Day26	Hour 14	06/26/2011 13:00	13:00	108.14	1,000 barrels/hr	21.5	lb/hr	1.86	Dry	No
Day26	Hour 15	06/26/2011 14:00	14:00	108.17	1,000 barrels/hr	21.3	lb/hr	1.93	Dry	No
Day26	Hour 16	06/26/2011 15:00	15:00	108.18	1,000 barrels/hr	21.5	lb/hr	1.82	Dry	No
Day26	Hour 17	06/26/2011 16:00	16:00	108.10	1,000 barrels/hr	21.4	lb/hr	1.89	Dry	No
Day26	Hour 18	06/26/2011 17:00	17:00	108.03	1,000 barrels/hr	21.4	lb/hr	1.93	Dry	No
Day26	Hour 19	06/26/2011 18:00	18:00	108.07	1,000 barrels/hr	21.5	lb/hr	2.00	Dry	No
Day26	Hour 20	06/26/2011 19:00	19:00	108.00	1,000 barrels/hr	21.4	lb/hr	2.07	Dry	No
Day26	Hour 21	06/26/2011 20:00	20:00	108.03	1,000 barrels/hr	21.6	lb/hr	1.94	Dry	No
Day26	Hour 22	06/26/2011 21:00	21:00	108.04	1,000 barrels/hr	21.6	lb/hr	1.98	Dry	No
Day26	Hour 23	06/26/2011 22:00	22:00	108.03	1,000 barrels/hr	21.7	lb/hr	2.00	Dry	No
Day26	Hour 24	06/26/2011 23:00	23:00	108.04	1,000 barrels/hr	21.6	lb/hr	1.99	Dry	No
Day27	Hour 1	06/27/2011 00:00	0:00	108.08	1,000 barrels/hr	21.6	lb/hr	2.05	Dry	No
Day27	Hour 2	06/27/2011 01:00	1:00	108.01	1,000 barrels/hr	21.6	lb/hr	2.03	Dry	No
Day27	Hour 3	06/27/2011 02:00	2:00	108.05	1,000 barrels/hr	21.7	lb/hr	1.93	Dry	No
Day27	Hour 4	06/27/2011 03:00	3:00	108.04	1,000 barrels/hr	21.5	lb/hr	1.97	Dry	No
Day27	Hour 5	06/27/2011 04:00	4:00	107.81	1,000 barrels/hr	21.6	lb/hr	1.93	Dry	No
Day27	Hour 6	06/27/2011 05:00	5:00	107.61	1,000 barrels/hr	21.1	lb/hr	2.49	Dry	No
Day27	Hour 7	06/27/2011 06:00	6:00	107.95	1,000 barrels/hr	22.3	lb/hr	1.60	Dry	No
Day27	Hour 8	06/27/2011 07:00	7:00	107.72	1,000 barrels/hr	21.4	lb/hr	2.06	Dry	No
Day27	Hour 9	06/27/2011 08:00	8:00	109.29	1,000 barrels/hr	21.6	lb/hr	1.72	Dry	No
Day27	Hour 10	06/27/2011 09:00	9:00	110.05	1,000 barrels/hr	21.8	lb/hr	1.56	Dry	No
Day27	Hour 11	06/27/2011 10:00	10:00	110.02	1,000 barrels/hr	21.2	lb/hr	2.02	Dry	No
Day27	Hour 12	06/27/2011 11:00	11:00	112.26	1,000 barrels/hr	21.7	lb/hr	1.63	Dry	No
Day27	Hour 13	06/27/2011 12:00	12:00	115.20	1,000 barrels/hr	22.2	lb/hr	1.52	Dry	No
Day27	Hour 14	06/27/2011 13:00	13:00	115.31	1,000 barrels/hr	22.2	lb/hr	1.27	Dry	No
Day27	Hour 15	06/27/2011 14:00	14:00	115.62	1,000 barrels/hr	23.0	lb/hr	1.80	Dry	No
Day27	Hour 16	06/27/2011 15:00	15:00	118.89	1,000 barrels/hr	22.6	lb/hr	2.24	Dry	No
Day27	Hour 17	06/27/2011 16:00	16:00	119.82	1,000 barrels/hr	22.6	lb/hr	1.95	Dry	No
Day27	Hour 18	06/27/2011 17:00	17:00	119.83	1,000 barrels/hr	22.1	lb/hr	2.25	Dry	No
Day27	Hour 19	06/27/2011 18:00	18:00	120.00	1,000 barrels/hr	22.3	lb/hr	2.17	Dry	No
Day27	Hour 20	06/27/2011 19:00	19:00	120.01	1,000 barrels/hr	22.1	lb/hr	2.35	Dry	No
Day27	Hour 21	06/27/2011 20:00	20:00	120.01	1,000 barrels/hr	22.1	lb/hr	1.74	Dry	No
Day27	Hour 22	06/27/2011 21:00	21:00	120.27	1,000 barrels/hr	22.9	lb/hr	1.45	Dry	No
Day27	Hour 23	06/27/2011 22:00	22:00	120.24	1,000 barrels/hr	22.5	lb/hr	1.93	Dry	No
Day27	Hour 24	06/27/2011 23:00	23:00	120.05	1,000 barrels/hr	22.1	lb/hr	2.22	Dry	No
Day28	Hour 1	06/28/2011 00:00	0:00	119.96	1,000 barrels/hr	22.6	lb/hr	1.85	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day28	Hour 2	06/28/2011 01:00	1:00	119.85	1,000 barrels/hr	22.5	lb/hr	1.84	Dry	No
Day28	Hour 3	06/28/2011 02:00	2:00	119.79	1,000 barrels/hr	22.1	lb/hr	2.13	Dry	No
Day28	Hour 4	06/28/2011 03:00	3:00	119.91	1,000 barrels/hr	22.2	lb/hr	1.99	Dry	No
Day28	Hour 5	06/28/2011 04:00	4:00	119.95	1,000 barrels/hr	22.4	lb/hr	1.96	Dry	No
Day28	Hour 6	06/28/2011 05:00	5:00	120.03	1,000 barrels/hr	22.3	lb/hr	2.00	Dry	No
Day28	Hour 7	06/28/2011 06:00	6:00	120.00	1,000 barrels/hr	22.1	lb/hr	2.16	Dry	No
Day28	Hour 8	06/28/2011 07:00	7:00	120.16	1,000 barrels/hr	21.8	lb/hr	2.43	Dry	No
Day28	Hour 9	06/28/2011 08:00	8:00	120.05	1,000 barrels/hr	21.9	lb/hr	2.19	Dry	No
Day28	Hour 10	06/28/2011 09:00	9:00	119.99	1,000 barrels/hr	22.0	lb/hr	2.14	Dry	No
Day28	Hour 11	06/28/2011 10:00	10:00	120.15	1,000 barrels/hr	21.8	lb/hr	1.93	Dry	No
Day28	Hour 12	06/28/2011 11:00	11:00	119.91	1,000 barrels/hr	21.3	lb/hr	2.11	Dry	No
Day28	Hour 13	06/28/2011 12:00	12:00	119.97	1,000 barrels/hr	21.9	lb/hr	1.45	Dry	No
Day28	Hour 14	06/28/2011 13:00	13:00	119.80	1,000 barrels/hr	21.5	lb/hr	1.86	Dry	No
Day28	Hour 15	06/28/2011 14:00	14:00	119.94	1,000 barrels/hr	21.4	lb/hr	1.91	Dry	No
Day28	Hour 16	06/28/2011 15:00	15:00	119.91	1,000 barrels/hr	21.9	lb/hr	1.69	Dry	No
Day28	Hour 17	06/28/2011 16:00	16:00	119.97	1,000 barrels/hr	21.1	lb/hr	2.10	Dry	No
Day28	Hour 18	06/28/2011 17:00	17:00	119.77	1,000 barrels/hr	21.5	lb/hr	1.46	Dry	No
Day28	Hour 19	06/28/2011 18:00	18:00	119.90	1,000 barrels/hr	20.9	lb/hr	2.00	Dry	No
Day28	Hour 20	06/28/2011 19:00	19:00	119.87	1,000 barrels/hr	21.6	lb/hr	1.43	Dry	No
Day28	Hour 21	06/28/2011 20:00	20:00	119.93	1,000 barrels/hr	21.4	lb/hr	2.62	Dry	No
Day28	Hour 22	06/28/2011 21:00	21:00	120.15	1,000 barrels/hr	21.2	lb/hr	1.57	Dry	No
Day28	Hour 23	06/28/2011 22:00	22:00	119.76	1,000 barrels/hr	22.0	lb/hr	1.88	Dry	No
Day28	Hour 24	06/28/2011 23:00	23:00	119.78	1,000 barrels/hr	22.3	lb/hr	1.46	Dry	No
Day29	Hour 1	06/29/2011 00:00	0:00	119.55	1,000 barrels/hr	22.1	lb/hr	1.89	Dry	No
Day29	Hour 2	06/29/2011 01:00	1:00	120.06	1,000 barrels/hr	22.4	lb/hr	1.46	Dry	No
Day29	Hour 3	06/29/2011 02:00	2:00	120.15	1,000 barrels/hr	22.4	lb/hr	1.48	Dry	No
Day29	Hour 4	06/29/2011 03:00	3:00	120.09	1,000 barrels/hr	22.2	lb/hr	1.68	Dry	No
Day29	Hour 5	06/29/2011 04:00	4:00	120.03	1,000 barrels/hr	22.4	lb/hr	1.41	Dry	No
Day29	Hour 6	06/29/2011 05:00	5:00	119.99	1,000 barrels/hr	22.4	lb/hr	1.38	Dry	No
Day29	Hour 7	06/29/2011 06:00	6:00	119.87	1,000 barrels/hr	21.9	lb/hr	1.86	Dry	No
Day29	Hour 8	06/29/2011 07:00	7:00	119.86	1,000 barrels/hr	22.0	lb/hr	1.92	Dry	No
Day29	Hour 9	06/29/2011 08:00	8:00	119.33	1,000 barrels/hr	22.1	lb/hr	1.26	Dry	No
Day29	Hour 10	06/29/2011 09:00	9:00	119.05	1,000 barrels/hr	21.9	lb/hr	1.62	Dry	No
Day29	Hour 11	06/29/2011 10:00	10:00	120.00	1,000 barrels/hr	22.1	lb/hr	1.41	Dry	No
Day29	Hour 12	06/29/2011 11:00	11:00	120.05	1,000 barrels/hr	21.9	lb/hr	1.85	Dry	No
Day29	Hour 13	06/29/2011 12:00	12:00	119.92	1,000 barrels/hr	22.0	lb/hr	1.73	Dry	No
Day29	Hour 14	06/29/2011 13:00	13:00	119.97	1,000 barrels/hr	22.1	lb/hr	1.62	Dry	No
Day29	Hour 15	06/29/2011 14:00	14:00	119.92	1,000 barrels/hr	22.2	lb/hr	1.52	Dry	No
Day29	Hour 16	06/29/2011 15:00	15:00	119.97	1,000 barrels/hr	22.1	lb/hr	1.54	Dry	No
Day29	Hour 17	06/29/2011 16:00	16:00	120.02	1,000 barrels/hr	22.0	lb/hr	1.70	Dry	No
Day29	Hour 18	06/29/2011 17:00	17:00	120.08	1,000 barrels/hr	22.0	lb/hr	1.66	Dry	No
Day29	Hour 19	06/29/2011 18:00	18:00	119.98	1,000 barrels/hr	22.4	lb/hr	1.56	Dry	No
Day29	Hour 20	06/29/2011 19:00	19:00	120.03	1,000 barrels/hr	22.3	lb/hr	1.81	Dry	No
Day29	Hour 21	06/29/2011 20:00	20:00	120.06	1,000 barrels/hr	22.4	lb/hr	1.75	Dry	No
Day29	Hour 22	06/29/2011 21:00	21:00	120.02	1,000 barrels/hr	22.2	lb/hr	2.00	Dry	No
Day29	Hour 23	06/29/2011 22:00	22:00	120.06	1,000 barrels/hr	22.3	lb/hr	1.87	Dry	No
Day29	Hour 24	06/29/2011 23:00	23:00	120.06	1,000 barrels/hr	22.2	lb/hr	1.83	Dry	No
Day30	Hour 1	06/30/2011 00:00	0:00	119.95	1,000 barrels/hr	22.1	lb/hr	1.33	Dry	No
Day30	Hour 2	06/30/2011 01:00	1:00	119.87	1,000 barrels/hr	22.0	lb/hr	2.10	Dry	No
Day30	Hour 3	06/30/2011 02:00	2:00	120.05	1,000 barrels/hr	22.2	lb/hr	1.66	Dry	No
Day30	Hour 4	06/30/2011 03:00	3:00	120.05	1,000 barrels/hr	22.2	lb/hr	1.70	Dry	No
Day30	Hour 5	06/30/2011 04:00	4:00	120.03	1,000 barrels/hr	22.1	lb/hr	1.68	Dry	No
Day30	Hour 6	06/30/2011 05:00	5:00	120.01	1,000 barrels/hr	21.9	lb/hr	1.90	Dry	No
Day30	Hour 7	06/30/2011 06:00	6:00	120.04	1,000 barrels/hr	22.0	lb/hr	1.75	Dry	No
Day30	Hour 8	06/30/2011 07:00	7:00	121.55	1,000 barrels/hr	22.1	lb/hr	1.57	Dry	No
Day30	Hour 9	06/30/2011 08:00	8:00	123.98	1,000 barrels/hr	23.2	lb/hr	1.29	Dry	No
Day30	Hour 10	06/30/2011 09:00	9:00	125.60	1,000 barrels/hr	23.2	lb/hr	1.60	Dry	No
Day30	Hour 11	06/30/2011 10:00	10:00	128.64	1,000 barrels/hr	22.9	lb/hr	1.49	Dry	No
Day30	Hour 12	06/30/2011 11:00	11:00	125.40	1,000 barrels/hr	22.5	lb/hr	1.95	Dry	No

Facility ID	Unit ID	Pollutant
VI6A1530	FCCU	CO_2 lb/hr

CEMS Hourly Average Emission Data Points for Pollutant for 30 Days that Include Testing Date

		Date (MM/DD/YYYY)	Hour (HH24:MM)	Daily production/ throughput rate (value)	Daily production/ throughput rate (units)	1-day average emission value for pollutant (as measured by the CEMS)	Unit of measure recorded by CEMS	O_2 content (%)	Moisture content (%)	Data average affected by a startup, shutdown, or other event? (If event, describe)
Day30	Hour 13	06/30/2011 12:00	12:00	125.67	1,000 barrels/hr	22.2	lb/hr	2.37	Dry	No
Day30	Hour 14	06/30/2011 13:00	13:00	111.06	1,000 barrels/hr	22.9	lb/hr	1.79	Dry	No
Day30	Hour 15	06/30/2011 14:00	14:00	125.14	1,000 barrels/hr	22.5	lb/hr	2.18	Dry	No
Day30	Hour 16	06/30/2011 15:00	15:00	124.97	1,000 barrels/hr	22.6	lb/hr	2.11	Dry	No
Day30	Hour 17	06/30/2011 16:00	16:00	125.05	1,000 barrels/hr	22.8	lb/hr	1.85	Dry	No
Day30	Hour 18	06/30/2011 17:00	17:00	125.05	1,000 barrels/hr	22.8	lb/hr	1.85	Dry	No
Day30	Hour 19	06/30/2011 18:00	18:00	125.07	1,000 barrels/hr	22.6	lb/hr	2.00	Dry	No
Day30	Hour 20	06/30/2011 19:00	19:00	126.20	1,000 barrels/hr	21.9	lb/hr	2.61	Dry	No
Day30	Hour 21	06/30/2011 20:00	20:00	127.97	1,000 barrels/hr	22.2	lb/hr	2.53	Dry	No
Day30	Hour 22	06/30/2011 21:00	21:00	129.40	1,000 barrels/hr	22.5	lb/hr	2.38	Dry	No
Day30	Hour 23	06/30/2011 22:00	22:00	130.23	1,000 barrels/hr	22.5	lb/hr	2.28	Dry	No
Day30	Hour 24	06/30/2011 23:00	23:00	130.33	1,000 barrels/hr	22.8	lb/hr	1.90	Dry	No

APPENDIX B.2

OPERATIONAL AND PRODUCTION DATA

PROCESS DATA

Process Data

Form Approved 03/28/2011
OMB Control No. 2060-0657
Approval Expires 03/31/2016

Facility Name	Unit ID No.	Facility ID No.

Daily Average Process Data for a 30 Day Period Including the Testing Dates

Day	Date	Process Input Rate	Units for Process Input Rate	Temperature (°F)	Pressure (psia)	Description of Process Variable 1	Value for Process Variable 1	Units for Process Variable 1
Day 1	6/1/2011	125.04	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	76.06	1,000 lb/hr
Day 2	6/2/2011	125.03	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	38.13	1,000 lb/hr
Day 3	6/3/2011	125.04	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	34.83	1,000 lb/hr
Day 4	6/4/2011	125.03	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	63.46	1,000 lb/hr
Day 5	6/5/2011	125.03	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	50.94	1,000 lb/hr
Day 6	6/6/2011	125.02	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	65.81	1,000 lb/hr
Day 7	6/7/2011	123.69	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	67.28	1,000 lb/hr
Day 8	6/8/2011	113.39	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	73.10	1,000 lb/hr
Day 9	6/9/2011	104.79	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	66.82	1,000 lb/hr
Day 10	6/10/2011	100.04	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	64.05	1,000 lb/hr
Day 11	6/11/2011	100.03	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	68.09	1,000 lb/hr
Day 12	6/12/2011	105.40	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	35.91	1,000 lb/hr
Day 13	6/13/2011	106.14	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	63.45	1,000 lb/hr
Day 14	6/14/2011	103.92	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	73.72	1,000 lb/hr
Day 15	6/15/2011	113.90	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	83.91	1,000 lb/hr
Day 16	6/16/2011	113.96	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	82.76	1,000 lb/hr
Day 17	6/17/2011	120.45	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	83.83	1,000 lb/hr
Day 18	6/18/2011	122.49	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	83.61	1,000 lb/hr
Day 19	6/19/2011	116.60	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	72.62	1,000 lb/hr
Day 20	6/20/2011	108.10	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	72.20	1,000 lb/hr
Day 21	6/21/2011	98.72	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	57.67	1,000 lb/hr
Day 22	6/22/2011	93.33	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	56.86	1,000 lb/hr
Day 23	6/23/2011	96.85	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	57.15	1,000 lb/hr
Day 24	6/24/2011	106.40	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	59.93	1,000 lb/hr
Day 25	6/25/2011	111.77	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	56.23	1,000 lb/hr
Day 26	6/26/2011	108.16	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	66.46	1,000 lb/hr
Day 27	6/27/2011	113.76	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	67.54	1,000 lb/hr
Day 28	6/28/2011	119.94	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	67.72	1,000 lb/hr
Day 29	6/29/2011	119.92	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	67.42	1,000 lb/hr
Day 30	6/30/2011	123.80	1,000 barrels/day	N/A	N/A	Coke Burn-Off Rate	76.75	1,000 lb/hr

For fluid or thermal catalytic cracking units, "throughput/production" (in bbls/hr) is determined in terms of charged liquid material, including both fresh and recycle feed. Use coke burn-o rate (lbs/hr) as the secondary process data element.

APPENDIX B.3

OPERATIONAL AND PRODUCTION DATA

FUEL GAS DRUM DATA

Fuel Gas Drum Data

Start Date 6/1/11 0:00

End Date 6/30/11 23:59

DCS Tags

74FI5008.PV	D-7939
8500FI6052.PV	D-8535
3302FI0651.PV	D-3304
3302FI0080.PV	D-3354
0920FI0121.PV	D-905
1100FI0036.PV	D-1110

D-2112 has no meter!!

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/1/11 0:00	41.6	16.0	10.9	53.4	4.3	0.9
6/1/11 1:00	40.9	18.1	11.0	52.8	4.2	0.8
6/1/11 2:00	40.2	18.6	10.8	41.4	4.1	0.8
6/1/11 3:00	40.7	19.4	11.0	46.9	4.2	0.8
6/1/11 4:00	40.7	19.4	11.1	53.7	4.3	0.8
6/1/11 5:00	40.8	19.9	11.1	49.7	4.4	0.8
6/1/11 6:00	40.6	19.8	11.2	50.4	4.5	0.8
6/1/11 7:00	41.3	19.8	11.2	51.7	4.4	0.7
6/1/11 8:00	41.7	19.5	11.1	53.1	4.4	0.7
6/1/11 9:00	42.1	19.0	11.1	54.6	4.3	0.7
6/1/11 10:00	41.6	17.4	11.1	55.0	4.2	0.7
6/1/11 11:00	42.2	18.1	11.1	54.6	4.3	0.7
6/1/11 12:00	42.6	18.1	10.7	52.5	4.4	0.7
6/1/11 13:00	42.5	19.0	10.7	53.1	4.4	0.7
6/1/11 14:00	42.5	19.8	11.0	54.0	4.5	0.7
6/1/11 15:00	42.0	19.7	11.0	53.9	4.6	0.7
6/1/11 16:00	42.1	19.6	11.0	53.6	4.6	0.7
6/1/11 17:00	41.5	19.6	10.9	46.5	4.6	0.7
6/1/11 18:00	41.4	19.4	10.8	33.1	4.6	0.8
6/1/11 19:00	41.2	18.9	10.7	17.7	4.6	0.8
6/1/11 20:00	41.2	17.4	10.6	43.3	4.6	0.8
6/1/11 21:00	41.1	17.0	10.6	37.8	4.6	0.8
6/1/11 22:00	41.4	18.8	10.6	32.8	4.6	0.8
6/1/11 23:00	41.6	18.0	10.7	27.0	4.6	0.8
6/2/11 0:00	41.4	17.0	10.7	29.0	4.6	0.7
6/2/11 1:00	41.0	17.7	10.7	40.1	4.6	0.8
6/2/11 2:00	41.0	18.7	10.8	32.8	4.6	0.8
6/2/11 3:00	40.7	19.1	10.7	15.3	4.6	0.8
6/2/11 4:00	40.4	19.4	10.7	11.7	4.6	0.8
6/2/11 5:00	40.8	19.0	10.7	0.0	4.7	0.8
6/2/11 6:00	40.4	17.5	10.6	14.9	4.7	0.7
6/2/11 7:00	40.9	18.6	10.6	29.5	4.6	0.6
6/2/11 8:00	41.5	19.6	10.7	37.2	4.5	0.6
6/2/11 9:00	41.7	20.4	10.8	48.8	4.4	0.6
6/2/11 10:00	41.7	20.1	10.9	56.0	4.4	0.6
6/2/11 11:00	41.5	18.8	10.9	57.3	4.4	0.6
6/2/11 12:00	41.5	19.6	10.8	55.1	4.4	0.6

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/2/11 13:00	41.5	20.0	10.8	53.4	4.4	0.6
6/2/11 14:00	42.2	20.0	10.8	50.7	4.4	0.7
6/2/11 15:00	42.8	20.0	10.9	50.6	4.4	0.7
6/2/11 16:00	41.7	19.7	11.0	50.0	4.4	0.7
6/2/11 17:00	40.7	17.6	10.8	48.1	4.5	0.6
6/2/11 18:00	40.9	19.1	10.7	45.2	4.5	0.6
6/2/11 19:00	40.4	20.6	10.7	44.1	4.5	0.6
6/2/11 20:00	40.3	21.5	11.0	46.1	4.5	0.3
6/2/11 21:00	41.2	20.7	11.1	50.0	4.6	0.1
6/2/11 22:00	40.8	20.5	11.0	51.3	4.6	0.6
6/2/11 23:00	40.7	19.5	10.9	47.5	4.6	0.6
6/3/11 0:00	41.1	20.6	10.9	48.5	4.6	0.2
6/3/11 1:00	40.8	22.3	10.9	46.4	4.6	0.6
6/3/11 2:00	40.8	20.8	11.0	50.6	4.6	0.6
6/3/11 3:00	41.0	21.4	11.0	47.5	4.7	0.6
6/3/11 4:00	40.5	23.3	11.1	47.2	4.7	0.6
6/3/11 5:00	40.9	24.2	11.2	47.4	4.7	0.6
6/3/11 6:00	40.6	23.8	11.2	49.7	4.6	0.4
6/3/11 7:00	40.4	23.1	11.2	49.7	4.6	0.6
6/3/11 8:00	41.2	23.3	11.2	55.9	4.6	0.2
6/3/11 9:00	41.7	23.5	11.3	61.6	4.5	0.2
6/3/11 10:00	42.7	22.6	11.2	65.3	4.4	0.6
6/3/11 11:00	42.6	22.5	11.3	57.4	4.4	0.2
6/3/11 12:00	41.9	20.8	11.0	59.5	4.4	0.1
6/3/11 13:00	42.0	21.3	11.0	55.2	4.4	0.5
6/3/11 14:00	42.0	23.4	11.0	55.1	4.4	0.4
6/3/11 15:00	42.3	25.0	11.0	54.9	4.5	0.1
6/3/11 16:00	41.9	24.9	10.9	54.6	4.5	0.5
6/3/11 17:00	42.0	24.8	10.7	54.0	4.4	0.5
6/3/11 18:00	42.0	24.1	10.7	53.6	4.4	0.3
6/3/11 19:00	41.6	24.0	10.7	52.7	4.3	0.6
6/3/11 20:00	41.5	23.7	10.6	52.1	4.4	0.6
6/3/11 21:00	41.5	22.6	10.2	50.3	4.4	0.2
6/3/11 22:00	41.3	19.2	10.4	48.8	4.4	0.6
6/3/11 23:00	41.2	19.3	10.6	52.5	4.5	0.2
6/4/11 0:00	41.1	20.7	10.6	60.2	4.5	0.6
6/4/11 1:00	41.2	21.3	10.8	54.9	4.5	0.6
6/4/11 2:00	41.4	21.3	10.9	56.6	4.6	0.6
6/4/11 3:00	42.2	20.9	10.8	53.2	4.7	0.5
6/4/11 4:00	42.1	20.9	10.9	55.5	4.6	0.8
6/4/11 5:00	41.3	20.7	10.9	53.5	4.6	0.8
6/4/11 6:00	41.3	20.2	10.8	52.4	4.7	0.8
6/4/11 7:00	41.6	20.5	10.8	55.2	4.6	0.8
6/4/11 8:00	41.7	18.2	10.7	52.9	4.7	0.8
6/4/11 9:00	42.1	19.9	10.7	53.6	4.7	0.8
6/4/11 10:00	43.0	22.1	10.9	56.0	4.6	0.8
6/4/11 11:00	43.1	22.6	11.0	54.9	4.4	0.8
6/4/11 12:00	42.3	22.8	10.9	54.4	4.5	0.8
6/4/11 13:00	42.8	22.5	10.9	55.2	4.5	0.8
6/4/11 14:00	43.1	22.4	11.0	55.3	4.4	0.8
6/4/11 15:00	42.9	22.4	10.9	53.6	4.5	0.8
6/4/11 16:00	42.9	22.1	10.9	53.8	4.4	0.9
6/4/11 17:00	42.9	21.6	10.9	53.8	4.4	0.9
6/4/11 18:00	42.6	19.2	10.7	52.0	4.5	0.9
6/4/11 19:00	42.5	20.0	10.7	49.9	4.5	0.9

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/4/11 20:00	42.1	21.3	10.6	51.5	4.5	0.9
6/4/11 21:00	42.2	22.2	10.7	53.8	4.5	0.9
6/4/11 22:00	42.0	22.4	10.8	54.9	4.5	0.9
6/4/11 23:00	41.9	21.7	10.8	54.1	4.4	0.9
6/5/11 0:00	42.0	21.4	10.8	54.2	4.4	0.9
6/5/11 1:00	42.0	21.1	10.9	53.9	4.4	0.9
6/5/11 2:00	42.3	21.3	11.0	54.1	4.4	0.9
6/5/11 3:00	42.2	21.4	10.9	54.5	4.4	0.9
6/5/11 4:00	42.3	18.6	10.9	54.1	4.4	0.9
6/5/11 5:00	42.3	19.0	10.8	54.2	4.5	0.9
6/5/11 6:00	42.2	21.2	10.8	53.9	4.4	0.9
6/5/11 7:00	42.4	22.0	10.9	54.3	4.5	0.9
6/5/11 8:00	42.5	22.7	11.0	55.5	4.5	0.9
6/5/11 9:00	42.8	22.3	11.0	55.3	4.4	0.9
6/5/11 10:00	42.5	22.3	10.9	55.8	4.4	0.9
6/5/11 11:00	42.3	22.2	10.8	54.5	4.4	0.9
6/5/11 12:00	42.5	22.3	10.7	53.3	4.3	0.9
6/5/11 13:00	41.9	21.5	10.6	53.2	4.3	0.9
6/5/11 14:00	43.5	20.0	10.6	52.8	4.2	0.9
6/5/11 15:00	43.1	20.2	10.6	53.4	4.2	0.9
6/5/11 16:00	42.4	21.4	10.3	50.7	4.1	0.9
6/5/11 17:00	42.6	21.8	10.5	52.0	4.2	0.9
6/5/11 18:00	41.6	21.1	10.4	51.3	4.2	0.9
6/5/11 19:00	42.1	20.1	10.6	52.0	4.3	1.0
6/5/11 20:00	43.6	19.9	10.5	49.7	4.2	0.9
6/5/11 21:00	43.5	19.4	10.6	53.4	4.3	0.9
6/5/11 22:00	44.2	18.8	10.7	54.5	4.3	0.9
6/5/11 23:00	44.2	18.1	10.7	53.1	4.3	0.9
6/6/11 0:00	44.4	16.4	10.7	53.4	4.4	0.9
6/6/11 1:00	43.1	17.8	10.7	53.2	4.4	0.9
6/6/11 2:00	41.9	19.8	10.6	52.6	4.3	0.9
6/6/11 3:00	42.6	20.6	10.6	52.6	4.1	0.9
6/6/11 4:00	42.3	20.9	10.5	51.8	4.1	0.9
6/6/11 5:00	42.3	20.9	10.5	51.3	4.1	0.9
6/6/11 6:00	43.0	20.9	10.6	52.2	4.0	0.9
6/6/11 7:00	42.9	20.5	10.6	51.5	3.9	0.9
6/6/11 8:00	43.6	20.9	10.7	52.7	4.0	0.8
6/6/11 9:00	44.0	20.6	10.8	52.8	4.0	0.7
6/6/11 10:00	45.5	19.1	11.0	54.5	3.9	0.7
6/6/11 11:00	45.5	19.4	10.8	53.1	3.8	0.8
6/6/11 12:00	45.6	21.0	10.9	53.9	3.8	0.8
6/6/11 13:00	45.4	21.5	10.9	54.0	3.7	0.7
6/6/11 14:00	45.0	20.5	10.9	53.7	3.8	0.7
6/6/11 15:00	44.2	20.3	11.0	53.2	3.8	0.8
6/6/11 16:00	43.7	20.4	10.9	53.4	3.8	0.8
6/6/11 17:00	43.2	20.3	10.8	52.7	3.7	0.8
6/6/11 18:00	41.7	20.2	10.7	51.6	3.8	0.8
6/6/11 19:00	41.5	19.6	10.4	50.7	3.7	0.8
6/6/11 20:00	41.7	19.9	10.6	51.9	3.8	0.8
6/6/11 21:00	40.7	19.8	10.7	52.2	3.8	0.8
6/6/11 22:00	39.8	17.4	10.5	50.8	3.8	0.8
6/6/11 23:00	39.9	18.3	10.3	50.4	3.8	0.8
6/7/11 0:00	38.4	20.0	10.4	50.4	4.0	0.9
6/7/11 1:00	38.2	21.9	10.7	52.1	4.2	0.9
6/7/11 2:00	37.4	22.3	10.5	50.5	4.3	0.9

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/7/11 3:00	38.6	23.4	10.9	53.3	4.3	0.9
6/7/11 4:00	36.5	22.4	10.9	51.5	4.3	0.9
6/7/11 5:00	37.7	23.2	11.2	53.0	4.3	0.9
6/7/11 6:00	38.5	23.2	11.2	54.4	4.3	0.9
6/7/11 7:00	38.4	22.7	11.3	53.6	4.3	0.9
6/7/11 8:00	38.5	23.1	11.3	53.6	4.3	0.9
6/7/11 9:00	37.2	19.6	11.0	51.6	4.3	0.9
6/7/11 10:00	38.9	20.2	11.0	51.7	4.4	0.9
6/7/11 11:00	39.4	22.4	11.5	54.6	4.3	0.9
6/7/11 12:00	38.7	21.8	11.8	56.7	4.3	0.9
6/7/11 13:00	39.0	21.4	11.4	54.9	4.3	0.9
6/7/11 14:00	39.3	20.5	11.3	54.0	4.3	0.9
6/7/11 15:00	39.7	20.5	11.7	55.8	4.3	0.9
6/7/11 16:00	39.4	20.9	11.8	55.2	4.3	0.9
6/7/11 17:00	39.5	20.7	11.6	55.4	4.3	0.9
6/7/11 18:00	40.4	20.6	11.8	56.8	4.2	0.9
6/7/11 19:00	40.8	21.0	11.6	56.2	4.0	0.9
6/7/11 20:00	40.7	18.7	11.7	56.9	3.7	0.9
6/7/11 21:00	40.0	19.5	11.7	56.3	3.7	0.9
6/7/11 22:00	40.4	20.5	11.6	56.0	3.7	0.9
6/7/11 23:00	38.2	21.8	11.5	55.8	3.8	0.9
6/8/11 0:00	38.2	22.1	11.4	55.3	3.8	0.9
6/8/11 1:00	38.3	21.7	11.3	54.9	3.8	0.9
6/8/11 2:00	39.1	21.5	11.4	55.4	3.8	0.9
6/8/11 3:00	38.9	22.3	11.6	56.0	3.8	0.9
6/8/11 4:00	39.4	21.3	11.9	56.7	3.5	0.9
6/8/11 5:00	38.4	21.5	11.5	55.8	3.4	0.9
6/8/11 6:00	38.6	20.5	11.5	56.0	3.7	0.9
6/8/11 7:00	38.2	18.8	11.5	55.7	3.8	0.9
6/8/11 8:00	37.2	18.7	11.2	54.0	3.8	0.9
6/8/11 9:00	37.6	19.9	11.2	54.6	3.8	0.9
6/8/11 10:00	37.7	21.0	11.1	53.7	4.2	0.9
6/8/11 11:00	38.2	20.8	10.6	52.8	4.1	0.9
6/8/11 12:00	38.0	20.0	10.8	52.4	4.4	1.0
6/8/11 13:00	41.0	20.3	11.2	55.5	4.2	0.9
6/8/11 14:00	38.7	19.3	11.1	53.7	4.2	0.9
6/8/11 15:00	39.8	18.9	11.3	55.4	4.2	0.9
6/8/11 16:00	40.7	18.8	11.3	54.9	4.2	0.9
6/8/11 17:00	40.6	18.7	11.0	52.6	4.1	0.9
6/8/11 18:00	39.9	15.4	10.8	50.3	4.1	0.9
6/8/11 19:00	40.1	13.3	10.6	50.0	4.1	0.9
6/8/11 20:00	39.5	12.0	10.7	50.3	4.1	0.9
6/8/11 21:00	37.6	8.9	10.5	49.8	3.6	1.0
6/8/11 22:00	35.5	8.2	10.3	47.9	3.6	0.9
6/8/11 23:00	34.4	7.5	9.9	46.3	3.7	0.9
6/9/11 0:00	34.1	7.3	9.6	45.2	4.2	0.9
6/9/11 1:00	34.6	7.1	9.7	45.6	4.2	0.9
6/9/11 2:00	35.5	7.2	9.7	45.9	4.2	0.9
6/9/11 3:00	36.2	7.7	9.9	46.6	4.1	0.9
6/9/11 4:00	35.9	8.2	9.7	45.9	4.1	0.9
6/9/11 5:00	35.3	8.3	9.5	45.2	4.0	0.9
6/9/11 6:00	35.5	8.4	9.5	45.3	4.0	0.9
6/9/11 7:00	34.8	8.3	9.5	45.2	4.0	1.0
6/9/11 8:00	35.5	8.4	9.5	44.9	4.0	1.0
6/9/11 9:00	36.8	8.4	9.8	46.8	4.0	1.0

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/9/11 10:00	37.1	6.3	9.7	45.9	3.9	0.9
6/9/11 11:00	37.0	5.3	9.9	46.9	4.0	0.9
6/9/11 12:00	36.8	5.6	9.9	46.7	3.9	1.0
6/9/11 13:00	36.2	7.0	9.8	46.5	4.0	0.9
6/9/11 14:00	36.9	6.7	9.7	46.6	4.2	0.9
6/9/11 15:00	36.9	6.8	9.8	46.3	4.1	0.9
6/9/11 16:00	35.9	7.4	9.6	41.2	4.3	0.9
6/9/11 17:00	35.9	7.4	9.6	42.1	4.2	0.9
6/9/11 18:00	35.0	7.5	9.6	43.8	4.3	1.0
6/9/11 19:00	35.0	7.4	9.5	44.1	4.2	1.0
6/9/11 20:00	34.2	7.0	9.4	44.1	4.2	0.9
6/9/11 21:00	33.2	6.8	9.4	43.5	4.2	0.9
6/9/11 22:00	33.8	6.9	9.3	43.5	4.2	0.9
6/9/11 23:00	33.9	6.6	9.7	46.0	3.9	0.9
6/10/11 0:00	33.8	6.6	9.8	46.3	3.6	0.9
6/10/11 1:00	33.1	6.5	9.9	47.5	3.5	0.8
6/10/11 2:00	32.7	5.3	9.8	46.7	3.4	0.8
6/10/11 3:00	32.6	5.6	9.9	47.2	3.8	0.9
6/10/11 4:00	34.2	6.6	9.8	47.2	3.8	0.9
6/10/11 5:00	34.7	7.5	9.7	46.8	3.7	0.9
6/10/11 6:00	35.6	11.5	9.7	47.1	3.5	0.8
6/10/11 7:00	35.7	14.3	9.9	48.4	3.2	0.8
6/10/11 8:00	35.1	16.5	10.1	49.6	3.0	0.8
6/10/11 9:00	35.9	17.5	10.1	49.3	3.2	0.9
6/10/11 10:00	36.0	18.5	9.8	47.1	3.2	0.9
6/10/11 11:00	33.0	19.6	10.3	51.7	2.9	0.8
6/10/11 12:00	31.7	20.8	10.3	49.5	3.5	0.9
6/10/11 13:00	30.9	19.6	10.1	48.3	3.7	0.9
6/10/11 14:00	31.7	19.0	10.1	48.5	3.8	0.9
6/10/11 15:00	32.5	18.7	10.2	48.7	3.8	0.9
6/10/11 16:00	32.3	18.9	10.3	49.6	3.8	0.7
6/10/11 17:00	32.0	18.5	10.1	48.7	3.8	0.7
6/10/11 18:00	32.3	17.4	9.7	47.1	3.7	0.6
6/10/11 19:00	32.3	17.4	9.5	46.3	3.8	0.7
6/10/11 20:00	31.9	18.1	9.5	46.3	3.9	0.8
6/10/11 21:00	31.9	18.5	9.7	46.9	3.9	0.8
6/10/11 22:00	32.2	18.3	9.7	46.8	3.9	0.8
6/10/11 23:00	32.4	17.8	9.8	47.1	3.9	0.6
6/11/11 0:00	32.1	16.2	9.6	45.9	3.9	0.6
6/11/11 1:00	32.0	17.5	9.5	45.8	4.0	0.7
6/11/11 2:00	32.5	18.5	9.5	46.1	3.8	0.6
6/11/11 3:00	32.9	19.2	9.7	47.0	3.9	0.6
6/11/11 4:00	33.4	18.9	9.8	47.2	3.9	0.6
6/11/11 5:00	33.8	19.0	9.9	47.7	3.9	0.7
6/11/11 6:00	33.3	19.5	9.9	47.8	3.8	0.7
6/11/11 7:00	33.3	19.6	9.9	48.0	3.8	0.7
6/11/11 8:00	33.5	19.8	10.0	48.4	3.8	0.7
6/11/11 9:00	33.5	19.9	10.0	48.5	3.8	0.6
6/11/11 10:00	33.7	19.7	10.0	48.7	3.8	0.7
6/11/11 11:00	33.5	18.8	10.1	49.4	3.9	0.7
6/11/11 12:00	33.3	14.6	10.1	49.1	4.0	0.7
6/11/11 13:00	33.3	12.4	10.3	49.4	4.1	0.7
6/11/11 14:00	33.1	11.6	10.3	49.8	4.2	0.7
6/11/11 15:00	32.8	10.1	10.0	48.0	4.2	0.8
6/11/11 16:00	32.6	11.5	10.0	47.8	4.3	0.8

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/11/11 17:00	32.7	11.9	9.6	45.9	4.3	0.8
6/11/11 18:00	32.7	13.7	9.6	45.8	4.3	0.8
6/11/11 19:00	32.1	16.2	9.6	45.8	4.3	0.8
6/11/11 20:00	32.0	17.2	9.8	46.9	4.2	0.8
6/11/11 21:00	31.6	17.9	9.9	47.6	4.2	0.8
6/11/11 22:00	31.7	19.3	10.0	48.5	4.2	0.8
6/11/11 23:00	32.1	19.4	9.9	48.0	4.1	0.8
6/12/11 0:00	32.5	17.7	10.1	48.6	4.1	0.8
6/12/11 1:00	32.4	18.6	10.1	48.6	4.1	0.8
6/12/11 2:00	32.4	19.4	10.2	49.3	4.1	0.8
6/12/11 3:00	32.3	20.0	10.3	49.8	4.1	0.7
6/12/11 4:00	32.1	20.1	10.4	50.3	4.0	0.7
6/12/11 5:00	32.0	19.5	10.4	50.3	4.0	0.7
6/12/11 6:00	32.1	19.0	10.5	50.8	4.1	0.7
6/12/11 7:00	32.4	19.1	10.5	50.9	4.0	0.7
6/12/11 8:00	32.8	19.4	10.5	50.9	4.0	0.7
6/12/11 9:00	33.2	19.6	10.6	51.8	3.9	0.6
6/12/11 10:00	33.4	20.0	10.5	50.8	3.9	0.7
6/12/11 11:00	34.2	20.9	10.4	50.6	3.9	0.7
6/12/11 12:00	36.1	19.9	10.4	50.6	3.9	0.7
6/12/11 13:00	35.7	20.4	10.4	50.8	3.9	0.7
6/12/11 14:00	35.9	22.7	10.6	52.1	3.9	0.7
6/12/11 15:00	35.8	24.7	10.6	51.6	3.9	0.7
6/12/11 16:00	35.7	25.9	10.4	49.8	3.8	0.6
6/12/11 17:00	35.3	25.3	10.3	51.2	3.8	0.7
6/12/11 18:00	34.6	24.4	10.6	51.7	4.0	0.7
6/12/11 19:00	34.5	23.2	10.6	51.7	4.0	0.7
6/12/11 20:00	34.5	22.8	10.6	51.8	4.0	0.7
6/12/11 21:00	34.7	21.2	10.6	51.7	3.9	0.7
6/12/11 22:00	35.0	20.1	10.5	51.3	3.9	0.7
6/12/11 23:00	35.2	20.6	10.7	52.1	3.8	0.7
6/13/11 0:00	35.3	22.3	10.8	52.7	3.8	0.7
6/13/11 1:00	35.1	24.4	10.9	53.4	4.0	0.7
6/13/11 2:00	35.0	24.6	10.7	52.2	4.0	0.7
6/13/11 3:00	35.3	24.0	10.7	52.3	4.0	0.8
6/13/11 4:00	35.3	23.8	10.8	52.4	4.1	0.8
6/13/11 5:00	35.0	23.4	10.6	51.7	4.1	0.8
6/13/11 6:00	34.9	23.5	10.8	52.9	4.1	0.8
6/13/11 7:00	34.9	23.7	10.9	53.4	4.1	0.8
6/13/11 8:00	34.5	21.9	10.9	53.0	4.1	0.8
6/13/11 9:00	35.0	21.7	10.6	51.4	4.1	0.8
6/13/11 10:00	35.4	24.1	10.4	49.9	4.0	0.8
6/13/11 11:00	35.5	25.0	10.2	48.9	3.8	0.7
6/13/11 12:00	34.5	24.7	10.5	51.1	4.0	0.8
6/13/11 13:00	32.8	23.1	10.7	52.0	4.0	0.7
6/13/11 14:00	33.3	23.1	10.6	50.7	4.0	0.7
6/13/11 15:00	33.4	23.8	10.5	50.5	3.9	0.5
6/13/11 16:00	33.7	23.6	10.4	50.2	3.9	0.6
6/13/11 17:00	33.0	21.4	10.6	50.9	3.9	0.6
6/13/11 18:00	34.7	21.3	10.3	50.1	3.9	0.6
6/13/11 19:00	34.5	22.5	10.3	50.0	3.9	0.7
6/13/11 20:00	34.3	24.1	10.8	52.7	3.8	0.6
6/13/11 21:00	34.5	24.6	10.9	53.0	3.9	0.7
6/13/11 22:00	34.6	24.5	10.7	51.7	4.2	0.7
6/13/11 23:00	34.3	23.9	10.5	51.7	4.5	0.8

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/14/11 0:00	33.9	23.5	10.5	51.2	4.5	0.8
6/14/11 1:00	33.6	23.4	10.5	51.0	4.5	0.8
6/14/11 2:00	33.3	23.1	10.4	50.6	4.4	0.7
6/14/11 3:00	33.2	22.8	10.4	50.6	4.3	0.8
6/14/11 4:00	33.5	21.1	10.4	50.8	4.3	0.7
6/14/11 5:00	33.3	21.1	10.2	50.0	4.0	0.7
6/14/11 6:00	33.3	22.2	10.4	50.4	4.2	0.6
6/14/11 7:00	33.7	24.5	10.3	50.2	4.0	0.7
6/14/11 8:00	32.0	25.4	10.3	50.4	4.2	0.6
6/14/11 9:00	30.9	25.2	10.4	50.3	4.3	0.5
6/14/11 10:00	32.2	24.4	10.5	50.6	4.3	0.6
6/14/11 11:00	32.6	24.3	10.5	50.8	4.4	0.7
6/14/11 12:00	32.1	23.2	10.2	49.2	4.4	0.7
6/14/11 13:00	32.5	21.2	10.2	49.3	4.3	0.6
6/14/11 14:00	29.8	20.6	10.5	50.7	4.0	0.3
6/14/11 15:00	32.9	20.0	10.3	49.8	3.6	0.4
6/14/11 16:00	32.4	20.4	10.2	49.7	4.1	0.7
6/14/11 17:00	32.3	21.3	10.2	49.6	4.1	0.7
6/14/11 18:00	33.7	21.7	10.3	50.1	4.2	0.8
6/14/11 19:00	33.7	21.6	10.2	44.8	4.2	0.6
6/14/11 20:00	34.0	21.6	10.6	52.9	4.1	0.6
6/14/11 21:00	34.6	21.9	10.6	51.3	3.9	0.7
6/14/11 22:00	36.5	21.8	10.6	52.6	3.1	0.5
6/14/11 23:00	37.5	20.5	10.3	51.5	3.3	0.5
6/15/11 0:00	37.9	20.9	10.4	52.0	3.3	0.6
6/15/11 1:00	37.6	20.5	10.2	53.1	3.3	0.6
6/15/11 2:00	37.5	20.8	10.5	51.6	3.1	0.5
6/15/11 3:00	37.9	21.9	10.5	53.4	3.2	0.4
6/15/11 4:00	37.3	22.0	10.6	53.7	3.4	0.5
6/15/11 5:00	37.0	22.3	10.6	50.6	3.5	0.6
6/15/11 6:00	37.2	22.1	10.7	51.7	3.5	0.5
6/15/11 7:00	37.8	21.9	10.4	53.2	3.3	0.5
6/15/11 8:00	37.9	20.7	10.7	49.5	3.3	0.5
6/15/11 9:00	38.8	21.0	10.6	38.0	2.7	0.3
6/15/11 10:00	38.6	19.1	10.6	51.9	2.4	0.2
6/15/11 11:00	38.4	19.6	10.5	44.8	2.5	0.1
6/15/11 12:00	37.6	20.1	10.5	55.9	2.8	0.3
6/15/11 13:00	35.4	20.7	10.3	47.4	3.1	0.5
6/15/11 14:00	36.8	21.4	10.4	54.4	3.2	0.4
6/15/11 15:00	36.6	21.6	10.2	49.6	3.3	0.6
6/15/11 16:00	37.0	21.4	10.3	47.4	3.4	0.5
6/15/11 17:00	37.0	21.5	10.4	41.9	3.4	0.5
6/15/11 18:00	35.8	21.4	10.2	48.5	3.3	0.6
6/15/11 19:00	35.0	20.5	10.0	50.4	3.4	0.6
6/15/11 20:00	36.4	19.1	10.4	51.9	3.6	0.6
6/15/11 21:00	37.1	19.7	10.2	48.9	3.8	0.6
6/15/11 22:00	36.7	21.5	10.0	46.7	3.5	0.6
6/15/11 23:00	38.1	22.7	10.5	54.0	3.5	0.6
6/16/11 0:00	36.3	20.6	10.4	51.9	3.8	0.7
6/16/11 1:00	40.5	21.2	10.6	53.5	3.6	0.3
6/16/11 2:00	39.9	21.4	10.7	50.3	3.5	0.1
6/16/11 3:00	40.6	21.7	10.7	52.0	3.5	0.6
6/16/11 4:00	40.8	22.1	10.8	53.5	3.4	0.4
6/16/11 5:00	39.9	21.5	11.0	46.0	3.5	0.0
6/16/11 6:00	40.0	20.3	10.9	60.0	3.5	0.4

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/16/11 7:00	38.5	20.7	10.7	44.0	3.5	0.6
6/16/11 8:00	36.7	20.8	10.6	60.2	3.2	0.0
6/16/11 9:00	37.9	21.5	10.8	47.2	3.2	0.4
6/16/11 10:00	38.9	21.9	10.9	46.2	3.2	0.2
6/16/11 11:00	38.1	22.1	10.8	54.6	3.2	0.6
6/16/11 12:00	38.1	22.3	10.9	55.6	3.2	0.7
6/16/11 13:00	38.4	21.6	10.8	54.1	3.2	0.6
6/16/11 14:00	38.3	21.2	10.9	56.7	3.3	0.6
6/16/11 15:00	37.7	20.9	10.9	51.7	3.3	0.7
6/16/11 16:00	38.5	20.9	11.3	43.8	3.4	0.7
6/16/11 17:00	38.7	18.6	11.4	50.9	3.4	0.7
6/16/11 18:00	38.0	18.8	10.9	42.6	3.5	0.7
6/16/11 19:00	37.9	20.3	10.9	13.1	3.4	0.3
6/16/11 20:00	38.5	21.8	11.2	42.5	3.2	0.2
6/16/11 21:00	39.5	22.1	11.3	44.6	3.4	0.0
6/16/11 22:00	40.8	21.8	11.4	46.6	3.3	0.0
6/16/11 23:00	41.0	21.6	11.5	46.5	3.4	0.0
6/17/11 0:00	41.6	21.4	11.4	45.7	3.4	0.0
6/17/11 1:00	41.3	21.1	11.4	42.3	3.3	0.0
6/17/11 2:00	41.0	18.8	11.5	42.9	3.0	0.0
6/17/11 3:00	40.8	18.0	11.5	38.2	2.9	0.1
6/17/11 4:00	39.2	18.8	11.4	42.4	3.0	0.0
6/17/11 5:00	40.9	20.4	11.5	47.1	2.9	0.0
6/17/11 6:00	41.8	20.8	11.6	45.3	3.2	0.0
6/17/11 7:00	41.6	20.3	11.5	41.8	3.5	0.0
6/17/11 8:00	40.2	19.9	11.5	40.9	3.4	0.0
6/17/11 9:00	40.7	20.1	11.7	36.1	3.2	0.0
6/17/11 10:00	41.0	20.4	11.6	27.6	3.3	0.0
6/17/11 11:00	40.7	19.2	11.8	33.4	3.4	0.0
6/17/11 12:00	40.3	18.3	11.6	42.7	3.2	0.0
6/17/11 13:00	40.1	19.5	11.6	43.7	3.1	0.0
6/17/11 14:00	40.1	20.1	11.6	48.3	3.0	0.0
6/17/11 15:00	40.9	21.1	11.7	61.4	3.1	0.0
6/17/11 16:00	41.1	21.1	11.5	62.1	3.0	0.0
6/17/11 17:00	40.6	21.0	11.5	61.7	3.3	0.0
6/17/11 18:00	40.3	21.1	11.7	54.8	3.4	0.0
6/17/11 19:00	40.1	20.7	11.7	52.7	3.4	0.0
6/17/11 20:00	40.2	20.1	11.6	52.7	3.3	0.0
6/17/11 21:00	41.6	20.0	11.6	53.1	3.2	0.0
6/17/11 22:00	42.5	17.6	11.7	55.8	3.1	0.0
6/17/11 23:00	42.5	18.5	11.6	53.8	3.3	0.0
6/18/11 0:00	42.1	19.5	11.5	51.5	3.4	0.0
6/18/11 1:00	41.8	19.6	11.7	53.5	3.5	0.0
6/18/11 2:00	41.6	20.7	11.7	53.6	3.6	0.0
6/18/11 3:00	41.7	20.6	11.7	52.2	3.6	0.0
6/18/11 4:00	41.7	20.7	11.2	51.3	3.6	0.0
6/18/11 5:00	41.7	20.3	10.9	49.8	3.7	0.0
6/18/11 6:00	41.5	19.8	10.8	49.9	4.0	0.0
6/18/11 7:00	41.6	20.1	10.9	49.9	4.4	0.0
6/18/11 8:00	40.8	18.3	11.0	52.1	4.2	0.0
6/18/11 9:00	41.4	19.0	11.0	53.7	4.3	0.0
6/18/11 10:00	41.7	20.1	10.9	52.4	4.2	0.0
6/18/11 11:00	41.5	21.1	11.0	52.7	4.2	0.0
6/18/11 12:00	41.9	21.2	11.0	52.4	4.2	0.0
6/18/11 13:00	41.5	21.2	11.0	54.0	4.3	0.0

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/18/11 14:00	41.4	21.2	10.9	53.7	4.3	0.0
6/18/11 15:00	40.7	21.3	11.0	49.9	4.2	0.0
6/18/11 16:00	41.0	21.0	11.0	52.9	4.2	0.0
6/18/11 17:00	40.9	20.8	11.0	51.3	4.3	0.0
6/18/11 18:00	40.2	18.6	11.0	57.8	4.2	0.0
6/18/11 19:00	39.7	19.6	11.0	45.3	4.3	0.0
6/18/11 20:00	39.7	20.2	10.8	48.0	4.2	0.0
6/18/11 21:00	41.2	21.7	11.1	50.6	4.1	0.0
6/18/11 22:00	40.9	22.7	11.0	51.4	4.3	0.0
6/18/11 23:00	40.8	22.5	11.0	46.5	4.3	0.0
6/19/11 0:00	40.7	21.9	11.1	44.8	4.4	0.0
6/19/11 1:00	40.9	21.5	10.9	48.1	4.4	0.0
6/19/11 2:00	40.9	21.2	10.7	44.8	4.3	0.0
6/19/11 3:00	40.9	21.3	10.8	46.6	4.2	0.0
6/19/11 4:00	40.8	18.9	10.7	48.0	4.3	0.0
6/19/11 5:00	40.7	19.2	11.0	47.5	3.7	0.0
6/19/11 6:00	40.4	21.2	11.0	42.7	3.6	0.0
6/19/11 7:00	39.5	22.6	11.3	45.9	3.5	0.1
6/19/11 8:00	40.2	22.7	11.3	46.4	3.6	0.0
6/19/11 9:00	40.7	22.7	11.2	58.6	3.7	0.0
6/19/11 10:00	41.6	22.6	11.0	53.3	4.0	0.0
6/19/11 11:00	41.0	22.5	11.0	54.4	3.9	0.0
6/19/11 12:00	41.0	22.2	10.7	50.4	3.8	0.0
6/19/11 13:00	40.7	21.8	10.8	54.2	3.9	0.0
6/19/11 14:00	37.7	19.9	11.1	54.4	3.7	0.0
6/19/11 15:00	36.5	20.4	11.0	50.5	3.9	0.0
6/19/11 16:00	35.8	21.9	10.9	47.8	3.8	0.0
6/19/11 17:00	36.3	22.7	10.9	49.9	3.8	0.0
6/19/11 18:00	35.3	22.7	10.9	48.6	3.9	0.0
6/19/11 19:00	35.6	22.8	10.8	47.0	3.9	0.0
6/19/11 20:00	35.3	22.4	10.7	49.4	3.6	0.0
6/19/11 21:00	35.3	21.5	10.4	40.0	4.3	0.1
6/19/11 22:00	35.2	21.0	10.7	31.5	4.3	0.0
6/19/11 23:00	35.1	20.1	10.9	35.9	4.4	0.0
6/20/11 0:00	35.7	19.0	10.5	46.3	4.2	0.0
6/20/11 1:00	34.9	19.7	10.2	42.8	4.2	0.0
6/20/11 2:00	35.6	21.6	10.0	43.1	3.8	0.0
6/20/11 3:00	35.6	21.9	10.2	42.3	3.4	0.1
6/20/11 4:00	35.5	21.5	10.4	43.8	3.6	0.1
6/20/11 5:00	35.3	21.4	10.4	43.0	3.6	0.0
6/20/11 6:00	35.5	21.7	10.7	45.3	3.6	0.1
6/20/11 7:00	35.6	21.5	10.8	44.9	3.5	0.0
6/20/11 8:00	36.4	21.4	10.8	46.5	3.5	0.0
6/20/11 9:00	36.7	21.5	11.0	49.9	3.4	0.0
6/20/11 10:00	36.9	19.8	11.0	47.4	3.3	0.0
6/20/11 11:00	35.7	19.4	10.7	55.1	3.3	0.0
6/20/11 12:00	37.6	22.1	10.9	53.2	3.1	0.0
6/20/11 13:00	37.2	24.3	10.6	59.8	3.7	0.0
6/20/11 14:00	37.1	23.3	10.8	56.8	3.9	0.0
6/20/11 15:00	36.8	22.8	10.8	51.5	3.9	0.0
6/20/11 16:00	36.8	23.3	10.8	46.4	3.9	0.0
6/20/11 17:00	36.8	23.4	10.7	48.0	3.9	0.0
6/20/11 18:00	36.3	22.5	10.7	52.9	4.0	0.0
6/20/11 19:00	36.6	22.5	10.8	50.4	3.8	0.0
6/20/11 20:00	35.3	21.5	10.6	48.9	3.7	0.0

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/20/11 21:00	34.5	21.5	10.6	47.2	3.9	0.0
6/20/11 22:00	34.8	22.6	10.8	48.7	4.1	0.0
6/20/11 23:00	34.6	24.5	10.9	48.8	3.9	0.0
6/21/11 0:00	34.4	24.4	10.7	48.1	4.0	0.0
6/21/11 1:00	34.8	23.2	10.8	48.5	4.1	0.0
6/21/11 2:00	35.3	22.6	11.0	49.8	3.6	0.1
6/21/11 3:00	35.3	23.7	11.1	50.0	3.3	0.0
6/21/11 4:00	34.3	23.6	10.9	49.7	3.3	0.0
6/21/11 5:00	34.6	23.3	10.9	49.6	3.4	0.1
6/21/11 6:00	34.3	21.5	10.8	50.0	3.3	0.1
6/21/11 7:00	34.7	21.0	10.9	53.6	3.3	0.1
6/21/11 8:00	35.1	22.9	11.0	53.2	3.5	0.1
6/21/11 9:00	34.2	24.7	10.9	52.4	3.8	0.0
6/21/11 10:00	33.9	24.7	10.8	53.2	3.8	0.0
6/21/11 11:00	33.8	24.3	10.8	51.0	3.7	0.0
6/21/11 12:00	33.7	23.5	10.9	53.6	3.7	0.0
6/21/11 13:00	34.0	22.5	11.0	51.1	3.7	0.0
6/21/11 14:00	33.8	21.9	10.9	50.7	3.8	0.0
6/21/11 15:00	33.8	21.3	10.9	50.8	3.7	0.0
6/21/11 16:00	33.6	19.1	10.9	51.2	3.8	0.0
6/21/11 17:00	31.6	19.1	10.2	48.1	3.9	0.1
6/21/11 18:00	31.9	21.2	10.3	49.2	4.0	0.0
6/21/11 19:00	30.2	22.1	10.4	49.1	3.9	0.1
6/21/11 20:00	30.0	22.2	10.4	49.4	4.3	0.0
6/21/11 21:00	29.6	21.9	10.4	49.3	4.5	0.1
6/21/11 22:00	29.9	21.8	10.3	48.7	4.4	0.1
6/21/11 23:00	30.0	21.4	10.2	46.6	4.5	0.0
6/22/11 0:00	29.8	19.9	9.9	39.6	4.3	0.0
6/22/11 1:00	29.7	19.9	10.2	41.3	4.2	0.0
6/22/11 2:00	30.2	19.0	10.1	43.1	4.2	0.0
6/22/11 3:00	30.5	18.4	10.0	44.7	4.2	0.0
6/22/11 4:00	30.9	19.8	10.0	43.3	4.2	0.0
6/22/11 5:00	30.1	21.4	10.0	43.5	4.0	0.0
6/22/11 6:00	30.1	21.6	10.1	43.2	4.1	0.0
6/22/11 7:00	30.1	21.5	10.1	44.1	4.1	0.0
6/22/11 8:00	30.5	21.6	10.2	44.6	4.0	0.1
6/22/11 9:00	31.0	21.8	10.6	47.1	3.9	0.0
6/22/11 10:00	30.6	21.1	11.0	48.6	3.9	0.0
6/22/11 11:00	30.9	21.0	11.1	49.6	3.6	0.0
6/22/11 12:00	31.9	19.7	11.1	48.6	3.4	0.0
6/22/11 13:00	31.2	19.9	10.8	48.6	3.5	0.0
6/22/11 14:00	31.2	22.6	10.8	55.2	3.3	0.0
6/22/11 15:00	30.5	23.9	10.4	54.2	3.3	0.0
6/22/11 16:00	30.0	23.4	10.7	50.1	3.5	0.0
6/22/11 17:00	28.5	23.2	10.6	49.2	3.4	0.0
6/22/11 18:00	28.0	23.6	10.8	48.3	3.4	0.0
6/22/11 19:00	26.4	23.2	10.7	48.4	3.3	0.0
6/22/11 20:00	28.5	21.8	10.6	46.6	3.4	0.0
6/22/11 21:00	28.3	22.6	10.5	44.4	3.3	0.0
6/22/11 22:00	28.4	21.4	10.4	43.3	3.2	0.0
6/22/11 23:00	28.2	20.6	10.2	40.4	3.2	0.0
6/23/11 0:00	28.8	22.7	10.5	42.7	3.2	0.0
6/23/11 1:00	28.9	23.1	10.5	43.4	3.3	0.0
6/23/11 2:00	28.7	23.2	10.5	43.0	3.4	0.0
6/23/11 3:00	28.8	22.6	10.4	42.5	3.4	0.0

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/23/11 4:00	29.9	23.1	10.6	39.8	3.5	0.0
6/23/11 5:00	30.0	22.7	10.6	39.4	3.4	0.0
6/23/11 6:00	30.1	22.5	10.6	38.3	3.5	0.0
6/23/11 7:00	30.4	22.3	10.6	42.8	3.4	0.0
6/23/11 8:00	32.9	19.8	10.7	54.9	3.4	0.0
6/23/11 9:00	33.0	21.3	10.8	58.7	3.4	0.0
6/23/11 10:00	32.4	23.2	10.8	55.9	3.3	0.0
6/23/11 11:00	30.1	24.3	10.7	50.2	3.4	0.0
6/23/11 12:00	27.7	24.7	10.4	47.1	4.0	0.0
6/23/11 13:00	28.7	23.8	10.2	48.1	4.3	0.0
6/23/11 14:00	29.4	23.6	10.3	47.2	4.2	0.0
6/23/11 15:00	27.5	23.6	10.3	45.7	4.2	0.0
6/23/11 16:00	26.9	23.3	10.1	48.0	4.3	0.0
6/23/11 17:00	26.8	23.6	10.0	47.4	4.3	0.0
6/23/11 18:00	26.9	20.9	9.8	40.2	4.3	0.0
6/23/11 19:00	28.8	21.3	9.9	43.5	4.4	0.2
6/23/11 20:00	28.2	23.5	10.0	45.7	4.4	0.1
6/23/11 21:00	27.8	25.9	10.1	44.0	4.1	0.1
6/23/11 22:00	27.8	25.8	9.9	43.2	4.3	0.2
6/23/11 23:00	27.0	23.9	10.2	53.0	4.6	0.1
6/24/11 0:00	26.9	22.9	10.2	45.8	4.7	0.1
6/24/11 1:00	27.2	22.4	10.4	40.6	4.3	0.0
6/24/11 2:00	26.6	22.7	10.2	46.2	4.6	0.0
6/24/11 3:00	26.9	22.2	10.2	53.0	4.6	0.1
6/24/11 4:00	27.8	19.6	10.0	42.1	4.7	0.1
6/24/11 5:00	27.8	20.0	10.1	44.5	4.7	0.2
6/24/11 6:00	27.6	22.5	10.4	49.0	4.5	0.2
6/24/11 7:00	27.7	24.1	10.3	40.5	4.6	0.0
6/24/11 8:00	28.1	23.6	10.3	34.8	4.5	0.0
6/24/11 9:00	28.3	23.1	10.4	39.5	4.4	0.0
6/24/11 10:00	28.4	23.6	10.4	38.2	4.6	0.0
6/24/11 11:00	28.8	23.5	10.6	33.4	4.5	0.0
6/24/11 12:00	29.1	23.2	10.6	38.3	4.5	0.0
6/24/11 13:00	28.9	23.5	10.6	40.9	4.3	0.0
6/24/11 14:00	29.0	23.1	10.6	38.8	3.9	0.0
6/24/11 15:00	29.1	22.8	10.8	54.7	3.4	0.0
6/24/11 16:00	28.7	25.1	11.2	45.8	3.2	0.0
6/24/11 17:00	28.2	27.5	11.1	51.2	3.4	0.0
6/24/11 18:00	28.7	28.4	10.9	52.5	3.7	0.0
6/24/11 19:00	29.4	27.0	10.7	41.6	3.9	0.0
6/24/11 20:00	29.0	26.9	10.7	37.6	3.7	0.0
6/24/11 21:00	29.4	26.2	10.9	38.0	3.5	0.1
6/24/11 22:00	29.4	26.0	10.7	34.6	3.6	0.0
6/24/11 23:00	29.3	24.3	10.7	39.4	3.5	0.0
6/25/11 0:00	29.4	23.5	10.3	39.9	3.6	0.0
6/25/11 1:00	29.6	24.6	10.5	40.5	3.6	0.0
6/25/11 2:00	29.7	26.1	10.5	37.7	3.7	0.0
6/25/11 3:00	29.6	22.4	10.5	37.2	3.8	0.0
6/25/11 4:00	30.0	21.5	10.6	40.3	3.8	0.0
6/25/11 5:00	29.8	22.5	10.4	32.7	3.7	0.0
6/25/11 6:00	30.1	22.9	10.5	35.2	3.8	0.0
6/25/11 7:00	30.2	23.0	10.5	37.1	3.8	0.0
6/25/11 8:00	30.6	23.4	10.8	38.8	3.8	0.0
6/25/11 9:00	31.0	23.1	10.6	42.5	3.7	0.0
6/25/11 10:00	30.5	21.0	10.5	40.5	3.8	0.0

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/25/11 11:00	30.7	21.4	10.6	37.1	3.7	0.0
6/25/11 12:00	30.8	24.0	10.6	36.8	3.6	0.0
6/25/11 13:00	31.0	25.0	10.6	34.1	3.4	0.0
6/25/11 14:00	30.6	26.1	10.5	51.5	3.1	0.0
6/25/11 15:00	29.0	25.8	10.7	68.7	3.4	0.0
6/25/11 16:00	29.1	24.4	10.9	56.1	3.5	0.0
6/25/11 17:00	28.8	23.8	10.9	44.9	3.5	0.0
6/25/11 18:00	28.8	24.1	10.8	57.4	3.4	0.0
6/25/11 19:00	28.6	22.6	10.5	45.0	3.1	0.1
6/25/11 20:00	28.2	19.5	10.1	43.5	3.1	0.1
6/25/11 21:00	28.6	20.7	10.1	41.6	3.2	0.1
6/25/11 22:00	28.5	24.2	10.3	42.7	3.1	0.0
6/25/11 23:00	28.2	25.9	10.2	46.3	3.3	0.0
6/26/11 0:00	28.0	24.5	10.2	43.5	3.3	0.2
6/26/11 1:00	28.1	22.3	10.4	43.9	3.3	0.1
6/26/11 2:00	27.4	21.3	10.4	42.6	3.1	0.1
6/26/11 3:00	26.9	22.2	10.4	45.6	3.1	0.1
6/26/11 4:00	26.8	22.3	10.3	42.5	3.2	0.1
6/26/11 5:00	26.5	21.8	10.2	42.6	3.1	0.0
6/26/11 6:00	26.8	20.2	10.4	41.3	3.2	0.1
6/26/11 7:00	27.0	20.2	10.4	38.1	3.4	0.0
6/26/11 8:00	26.9	21.2	10.6	41.1	3.2	0.0
6/26/11 9:00	26.7	24.1	10.7	41.4	3.2	0.1
6/26/11 10:00	27.2	24.4	10.6	43.0	3.2	0.0
6/26/11 11:00	27.1	24.2	10.7	41.8	3.2	0.0
6/26/11 12:00	27.3	24.5	10.8	42.1	3.4	0.0
6/26/11 13:00	26.6	23.7	10.5	37.6	3.3	0.0
6/26/11 14:00	27.4	24.0	10.3	44.3	3.1	0.0
6/26/11 15:00	27.6	23.6	10.6	61.4	2.8	0.0
6/26/11 16:00	28.1	19.9	10.4	51.0	2.8	0.0
6/26/11 17:00	27.8	20.7	10.4	47.5	2.8	0.0
6/26/11 18:00	27.5	21.2	10.6	48.0	2.5	0.0
6/26/11 19:00	26.9	21.6	10.6	48.8	2.8	0.0
6/26/11 20:00	27.1	20.8	10.6	43.7	2.8	0.0
6/26/11 21:00	27.1	21.2	10.8	46.1	2.7	0.0
6/26/11 22:00	27.3	21.6	10.9	46.0	2.8	0.2
6/26/11 23:00	27.3	21.7	11.0	48.3	2.8	0.6
6/27/11 0:00	27.0	20.7	11.0	45.9	2.8	0.6
6/27/11 1:00	27.3	19.7	11.1	46.5	2.8	0.6
6/27/11 2:00	27.4	18.3	11.0	46.2	3.1	0.6
6/27/11 3:00	27.6	18.2	10.8	40.5	3.4	0.7
6/27/11 4:00	27.4	19.2	10.6	40.6	3.4	0.7
6/27/11 5:00	27.7	20.2	10.7	43.2	3.3	0.7
6/27/11 6:00	25.8	20.2	10.7	39.2	3.4	0.7
6/27/11 7:00	25.6	20.1	10.8	45.5	3.6	0.7
6/27/11 8:00	26.4	20.4	11.0	51.2	3.4	0.7
6/27/11 9:00	28.2	21.4	11.0	53.5	3.4	0.6
6/27/11 10:00	28.7	20.5	11.0	48.5	3.5	0.7
6/27/11 11:00	27.7	19.7	11.1	45.2	3.5	0.7
6/27/11 12:00	27.2	17.7	10.9	40.0	3.6	0.7
6/27/11 13:00	28.0	18.4	10.6	40.3	3.7	0.7
6/27/11 14:00	27.4	20.8	10.9	51.4	3.5	0.7
6/27/11 15:00	29.1	22.1	10.9	46.8	3.4	0.6
6/27/11 16:00	28.4	21.8	10.9	46.0	3.5	0.7
6/27/11 17:00	29.5	21.2	11.0	48.0	3.3	0.6

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/27/11 18:00	28.1	21.1	11.0	50.9	3.4	0.7
6/27/11 19:00	28.6	21.0	11.1	47.4	3.5	0.7
6/27/11 20:00	28.0	20.6	11.1	51.7	3.8	0.8
6/27/11 21:00	29.2	20.3	11.2	52.2	3.7	0.7
6/27/11 22:00	31.7	18.0	10.9	42.5	3.5	0.6
6/27/11 23:00	30.6	18.1	10.6	35.8	3.1	0.5
6/28/11 0:00	30.7	19.7	10.9	68.2	2.5	0.1
6/28/11 1:00	31.1	20.9	10.7	57.5	3.3	0.6
6/28/11 2:00	30.4	21.4	10.8	49.8	3.3	0.6
6/28/11 3:00	30.0	20.8	10.9	47.4	3.0	0.6
6/28/11 4:00	30.8	21.3	10.9	46.6	3.0	0.5
6/28/11 5:00	30.7	21.2	10.8	48.0	3.1	0.6
6/28/11 6:00	30.1	20.6	10.9	48.1	3.0	0.6
6/28/11 7:00	30.3	20.6	11.2	54.6	2.8	0.6
6/28/11 8:00	29.6	19.3	11.1	52.8	2.5	0.6
6/28/11 9:00	30.0	20.1	11.0	51.2	2.6	0.6
6/28/11 10:00	30.8	22.9	11.1	53.6	2.8	0.6
6/28/11 11:00	31.0	23.7	11.2	54.7	2.9	0.6
6/28/11 12:00	30.7	22.8	10.7	48.5	3.7	0.6
6/28/11 13:00	31.6	22.3	10.6	47.0	3.8	0.7
6/28/11 14:00	29.9	22.7	10.6	47.3	3.4	0.6
6/28/11 15:00	31.2	22.5	10.8	48.9	3.4	0.6
6/28/11 16:00	30.8	22.4	10.9	46.9	3.4	0.6
6/28/11 17:00	29.0	22.8	10.7	44.0	3.3	0.6
6/28/11 18:00	31.0	20.4	10.7	45.2	3.3	0.6
6/28/11 19:00	28.5	20.4	10.5	42.9	3.5	0.6
6/28/11 20:00	30.8	21.6	10.8	44.8	3.4	0.6
6/28/11 21:00	30.1	24.2	10.9	45.1	3.3	0.6
6/28/11 22:00	29.6	24.7	10.8	44.6	3.4	0.6
6/28/11 23:00	32.0	22.0	10.9	46.5	3.5	0.6
6/29/11 0:00	32.0	19.3	10.7	43.1	3.5	0.6
6/29/11 1:00	32.2	18.9	10.7	43.9	3.5	0.6
6/29/11 2:00	33.1	18.8	10.7	42.5	3.6	0.6
6/29/11 3:00	32.6	18.6	10.6	39.9	3.6	0.6
6/29/11 4:00	32.2	18.4	10.6	35.3	3.5	0.6
6/29/11 5:00	32.1	18.5	10.7	22.1	3.5	0.6
6/29/11 6:00	32.1	18.7	10.6	26.8	3.5	0.6
6/29/11 7:00	31.0	18.4	10.6	17.8	3.5	0.6
6/29/11 8:00	32.4	18.4	11.1	32.4	3.4	0.6
6/29/11 9:00	31.9	17.8	10.9	27.7	3.4	0.6
6/29/11 10:00	32.3	18.0	10.9	34.2	3.4	0.6
6/29/11 11:00	32.5	19.1	10.9	31.1	3.4	0.5
6/29/11 12:00	31.8	20.2	10.9	32.9	3.5	0.4
6/29/11 13:00	32.0	21.2	11.1	33.9	3.3	0.3
6/29/11 14:00	32.0	21.0	11.3	40.8	3.4	0.6
6/29/11 15:00	31.7	20.8	11.0	40.8	3.4	0.6
6/29/11 16:00	30.6	19.8	10.9	41.2	3.5	0.7
6/29/11 17:00	30.1	18.5	10.7	41.0	3.6	0.6
6/29/11 18:00	30.5	18.2	10.8	42.3	3.7	0.6
6/29/11 19:00	31.1	17.6	10.8	40.3	3.7	0.3
6/29/11 20:00	30.9	17.7	10.7	38.1	3.7	0.2
6/29/11 21:00	31.1	14.8	10.8	50.6	3.6	0.4
6/29/11 22:00	30.7	16.6	10.5	43.9	3.6	0.4
6/29/11 23:00	30.9	17.7	10.6	45.4	3.5	0.5
6/30/11 0:00	31.4	18.4	11.1	53.2	3.5	0.4

	74FI5008.PV -	8500FI6052.PV	3302FI0651.F	3302FI0080.PV -	0920FI0121.PV -	1100FI0036.PV - Average
Timestamp	MMSCFD	MMSCFD	MMSCFD	MMSCFD	MMCFD	MMCFD
6/30/11 1:00	31.0	20.5	10.9	47.0	3.6	0.6
6/30/11 2:00	30.4	20.5	10.8	69.3	3.5	0.6
6/30/11 3:00	31.2	19.9	10.8	61.6	3.7	0.7
6/30/11 4:00	31.0	19.8	10.8	52.8	3.8	0.8
6/30/11 5:00	30.9	20.5	10.8	46.8	3.7	0.7
6/30/11 6:00	30.9	20.4	10.8	46.3	3.8	0.8
6/30/11 7:00	31.4	18.1	10.8	47.1	3.7	0.8
6/30/11 8:00	31.3	16.6	10.8	44.3	4.2	0.7
6/30/11 9:00	32.9	15.7	10.7	55.4	4.4	0.8
6/30/11 10:00	33.9	14.7	10.6	55.8	4.2	0.8
6/30/11 11:00	33.9	13.9	10.4	49.7	3.7	0.8
6/30/11 12:00	34.6	13.2	10.5	48.5	3.8	0.8
6/30/11 13:00	32.8	13.6	10.3	47.4	3.8	0.8
6/30/11 14:00	34.7	13.6	10.2	47.7	3.7	0.8
6/30/11 15:00	33.2	13.3	10.2	46.1	3.7	0.8
6/30/11 16:00	34.0	11.5	10.4	48.7	3.8	0.7
6/30/11 17:00	34.4	7.1	10.3	48.1	4.0	0.8
6/30/11 18:00	33.9	5.8	10.1	47.9	4.1	0.8
6/30/11 19:00	33.4	4.7	9.9	47.4	4.2	0.8
6/30/11 20:00	31.6	3.7	9.7	46.9	4.2	0.9
6/30/11 21:00	32.3	6.0	9.7	46.6	4.2	0.9
6/30/11 22:00	33.2	5.9	9.7	48.8	4.2	0.9
6/30/11 23:00	34.1	5.8	9.9	47.7	4.1	0.8

APPENDIX C

LABORATORY CHAINS OF CUSTODY AND LABORATORY DATA

APPENDIX C.1

LABORATORY DATA

METHOD 30B – SPECIATED MERCURY

AuraScientific

Chuck Duncan
Entec
30 Monroe Drive
Pelham, Alabama 35124
Telephone (919) 244-7777
Email: cduncan@entecservices.com

Dear Mr. Duncan,

Attached are the results of the recent Method 30B Hg testing your company performed for Hovensa. The analytical results were obtained using the thermal desorption technique with an Ohio Lumex analyzer with M-324 furnace attachment. The data for runs 1-3 are shown on the following pages. All of the runs passed the second section percent breakthrough and paired train agreement QA/QC requirements. In addition, all three runs passed the field recovery criteria defined in the Speciated Method 30B Standard Operating Procedure (SOP) approved by the EPA. If you have any questions or concerns please do not hesitate to call me or contact me by e-mail.

Sincerely,

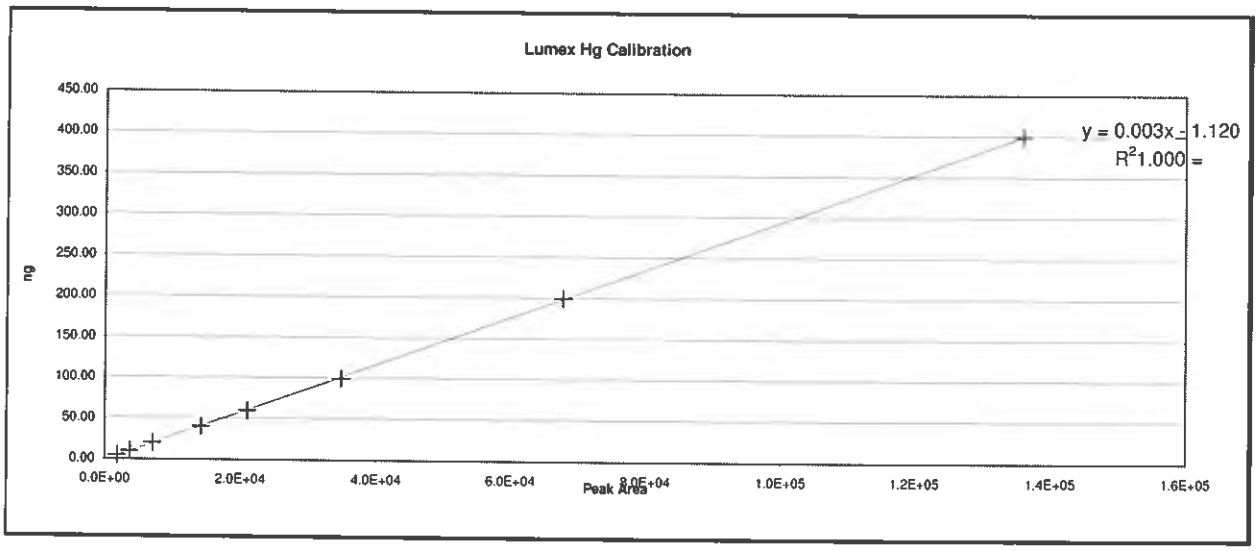
Robert Keeney

Robert Keeney
President
Aura-Scientific, LLC
2481 Reliance Avenue
Apex, NC 27539
Direct: (919) 387-0090
Cell: (919) 265-4721
Fax: (919) 387-6611
Email: rkeeney@aura-scientific.com

AuraScientific

KCL Calibration Curve

Slope:	2.95E-03	MDL (ng)	Temp. Profile #	1	Response Factor 0.00276
Intercept:	-1.32		Air Flow (l/min)	1	
R^2:	1.0000				
Station Unit (s)		Entec Hovensa			

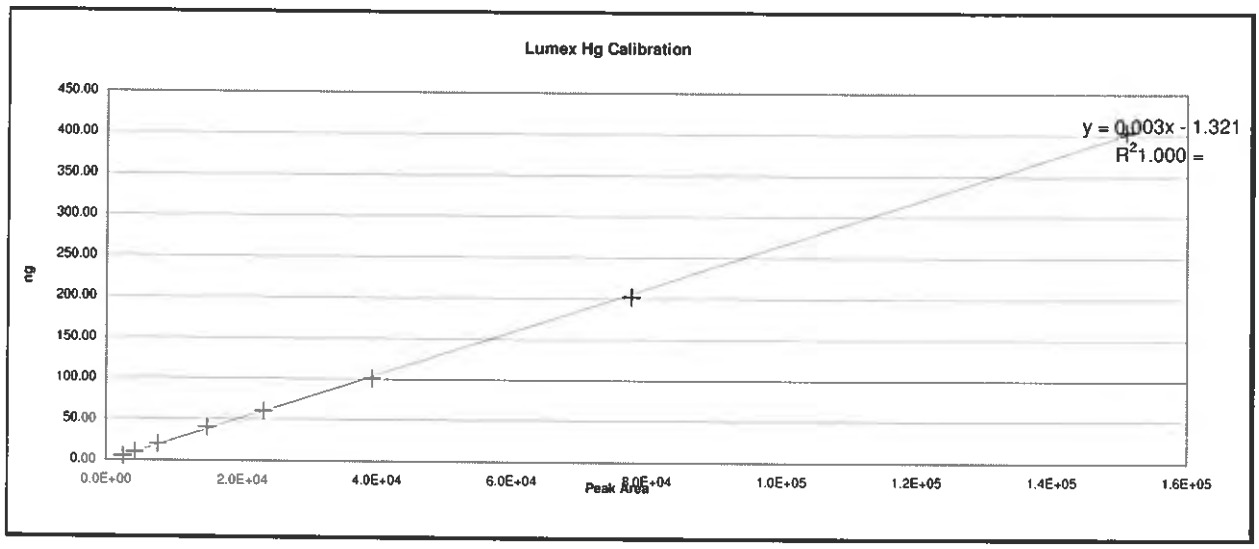


Analysis #	Trap #	Fraction	Known ng	Peak Area	ng	% Recovery
1			5.02	1,820	4.0	80.6%
2			10.03	3,690	9.6	95.2%
3			20.07	7,010	19.3	96.4%
4			40.13	14,200	40.5	101.0%
5			60.20	21,000	60.6	100.6%
6			99.85	34,800	101.3	101.4%
7			199.70	67,800	198.5	99.4%
8			399.41	136,000	399.6	100.0%

AuraScientific

Carbon Calibration Curve

Slope:	2.67E-03	MDL (ng)	Temp. Profile #	1	Response Factor 0.00205
Intercept:	-1.27		Air Flow (l/min)	1	
R^2:	0.9997				
Station Unit (s)		Entec Hovensa			



Analysis #	Trap #	Fraction	Known ng	Peak Area	ng	% Recovery
1			5.06	2,470	5.3	105.2%
2			10.12	4,190	9.9	97.9%
3			20.25	7,610	19.0	94.0%
4			40.49	14,800	38.2	94.4%
5			60.74	23,100	60.4	99.4%
6			101.01	39,200	103.3	102.3%
7			202.01	77,700	206.1	102.0%
8			404.03	151,000	401.7	99.4%

AuraScientific

Client	Entec - Hovensa	Spike Level (ng)	50
Station			
Unit (s)	1		
Analyzer Used	Ohio Lumex		

CCV		
	min	92.8%
	max	107.3%

Sampling Date	Analysis Date	Analysis #	Sample ID: Facility ID	Sample ID: Unit/Stack #	Sample ID: Sample #	Trap #	Fraction	Known ng	Peak Area	ng	% Recovery	Trap Total ng	% Breakthrough	Sample Volume (Std L)	Hg Conc (µg/dscm)	% Oxidized	Average Hg Conc (µg/dscm)	C_{rec}	Spike Recovery %	Pair %D
		9				ICV (KCL)		61.27	20,000	57.6	94.1%									
		10				ICV (carbon)		61.27	24,100	63.0	102.9%									
		11				CCV (KCL)		60.20	20,200	58.2	96.7%									
		12				CCV (carbon)		60.74	22,400	58.5	96.3%									
6/15/2011	7/26/2011	13	Hovensa	Unit	1	1-A	AU 014067	Section 1		554	1.5		1.8	15.3%	55.71	0.31	10.4%	0.34	0.96	107.5%	9.96
		14						Section 2		85	0.2										
		15						Section 3		5,870	14.4		15.2	5.8%							
		16						Section 4		408	0.8										
6/15/2011	7/26/2011	17	Hovensa	Unit	1	1-B	AU 011367	Section 1		26,700	70.0		70.8	1.2%	55.91	0.37	NA				
		18						Section 2		414	0.8										
		19				CCV (KCL)		60.20	19,400	55.9	92.8%									
		20				CCV (carbon)		60.74	24,900	65.2	107.3%									
6/15/2011	7/26/2011	21	Hovensa	Unit	1	2-A	AU 014085	Section 1		583	1.6		1.8	14.2%	56.48	0.33	9.7%	0.36	0.93	104.6%	5.71
		22						Section 2		83	0.2										
		23						Section 3		6,520	16.1		17.1	5.9%							
		24						Section 4		462	0.9										
6/15/2011	7/26/2011	25	Hovensa	Unit	1	2-B	AU 009342	Section 1		26,600	69.7		71.2	2.1%	56.34	0.38	NA				
		26						Section 2		701	1.4										
		27				CCV (KCL)		60.20	20,100	57.9	96.2%									
		28				CCV (carbon)		60.74	22,100	57.7	95.0%									
6/15/2011	7/26/2011	29	Hovensa	Unit	1	3-A	AU 013960	Section 1		521	1.4		1.6	13.6%	55.80	0.30	9.7%	0.35	1.00	110.5%	13.68
		30						Section 2		71	0.2										
		31						Section 3		5,780	14.2		15.1	7.0%							
		32						Section 4		484	1.0										
6/15/2011	7/26/2011	33	Hovensa	Unit	1	3-B	AU 011220	Section 1		26,700	70.0		71.9	2.7%	55.25	0.40	NA				
		34						Section 2		926	1.9										
		35				CCV (KCL)		60.20	20,000	57.6	95.7%									
		36				CCV (carbon)		60.74	22,000	57.4	94.6%									

Analyst: Robert Keeney Date 7/26/2011

APPENDIX C.2

LABORATORY DATA

METHOD 0010 – SPECIATED SEMI-VOLATILE ORGANIC HAPS

Entec Services, Inc.

9420 Holly Springs Rd
Apex, NC 27539

Hovensa - FCCU Stack
St Croix, US VI
Project# 511150

Analytical Report
(0611-36)

EPA SW-846 Method 8270C
19 PAHs-Selective Ion Mode
SW-846 Method 8270C - SCAN Mode

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

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

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 35 pages.

Valgena Respass

QA Review Performed by – Valgena Respass

Report Issued: 07/19/2011

Results
(Scan)

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 1 *50**
Data File: W1101388.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
N-Nitrosodimethylamine	74	NA	0	0.772	193	ND
Pyridine	79	NA	0	10.5	2,630	ND
Phenol (CCC)	94	5.85	773,155	114	28,524	
Aniline	66	5.94	29,667	9.08	2,271	
bis(2-Chloroethyl)ether	63	NA	0	0.788	197	ND
2-Chlorophenol	128	NA	0	0.624	156	ND
1,3-Dichlorobenzene	146	NA	0	0.558	140	ND
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	132	ND
Benzyl alcohol	108	NA	0	0.700	175	ND
1,2-Dichlorobenzene	146	NA	0	0.558	139	ND
2-Methylphenol	107	6.44	220,406	49.0	12,251	
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	245	ND
3/4-Methylphenol	107	6.60	410,831	75.2	18,790	
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	208	ND
o-Toluidine	106	6.71	15,262	1.83	458	J
Hexachloroethane	117	NA	0	0.632	158	ND
Nitrobenzene	77	NA	0	0.816	204	ND
Isophorone	82	NA	0	0.748	187	ND
2,4-Dimethylphenol	107	7.25	42,867	6.80	1,700	
2-Nitrophenol (CCC)	139	7.27	13,871	4.99	1,248	J
Benzoic acid	105	NA	0	11.6	2,889	ND
bis(2-Chloroethoxy)methane	93	NA	0	0.732	183	ND
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	163	ND
a,a-Dimethylphenethylamine	58	NA	0	5.00	1,250	ND
1,2,4-Trichlorobenzene	180	NA	0	0.617	154	ND
4-Chloroaniline	65	NA	0	0.849	212	ND
Hexachlorobutadiene (CCC)	225	NA	0	0.609	152	ND
Quinoline	129	NA	0	1.00	250	ND
1,4-Phenylenediamine	108	NA	0	5.00	1,250	ND
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	165	ND
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	2,030	ND
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	185	ND
2,4,5-Trichlorophenol	196	NA	0	0.541	135	ND
Biphenyl	154	NA	0	1.00	250	ND
2-Chloronaphthalene	162	NA	0	0.652	163	ND
2-Nitroaniline	65	NA	0	0.966	241	ND
1,4-Dinitrobenzene	168	NA	0	0.672	168	ND
Dimethylphthalate	163	NA	0	0.809	202	ND
1,3-Dinitrobenzene	168	NA	0	0.819	205	ND
2,6-Dinitrotoluene	165	NA	0	0.775	194	ND
1,2-Dinitrobenzene	168	NA	0	0.777	194	ND
3-Nitroaniline	138	NA	0	0.816	204	ND
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	1,263	ND
4-Nitrophenol (SPCC)	139	NA	0	5.78	1,446	ND
2,4-Dinitrotoluene	165	NA	0	0.804	201	ND
Dibenzofuran	168	NA	0	0.688	172	ND
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	190	ND
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	175	ND
Diethlyphthalate	149	NA	0	1.02	255	ND
4-Chlorophenyl-phenylether	204	NA	0	0.754	189	ND

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 1 *50**
Data File: W1101388.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
4-Nitroaniline	138	NA	0	0.943	236	ND
4,6-Dinitro2-methylphenol	198	NA	0	5.16	1,291	ND
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	179	ND
Azobenzene	77	NA	0	0.991	248	ND
4-Bromophenyl-phenylether	248	NA	0	0.671	168	ND
Hexachlorobenzene	284	NA	0	0.546	136	ND
Pentachlorophenol (CCC)	266	NA	0	0.565	141	ND
Carbazole	167	NA	0	0.705	176	ND
Di-n-butylphthalate	149	NA	0	1.04	260	ND
Benzidine	184	NA	0	22.8	5,690	ND
4-Dimethylaminoazobenzene	120	NA	0	0.632	158	ND
Butylbenzylphthalate	149	NA	0	0.810	203	ND
3,3-Dimethylbenzidine	212	NA	0	10.8	2,697	ND
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	219	ND
3,3-Dimethoxybenzidine	244	NA	0	20.0	5,000	ND
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	435	ND
3,3'-Dichlorobenzidine	252	NA	0	9.36	2,341	ND
Di-n-octylphthalate (CCC)	149	NA	0	0.644	161	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.28	216,151	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	684,053	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	398,078	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	639,065	40.0	N/A		
Chrysene-d12 (I)	240	19.1	573,892	40.0	N/A		
Perylene-d12 (I)	264	21.8	215,779	40.0	N/A		

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	248,766	216,151	Pass
Naphthalene-d8 (I)	7.82	7.82	765,696	684,053	Pass
Acenaphthene-d10 (I)	10.76	10.75	437,214	398,078	Pass
Phenanthrene-d10 (I)	13.67	13.66	735,382	639,065	Pass
Chrysene-d12 (I)	19.08	19.07	646,166	573,892	Pass
Perylene-d12 (I)	21.82	21.81	424,083	215,779	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 2 *50**
Data File: W1101389.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
N-Nitrosodimethylamine	74	NA	0	0.772	193	ND
Pyridine	79	NA	0	10.5	2,630	ND
Phenol (CCC)	94	5.85	783,893	123	30,748	
Aniline	66	5.95	30,248	9.85	2,461	
bis(2-Chloroethyl)ether	63	NA	0	0.788	197	ND
2-Chlorophenol	128	NA	0	0.624	156	ND
1,3-Dichlorobenzene	146	NA	0	0.558	140	ND
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	132	ND
Benzyl alcohol	108	NA	0	0.700	175	ND
1,2-Dichlorobenzene	146	NA	0	0.558	139	ND
2-Methylphenol	107	6.44	218,896	51.7	12,936	
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	245	ND
3/4-Methylphenol	107	6.60	392,720	76.4	19,097	
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	208	ND
o-Toluidine	106	6.71	20,680	2.64	660	J
Hexachloroethane	117	NA	0	0.632	158	ND
Nitrobenzene	77	NA	0	0.816	204	ND
Isophorone	82	NA	0	0.748	187	ND
2,4-Dimethylphenol	107	7.25	57,911	10.3	2,566	
2-Nitrophenol (CCC)	139	7.28	14,771	5.94	1,485	
Benzoic acid	105	NA	0	11.6	2,889	ND
bis(2-Chloroethoxy)methane	93	NA	0	0.732	183	ND
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	163	ND
a,a-Dimethylphenethylamine	58	NA	0	5.00	1,250	ND
1,2,4-Trichlorobenzene	180	NA	0	0.617	154	ND
4-Chloroaniline	65	NA	0	0.849	212	ND
Hexachlorobutadiene (CCC)	225	NA	0	0.609	152	ND
Quinoline	129	NA	0	1.00	250	ND
1,4-Phenylenediamine	108	NA	0	5.00	1,250	ND
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	165	ND
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	2,030	ND
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	185	ND
2,4,5-Trichlorophenol	196	NA	0	0.541	135	ND
Biphenyl	154	NA	0	1.00	250	ND
2-Chloronaphthalene	162	NA	0	0.652	163	ND
2-Nitroaniline	65	NA	0	0.966	241	ND
1,4-Dinitrobenzene	168	NA	0	0.672	168	ND
Dimethylphthalate	163	NA	0	0.809	202	ND
1,3-Dinitrobenzene	168	NA	0	0.819	205	ND
2,6-Dinitrotoluene	165	NA	0	0.775	194	ND
1,2-Dinitrobenzene	168	NA	0	0.777	194	ND
3-Nitroaniline	138	NA	0	0.816	204	ND
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	1,263	ND
4-Nitrophenol (SPCC)	139	NA	0	5.78	1,446	ND
2,4-Dinitrotoluene	165	NA	0	0.804	201	ND
Dibenzofuran	168	NA	0	0.688	172	ND
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	190	ND
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	175	ND
Diethlyphthalate	149	NA	0	1.02	255	ND
4-Chlorophenyl-phenylether	204	NA	0	0.754	189	ND

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 2 *50**
Data File: W1101389.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
4-Nitroaniline	138	NA	0	0.943	236	ND
4,6-Dinitro2-methylphenol	198	NA	0	5.16	1,291	ND
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	179	ND
Azobenzene	77	NA	0	0.991	248	ND
4-Bromophenyl-phenylether	248	NA	0	0.671	168	ND
Hexachlorobenzene	284	NA	0	0.546	136	ND
Pentachlorophenol (CCC)	266	NA	0	0.565	141	ND
Carbazole	167	NA	0	0.705	176	ND
Di-n-butylphthalate	149	NA	0	1.04	260	ND
Benzidine	184	NA	0	22.8	5,690	ND
4-Dimethylaminoazobenzene	120	NA	0	0.632	158	ND
Butylbenzylphthalate	149	NA	0	0.810	203	ND
3,3-Dimethylbenzidine	212	NA	0	10.8	2,697	ND
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	219	ND
3,3-Dimethoxybenzidine	244	NA	0	20.0	5,000	ND
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	435	ND
3,3'-Dichlorobenzidine	252	NA	0	9.36	2,341	ND
Di-n-octylphthalate (CCC)	149	NA	0	0.644	161	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.28	203,300	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	612,293	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	344,196	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	561,920	40.0	N/A		
Chrysene-d12 (I)	240	19.1	468,124	40.0	N/A		
Perylene-d12 (I)	264	21.8	337,189	40.0	N/A		

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	248,766	203,300	Pass
Naphthalene-d8 (I)	7.82	7.82	765,696	612,293	Pass
Acenaphthene-d10 (I)	10.76	10.75	437,214	344,196	Pass
Phenanthrene-d10 (I)	13.67	13.66	735,382	561,920	Pass
Chrysene-d12 (I)	19.08	19.07	646,166	468,124	Pass
Perylene-d12 (I)	21.82	21.82	424,083	337,189	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 3 *50**
Data File: W1101390.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
N-Nitrosodimethylamine	74	NA	0	0.772	193	ND
Pyridine	79	NA	0	10.5	2,630	ND
Phenol (CCC)	94	5.85	835,532	86.9	21,735	
Aniline	66	5.95	30,660	6.62	1,655	
bis(2-Chloroethyl)ether	63	NA	0	0.788	197	ND
2-Chlorophenol	128	NA	0	0.624	156	ND
1,3-Dichlorobenzene	146	NA	0	0.558	140	ND
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	132	ND
Benzyl alcohol	108	NA	0	0.700	175	ND
1,2-Dichlorobenzene	146	NA	0	0.558	139	ND
2-Methylphenol	107	6.44	240,973	37.8	9,444	
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	245	ND
3/4-Methylphenol	107	6.60	438,600	56.6	14,144	
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	208	ND
o-Toluidine	106	6.71	16,390	1.39	347	J
Hexachloroethane	117	NA	0	0.632	158	ND
Nitrobenzene	77	NA	0	0.816	204	ND
Isophorone	82	NA	0	0.748	187	ND
2,4-Dimethylphenol	107	7.25	47,762	5.87	1,468	
2-Nitrophenol (CCC)	139	7.28	18,660	5.21	1,301	
Benzoic acid	105	NA	0	11.6	2,889	ND
bis(2-Chloroethoxy)methane	93	NA	0	0.732	183	ND
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	163	ND
a,a-Dimethylphenethylamine	58	NA	0	5.00	1,250	ND
1,2,4-Trichlorobenzene	180	NA	0	0.617	154	ND
4-Chloroaniline	65	NA	0	0.849	212	ND
Hexachlorobutadiene (CCC)	225	NA	0	0.609	152	ND
Quinoline	129	NA	0	1.00	250	ND
1,4-Phenylenediamine	108	NA	0	5.00	1,250	ND
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	165	ND
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	2,030	ND
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	185	ND
2,4,5-Trichlorophenol	196	NA	0	0.541	135	ND
Biphenyl	154	NA	0	1.00	250	ND
2-Chloronaphthalene	162	NA	0	0.652	163	ND
2-Nitroaniline	65	NA	0	0.966	241	ND
1,4-Dinitrobenzene	168	NA	0	0.672	168	ND
Dimethylphthalate	163	NA	0	0.809	202	ND
1,3-Dinitrobenzene	168	NA	0	0.819	205	ND
2,6-Dinitrotoluene	165	NA	0	0.775	194	ND
1,2-Dinitrobenzene	168	NA	0	0.777	194	ND
3-Nitroaniline	138	NA	0	0.816	204	ND
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	1,263	ND
4-Nitrophenol (SPCC)	139	NA	0	5.78	1,446	ND
2,4-Dinitrotoluene	165	NA	0	0.804	201	ND
Dibenzofuran	168	NA	0	0.688	172	ND
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	190	ND
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	175	ND
Diethlyphthalate	149	NA	0	1.02	255	ND
4-Chlorophenyl-phenylether	204	NA	0	0.754	189	ND

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 3 *50**
Data File: W1101390.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
4-Nitroaniline	138	NA	0	0.943	236	ND
4,6-Dinitro2-methylphenol	198	NA	0	5.16	1,291	ND
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	179	ND
Azobenzene	77	NA	0	0.991	248	ND
4-Bromophenyl-phenylether	248	NA	0	0.671	168	ND
Hexachlorobenzene	284	NA	0	0.546	136	ND
Pentachlorophenol (CCC)	266	NA	0	0.565	141	ND
Carbazole	167	NA	0	0.705	176	ND
Di-n-butylphthalate	149	NA	0	1.04	260	ND
Benzidine	184	NA	0	22.8	5,690	ND
4-Dimethylaminoazobenzene	120	NA	0	0.632	158	ND
Butylbenzylphthalate	149	NA	0	0.810	203	ND
3,3-Dimethylbenzidine	212	NA	0	10.8	2,697	ND
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	219	ND
3,3-Dimethoxybenzidine	244	NA	0	20.0	5,000	ND
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	435	ND
3,3'-Dichlorobenzidine	252	NA	0	9.36	2,341	ND
Di-n-octylphthalate (CCC)	149	NA	0	0.644	161	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.27	306,556	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	882,412	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	496,274	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	767,990	40.0	N/A		
Chrysene-d12 (I)	240	19.1	595,683	40.0	N/A		
Perylene-d12 (I)	264	21.8	404,562	40.0	N/A		

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.27	248,766	306,556	Pass
Naphthalene-d8 (I)	7.82	7.82	765,696	882,412	Pass
Acenaphthene-d10 (I)	10.76	10.75	437,214	496,274	Pass
Phenanthrene-d10 (I)	13.67	13.66	735,382	767,990	Pass
Chrysene-d12 (I)	19.08	19.07	646,166	595,683	Pass
Perylene-d12 (I)	21.82	21.82	424,083	404,562	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 3 LD *50**
Data File: W1101391.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	% Diff
N-Nitrosodimethylamine	74	NA	0	0.772	193	ND	0.0
Pyridine	79	NA	0	10.5	2,630	ND	0.0
Phenol (CCC)	94	5.85	698,029	91.5	22,886		5.3
Aniline	66	5.94	24,874	6.77	1,692		2.3
bis(2-Chloroethyl)ether	63	NA	0	0.788	197	ND	0.0
2-Chlorophenol	128	NA	0	0.624	156	ND	0.0
1,3-Dichlorobenzene	146	NA	0	0.558	140	ND	0.0
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	132	ND	0.0
Benzyl alcohol	108	NA	0	0.700	175	ND	0.0
1,2-Dichlorobenzene	146	NA	0	0.558	139	ND	0.0
2-Methylphenol	107	6.44	193,085	38.2	9,538		1.0
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	245	ND	0.0
3/4-Methylphenol	107	6.60	368,756	60.0	14,988		6.0
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	208	ND	0.0
o-Toluidine	106	6.71	14,052	1.50	375	J	8.1
Hexachloroethane	117	NA	0	0.632	158	ND	0.0
Nitrobenzene	77	NA	0	0.816	204	ND	0.0
Isophorone	82	NA	0	0.748	187	ND	0.0
2,4-Dimethylphenol	107	7.25	41,409	5.86	1,464		0.3
2-Nitrophenol (CCC)	139	7.28	14,388	4.62	1,154	J	11.3
Benzoic acid	105	NA	0	11.6	2,889	ND	0.0
bis(2-Chloroethoxy)methane	93	NA	0	0.732	183	ND	0.0
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	163	ND	0.0
a,a-Dimethylphenethylamine	58	NA	0	5.00	1,250	ND	0.0
1,2,4-Trichlorobenzene	180	NA	0	0.617	154	ND	0.0
4-Chloroaniline	65	NA	0	0.849	212	ND	0.0
Hexachlorobutadiene (CCC)	225	NA	0	0.609	152	ND	0.0
Quinoline	129	NA	0	1.00	250	ND	0.0
1,4-Phenylenediamine	108	NA	0	5.00	1,250	ND	0.0
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	165	ND	0.0
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	2,030	ND	0.0
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	185	ND	0.0
2,4,5-Trichlorophenol	196	NA	0	0.541	135	ND	0.0
Biphenyl	154	NA	0	1.00	250	ND	0.0
2-Chloronaphthalene	162	NA	0	0.652	163	ND	0.0
2-Nitroaniline	65	NA	0	0.966	241	ND	0.0
1,4-Dinitrobenzene	168	NA	0	0.672	168	ND	0.0
Dimethylphthalate	163	NA	0	0.809	202	ND	0.0
1,3-Dinitrobenzene	168	NA	0	0.819	205	ND	0.0
2,6-Dinitrotoluene	165	NA	0	0.775	194	ND	0.0
1,2-Dinitrobenzene	168	NA	0	0.777	194	ND	0.0
3-Nitroaniline	138	NA	0	0.816	204	ND	0.0
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	1,263	ND	0.0
4-Nitrophenol (SPCC)	139	NA	0	5.78	1,446	ND	0.0
2,4-Dinitrotoluene	165	NA	0	0.804	201	ND	0.0
Dibenzofuran	168	NA	0	0.688	172	ND	0.0
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	190	ND	0.0
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	175	ND	0.0
Diethlyphthalate	149	NA	0	1.02	255	ND	0.0
4-Chlorophenyl-phenylether	204	NA	0	0.754	189	ND	0.0

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **RUN 3 LD *50**
Data File: W1101391.D
Tank/Misc ID: 0611-36

DF: 50
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	% Diff
4-Nitroaniline	138	NA	0	0.943	236	ND	0.0
4,6-Dinitro2-methylphenol	198	NA	0	5.16	1,291	ND	0.0
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	179	ND	0.0
Azobenzene	77	NA	0	0.991	248	ND	0.0
4-Bromophenyl-phenylether	248	NA	0	0.671	168	ND	0.0
Hexachlorobenzene	284	NA	0	0.546	136	ND	0.0
Pentachlorophenol (CCC)	266	NA	0	0.565	141	ND	0.0
Carbazole	167	NA	0	0.705	176	ND	0.0
Di-n-butylphthalate	149	NA	0	1.04	260	ND	0.0
Benzidine	184	NA	0	22.8	5,690	ND	0.0
4-Dimethylaminoazobenzene	120	NA	0	0.632	158	ND	0.0
Butylbenzylphthalate	149	NA	0	0.810	203	ND	0.0
3,3-Dimethylbenzidine	212	NA	0	10.8	2,697	ND	0.0
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	219	ND	0.0
3,3-Dimethoxybenzidine	244	NA	0	20.0	5,000	ND	0.0
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	435	ND	0.0
3,3'-Dichlorobenzidine	252	NA	0	9.36	2,341	ND	0.0
Di-n-octylphthalate (CCC)	149	NA	0	0.644	161	ND	0.0

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.27	243,221	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	767,298	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	437,049	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	696,255	40.0	N/A		
Chrysene-d12 (I)	240	19.1	529,601	40.0	N/A		
Perylene-d12 (I)	264	21.8	345,855	40.0	N/A		

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.27	248,766	243,221	Pass
Naphthalene-d8 (I)	7.82	7.82	765,696	767,298	Pass
Acenaphthene-d10 (I)	10.76	10.75	437,214	437,049	Pass
Phenanthrene-d10 (I)	13.67	13.66	735,382	696,255	Pass
Chrysene-d12 (I)	19.08	19.07	646,166	529,601	Pass
Perylene-d12 (I)	21.82	21.82	424,083	345,855	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **FIELD BLANK**
Data File: W1101371.D
Tank/Misc ID: 0611-36

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
N-Nitrosodimethylamine	74	NA	0	0.772	3.86	ND
Pyridine	79	NA	0	10.5	52.6	ND
Phenol (CCC)	94	NA	0	0.649	3.25	ND
Aniline	66	NA	0	0.694	3.47	ND
bis(2-Chloroethyl)ether	63	NA	0	0.788	3.94	ND
2-Chlorophenol	128	NA	0	0.624	3.12	ND
1,3-Dichlorobenzene	146	NA	0	0.558	2.79	ND
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	2.64	ND
Benzyl alcohol	108	NA	0	0.700	3.50	ND
1,2-Dichlorobenzene	146	NA	0	0.558	2.79	ND
2-Methylphenol	107	NA	0	0.677	3.39	ND
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	4.91	ND
3/4-Methylphenol	107	NA	0	0.591	2.95	ND
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	4.16	ND
o-Toluidine	106	NA	0	0.966	4.83	ND
Hexachloroethane	117	NA	0	0.632	3.16	ND
Nitrobenzene	77	NA	0	0.816	4.08	ND
Isophorone	82	NA	0	0.748	3.74	ND
2,4-Dimethylphenol	107	NA	0	0.729	3.64	ND
2-Nitrophenol (CCC)	139	NA	0	0.669	3.35	ND
Benzoic acid	105	NA	0	11.6	57.8	ND
bis(2-Chloroethoxy)methane	93	NA	0	0.732	3.66	ND
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	3.26	ND
a,a-Dimethylphenethylamine	58	NA	0	5.00	25.0	ND
1,2,4-Trichlorobenzene	180	NA	0	0.617	3.09	ND
4-Chloroaniline	65	NA	0	0.849	4.24	ND
Hexachlorobutadiene (CCC)	225	NA	0	0.609	3.05	ND
Quinoline	129	NA	0	1.00	5.00	ND
1,4-Phenylenediamine	108	NA	0	5.00	25.0	ND
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	3.31	ND
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	40.6	ND
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	3.69	ND
2,4,5-Trichlorophenol	196	NA	0	0.541	2.70	ND
Biphenyl	154	NA	0	1.00	5.00	ND
2-Chloronaphthalene	162	NA	0	0.652	3.26	ND
2-Nitroaniline	65	NA	0	0.966	4.83	ND
1,4-Dinitrobenzene	168	NA	0	0.672	3.36	ND
Dimethylphthalate	163	NA	0	0.809	4.05	ND
1,3-Dinitrobenzene	168	NA	0	0.819	4.09	ND
2,6-Dinitrotoluene	165	NA	0	0.775	3.88	ND
1,2-Dinitrobenzene	168	NA	0	0.777	3.89	ND
3-Nitroaniline	138	NA	0	0.816	4.08	ND
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	25.3	ND
4-Nitrophenol (SPCC)	139	NA	0	5.78	28.9	ND
2,4-Dinitrotoluene	165	NA	0	0.804	4.02	ND
Dibenzofuran	168	NA	0	0.688	3.44	ND
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	3.80	ND
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	3.50	ND
Diethlyphthalate	149	NA	0	1.02	5.10	ND
4-Chlorophenyl-phenylether	204	NA	0	0.754	3.77	ND

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **FIELD BLANK**
Data File: W1101371.D
Tank/Misc ID: 0611-36

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
4-Nitroaniline	138	NA	0	0.943	4.72	ND
4,6-Dinitro2-methylphenol	198	NA	0	5.16	25.8	ND
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	3.58	ND
Azobenzene	77	NA	0	0.991	4.96	ND
4-Bromophenyl-phenylether	248	NA	0	0.671	3.35	ND
Hexachlorobenzene	284	NA	0	0.546	2.73	ND
Pentachlorophenol (CCC)	266	NA	0	0.565	2.83	ND
Carbazole	167	NA	0	0.705	3.53	ND
Di-n-butylphthalate	149	NA	0	1.04	5.19	ND
Benzidine	184	NA	0	22.8	114	ND
4-Dimethylaminoazobenzene	120	NA	0	0.632	3.16	ND
Butylbenzylphthalate	149	NA	0	0.810	4.05	ND
3,3-Dimethylbenzidine	212	NA	0	10.8	53.9	ND
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	4.37	ND
3,3-Dimethoxybenzidine	244	NA	0	20.0	100	ND
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	8.71	ND
3,3'-Dichlorobenzidine	252	NA	0	9.36	46.8	ND
Di-n-octylphthalate (CCC)	149	NA	0	0.644	3.22	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.28	276,100	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	827,946	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	477,264	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	756,370	40.0	N/A		
Chrysene-d12 (I)	240	19.1	541,957	40.0	N/A		
Perylene-d12 (I)	264	21.8	333,942	40.0	N/A		
2-Fluorophenol (surr)	112	5.13	127,318	16.6	82.9	100	PASS
Phenol-d5 (surr)	99	5.83	142,366	17.1	85.3	100	PASS
Nitrobenzene-d5 (surr)	82	6.86	145,236	17.8	89.1	100	PASS
2-Fluorobiphenyl (surr)	172	9.49	311,593	19.3	96.6	100	PASS
Fluorene-d10 (surr)	176	11.7	4,568	0.367	91.9	2.00	PASS
2,4,6-Tribromophenol (surr)	330	12.3	26,165	17.3	86.3	100	PASS
Pyrene-d10 (surr)	212	16.6	6,456	0.360	90.0	2.00	PASS
Terphenyl-d14 (surr)	244	16.9	273,986	21.3	107	100	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	331,601	276,100	Pass
Naphthalene-d8 (I)	7.82	7.82	969,513	827,946	Pass
Acenaphthene-d10 (I)	10.76	10.75	590,916	477,264	Pass
Phenanthrene-d10 (I)	13.67	13.67	1,041,770	756,370	Pass
Chrysene-d12 (I)	19.08	19.07	810,271	541,957	Pass
Perylene-d12 (I)	21.83	21.82	504,075	333,942	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 MB**
Data File: W1101370.D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
N-Nitrosodimethylamine	74	NA	0	0.772	3.86	ND
Pyridine	79	NA	0	10.5	52.6	ND
Phenol (CCC)	94	NA	0	0.649	3.25	ND
Aniline	66	NA	0	0.694	3.47	ND
bis(2-Chloroethyl)ether	63	NA	0	0.788	3.94	ND
2-Chlorophenol	128	NA	0	0.624	3.12	ND
1,3-Dichlorobenzene	146	NA	0	0.558	2.79	ND
1,4-Dichlorobenzene (CCC)	146	NA	0	0.528	2.64	ND
Benzyl alcohol	108	NA	0	0.700	3.50	ND
1,2-Dichlorobenzene	146	NA	0	0.558	2.79	ND
2-Methylphenol	107	NA	0	0.677	3.39	ND
bis(2-Chloroisopropyl) ether	45	NA	0	0.982	4.91	ND
3/4-Methylphenol	107	NA	0	0.591	2.95	ND
N-Nitroso-di-n-propylamine (SPCC)	70	NA	0	0.832	4.16	ND
o-Toluidine	106	NA	0	0.966	4.83	ND
Hexachloroethane	117	NA	0	0.632	3.16	ND
Nitrobenzene	77	NA	0	0.816	4.08	ND
Isophorone	82	NA	0	0.748	3.74	ND
2,4-Dimethylphenol	107	NA	0	0.729	3.64	ND
2-Nitrophenol (CCC)	139	NA	0	0.669	3.35	ND
Benzoic acid	105	NA	0	11.6	57.8	ND
bis(2-Chloroethoxy)methane	93	NA	0	0.732	3.66	ND
2,4-Dichlorophenol (CCC)	162	NA	0	0.652	3.26	ND
a,a-Dimethylphenethylamine	58	NA	0	5.00	25.0	ND
1,2,4-Trichlorobenzene	180	NA	0	0.617	3.09	ND
4-Chloroaniline	65	NA	0	0.849	4.24	ND
Hexachlorobutadiene (CCC)	225	NA	0	0.609	3.05	ND
Quinoline	129	NA	0	1.00	5.00	ND
1,4-Phenylenediamine	108	NA	0	5.00	25.0	ND
4-Chloro-3 methylphenol (CCC)	107	NA	0	0.661	3.31	ND
Hexachlorocyclopentadiene (SPCC)	237	NA	0	8.12	40.6	ND
2,4,6-Trichlorophenol (CCC)	196	NA	0	0.738	3.69	ND
2,4,5-Trichlorophenol	196	NA	0	0.541	2.70	ND
Biphenyl	154	NA	0	1.00	5.00	ND
2-Chloronaphthalene	162	NA	0	0.652	3.26	ND
2-Nitroaniline	65	NA	0	0.966	4.83	ND
1,4-Dinitrobenzene	168	NA	0	0.672	3.36	ND
Dimethylphthalate	163	NA	0	0.809	4.05	ND
1,3-Dinitrobenzene	168	NA	0	0.819	4.09	ND
2,6-Dinitrotoluene	165	NA	0	0.775	3.88	ND
1,2-Dinitrobenzene	168	NA	0	0.777	3.89	ND
3-Nitroaniline	138	NA	0	0.816	4.08	ND
2,4-Dinitrophenol (SPCC)	184	NA	0	5.05	25.3	ND
4-Nitrophenol (SPCC)	139	NA	0	5.78	28.9	ND
2,4-Dinitrotoluene	165	NA	0	0.804	4.02	ND
Dibenzofuran	168	NA	0	0.688	3.44	ND
2,3,5,6-Tetrachlorophenol	232	NA	0	0.761	3.80	ND
2,3,4,6-Tetrachlorophenol	232	NA	0	0.701	3.50	ND
Diethlyphthalate	149	NA	0	1.02	5.10	ND
4-Chlorophenyl-phenylether	204	NA	0	0.754	3.77	ND

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 MB**
Data File: W1101370.D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags
4-Nitroaniline	138	NA	0	0.943	4.72	ND
4,6-Dinitro2-methylphenol	198	NA	0	5.16	25.8	ND
N-Nitrosodiphenylamine (CCC)	169	NA	0	0.716	3.58	ND
Azobenzene	77	NA	0	0.991	4.96	ND
4-Bromophenyl-phenylether	248	NA	0	0.671	3.35	ND
Hexachlorobenzene	284	NA	0	0.546	2.73	ND
Pentachlorophenol (CCC)	266	NA	0	0.565	2.83	ND
Carbazole	167	NA	0	0.705	3.53	ND
Di-n-butylphthalate	149	NA	0	1.04	5.19	ND
Benzidine	184	NA	0	22.8	114	ND
4-Dimethylaminoazobenzene	120	NA	0	0.632	3.16	ND
Butylbenzylphthalate	149	NA	0	0.810	4.05	ND
3,3-Dimethylbenzidine	212	NA	0	10.8	53.9	ND
bis(2-Ethylhexyl)adipate	129	NA	0	0.874	4.37	ND
3,3-Dimethoxybenzidine	244	NA	0	20.0	100	ND
bis(2-Ethylhexyl)phthalate	149	NA	0	1.74	8.71	ND
3,3'-Dichlorobenzidine	252	NA	0	9.36	46.8	ND
Di-n-octylphthalate (CCC)	149	NA	0	0.644	3.22	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.28	326,116	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	972,608	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	579,187	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	956,231	40.0	N/A		
Chrysene-d12 (I)	240	19.1	777,651	40.0	N/A		
Perylene-d12 (I)	264	21.8	531,007	40.0	N/A		
2-Fluorophenol (surr)	112	5.13	126,687	14.0	69.9	100	PASS
Phenol-d5 (surr)	99	5.83	148,664	15.1	75.4	100	PASS
Nitrobenzene-d5 (surr)	82	6.86	280,267	29.1	72.8	200	PASS
2-Fluorobiphenyl (surr)	172	9.49	558,459	28.5	71.3	200	PASS
Fluorene-d10 (surr)	176	11.7	5,118	0.339	84.8	2.00	PASS
2,4,6-Tribromophenol (surr)	330	12.3	28,787	15.0	75.1	100	PASS
Pyrene-d10 (surr)	212	16.6	7,584	0.334	83.6	2.00	PASS
Terphenyl-d14 (surr)	244	16.9	588,508	36.2	90.6	200	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	331,601	326,116	Pass
Naphthalene-d8 (I)	7.82	7.82	969,513	972,608	Pass
Acenaphthene-d10 (I)	10.76	10.76	590,916	579,187	Pass
Phenanthrene-d10 (I)	13.67	13.67	1,041,770	956,231	Pass
Chrysene-d12 (I)	19.08	19.07	810,271	777,651	Pass
Perylene-d12 (I)	21.83	21.82	504,075	531,007	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 LCS-1**
Data File: W1101366.D
Tank/Misc ID:

DF: 1 00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	Tag Value (ng)	% Rec
N-Nitrosodimethylamine	74	4.11	78,706	16.1	80.4		100	80.4
Pyridine	79	NA	0	10.5	52.6	ND	100	0.0
Phenol (CCC)	94	5.85	169,183	17.9	89.4		100	89.4
Aniline	66	5.94	46,110	10.1	50.5		100	50.5
bis(2-Chloroethyl)ether	63	5.96	94,905	15.8	79.1		100	79.1
2-Chlorophenol	128	6.07	139,135	16.8	83.8		100	83.8
1,3-Dichlorobenzene	146	6.23	151,284	14.2	70.9		100	70.9
1,4-Dichlorobenzene (CCC)	146	6.29	155,862	14.4	72.2		100	72.2
Benzyl alcohol	108	6.36	85,013	18.6	93.1		100	93.1
1,2-Dichlorobenzene	146	6.46	143,734	14.6	73.0		100	73.0
2-Methylphenol	107	6.44	112,014	17.8	89.2		100	89.2
bis(2-Chloroisopropyl) ether	45	6.49	135,843	17.1	85.7		100	85.7
3/4-Methylphenol	107	6.60	139,373	18.3	91.3		100	91.3
N-Nitroso-di-n-propylamine (SPCC)	70	6.63	97,864	18.2	90.8		100	90.8
o-Toluidine	106	6.71	166,847	14.3	71.7		100	71.7
Hexachloroethane	117	6.85	60,256	14.1	70.7		100	70.7
Nitrobenzene	77	6.88	152,935	18.8	94.0		100	94.0
Isophorone	82	7.15	243,192	17.0	85.1		100	85.1
2,4-Dimethylphenol	107	7.25	148,822	17.4	87.1		100	87.1
2-Nitrophenol (CCC)	139	7.28	69,793	18.5	92.7		100	92.7
Benzoic acid	105	7.28	98,505	26.3	132		100	131.6
bis(2-Chloroethoxy)methane	93	7.37	142,914	17.5	87.4		100	87.4
2,4-Dichlorophenol (CCC)	162	7.58	120,983	17.8	88.8		100	88.8
a,a-Dimethylphenethylamine	58	NA	0	5.00	25.0	ND	100	0.0
1,2,4-Trichlorobenzene	180	7.72	139,192	15.6	77.9		100	77.9
Naphthalene	128	7.85	394,714	16.3	81.7		100	81.7
4-Chloroaniline	65	7.87	41,795	13.3	66.6		100	66.6
Hexachlorobutadiene (CCC)	225	8.00	83,740	14.5	72.5		100	72.5
Quinoline	129	8.33	235,609	17.7	88.3		100	88.3
1,4-Phenylenediamine	108	NA	0	5.00	25.0	ND	100	0.0
4-Chloro-3 methylphenol (CCC)	107	8.55	120,777	18.3	91.7		100	91.7
2-Methylnaphthalene	142	8.90	264,439	16.7	83.5		100	83.5
1-Methylnaphthalene	142	9.07	255,789	17.0	85.1		100	85.1
Hexachlorocyclopentadiene (SPCC)	237	9.17	44,522	11.9	59.6		100	59.6
2,4,6-Trichlorophenol (CCC)	196	9.35	88,326	17.7	88.5		100	88.5
2,4,5-Trichlorophenol	196	9.41	94,781	18.0	89.9		100	89.9
Biphenyl	154	9.672	342,282	16.6	83.0		100	0.0
2-Chloronaphthalene	162	9.74	251,520	15.9	79.5		100	79.5
2-Nitroaniline	65	9.88	75,874	21.0	105		100	105.1
1,4-Dinitrobenzene	168	10.1	37,814	20.0	100		100	100.2
Dimethylphthalate	163	10.2	318,878	18.3	91.7		100	91.7
1,3-Dinitrobenzene	168	10.2	46,718	19.9	99.3		100	99.3
2,6-Dinitrotoluene	165	10.3	71,998	20.2	101		100	101.1
1,2-Dinitrobenzene	168	10.4	32,025	19.5	97.7		100	97.7
Acenaphthylene	152	10.5	417,893	17.2	85.8		100	85.8
3-Nitroaniline	138	10.6	57,349	16.8	84.2		100	84.2
Acenaphthene (CCC)	154	10.8	261,968	17.8	89.1		100	89.1
2,4-Dinitrophenol (SPCC)	184	10.8	21,738	15.1	75.5	J	100	75.5
4-Nitrophenol (SPCC)	139	10.9	41,662	18.4	92.2		100	92.2
2,4-Dinitrotoluene	165	11.1	86,202	20.3	102		100	101.7
Dibenzofuran	168	11.1	375,865	18.0	90.2		100	90.2
2,3,5,6-Tetrachlorophenol	232	11.3	69,859	20.1	101		100	100.6
2,3,4,6-Tetrachlorophenol	232	11.4	72,087	19.6	97.9		100	97.9
Diethylphthalate	149	11.5	332,775	19.0	95.0		100	95.0
4-Chlorophenyl-phenylether	204	11.8	155,800	17.8	89.2		100	89.2
Fluorene	166	11.8	325,026	18.5	92.7		100	92.7
4-Nitroaniline	138	11.8	58,312	17.1	85.3		100	85.3
4,6-Dinitro2-methylphenol	198	11.9	38,243	18.1	90.5	J	100	90.5
N-Nitrosodiphenylamine (CCC)	169	12.0	277,789	19.2	95.9		100	95.9
Azobenzene	77	12.1	328,844	18.4	92.2		100	92.2
4-Bromophenyl-phenylether	248	12.7	91,857	17.2	86.1		100	86.1
Hexachlorobenzene	284	12.9	97,055	17.9	89.3		100	89.3

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 LCS-1**
Data File: W1101366.D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	Tag Value (ng)	% Rec
Pentachlorophenol (CCC)	266	13.3	46,516	16.5	82.4	J	100	82.4
Phenanthrene	178	13.7	463,697	18.2	91.2		100	91.2
Anthracene	178	13.8	458,568	18.0	90.1		100	90.1
Carbazole	167	14.1	391,724	18.6	92.9		100	92.9
Di-n-butylphthalate	149	14.8	567,475	19.0	94.8		100	94.8
Fluoranthene (CCC)	202	16.1	502,363	19.0	95.1		100	95.1
Benzidine	184	NA	0	22.8	114	ND	100	0.0
Pyrene	202	16.6	509,666	19.2	95.9		100	95.9
4-Dimethylaminoazobenzene	120	17.2	136,135	17.4	86.9		100	86.9
Butylbenzylphthalate	149	17.9	229,160	17.5	87.4		100	87.4
3,3-Dimethylbenzidine	212	NA	0	10.8	53.9	ND	100	0.0
bis(2-Ethylhexyl)adipate	129	18.0	182,546	17.5	87.5		100	87.5
3,3-Dimethoxybenzidine	244	NA	0	20.0	100	ND	100	0.0
bis(2-Ethylhexyl)phthalate	149	19.0	331,792	18.3	91.3		100	91.3
3,3'-Dichlorobenzidine	252	19.0	84,016	11.4	56.8		100	56.8
Benzo(a)anthracene	228	19.1	414,425	18.2	91.0		100	91.0
Chrysene	228	19.1	372,431	18.1	90.4		100	90.4
Di-n-octylphthalate (CCC)	149	20.3	430,014	17.5	87.5		100	87.5
7,12-Dimethylbenz(a)anthracene	256	21.1	145,999	18.0	90.2		100	90.2
Benzo(b)fluoranthene	252	21.1	304,860	17.5	87.5		100	87.5
Benzo(k)fluoranthene	252	21.2	291,785	18.5	92.5		100	92.5
Benzo(e)pyrene	252	21.6	258,728	18.5	92.3		100	92.3
Benzo(a)pyrene (CCC)	252	21.7	246,728	17.3	86.7		100	86.7
Perylene	252	21.9	267,952	18.2	90.8		100	90.8
3-Methylcholanthrene	268	22.4	128,896	17.4	86.8		100	86.8
Indeno(1,2,3-cd)pyrene	276	24.1	223,189	16.4	82.1		100	82.1
Dibenz(a,h)anthracene	278	24.1	185,081	16.3	81.5		100	81.5
Benzo(g,h,i)perylene	276	24.7	180,423	16.6	83.2		100	83.2
Dibenzo(a,e)pyrene	302	29.5	109,031	15.0	74.8		100	74.8

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	6.28	301,905	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	927 193	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	571,868	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	997,769	40.0	N/A		
Chrysene-d12 (I)	240	19.1	836,424	40.0	N/A		
Perylene-d12 (I)	264	21.8	529,835	40.0	N/A		
2-Fluorophenol (surr)	112	5.13	133,164	15.9	79.3	100	PASS
Phenol-d5 (surr)	99	5.84	157,647	17.3	86.4	100	PASS
Nitrobenzene-d5 (surr)	82	6.86	314,116	35.2	88.1	200	PASS
2-Fluorobiphenyl (surr)	172	9.49	609,995	31.6	78.9	200	PASS
Fluorene-d10 (surr)	176	11.7	5,867	0.394	98.5	2.00	PASS
2,4,6-Tribromophenol (surr)	330	12.3	37,045	18.5	92.6	100	PASS
Pyrene-d10 (surr)	212	16 6	8,657	0.366	91.5	2.00	PASS
Terphenyl-d14 (surr)	244	16.9	677,116	40.0	99.9	200	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	331,601	301,905	Pass
Naphthalene-d8 (I)	7.82	7.82	969,513	927,193	Pass
Acenaphthene-d10 (I)	10.76	10.76	590,916	571,868	Pass
Phenanthrene-d10 (I)	13.67	13.67	1,041,770	997,769	Pass
Chrysene-d12 (I)	19.08	19.07	810,271	836,424	Pass
Perylene-d12 (I)	21.83	21.82	504,075	529,835	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 LCS-2**
Data File: W1101367 D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	Tag Value (ng)	% Rec
N-Nitrosodimethylamine	74	4.11	84,583	17.4	86.9		100	86.9
Pyridine	79	NA	0	10.5	52.6	ND	100	0.0
Phenol (CCC)	94	5.85	164,241	17.5	87.3		100	87.3
Aniline	66	5.94	53,267	11.7	58.7		100	58.7
bis(2-Chloroethyl)ether	63	5.96	97,734	16.4	81.9		100	81.9
2-Chlorophenol	128	6.07	141,621	17.2	85.8		100	85.8
1,3-Dichlorobenzene	146	6.23	155,042	14.6	73.1		100	73.1
1,4-Dichlorobenzene (CCC)	146	6.29	159,847	14.9	74.4		100	74.4
Benzyl alcohol	108	6.36	82,342	18.1	90.7		100	90.7
1,2-Dichlorobenzene	146	6.46	149,403	15.3	76.3		100	76.3
2-Methylphenol	107	6.44	109,514	17.5	87.7		100	87.7
bis(2-Chloroisopropyl) ether	45	6.49	138,205	17.5	87.6		100	87.6
3/4-Methylphenol	107	6.60	137,310	18.1	90.4		100	90.4
N-Nitroso-di-n-propylamine (SPCC)	70	6.63	96,429	18.0	89.9		100	89.9
o-Toluidine	106	6.71	173,113	15.0	74.8		100	74.8
Hexachloroethane	117	6.85	60,949	14.4	72.0		100	72.0
Nitrobenzene	77	6.88	150,806	18.6	93.2		100	93.2
Isophorone	82	7.15	239,692	17.6	88.1		100	88.1
2,4-Dimethylphenol	107	7.25	139,395	17.1	85.7		100	85.7
2-Nitrophenol (CCC)	139	7.28	69,850	19.5	97.4		100	97.4
Benzoic acid	105	7.28	84,543	23.7	119		100	118.6
bis(2-Chloroethoxy)methane	93	7.37	139,959	18.0	89.9		100	89.9
2,4-Dichlorophenol (CCC)	162	7.58	116,357	17.9	89.7		100	89.7
a,a-Dimethylphenethylamine	58	NA	0	5.00	25.0	ND	100	0.0
1,2,4-Trichlorobenzene	180	7.72	136,488	16.1	80.3		100	80.3
Naphthalene	128	7.85	385,784	16.8	83.9		100	83.9
4-Chloroaniline	65	7.87	40,966	13.7	68.5		100	68.5
Hexachlorobutadiene (CCC)	225	8.00	82,508	15.0	75.1		100	75.1
Quinoline	129	8.33	198,188	15.6	78.0		100	78.0
1,4-Phenylenediamine	108	NA	0	5.00	25.0	ND	100	0.0
4-Chloro-3 methylphenol (CCC)	107	8.55	104,902	16.7	83.7		100	83.7
2-Methylnaphthalene	142	8.90	246,599	16.4	81.8		100	81.8
1-Methylnaphthalene	142	9.07	239,166	16.7	83.6		100	83.6
Hexachlorocyclopentadiene (SPCC)	237	9.17	58,588	16.5	82.4		100	82.4
2,4,6-Trichlorophenol (CCC)	196	9.35	77,384	17.7	88.5		100	88.5
2,4,5-Trichlorophenol	196	9.41	80,929	17.5	87.5		100	87.5
Biphenyl	154	9.6748	306,144	16.9	84.7		100	0.0
2-Chloronaphthalene	162	9.74	233,141	16.8	84.0		100	84.0
2-Nitroaniline	65	9.87	59,247	18.7	93.6		100	93.6
1,4-Dinitrobenzene	168	10.1	29,044	17.6	87.8		100	87.8
Dimethylphthalate	163	10.2	263,040	17.3	86.3		100	86.3
1,3-Dinitrobenzene	168	10.2	36,845	17.9	89.3		100	89.3
2,6-Dinitrotoluene	165	10.3	57,295	18.4	91.8		100	91.8
1,2-Dinitrobenzene	168	10.4	25,978	18.1	90.4		100	90.4
Acenaphthylene	152	10.5	359,346	16.8	84.2		100	84.2
3-Nitroaniline	138	10.6	45,839	15.4	76.8		100	76.8
Acenaphthene (CCC)	154	10.8	220,842	17.1	85.7		100	85.7
2,4-Dinitrophenol (SPCC)	184	10.8	17,003	13.5	67.3	J	100	67.3
4-Nitrophenol (SPCC)	139	10.9	31,740	16.0	80.1		100	80.1
2,4-Dinitrotoluene	165	11.1	66,527	17.9	89.5		100	89.5
Dibenzofuran	168	11.1	318,066	17.4	87.0		100	87.0
2,3,5,6-Tetrachlorophenol	232	11.3	56,514	18.6	92.9		100	92.9
2,3,4,6-Tetrachlorophenol	232	11.4	56,148	17.4	86.9		100	86.9
Diethlyphthalate	149	11.5	263,951	17.2	86.0		100	86.0
4-Chlorophenyl-phenylether	204	11.8	129,772	17.0	84.8		100	84.8
Fluorene	166	11.8	257,581	16.8	83.8		100	83.8
4-Nitroaniline	138	11.8	43,806	14.6	73.1		100	73.1
4,6-Dinitro2-methylphenol	198	11.9	27,540	14.9	74.4	J	100	74.4
N-Nitrosodiphenylamine (CCC)	169	12.0	219,854	17.3	86.6		100	86.6
Azobenzene	77	12.1	263,433	16.8	84.2		100	84.2
4-Bromophenyl-phenylether	248	12.7	75,158	18.4	92.1		100	92.1
Hexachlorobenzene	284	12.9	74,764	18.0	89.9		100	89.9

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **0611-36/42 LCS-2**
Data File: W1101367.D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ug/mL)	Catch Weight (ug)	Flags	Tag Value (ng)	% Rec
Pentachlorophenol (CCC)	266	13.3	33,648	15.6	78.0	J	100	78.0
Phenanthrene	178	13.7	349,952	18.0	90.0		100	90.0
Anthracene	178	13.8	346,479	17.8	89.0		100	89.0
Carbazole	167	14.1	287,380	17.8	89.1		100	89.1
Di-n-butylphthalate	149	14.8	424,676	18.6	92.8		100	92.8
Fluoranthene (CCC)	202	16.1	361,611	17.9	89.5		100	89.5
Benzidine	184	NA	0	22.8	114	ND	100	0.0
Pyrene	202	16.6	363,364	17.9	89.4		100	89.4
4-Dimethylaminoazobenzene	120	17.2	91,834	16.7	83.5		100	83.5
Butylbenzylphthalate	149	17.9	155,298	16.9	84.4		100	84.4
3,3-Dimethylbenzidine	212	NA	0	10.8	53.9	ND	100	0.0
bis(2-Ethylhexyl)adipate	129	18.0	130,469	17.8	89.1		100	89.1
3,3-Dimethoxybenzidine	244	NA	0	20.0	100	ND	100	0.0
bis(2-Ethylhexyl)phthalate	149	19.0	217,769	17.1	85.4		100	85.4
3,3'-Dichlorobenzidine	252	19.0	71,331	13.7	68.7		100	68.7
Benzo(a)anthracene	228	19.1	283,041	17.7	88.6		100	88.6
Chrysene	228	19.1	254,961	17.6	88.2		100	88.2
Di-n-octylphthalate (CCC)	149	20.3	268,481	15.6	77.8		100	77.8
7,12-Dimethylbenz(a)anthracene	256	21.1	99,116	17.2	86.1		100	86.1
Benzo(b)fluoranthene	252	21.1	223,435	18.1	90.3		100	90.3
Benzo(k)fluoranthene	252	21.2	203,308	18.1	90.7		100	90.7
Benzo(e)pyrene	252	21.6	181,554	18.2	91.1		100	91.1
Benzo(a)pyrene (CCC)	252	21.7	173,032	17.1	85.5		100	85.5
Perylene	252	21.9	187,126	17.8	89.2		100	89.2
3-Methylcholanthrene	268	22.4	90,810	17.2	86.1		100	86.1
Indeno(1,2,3-cd)pyrene	276	24.1	159,356	16.5	82.5		100	82.5
Dibenz(a,h)anthracene	278	24.1	133,165	16.5	82.5		100	82.5
Benzo(g,h,i)perylene	276	24.7	134,520	17.5	87.3		100	87.3
Dibenzo(a,e)pyrene	302	29.5	81,395	15.7	78.6		100	78.6

					Rec. (%)	Spk Amt	Flags
1,4 Dichlorobenzene-d4 (I)	152	6.28	300,208	40.0	N/A		
Naphthalene-d8 (I)	136	7.82	882,698	40.0	N/A		
Acenaphthene-d10 (I)	164	10.8	501,391	40.0	N/A		
Phenanthrene-d10 (I)	188	13.7	762,797	40.0	N/A		
Chrysene-d12 (I)	240	19.1	587,105	40.0	N/A		
Perylene-d12 (I)	264	21.8	376,511	40.0	N/A		
2-Fluorophenol (surr)	112	5.13	139,427	16.7	83.5	100	PASS
Phenol-d5 (surr)	99	5.83	152,948	16.9	84.3	100	PASS
Nitrobenzene-d5 (surr)	82	6.86	301,214	34.0	84.9	200	PASS
2-Fluorobiphenyl (surr)	172	9.49	563,742	33.3	83.2	200	PASS
Fluorene-d10 (surr)	176	11.7	4,268	0.327	81.7	2.00	PASS
2,4,6-Tribromophenol (surr)	330	12.3	28,847	18.9	94.4	100	PASS
Pyrene-d10 (surr)	212	16.6	6,667	0.369	92.1	2.00	PASS
Terphenyl-d14 (surr)	244	16.9	480,160	37.1	92.6	200	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	6.28	6.28	331,601	300,208	Pass
Naphthalene-d8 (I)	7.82	7.82	969,513	882,698	Pass
Acenaphthene-d10 (I)	10.76	10.76	590,916	501,391	Pass
Phenanthrene-d10 (I)	13.67	13.66	1,041,770	762,797	Pass
Chrysene-d12 (I)	19.08	19.08	810,271	587,105	Pass
Perylene-d12 (I)	21.83	21.82	504,075	376,511	Pass

Results (SIM)

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **R1 *10**
Data File: W1101308.D
Tank/Misc ID: 0611-36

DF: 10.0
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags
Naphthalene	128	6.51	1,820	23.5	1,175	
2-Methylnaphthalene	142	7.44	538	11.9	594	
1-Methylnaphthalene	142	7.59	657	13.9	696	
Acenaphthylene	152	NA	0	10.0	500	ND
Acenaphthene (CCC)	154	NA	0	10.0	500	ND
Fluorene	166	NA	0	10.0	500	ND
Phenanthrene	178	12.0	16,373	198	9,900	
Anthracene	178	12.1	5,197	72.8	3,640	
Fluoranthene (CCC)	202	14.3	10,891	156	7,812	
Pyrene	202	14.8	34,869	451	22,548	
Benzo(a)anthracene	228	17.2	3,268	81.3	4,063	
Chrysene	228	17.3	4,337	76.9	3,847	
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	1,000	ND
Benzo(b)fluoranthene	252	NA	0	10.0	500	ND
Benzo(k)fluoranthene	252	NA	0	10.0	500	ND
Benzo(e)pyrene	252	NA	0	10.0	500	ND
Benzo(a)pyrene (CCC)	252	NA	0	10.0	500	ND
Perylene	252	NA	0	10.0	500	ND
3-Methylcholanthrene	268	NA	0	20.0	1,000	ND
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	500	ND
Dibenz(a,h)anthracene	278	NA	0	10.0	500	ND
Benzo(g,h,i)perylene	276	NA	0	10.0	500	ND
Dibenzo(a,e)pyrene	302	NA	0	20.0	1,000	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	12,440	400	N/A		
Naphthalene-d8 (I)	136	6.49	33,263	400	N/A		
Acenaphthene-d10 (I)	164	9.13	19,949	400	N/A		
Phenanthrene-d10 (I)	188	11.9	34,999	400	N/A		
Chrysene-d12 (I)	240	17.2	23,250	400	N/A		
Perylene-d12 (I)	264	19.9	10,537	400	N/A		
Fluorene-d10 (surr)	176	10.1	2,406	59.3	148	2000	FAIL
Pyrene-d10 (surr)	212	14.7	4,520	67.4	169	2000	FAIL

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	6,264	12,440	Pass
Naphthalene-d8 (I)	6.49	6.49	22,420	33,263	Pass
Acenaphthene-d10 (I)	9.14	9.13	11,826	19,949	Pass
Phenanthrene-d10 (I)	11.92	11.92	17,761	34,999	Pass
Chrysene-d12 (I)	17.21	17.20	9,820	23,250	Fail
Perylene-d12 (I)	19.89	19.89	4,690	10,537	Fail

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **R1 *10 LD**
Data File: W1101311.D
Tank/Misc ID: 0611-36, Conf

DF: 10.0
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags	% Diff
Naphthalene	128	6.51	1,798	22.8	1,142		2.8
2-Methylnaphthalene	142	7.44	528	11.5	574		3.5
1-Methylnaphthalene	142	7.60	658	13.7	685		1.5
Acenaphthylene	152	NA	0	10.0	500	ND	0.0
Acenaphthene (CCC)	154	NA	0	10.0	500	ND	0.0
Fluorene	166	NA	0	10.0	500	ND	0.0
Phenanthrene	178	12.0	15,841	191	9,565		3.4
Anthracene	178	12.1	5,327	74.5	3,726		2.4
Fluoranthene (CCC)	202	14.3	10,606	152	7,597		2.8
Pyrene	202	14.8	32,879	425	21,231		5.8
Benzo(a)anthracene	228	17.2	3,024	75.4	3,771		7.2
Chrysene	228	17.3	4,389	78.1	3,906		1.5
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	1,000	ND	0.0
Benzo(b)fluoranthene	252	NA	0	10.0	500	ND	0.0
Benzo(k)fluoranthene	252	NA	0	10.0	500	ND	0.0
Benzo(e)pyrene	252	NA	0	10.0	500	ND	0.0
Benzo(a)pyrene (CCC)	252	NA	0	10.0	500	ND	0.0
Perylene	252	NA	0	10.0	500	ND	0.0
3-Methylcholanthrene	268	NA	0	20.0	1,000	ND	0.0
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	500	ND	0.0
Dibenz(a,h)anthracene	278	NA	0	10.0	500	ND	0.0
Benzo(g,h,i)perylene	276	NA	0	10.0	500	ND	0.0
Dibenzo(a,e)pyrene	302	NA	0	20.0	1,000	ND	0.0

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	12,967	400	N/A		
Naphthalene-d8 (I)	136	6.49	33,816	400	N/A		
Acenaphthene-d10 (I)	164	9.13	19,988	400	N/A		
Phenanthrene-d10 (I)	188	11.9	35,048	400	N/A		
Chrysene-d12 (I)	240	17.2	23,179	400	N/A		
Perylene-d12 (I)	264	19.9	10,589	400	N/A		
Fluorene-d10 (surr)	176	10.1	2,327	57.2	143	2000	FAIL
Pyrene-d10 (surr)	212	14.7	4,908	73.1	183	2000	FAIL

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	6,264	12,967	Fail
Naphthalene-d8 (I)	6.49	6.49	22,420	33,816	Pass
Acenaphthene-d10 (I)	9.14	9.13	11,826	19,988	Pass
Phenanthrene-d10 (I)	11.92	11.91	17,761	35,048	Pass
Chrysene-d12 (I)	17.21	17.21	9,820	23,179	Fail
Perylene-d12 (I)	19.89	19.88	4,690	10,589	Fail

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **R2 *10**
Data File: W1101309.D
Tank/Misc ID: 0611-36

DF: 10.0
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags
Naphthalene	128	6.51	1,455	19.4	969	
2-Methylnaphthalene	142	NA	0	10.0	500	ND
1-Methylnaphthalene	142	7.59	494	10.8	540	
Acenaphthylene	152	NA	0	10.0	500	ND
Acenaphthene (CCC)	154	NA	0	10.0	500	ND
Fluorene	166	NA	0	10.0	500	ND
Phenanthrene	178	12.0	8,449	117	5,855	
Anthracene	178	12.1	2,192	35.2	1,760	
Fluoranthene (CCC)	202	14.3	6,573	108	5,404	
Pyrene	202	14.8	24,932	370	18,478	
Benzo(a)anthracene	228	17.2	3,024	81.7	4,084	
Chrysene	228	17.3	3,907	75.3	3,766	
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	1,000	ND
Benzo(b)fluoranthene	252	NA	0	10.0	500	ND
Benzo(k)fluoranthene	252	NA	0	10.0	500	ND
Benzo(e)pyrene	252	NA	0	10.0	500	ND
Benzo(a)pyrene (CCC)	252	NA	0	10.0	500	ND
Perylene	252	NA	0	10.0	500	ND
3-Methylcholanthrene	268	NA	0	20.0	1,000	ND
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	500	ND
Dibenz(a,h)anthracene	278	NA	0	10.0	500	ND
Benzo(g,h,i)perylene	276	NA	0	10.0	500	ND
Dibenzo(a,e)pyrene	302	NA	0	20.0	1,000	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	12,472	400	N/A		
Naphthalene-d8 (I)	136	6.49	32,237	400	N/A		
Acenaphthene-d10 (I)	164	9.13	18,415	400	N/A		
Phenanthrene-d10 (I)	188	11.9	30,537	400	N/A		
Chrysene-d12 (I)	240	17.2	21,399	400	N/A		
Perylene-d12 (I)	264	19.9	9,363	400	N/A		
Fluorene-d10 (surr)	176	10.1	2,163	57.7	144	2000	FAIL
Pyrene-d10 (surr)	212	14.7	3,910	66.9	167	2000	FAIL

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	6,264	12,472	Pass
Naphthalene-d8 (I)	6.49	6.49	22,420	32,237	Pass
Acenaphthene-d10 (I)	9.14	9.13	11,826	18,415	Pass
Phenanthrene-d10 (I)	11.92	11.92	17,761	30,537	Pass
Chrysene-d12 (I)	17.21	17.21	9,820	21,399	Fail
Perylene-d12 (I)	19.89	19.89	4,690	9,363	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **R3 *10**
Data File: W1101310.D
Tank/Misc ID: 0611-36

DF: 10.0
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags
Naphthalene	128	6.51	1,674	24.3	1,216	
2-Methylnaphthalene	142	7.44	409	10.2	509	
1-Methylnaphthalene	142	7.61	643	15.3	766	
Acenaphthylene	152	NA	0	10.0	500	ND
Acenaphthene (CCC)	154	9.20	459	11.4	570	
Fluorene	166	NA	0	10.0	500	ND
Phenanthrene	178	12.0	21,845	306	15,318	
Anthracene	178	12.1	5,799	94.2	4,711	
Fluoranthene (CCC)	202	14.3	9,467	158	7,875	
Pyrene	202	14.8	31,966	479	23,971	
Benzo(a)anthracene	228	17.2	3,390	88.1	4,404	
Chrysene	228	17.3	4,454	82.6	4,129	
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	1,000	ND
Benzo(b)fluoranthene	252	NA	0	10.0	500	ND
Benzo(k)fluoranthene	252	NA	0	10.0	500	ND
Benzo(e)pyrene	252	NA	0	10.0	500	ND
Benzo(a)pyrene (CCC)	252	NA	0	10.0	500	ND
Perylene	252	NA	0	10.0	500	ND
3-Methylcholanthrene	268	NA	0	20.0	1,000	ND
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	500	ND
Dibenz(a,h)anthracene	278	NA	0	10.0	500	ND
Benzo(g,h,i)perylene	276	NA	0	10.0	500	ND
Dibenzo(a,e)pyrene	302	NA	0	20.0	1,000	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	11,931	400	N/A		
Naphthalene-d8 (I)	136	6.49	29,552	400	N/A		
Acenaphthene-d10 (I)	164	9.14	17,009	400	N/A		
Phenanthrene-d10 (I)	188	11.9	30,180	400	N/A		
Chrysene-d12 (I)	240	17.2	22,247	400	N/A		
Perylene-d12 (I)	264	19.9	10,854	400	N/A		
Fluorene-d10 (surr)	176	10.1	2,072	59.9	150	2000	FAIL
Pyrene-d10 (surr)	212	14.7	4,327	74.9	187	2000	FAIL

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	6,264	11,931	Pass
Naphthalene-d8 (I)	6.49	6.49	22,420	29,552	Pass
Acenaphthene-d10 (I)	9.14	9.14	11,826	17,009	Pass
Phenanthrene-d10 (I)	11.92	11.92	17,761	30,180	Pass
Chrysene-d12 (I)	17.21	17.21	9,820	22,247	Fail
Perylene-d12 (I)	19.89	19.89	4,690	10,854	Fail

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **FIELD BLANK**
Data File: W1101304.D
Tank/Misc ID: 0611-36, Conf

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 2

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags
Naphthalene	128	6.51	4,319	56.7	284	
2-Methylnaphthalene	142	7.44	459	10.3	51.6	
1-Methylnaphthalene	142	NA	0	10.0	50.0	ND
Acenaphthylene	152	NA	0	10.0	50.0	ND
Acenaphthene (CCC)	154	NA	0	10.0	50.0	ND
Fluorene	166	NA	0	10.0	50.0	ND
Phenanthrene	178	NA	0	10.0	50.0	ND
Anthracene	178	NA	0	10.0	50.0	ND
Fluoranthene (CCC)	202	NA	0	10.0	50.0	ND
Pyrene	202	NA	0	10.0	50.0	ND
Benzo(a)anthracene	228	NA	0	10.0	50.0	ND
Chrysene	228	NA	0	10.0	50.0	ND
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	100	ND
Benzo(b)fluoranthene	252	NA	0	10.0	50.0	ND
Benzo(k)fluoranthene	252	NA	0	10.0	50.0	ND
Benzo(e)pyrene	252	NA	0	10.0	50.0	ND
Benzo(a)pyrene (CCC)	252	NA	0	10.0	50.0	ND
Perylene	252	NA	0	10.0	50.0	ND
3-Methylcholanthrene	268	NA	0	20.0	100	ND
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	50.0	ND
Dibenz(a,h)anthracene	278	NA	0	10.0	50.0	ND
Benzo(g,h,i)perylene	276	NA	0	10.0	50.0	ND
Dibenzo(a,e)pyrene	302	NA	0	20.0	100	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	12,048	400	N/A		
Naphthalene-d8 (I)	136	6.48	32,691	400	N/A		
Acenaphthene-d10 (I)	164	9.13	18,699	400	N/A		
Phenanthrene-d10 (I)	188	11.9	28,298	400	N/A		
Chrysene-d12 (I)	240	17.2	16,943	400	N/A		
Perylene-d12 (I)	264	19.9	6,769	400	N/A		
Fluorene-d10 (surr)	176	10.1	15,926	419	105	2000	PASS
Pyrene-d10 (surr)	212	14.7	22,776	420	105	2000	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	6,264	12,048	Pass
Naphthalene-d8 (I)	6.49	6.48	22,420	32,691	Pass
Acenaphthene-d10 (I)	9.14	9.13	11,826	18,699	Pass
Phenanthrene-d10 (I)	11.92	11.92	17,761	28,298	Pass
Chrysene-d12 (I)	17.21	17.20	9,820	16,943	Pass
Perylene-d12 (I)	19.89	19.89	4,690	6,769	Pass

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Sample ID: **MB 0611-36/42**
Data File: W1101288.D
Tank/Misc ID:

DF: 1.00
Aliquot Factor: 1.00
Extraction Vol (mL): 5.00
ConCal 1

Compound	Quant	Ret. Time (min)	Area	Conc. (ng/mL)	Catch Weight (ng)	Flags
Naphthalene	128	6.51	19,332	355	1,774	
2-Methylnaphthalene	142	7.44	489	15.4	76.8	
1-Methylnaphthalene	142	NA	0	10.0	50.0	ND
Acenaphthylene	152	NA	0	10.0	50.0	ND
Acenaphthene (CCC)	154	NA	0	10.0	50.0	ND
Fluorene	166	NA	0	10.0	50.0	ND
Phenanthrene	178	NA	0	10.0	50.0	ND
Anthracene	178	NA	0	10.0	50.0	ND
Fluoranthene (CCC)	202	NA	0	10.0	50.0	ND
Pyrene	202	NA	0	10.0	50.0	ND
Benzo(a)anthracene	228	NA	0	10.0	50.0	ND
Chrysene	228	NA	0	10.0	50.0	ND
7,12-Dimethylbenz(a)anthracene	256	NA	0	20.0	100	ND
Benzo(b)fluoranthene	252	NA	0	10.0	50.0	ND
Benzo(k)fluoranthene	252	NA	0	10.0	50.0	ND
Benzo(e)pyrene	252	NA	0	10.0	50.0	ND
Benzo(a)pyrene (CCC)	252	NA	0	10.0	50.0	ND
Perylene	252	NA	0	10.0	50.0	ND
3-Methylcholanthrene	268	NA	0	20.0	100	ND
Indeno(1,2,3-cd)pyrene	276	NA	0	10.0	50.0	ND
Dibenz(a,h)anthracene	278	NA	0	10.0	50.0	ND
Benzo(g,h,i)perylene	276	NA	0	10.0	50.0	ND
Dibenzo(a,e)pyrene	302	NA	0	20.0	100	ND

					Rec. (%)	Spk Amt	Flags
1,4-Dichlorobenzene-d4 (I)	152	5.20	8,564	400	N/A		
Naphthalene-d8 (I)	136	6.49	23,407	400	N/A		
Acenaphthene-d10 (I)	164	9.13	12,403	400	N/A		
Phenanthrene-d10 (I)	188	11.9	18,556	400	N/A		
Chrysene-d12 (I)	240	17.2	11,156	400	N/A		
Perylene-d12 (I)	264	19.9	5,137	400	N/A		
Fluorene-d10 (surr)	176	10.1	10,404	412	103	2000	PASS
Pyrene-d10 (surr)	212	14.7	14,184	399	99.8	2000	PASS

Internal Standard Acceptance Criteria (Area -50%/+100%, RT +/- 30 sec.)

Internal Standard Name	Concal RT	Sample RT	Concal IS Area	Sample IS Area	Flag
1,4-Dichlorobenzene-d4 (I)	5.20	5.20	8,563	8,564	Pass
Naphthalene-d8 (I)	6.49	6.49	30,037	23,407	Pass
Acenaphthene-d10 (I)	9.14	9.13	16,803	12,403	Pass
Phenanthrene-d10 (I)	11.92	11.92	24,040	18,556	Pass
Chrysene-d12 (I)	17.20	17.20	15,737	11,156	Pass
Perylene-d12 (I)	19.88	19.88	7,431	5,137	Pass

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Entec Services, Inc.
Analyst	TDD
Parameters	EPA SW-846 Method 8270C

Client #	511150
Job #	0611-36
# Samples	3 Runs & 1 Field Blank

Custody

Heather Tarjeft received the samples on 6/23/11 and 6/24/11 after being relinquished by Entec Services, Inc. The samples were received at 9.6°C and 24.2°C, respectively, and 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 Polyaromatic Hydrocarbons (PAHs) by Selected Ion Monitoring (SIM) and for Semi-Volatile ICR target anlaytes by scan using the analytical procedures in EPA SW-846 Method 8270C, *Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*.

Each sample train consisted of four fractions: Filter, XAD-2 Trap, Methanol/Methylene chloride Rinse, and condensate. There was no impinger fraction for the ***Field Blank***. The Filter and XAD-2 Trap contents for each sample were combined and soxhlet extracted. The condensate, and rinse fraction for each sample run were combined and Separatory funnel extracted.

Prior to sample collection, the XAD-2 traps were spiked with a BN Surrogate Mix that consisted of 100 µg of nitrobenzene-d_5, 2-fluorobiphenyl, and terphenyl-d_{14}.

Each Filter/XAD-2, COND and QC sample was spiked with 100 µg of the acid extraction surrogates (2-fluorophenol, phenol-d_5, and 2, 4, 6-tribromophenol) and with 2 µg of the SIM PAH extraction surrogates (fluorene-d_{10} and pyrene-d_{10}), 50% into each of the two fractions.

Each filter/XAD-2 fraction was Soxhlet extracted for 18 hours.

Each condensate/Rinse extract was combined with the corresponding Filter/XAD-2 extract and concentrated to a 5mL final volume.

Laboratory method blanks and Laboratory Control Samples (LCSs) were prepared and analyzed with these samples. These laboratory QC samples were spiked in the same manner as the samples, except the BN surrogate solution was spiked into both the Filter/XAD-2 and Condensate fractions, resulting in a 200ug spike.

Enthalpy Analytical Narrative Summary
(continued)

Analysis (continued)	A 100 µL aliquot of each sample extract was spiked with SVOA internal standard spiking solution such that the final concentration of the internal standards were 40 µg/mL, prior to scan analyses and 400ng/mL, prior to SIM analysis. The Agilent Technologies Model 6890N, Gas Chromatograph "Wiley" (S/N CN10244010) was equipped with a 5973N Mass Selective Detector and a Restek Rxi-5Sil MS, 30m x 0.25mm x 0.5µm (SN 1040180) capillary column, for these analyses.
Calibration	All analytes met the 15% mean RSD initial calibration requirements. All SPCC and CCC criteria were met in the initial and continuing calibrations. All other compounds in the continuing calibration met the 50% difference in-house requirements.
Chromatographic Conditions	The acquisition methods M8270SCN.m, PAHSIM.m, and DFTPP-1.m are included in the Calibration Curve Chromatograms section of the report.
QC Notes	All internal standard response and retention time criteria were met for the scan analysis. All surrogate recovery criteria were met in the scan analyses. At least one of the internal standard responses in the SIM analysis for ***Run 1***, ***Run 2***, and ***Run 3*** failed to met response criteria. The surrogates recoveries for the SIM analyses of these samples were high. A second aliquot of each sample was analyzed and the failing internal standard responses and surrogate recoveries were confirmed. The LCSs were spiked with each analyte of interest and analyzed with these samples. The spiked compounds exhibited recovery values within acceptance limits, except for pyridine, a,a-dimethylphenethylamine, 1,4-phenylenediamine, 3, 3-dimethylbenzidine, 3, 3-dimethoxybenzidine, and benzidine which exhibited low recoveries. All sample preparation and analytical holding times specified in the method were met.
Reporting Notes	All final results are reported as total 'Catch weight' values. The reporting units are ***µg*** for all scan analyses and ***ng*** for all SIM analyses. 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 a pplicable to all Enthalpy Analytical, Inc. data reports, unless specifically noted otherwise.

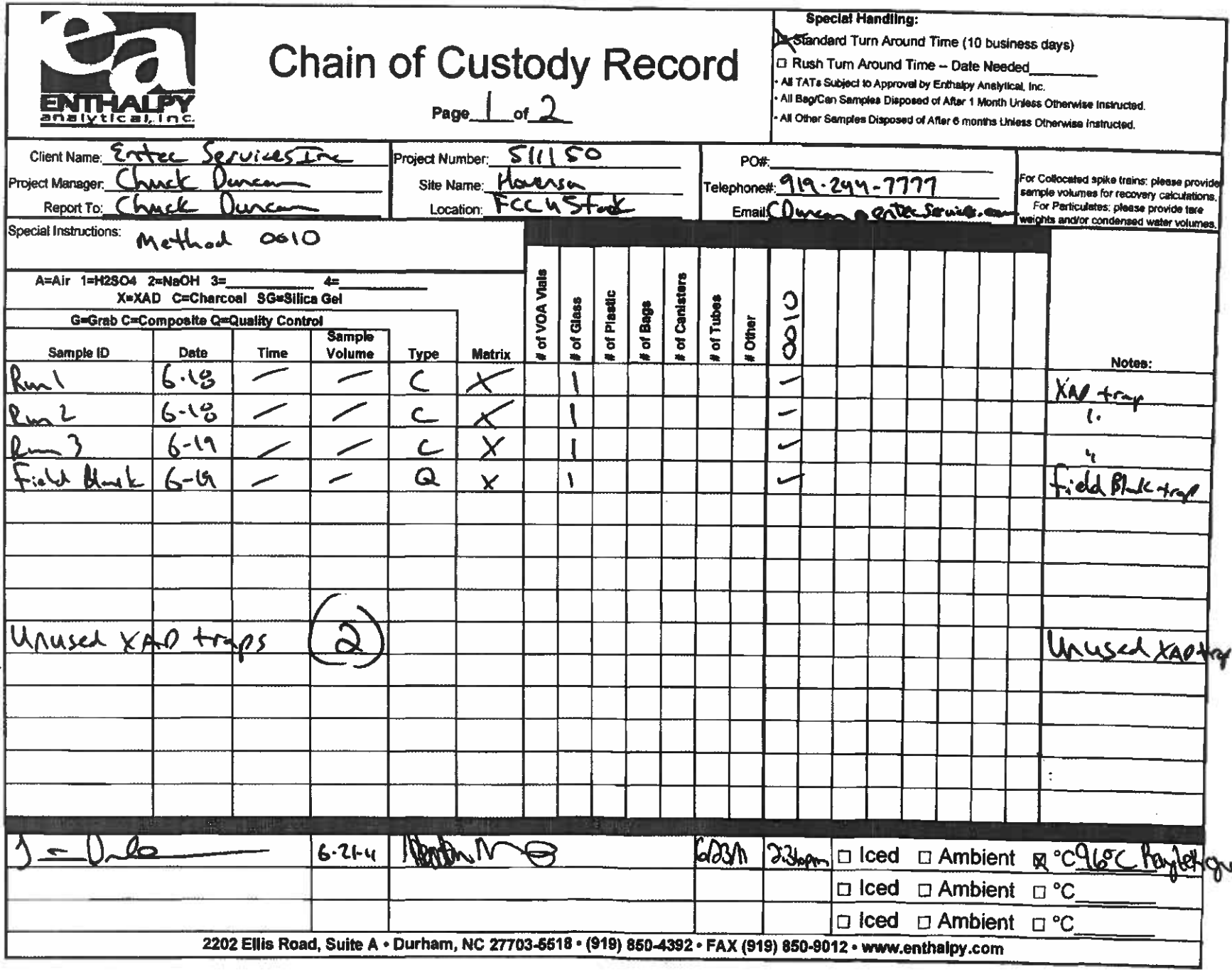
- The acronym ***MDL*** represents the Minim um Detection Lim it. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.
- The acronym ***LOQ*** represents the Lim it of Quantification. Below this value the laboratory cannot quantitate the analyte of interest 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 analy tical 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 analy tical 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 sam ple during the preparation and/or analy sis process. The analy tical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.
- The addition of ***MS*** to the Sam ple ID represents a Matrix Spike. An aliquot of an actual sam ple 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 Sam ple ID represents a Matrix Spike Duplicate. Prepared in the sam e manner as an MS, the use of duplicate m atrix 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 Sam ple ID represents a Laborat ory Duplicate. The analy st prepares an additional aliquot of sam ple for testing and the resu lts of the duplicate analy sis 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 Sam ple ID represents an Alte rnate Dilution. The analy st prepares an additional aliquot at a different dilution factor (usu ally double the initial factor). This analy sis 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 analy zed by the laboratory using the sam e reagents, spiking standards and procedures used for the client sam ples. 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 asso ciated project number and kept in-house at the appropriate temperature conditions. When the project sam ples are received for analy sis, the LCSs are analyzed to confirm that the analy te could be recovered from the m edia, separate from the samples which were used on the project and which m ay 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.

Sample Custody



Chain of Custody Record

ENTHALPY analytical, inc.

Page 1 of 2

Special Handling:

- [x] Standard Turn Around Time (10 business days)
- [ ] Rush Turn Around Time -- Date Needed _____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services Inc
Project Manager: Chuck Duncan
Report To: Chuck Duncan

Project Number: 511150
Site Name: Hovensa
Location: FCC4Stack

PO#:
Telephone#: 919-244-7777
Email: CDuncan@EntecServices.com

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: Method 0010

A=Air 1=H2SO4 2=NaOH 3=_____ 4=_____
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# of Other	0010								Notes:
Run 1	6-18	—	—	C	X		1						✓								XAD trap 1.
Run 2	6-18	—	—	C	X		1						✓								
Run 3	6-19	—	—	C	X		1						✓								4
Field Blank	6-19	—	—	Q	X		1						✓								Field Blk trap
* Unused XAD traps			(2)																		Unused XAD traps (2)

J — Uhle	6-21-4	[illegible]	6:03 PM	23 °C

- [ ] Iced [ ] Ambient [x] °C 16°C Ryglet gunfire
- [ ] Iced [ ] Ambient [ ] °C _____
- [ ] Iced [ ] Ambient [ ] °C _____

2202 Ellis Road, Suite A • Durham, NC 27703-6518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

Chain of Custody Record

ENTHALPY analytical, inc.

Page 1 of 1

Special Handling:
- ☒ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time – Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services Inc
Project Manager: Chuck Duncan III
Report To: Chuck Duncan III

Project Number: 511150
Site Name: Hovensa
Location: Ecen Stack

PO#:
Telephone#: 919-244-7777
Email: CDuncan@

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: M-0010

A=Air 1=H2SO4 2=NaOH 3=water 4=filter 5-meth/mecl
X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	0010	Notes:
Run 1	6-16	✓	✓	C	3		1						✓	Condensate
Run 2	6-16	✓	✓	C	3		1						✓	Condensate
Run 3	6-17	✓	✓	C	3		1						✓	Condensate
Run 1	6-16	✓	✓	C	4		1	1					✓	filter
Run 2	6-16	✓	✓	C	4		1	1					✓	filter
Run 3	6-17	✓	✓	C	4		1	1					✓	filter
Field Blank	6-17	✓	✓	Q	4		1						✓	Field Blank filter
Blank	6-17	✓	✓	Q	5		1						✓	meth/mecl Blank
Blank	6-17	✓	✓	Q	5		1						✓	Probe Blank Meth/mecl
Blank	6-17	✓	✓	Q	5		1						✓	Field Blank meth/mecl
Run 1	6-16	✓	✓	C	5		1						✓	Meth/Mecl Rinse
Run 2	6-16	✓	✓	C	5		1						✓	meth/mecl Rinse
Run 3	6-17	✓	✓	C	5		1						✓	meth/mecl Rinse

[illegible]	6-22-11	[illegible]		6/24/11	3:35pm

☐ Iced ☐ Ambient ☒ °C 24.20C Temperature gun #2
☐ Iced ☐ Ambient ☐ °C_____
☐ Iced ☐ Ambient ☐ °C_____

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

APPENDIX C.3

LABORATORY DATA

METHOD 23 - DIOXINS AND FURANS

21 July 2011

Chuck Duncan
ENTEC Services Inc.
30 Monroe Drive
Pelham, AL 35124

Ph.: 919-244-7777
Email: cduncan@enteeservices.com

Subject: Certificate of Results

Dear Chuck;

Attached to this narrative are the analytical results you requested on samples submitted for the determination of the 17-2, 3, 7, 8-substituted polychlorinated dibenzo-*p*-dioxins and dibenzofurans and totals, and the 12 coplanar polychlorinated biphenyls. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	511150
AP Project #	**A3309**
Analytical Protocol	WHO2+ (Method 23 & HRPCB)
No. Samples Submitted	6
No. Samples Analyzed	4 (Reagent and Probe Blanks Archived)
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	22-Jun-2011
Condition Received	good
Temperature upon Receipt (C)	6 (traps and filters) / 23 (solvents)
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

QC Annotations:

See Appendix A & B for data qualifier, data attribute, and lab identifier information.

Analytical Perspectives Certification IDs:

SOUTH CAROLINA	99054
ARKANSAS	88-0628
NEW JERSEY (NELAP)	NC005
FLORIDA (PRIMARY NELAP)	E87608
LOUISIANA	4024
NORTH CAROLINA	37783
WASHINGTON	C2027
TEXAS (NELAP)	T104704484-10-1
PENNSYLVANIA (NELAP)	68-01849

Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please do not hesitate to contact us. Thank you for choosing Analytical Perspectives as part of your analytical support team.

Sincerely,

Kimberly Mace Ph.D.
Project Scientist

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
*	The reported concentration exceeds the calibration range (upper point of the calibration curve).[1]
>	Indicates high recoveries. Shown with the numeric value at the top of the range.[1]
B	The analyte is found in the method blank, at a level that is <=10x the sample concentration.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), where there is a co-eluting interference, or where a single ion is utilized for quantitation due to PFK interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned.[1]
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
Ra	The new ratio – [Ra] -- for 2,3,7,8-TCDD following the $^{37}Cl_4$-2,3,7,8-TCDD correction is shown between squared brackets in the DL column.[1]
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.[1]
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

[1]Denotes data qualifiers/attributes whose use will be phased out over time

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

A3309 - TEQ
Project ID: 511150

Sample Summary Part 1	ANALYTICAL PERSPECTIVES				Method WHO-2
Analyte	Method Blank	Train Blank	Run 1	Run 2	Run 3
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.74)	(2.23)	(3.19)	(2.42)	(4.22)
1,2,3,7,8-PeCDD	(2.06)	(2.86)	(4.12)	(3.85)	(5.27)
1,2,3,4,7,8-HxCDD	(1.71)	(1.86)	(3.76)	(3.96)	(5.28)
1,2,3,6,7,8-HxCDD	(1.84)	(1.9)	(3.71)	(3.83)	(5.24)
1,2,3,7,8,9-HxCDD	(1.87)	(1.97)	(3.76)	(4.01)	(5.24)
1,2,3,4,6,7,8-HpCDD	(2.04)	(3.13)	(3.9)	(3.71)	(6.42)
OCDD	(3.46)	(6.1)	10.5	(7.11)	10.9
2,3,7,8-TCDF	(1.33)	(1.68)	(2.42)	(1.75)	(2.97)
1,2,3,7,8-PeCDF	(1.42)	(2.07)	(2.3)	(2.69)	(2.82)
2,3,4,7,8-PeCDF	(1.27)	(1.91)	(2.28)	(2.73)	(3.09)
1,2,3,4,7,8-HxCDF	(1.07)	(1.39)	(2.15)	(2.25)	(2.87)
1,2,3,6,7,8-HxCDF	(1.04)	(1.38)	(2.12)	(2.16)	(2.83)
2,3,4,6,7,8-HxCDF	(1.07)	(1.35)	(2.18)	(2.06)	(2.72)
1,2,3,7,8,9-HxCDF	(1.44)	(1.76)	(2.41)	(2.56)	(3.28)
1,2,3,4,6,7,8-HpCDF	(0.95)	(1.97)	(3.16)	(3)	(3.7)
1,2,3,4,7,8,9-HpCDF	(1.54)	(2.83)	(4.69)	(4.19)	(5.14)
OCDF	(4.43)	(6.51)	(8.09)	(6.79)	(8.42)
ITEF TEQ (ND=0; EMPC=0)	0.00	0.00	0.0105	0.00	0.0109
ITEF TEQ (ND=0; EMPC=EMPC)	0.00	0.00	0.0105	0.00	0.0109
ITEF TEQ (ND=DL/2; EMPC=0)	2.33	3.07	4.45	4.11	5.88
ITEF TEQ (ND=DL/2; EMPC=EMPC)	2.33	3.07	4.45	4.11	5.88
ITEF TEQ (ND=DL; EMPC=EMPC)	4.66	6.14	8.89	8.22	11.8
PCB-77 33'44'-TeCB	1.22	5.31	[7.41]	73.1	[5.02]
PCB-81 344'5-TeCB	(0.518)	(1.31)	(1.47)	5.05	(2)
PCB-105 233'44'-PeCB	[2.65]	8.74	18.3	45.3	[10.9]
PCB-114 2344'5-PeCB	(0.967)	(0.972)	(1.51)	[3.43]	(1.46)
PCB-118 23'44'5-PeCB	7.88	17.8	42.6	102	27.6
PCB-123 2'344'5-PeCB	(0.855)	0.997	[2.88]	4.7	(1.36)
PCB-126 33'44'5-PeCB	(1.41)	(1.36)	(2.01)	(2.25)	(1.97)
PCB-156 233'44'5-HxCB	(0.736)	1.25	4.09	2.47	2.53
PCB-157 233'44'5'-HxCB	(0.789)	(0.925)	1.17	(1.19)	(1.07)
PCB-167 23'44'55'-HxCB	(0.561)	[0.964]	2.18	[1.52]	1.03
PCB-169 33'44'55'-HxCB	(1.04)	(1.18)	(1.54)	(1.63)	(1.46)
PCB-189 233'44'55'-HpCB	(1.53)	(1.67)	(2.17)	(1.76)	(1.75)
ITEF + WHO-2005					
PCDD/F + PCB TEQs (ND = 0)	0.000358	0.0014	0.0126	0.0134	0.0118
PCDD/F + PCB TEQs (ND = DL / 2)	2.42	3.16	4.58	4.26	6.01
PCDD/F + PCB TEQs (ND = DL)	4.84	6.31	9.14	8.51	12
ITEF + WHO-1998					
PCDD/F + PCB TEQs (ND = 0)	0.00091	0.00391	0.0192	0.0242	0.0149
PCDD/F + PCB TEQs (ND = DL / 2)	2.41	3.15	4.57	4.26	5.99
PCDD/F + PCB TEQs (ND = DL)	4.82	6.29	9.12	8.49	12
Checkcode	360-459-YPR	853-676-VMN	889-058-QCW	032-060-JVW	282-915-VYD
Lab ID	MB1_8795_W2_SDS-RJ2	A3309_8795_W2_001-RJ2	A3309_8795_W2_002-RJ2	A3309_8795_W2_003-RJ2	A3309_8795_W2_004-RJ2

( ) = DL
[ ] = EMPC

A3309 - DLs
Project ID: 511150

Sample Summary Part 5

ANALYTICAL PERSPECTIVES

Method WHO-2

Analyte	Method Blank	Train Blank	Run 1	Run 2	Run 3
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	1.74	2.23	3.19	2.42	4.22
1,2,3,7,8-PeCDD	2.06	2.86	4.12	3.85	5.27
1,2,3,4,7,8-HxCDD	1.71	1.86	3.76	3.96	5.28
1,2,3,6,7,8-HxCDD	1.84	1.9	3.71	3.83	5.24
1,2,3,7,8,9-HxCDD	1.87	1.97	3.76	4.01	5.24
1,2,3,4,6,7,8-HpCDD	2.04	3.13	3.9	3.71	6.42
OCDD	3.46	6.1	7.68	7.11	9.35
2,3,7,8-TCDF	1.33	1.68	2.42	1.75	2.97
1,2,3,7,8-PeCDF	1.42	2.07	2.3	2.69	2.82
2,3,4,7,8-PeCDF	1.27	1.91	2.28	2.73	3.09
1,2,3,4,7,8-HxCDF	1.07	1.39	2.15	2.25	2.87
1,2,3,6,7,8-HxCDF	1.04	1.38	2.12	2.16	2.83
2,3,4,6,7,8-HxCDF	1.07	1.35	2.18	2.06	2.72
1,2,3,7,8,9-HxCDF	1.44	1.76	2.41	2.56	3.28
1,2,3,4,6,7,8-HpCDF	0.95	1.97	3.16	3	3.7
1,2,3,4,7,8,9-HpCDF	1.54	2.83	4.69	4.19	5.14
OCDF	4.43	6.51	8.09	6.79	8.42
Total TCDD	1.74	2.23	3.19	2.42	4.22
Total PeCDD	2.06	2.86	4.12	3.85	5.27
Total HxCDD	1.8	1.9	3.73	3.92	5.24
Total HpCDD	2.04	3.13	3.9	3.71	6.42
Total TCDF	1.33	1.68	2.42	1.75	2.97
Total PeCDF	1.34	1.99	2.29	2.7	2.95
Total HxCDF	1.14	1.46	2.21	2.25	2.91
Total HpCDF	1.22	2.36	3.85	3.54	4.36
PCB-77 33'44'-TeCB	0.58	1.37	1.42	2.88	1.92
PCB-81 344'5-TeCB	0.518	1.31	1.47	2.67	2
PCB-105 233'44'-PeCB	0.993	1.08	1.59	1.88	1.59
PCB-114 2344'5-PeCB	0.967	0.972	1.51	1.56	1.46
PCB-118 23'44'5-PeCB	0.879	0.897	1.46	1.44	1.35
PCB-123 2'344'5-PeCB	0.855	0.92	1.41	1.5	1.36
PCB-126 33'44'5-PeCB	1.41	1.36	2.01	2.25	1.97
PCB-156 233'44'5-HxCB	0.736	0.847	1.14	1.14	1.08
PCB-157 233'44'5'-HxCB	0.789	0.925	1.19	1.19	1.07
PCB-167 23'44'55'-HxCB	0.561	0.633	0.979	0.977	0.917
PCB-169 33'44'55'-HxCB	1.04	1.18	1.54	1.63	1.46
PCB-189 233'44'55'-HpCB	1.53	1.67	2.17	1.76	1.75
Checkcode	360-459-YPR	853-676-VMN	889-058-QCW	032-060-JVW	282-915-VYD
Lab ID	MB1_8795_W2_SDS-RJ2	A3309_8795_W2_001-RJ2	A3309_8795_W2_002-RJ2	A3309_8795_W2_003-RJ2	A3309_8795_W2_004-RJ2

A3309 - WHO-2005-TEQ

Project ID: 511150

Sample Summary Part 1

ANALYTICAL PERSPECTIVES

Method WHO-2

Analyte	Method Blank	Train Blank	Run 1	Run 2	Run 3
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.74)	(2.23)	(3.19)	(2.42)	(4.22)
1,2,3,7,8-PeCDD	(2.06)	(2.86)	(4.12)	(3.85)	(5.27)
1,2,3,4,7,8-HxCDD	(1.71)	(1.86)	(3.76)	(3.96)	(5.28)
1,2,3,6,7,8-HxCDD	(1.84)	(1.9)	(3.71)	(3.83)	(5.24)
1,2,3,7,8,9-HxCDD	(1.87)	(1.97)	(3.76)	(4.01)	(5.24)
1,2,3,4,6,7,8-HpCDD	(2.04)	(3.13)	(3.9)	(3.71)	(6.42)
OCDD	(3.46)	(6.1)	10.5	(7.11)	10.9
2,3,7,8-TCDF	(1.33)	(1.68)	(2.42)	(1.75)	(2.97)
1,2,3,7,8-PeCDF	(1.42)	(2.07)	(2.3)	(2.69)	(2.82)
2,3,4,7,8-PeCDF	(1.27)	(1.91)	(2.28)	(2.73)	(3.09)
1,2,3,4,7,8-HxCDF	(1.07)	(1.39)	(2.15)	(2.25)	(2.87)
1,2,3,6,7,8-HxCDF	(1.04)	(1.38)	(2.12)	(2.16)	(2.83)
2,3,4,6,7,8-HxCDF	(1.07)	(1.35)	(2.18)	(2.06)	(2.72)
1,2,3,7,8,9-HxCDF	(1.44)	(1.76)	(2.41)	(2.56)	(3.28)
1,2,3,4,6,7,8-HpCDF	(0.95)	(1.97)	(3.16)	(3)	(3.7)
1,2,3,4,7,8,9-HpCDF	(1.54)	(2.83)	(4.69)	(4.19)	(5.14)
OCDF	(4.43)	(6.51)	(8.09)	(6.79)	(8.42)
WHO-2005 TEQ (ND=0; EMPC=0)	**0.00**	**0.00**	**0.00315**	**0.00**	**0.00327**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.00**	**0.00**	**0.00315**	**0.00**	**0.00327**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**2.7**	**3.57**	**5.22**	**4.77**	**6.86**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**2.7**	**3.57**	**5.22**	**4.77**	**6.86**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**5.41**	**7.14**	**10.4**	**9.54**	**13.7**
Checkcode	360-459-YPR	853-676-VMN	889-058-QCW	032-060-JVW	282-915-VYD
Lab ID	MB1_8795_W2_SDS-RJ2	A3309_8795_W2_001-RJ2	A3309_8795_W2_002-RJ2	A3309_8795_W2_003-RJ2	A3309_8795_W2_004-RJ2

( ) = DL
[ ] = EMPC

A3309 - Totals

Project ID: 511150

Sample Summary Part 2

ANALYTICAL PERSPECTIVES

Method WHO-2

Analyte	Method Blank	Train Blank	Run 1	Run 2	Run 3
	pg	pg	pg	pg	pg
Totals					
TCDDs	8.89	14.7	0	5.25	0
PeCDDs	0	0	0	0	0
HxCDDs	0	0	0	0	0
HpCDDs	0	0	0	0	0
OCDD	0	0	10.5	0	10.9
TCDFs	0	0	14	18	0
PeCDFs	0	0	0	0	0
HxCDFs	0	0	0	0	0
HpCDFs	0	0	0	0	0
OCDF	0	0	0	0	0
Total PCDD/Fs (ND=0; EMPC=0)	**8.89**	**14.7**	**24.5**	**23.2**	**10.9**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**8.89**	**19.7**	**31.1**	**27.6**	**10.9**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**39.2**	**62.6**	**85.3**	**86.7**	**80.4**
Total 2378s (ND=0; EMPC=0)	**0**	**0**	**10.5**	**0**	**10.9**
Total 2378s (ND=0.5; EMPC=0)	**15.1**	**21.5**	**37.6**	**29.5**	**45.6**
Total 2378s (ND=1; EMPC=0)	**30.3**	**42.9**	**64.7**	**59.1**	**80.4**
Total 2378s (ND=0; EMPC=1)	**0**	**0**	**10.5**	**0**	**10.9**
Total 2378s (ND=0.5; EMPC=1)	**15.1**	**21.5**	**37.6**	**29.5**	**45.6**
Total 2378s (ND=1; EMPC=1)	**30.3**	**42.9**	**64.7**	**59.1**	**80.4**
Checkcode	360-459-YPR	853-676-VMN	889-058-QCW	032-060-JVW	282-915-VYD
Lab ID	MB1_8795_W2_SDS-RJ2	A3309_8795_W2_001-RJ2	A3309_8795_W2_002-RJ2	A3309_8795_W2_003-RJ2	A3309_8795_W2_004-RJ2

( ) = DL
[ ] = EMPC

A3309 - Others
Project ID: 511150

Sample Summary Part 3

ANALYTICAL PERSPECTIVES

Method WHO-2

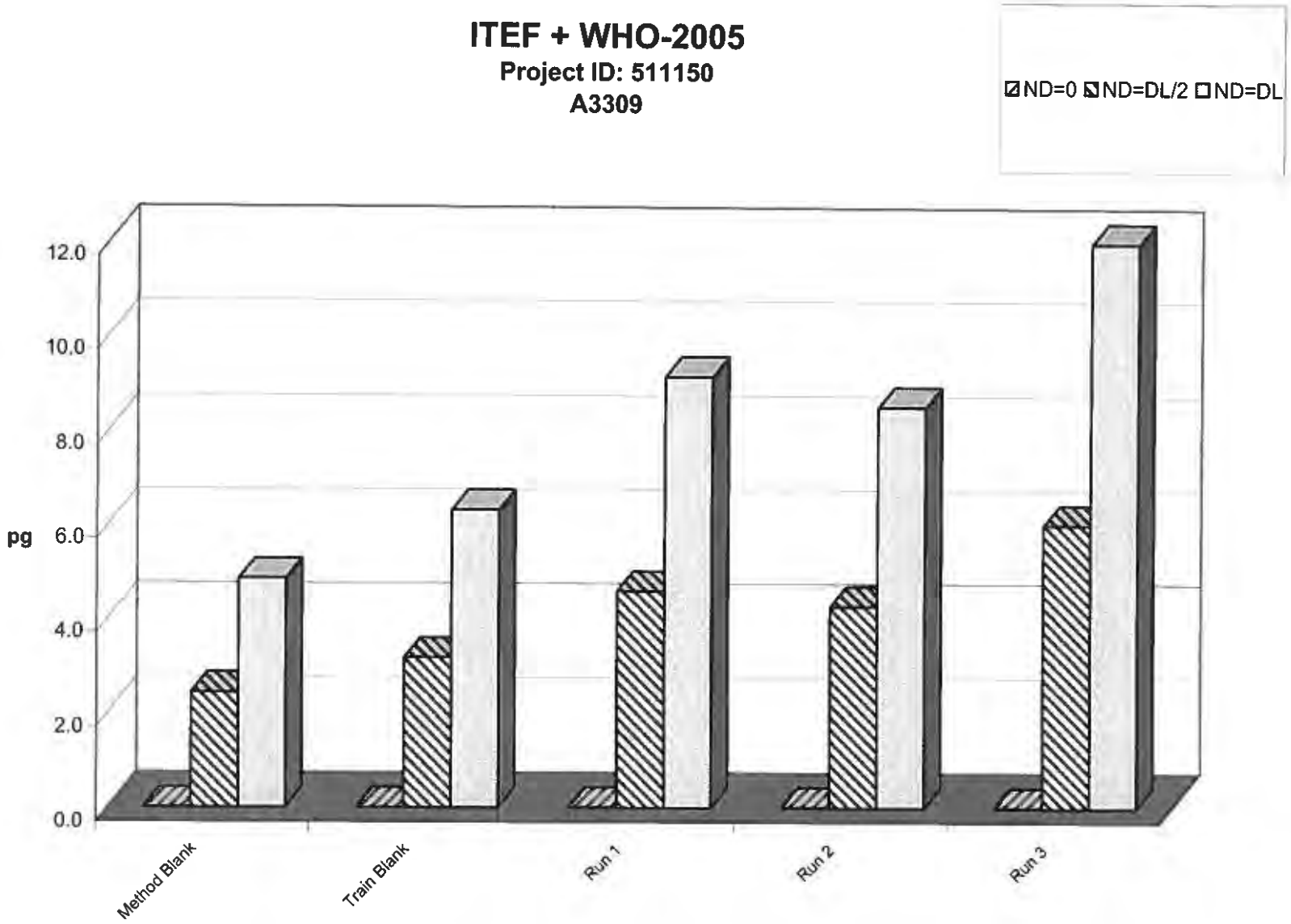
Analyte	Method Blank	Train Blank	Run 1	Run 2	Run 3
	pg	pg	pg	pg	pg
Other PCDD/Fs (ND=0, EMPC=0)					
Other TCDD	8.89	14.7	0	5.25	0
Other PeCDD	0	0	0	0	0
Other HxCDD	0	0	0	0	0
Other HpCDD	0	0	0	0	0
Other TCDF	0	0	14	18	0
Other PeCDF	0	0	0	0	0
Other HxCDF	0	0	0	0	0
Other HpCDF	0	0	0	0	0
Other PCDD/Fs (ND=0, EMPC=EMPC)					
Other TCDD	8.89	19.7	0	5.25	0
Other PeCDD	0	0	0	0	0
Other HxCDD	0	0	0	0	0
Other HpCDD	0	0	0	0	0
Other TCDF	0	0	20.6	22.4	0
Other PeCDF	0	0	0	0	0
Other HxCDF	0	0	0	0	0
Other HpCDF	0	0	0	0	0
Checkcode	360-459-YPR	853-676-VMN	889-058-QCW	032-060-JVW	282-915-VYD
Lab ID	MB1_8795_W2_SDS-RJ2	A3309_8795_W2_001-RJ2	A3309_8795_W2_002-RJ2	A3309_8795_W2_003-RJ2	A3309_8795_W2_004-RJ2

( ) = DL
[ ] = EMPC

ITEF + WHO-2005

Project ID: 511150

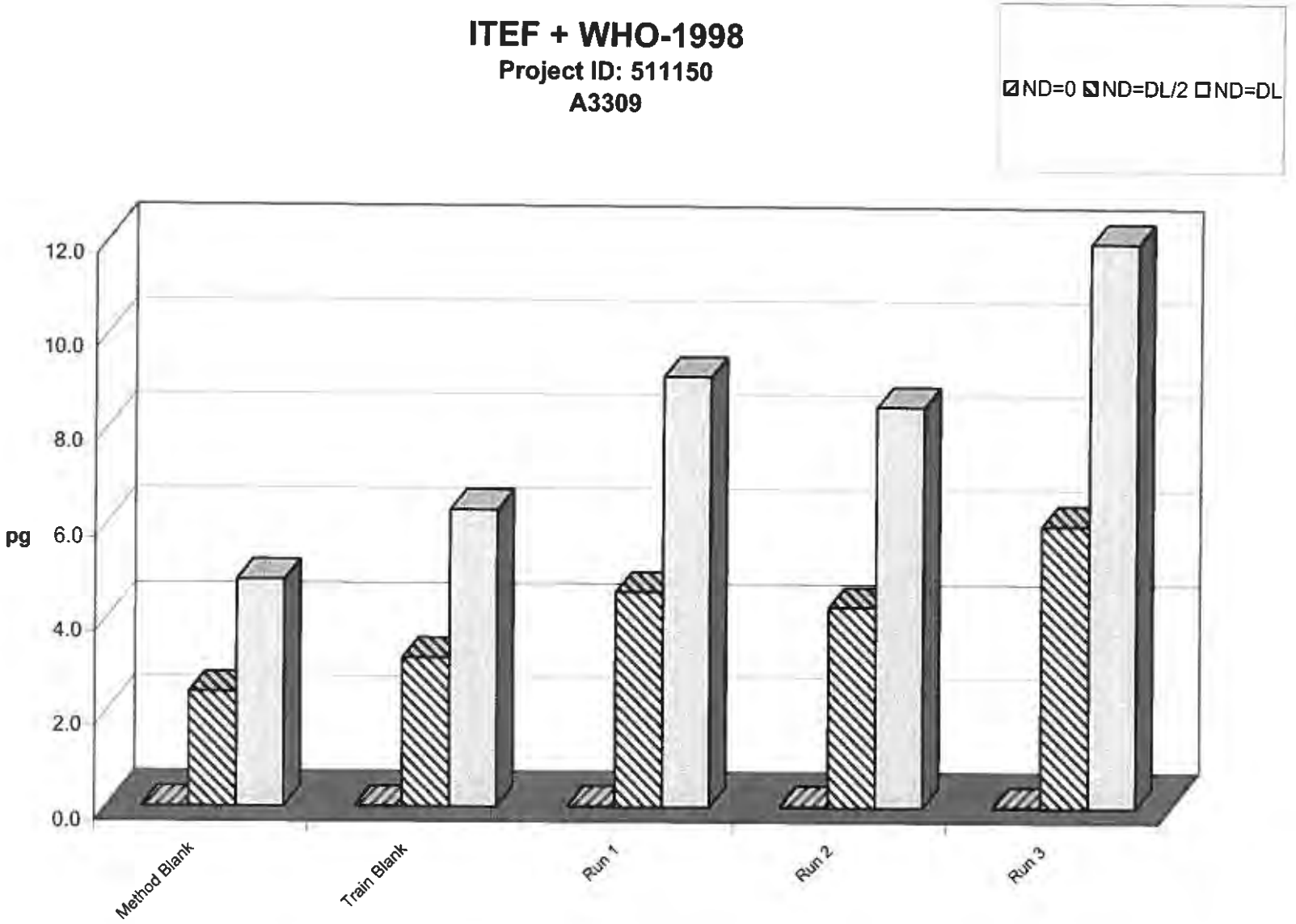
A3309



ITEF + WHO-1998

Project ID: 511150

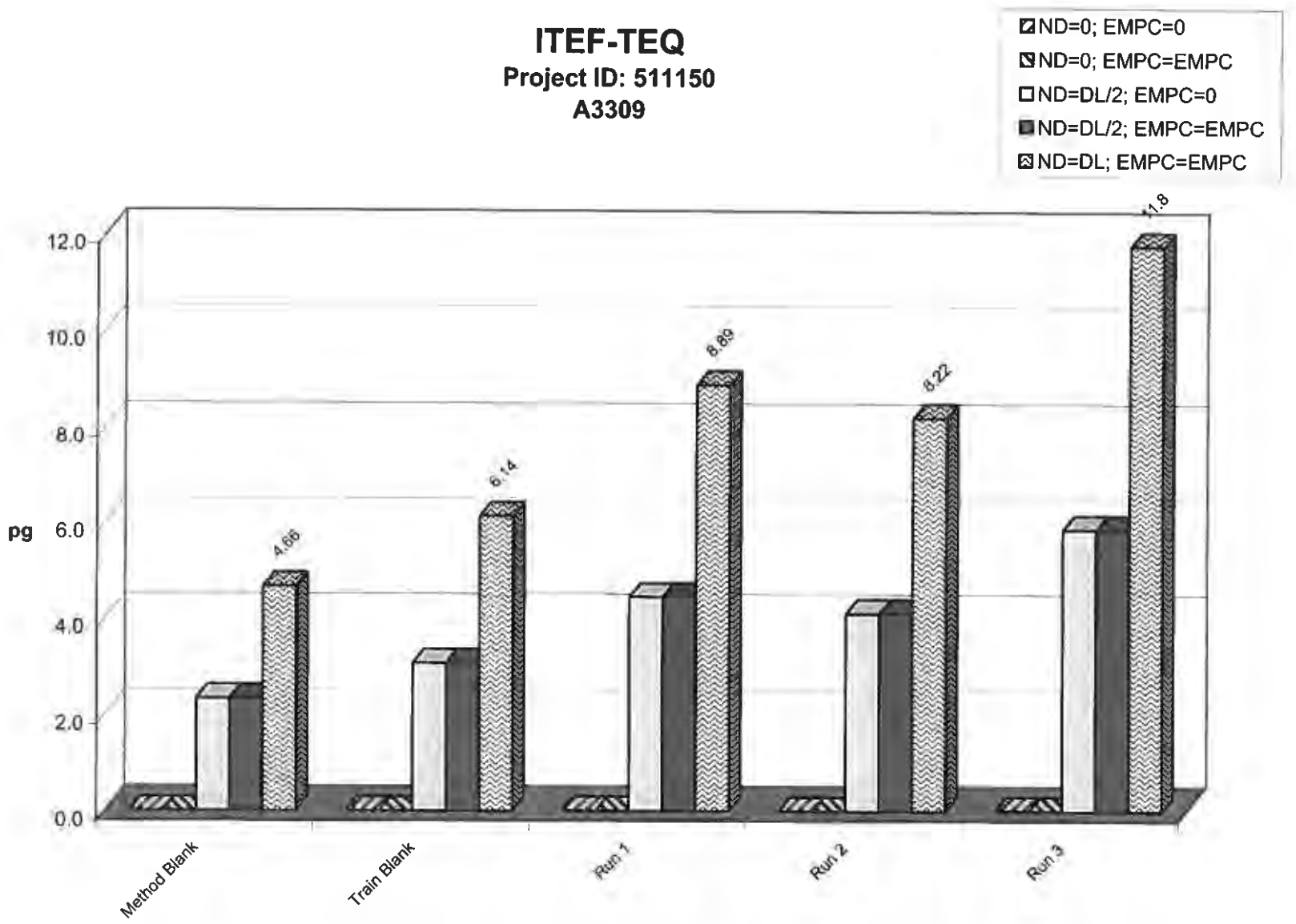
A3309



ITEF-TEQ

Project ID: 511150

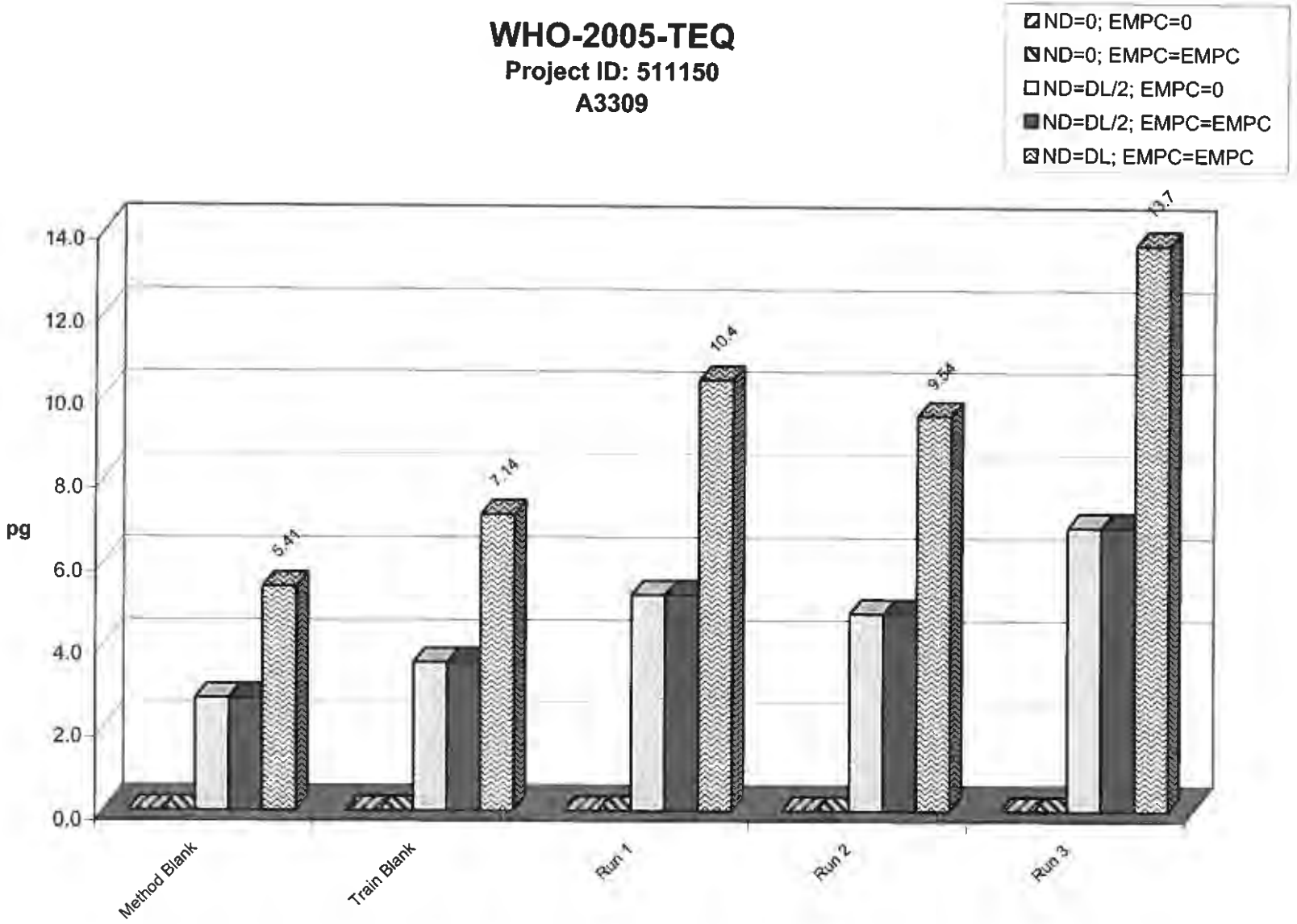
A3309



WHO-2005-TEQ

Project ID: 511150

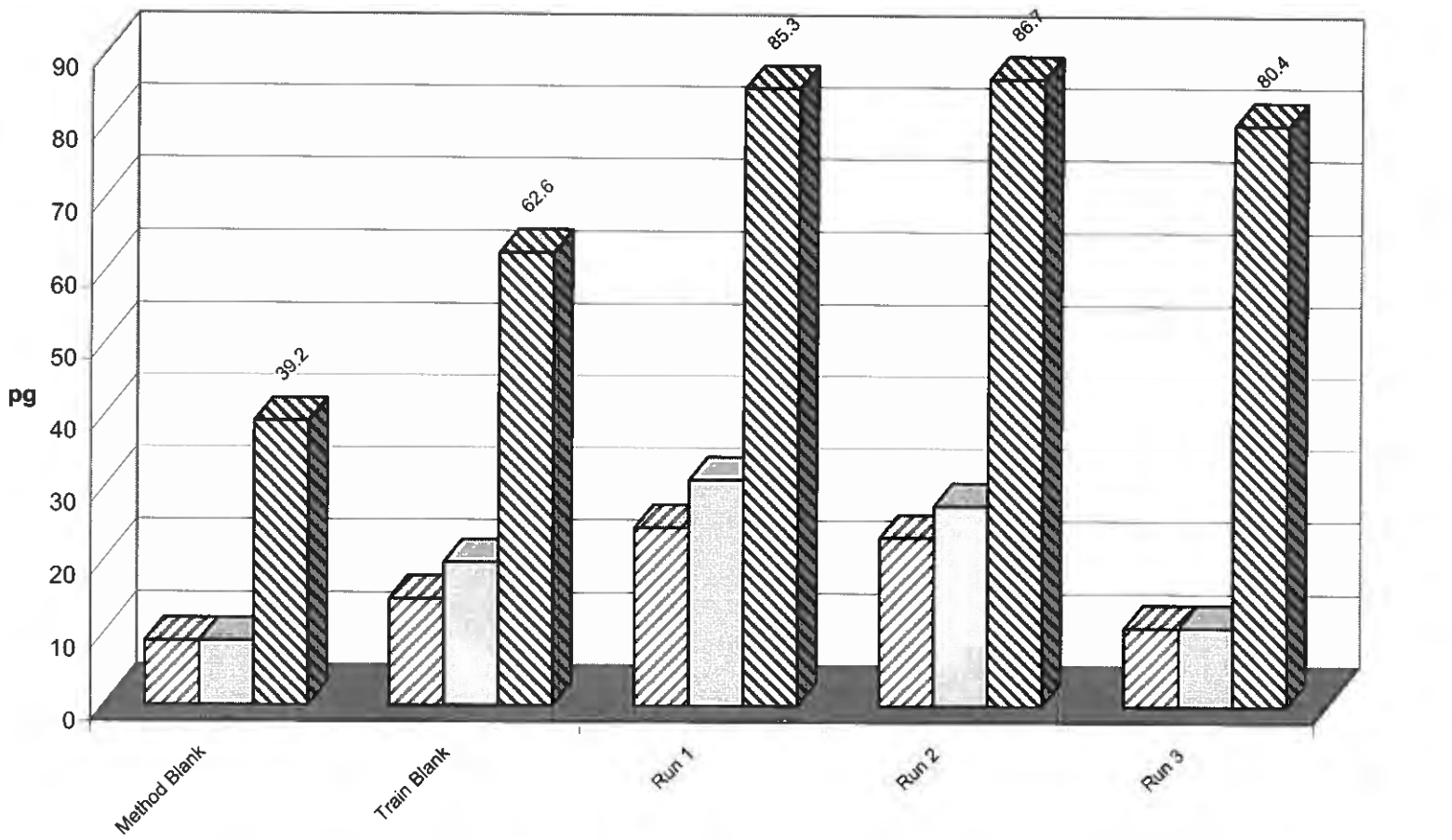
A3309



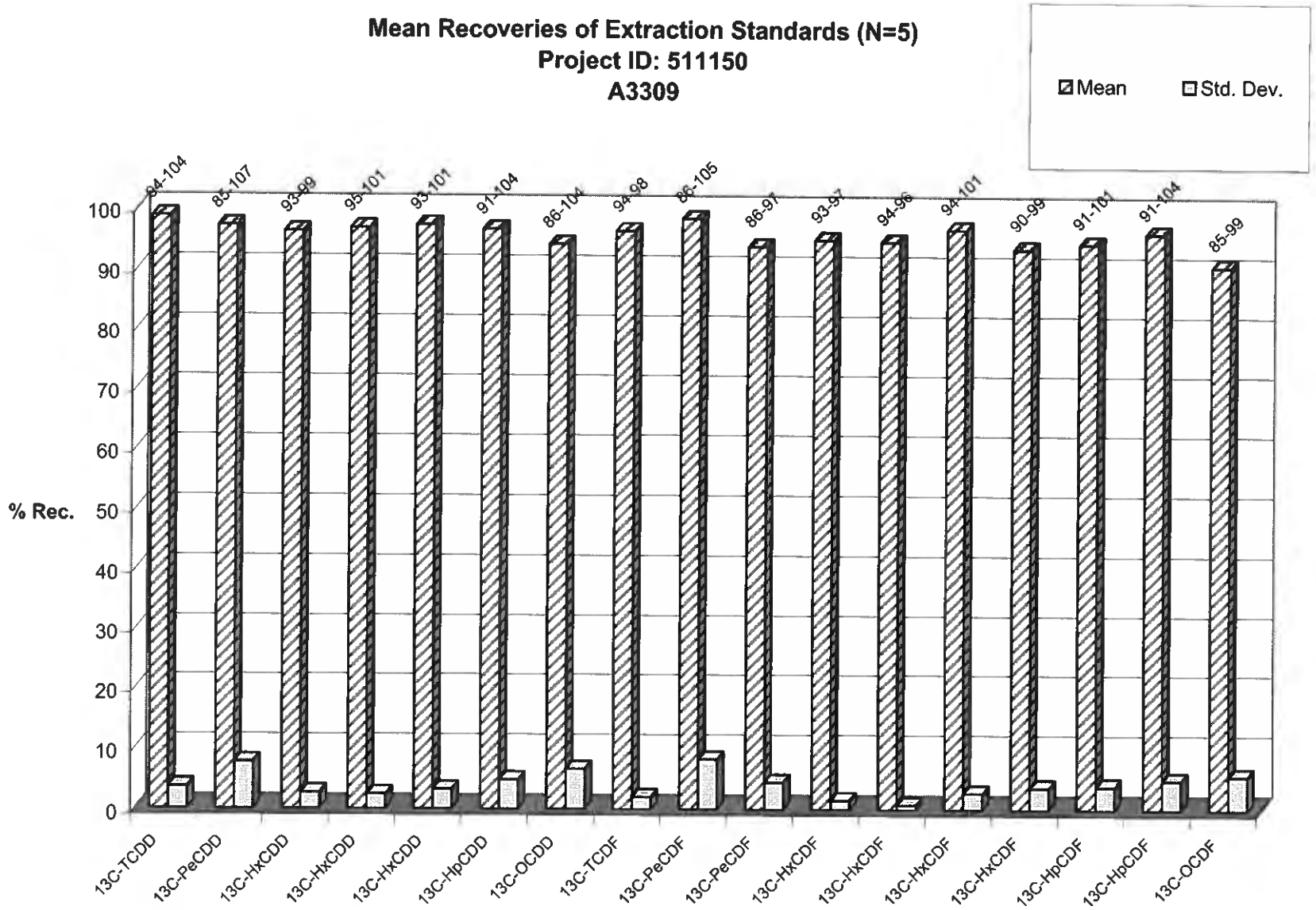
Totals

Project ID: 511150

A3309

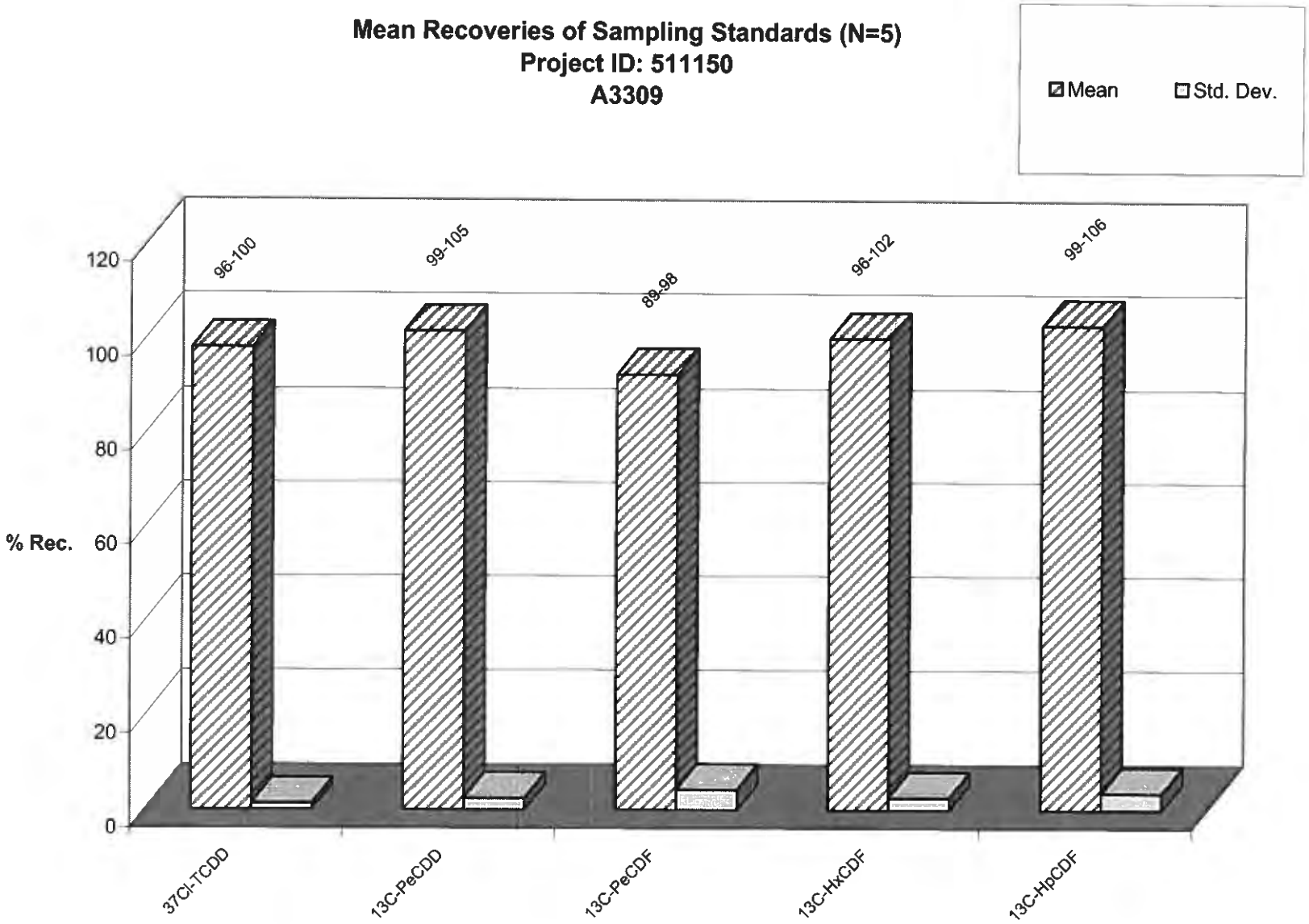


Mean Recoveries of Extraction Standards (N=5)
Project ID: 511150
A3309

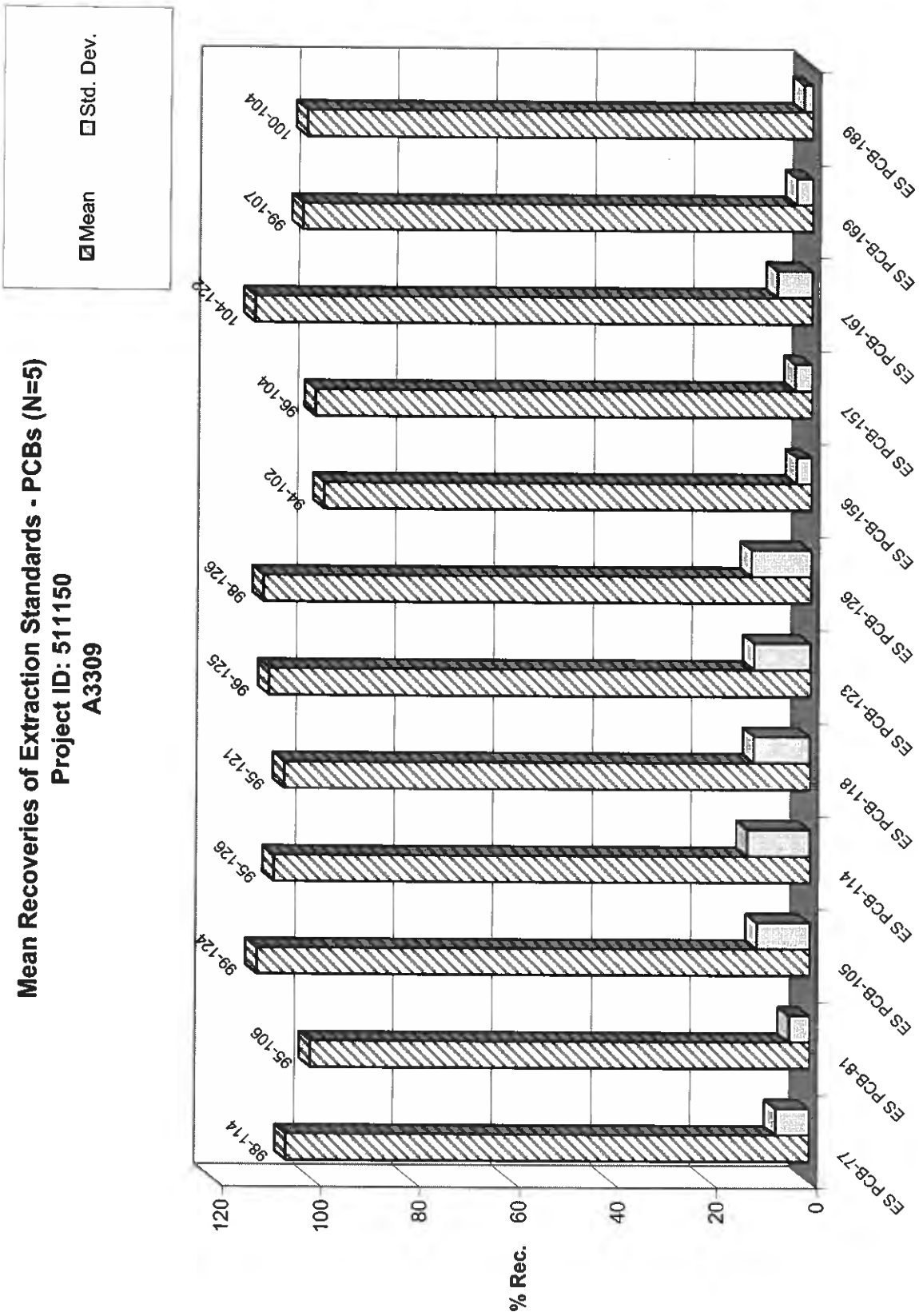


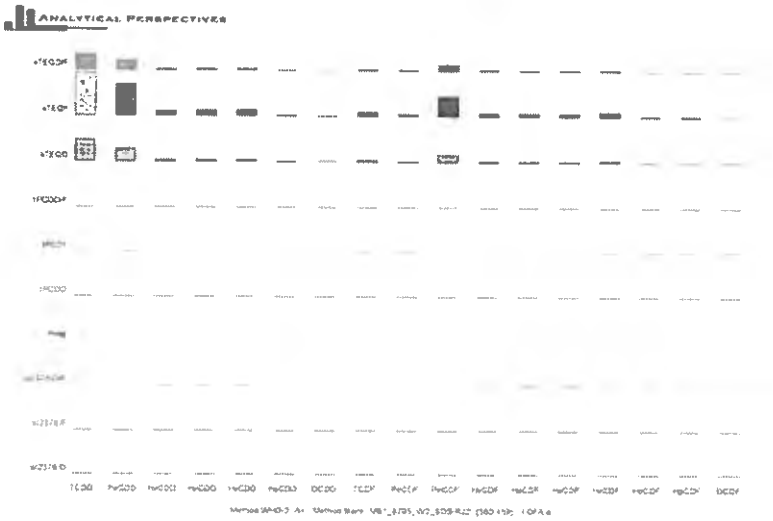
Method Specification Limits: Tetra-Hexa ES: 40-130%, Hepta-Octa ES: 25-130% (F = fail)

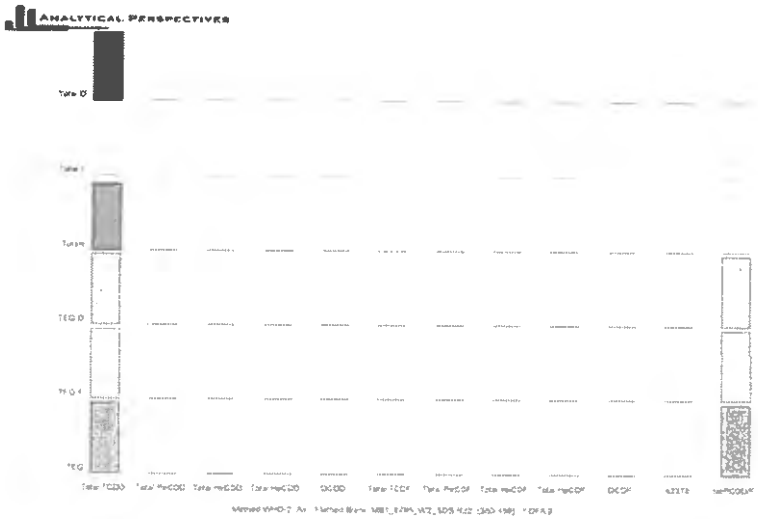
Mean Recoveries of Sampling Standards (N=5)
Project ID: 511150
A3309

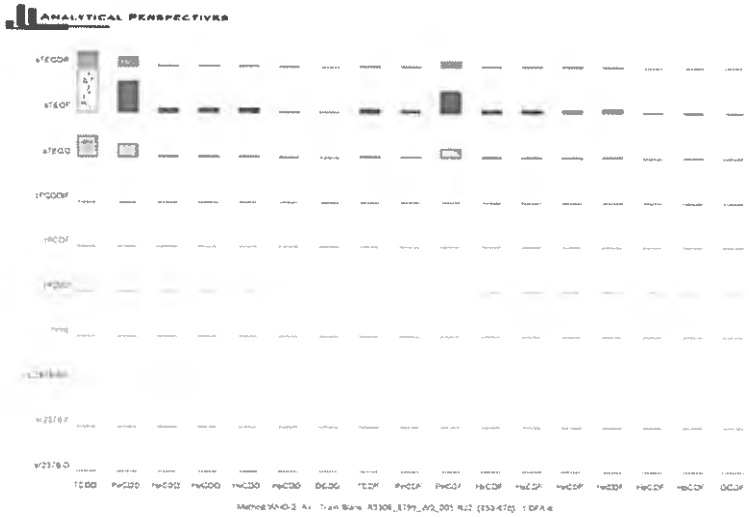


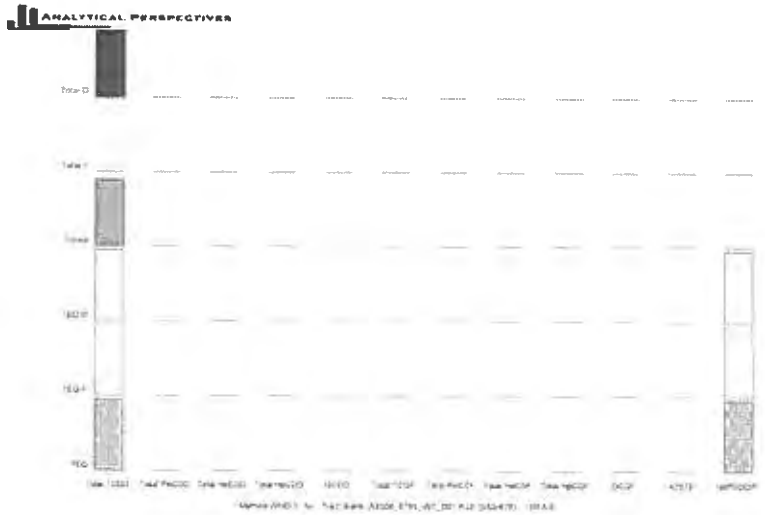
Method Specification Limits: Tetra-Octa SS: 70-130% (F = fail)

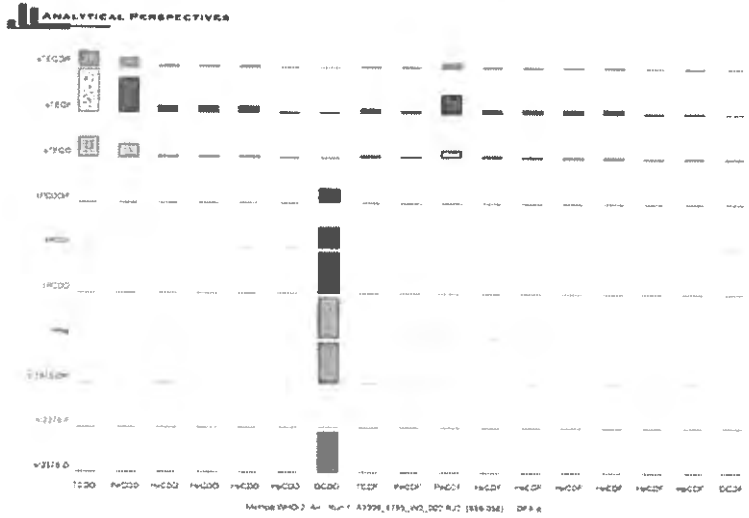

Mean Recoveries of Extraction Standards - PCBs (N=5)
Project ID: 511150
A3309
Mean
Std. Dev.
% Rec.
0
20
40
60
80
100
120
ES PCB-77
ES PCB-81
ES PCB-105
ES PCB-114
ES PCB-118
ES PCB-123
ES PCB-126
ES PCB-156
ES PCB-157
ES PCB-167
ES PCB-169
ES PCB-189
98-114
95-106
99-124
95-126
95-121
96-125
98-126
94-102
96-104
104-122
99-107
100-104

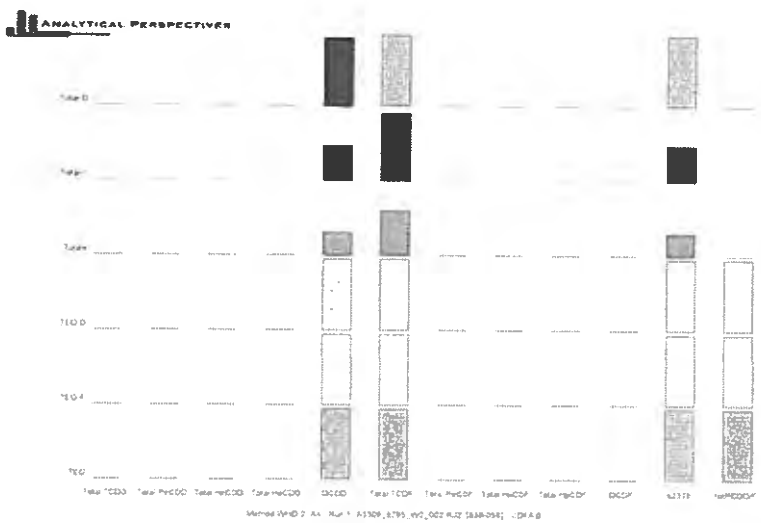

ANALYTICAL PERSPECTIVES

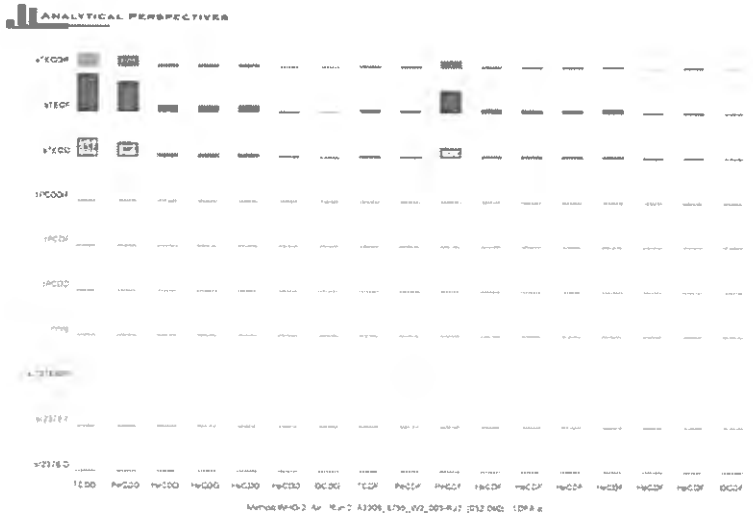

ANALYTICAL PERSPECTIVES

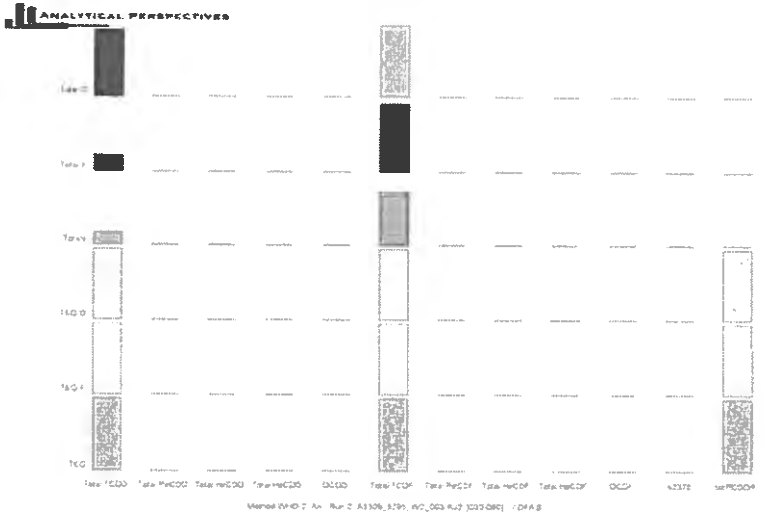

ANALYTICAL PERSPECTIVES

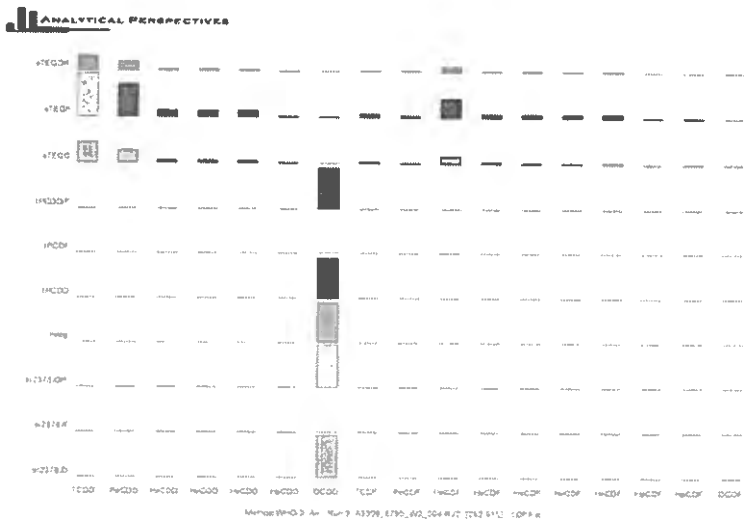

ANALYTICAL PERSPECTIVES

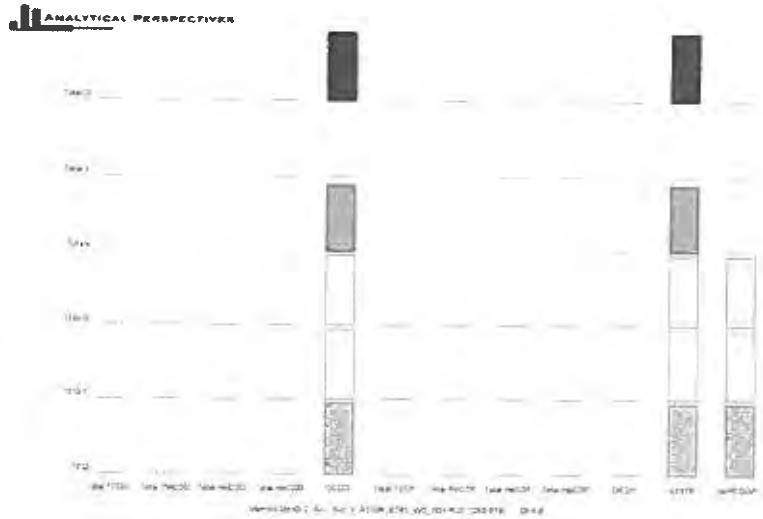

ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES

Sample ID: Method Blank

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID	MB1_8795_W2_SDS-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	17-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	17:23:40

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers
2378-TCDD	ND	1.74		
12378-PeCDD	ND	2.06		
123478-HxCDD	ND	1.71		
123678-HxCDD	ND	1.84		
123789-HxCDD	ND	1.87		
1234678-HpCDD	ND	2.04		
OCDD	ND	3.46		
2378-TCDF	ND	1.33		
12378-PeCDF	ND	1.42		
23478-PeCDF	ND	1.27		
123478-HxCDF	ND	1.07		
123678-HxCDF	ND	1.04		
234678-HxCDF	ND	1.07		
123789-HxCDF	ND	1.44		
1234678-HpCDF	ND	0.95		
1234789-HpCDF	ND	1.54		
OCDF	ND	4.43		
Totals				
Total TCDD	8.89		8.89	
Total PeCDD	ND	2.06	ND	
Total HxCDD	ND	1.8	ND	
Total HpCDD	ND	2.04	ND	
Total TCDF	ND	1.33	ND	
Total PeCDF	ND	1.34	ND	
Total HxCDF	ND	1.14	ND	
Total HpCDF	ND	1.22	ND	
Total PCDD/Fs	**8.89**		**8.89**	
ITEF TEQs				
TEQ: ND=0	0		0	
TEQ: ND=DL/2	2.33	2.33	2.33	
TEQ: ND=DL	4.66	4.66	4.66	

Standard	ES Recoveries	Qualifiers
ES 2378-TCDD	93.8	
ES 12378-PeCDD	85.4	
ES 123478-HxCDD	94.2	
ES 123678-HxCDD	95.9	
ES 123789-HxCDD	93.2	
ES 1234678-HpCDD	91.3	
ES OCDD	85.8	
ES 2378-TCDF	93.6	
ES 12378-PeCDF	85.6	
ES 23478-PeCDF	86.2	
ES 123478-HxCDF	93.6	
ES 123678-HxCDF	95.2	
ES 234678-HxCDF	94.2	
ES 123789-HxCDF	89.5	
ES 1234678-HpCDF	90.9	
ES 1234789-HpCDF	91.4	
ES OCDF	85.2	

Standard	SS Recoveries
SS 37Cl-2378-TCDD	96.1
SS 12347-PeCDD	98.9
SS 12346-PeCDF	98.4
SS 123469-HxCDF	95.7
SS 1234689-HpCDF	99.1

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290
www.ultratrace.com

Sample ID: Method Blank

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID:	MB1_8795_W2_SDS-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	17-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	17:23:40

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recovery
PCB-77 33'44'-TeCB	1.22			J	ES PCB-77	99.9
PCB-81 344'5-TeCB	ND	0.518			ES PCB-81	100
PCB-105 233'44'-PeCB	EMPC		2.65	J	ES PCB-105	102
PCB-114 2344'5-PeCB	ND	0.967			ES PCB-114	98.8
PCB-118 23'44'5-PeCB	7.88			J	ES PCB-118	94.8
PCB-123 2'344'5-PeCB	ND	0.855			ES PCB-123	101
PCB-126 33'44'5-PeCB	ND	1.41			ES PCB-126	100
PCB-156 233'44'5-HxCB	ND	0.736			ES PCB-156	94
PCB-157 233'44'5'-HxCB	ND	0.789			ES PCB-157	95.9
PCB-167 23'44'55'-HxCB	ND	0.561			ES PCB-167	114
PCB-169 33'44'55'-HxCB	ND	1.04			ES PCB-169	98.8
PCB-189 233'44'55'-HpCB	ND	1.53			ES PCB-189	99.9

TEQs	ITEF + WHO-2005			WHO-1998		WHO-2005	
	Conc.	EMPC		Conc.	EMPC	Conc.	EMPC
DF+PCB (ND=0)	0.000358	0.000438	PCB (ND=0)	0.00091	0.00117	0.000358	0.000438
DF+PCB (ND=DL/2)	2.42	2.42	PCB (ND=DL/2)	0.0774	0.0776	0.0866	0.0867
DF+PCB (ND=DL)	4.84	4.84	PCB (ND=DL)	0.154	0.154	0.173	0.173
DF+PCB (< J-level=0)	0	0.0000794	PCB (< J-level = 0)	0	0.000265	0	0.0000794
	ITEF + WHO-1998						
DF+PCB (ND=0)	0.00091	0.00117	DF+PCB (ND=0)	0.00091	0.00117	0.000358	0.000438
DF+PCB (ND=DL/2)	2.41	2.41	DF+PCB (ND=DL/2)	2.92	2.92	2.79	2.79
DF+PCB (ND=DL)	4.82	4.82	DF+PCB (ND=DL)	5.84	5.84	5.58	5.58
DF+PCB (< J-level=0)	0	0.000265	DF+PCB (< J-level=0)	0	0.000265	0	0.0000794

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: 794-3919); Toll-Free 866 846-8290
www.ultratrace.com

Checkcode: 360-459-YPR

AP WHO-2 2010 Rev. A

Report Created: 21-Jul-2011 11:26 Analyst: AP

Sample ID: Method Blank — TEQ Summary — Method WHO-2

Client Project Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Sample ID:	MB1_8795_W2_SDS-RJ2
Cliend Project ID:	511150	Weight/Volume:	1	QC Batch No.:	8795
Date Collected:	17-Jun-2011	Split:	2	Date Extracted:	30-Jun-2011
Date Received:	22-Jun-2011	Dilution:	-	Date Analyzed:	19-Jul-2011 17:23
Lab Project No:	A3309	Units	pg		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	(1.74)		1.74	(1.74)	(1.74)	(1.74)
12378-PeCDD	(2.06)		2.06	(1.03)	(2.06)	(2.06)
123478-HxCDD	(1.71)		1.71	(0.171)	(0.171)	(0.171)
123678-HxCDD	(1.84)		1.84	(0.184)	(0.184)	(0.184)
123789-HxCDD	(1.87)		1.87	(0.187)	(0.187)	(0.187)
1234678-HpCDD	(2.04)		2.04	(0.0204)	(0.0204)	(0.0204)
OCDD	(3.46)		3.46	(0.00346)	(0.000346)	(0.00104)
2378-TCDF	(1.33)		1.33	(0.133)	(0.133)	(0.133)
12378-PeCDF	(1.42)		1.42	(0.071)	(0.071)	(0.0426)
23478-PeCDF	(1.27)		1.27	(0.635)	(0.635)	(0.381)
123478-HxCDF	(1.07)		1.07	(0.107)	(0.107)	(0.107)
123678-HxCDF	(1.04)		1.04	(0.104)	(0.104)	(0.104)
234678-HxCDF	(1.07)		1.07	(0.107)	(0.107)	(0.107)
123789-HxCDF	(1.44)		1.44	(0.144)	(0.144)	(0.144)
1234678-HpCDF	(0.95)		0.95	(0.0095)	(0.0095)	(0.0095)
1234789-HpCDF	(1.54)		1.54	(0.0154)	(0.0154)	(0.0154)
OCDF	(4.43)		4.43	(0.00443)	(0.000443)	(0.00133)

TEQ Summaries			
EMPC = 0, ND = 0	0	0	0
EMPC = 0, ND = DL / 2	2.33	2.84	2.7
EMPC = 0, ND = DL	4.67	5.69	5.41
EMPC = 0, < J-level = 0	0	0	0
EMPC = EMPC, ND = 0	0	0	0
EMPC = EMPC, ND = DL / 2	2.33	2.84	2.7
EMPC = EMPC, ND = DL	4.67	5.69	5.41
EMPC = EMPC, < J-level = 0	0	0	0

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405, USA
Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

Checkcode: 360-459-YPR

AP WHO-2 2010 Rev. A

Sample ID: Train Blank

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID	A3309_8795_W2_001-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	18:11:46

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers
2378-TCDD	ND	2.23		
12378-PeCDD	ND	2.86		
123478-HxCDD	ND	1.86		
123678-HxCDD	ND	1.9		
123789-HxCDD	ND	1.97		
1234678-HpCDD	ND	3.13		
OCDD	ND	6.1		
2378-TCDF	ND	1.68		
12378-PeCDF	ND	2.07		
23478-PeCDF	ND	1.91		
123478-HxCDF	ND	1.39		
123678-HxCDF	ND	1.38		
234678-HxCDF	ND	1.35		
123789-HxCDF	ND	1.76		
1234678-HpCDF	ND	1.97		
1234789-HpCDF	ND	2.83		
OCDF	ND	6.51		
Totals				
Total TCDD	14.7		19.7	
Total PeCDD	ND	2.86	ND	
Total HxCDD	ND	1.9	ND	
Total HpCDD	ND	3.13	ND	
Total TCDF	ND	1.68	ND	
Total PeCDF	ND	1.99	ND	
Total HxCDF	ND	1.46	ND	
Total HpCDF	ND	2.36	ND	
Total PCDD/Fs	**14.7**		**19.7**	
ITEF TEQs				
TEQ: ND=0	0		0	
TEQ: ND=DL/2	3.07	3.07	3.07	
TEQ: ND=DL	6.14	6.14	6.14	

Standard	ES Recoveries	Qualifiers
ES 2378-TCDD	98.2	
ES 12378-PeCDD	98.6	
ES 123478-HxCDD	93.2	
ES 123678-HxCDD	94.7	
ES 123789-HxCDD	98.3	
ES 1234678-HpCDD	93.7	
ES OCDD	94.1	
ES 2378-TCDF	98	
ES 12378-PeCDF	95	
ES 23478-PeCDF	95.6	
ES 123478-HxCDF	93.4	
ES 123678-HxCDF	93.9	
ES 234678-HxCDF	94.6	
ES 123789-HxCDF	91	
ES 1234678-HpCDF	93.3	
ES 1234789-HpCDF	97.1	
ES OCDF	93.1	
Standard	**SS Recoveries**	
SS 37Cl-2378-TCDD	98.2	
SS 12347-PeCDD	99.8	
SS 12346-PeCDF	95.7	
SS 123469-HxCDF	101	
SS 1234689-HpCDF	99.1	

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290
www.ultratrace.com

Sample ID: Train Blank

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID:	A3309_8795_W2_001-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	18:11:46

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recovery
PCB-77 33'44'-TeCB	5.31			J	ES PCB-77	98
PCB-81 344'5-TeCB	ND	1.31			ES PCB-81	94.6
PCB-105 233'44'-PeCB	8.74			J	ES PCB-105	99.4
PCB-114 2344'5-PeCB	ND	0.972			ES PCB-114	94.9
PCB-118 23'44'5-PeCB	17.8			J B	ES PCB-118	94.8
PCB-123 2'344'5-PeCB	0.997			J	ES PCB-123	96.4
PCB-126 33'44'5-PeCB	ND	1.36			ES PCB-126	97.6
PCB-156 233'44'5-HxCB	1.25			J	ES PCB-156	97.2
PCB-157 233'44'5'-HxCB	ND	0.925			ES PCB-157	98
PCB-167 23'44'55'-HxCB	EMPC		0.964	J	ES PCB-167	116
PCB-169 33'44'55'-HxCB	ND	1.18			ES PCB-169	101
PCB-189 233'44'55'-HpCB	ND	1.67			ES PCB-189	103

TEQs	ITEF + WHO-2005			WHO-1998		WHO-2005	
	Conc.	EMPC		Conc.	EMPC	Conc.	EMPC
DF+PCB (ND=0)	0.0014	0.00142	PCB (ND=0)	0.00391	0.00392	0.0014	0.00142
DF+PCB (ND=DL/2)	3.16	3.16	PCB (ND=DL/2)	0.0784	0.0784	0.0874	0.0874
DF+PCB (ND=DL)	6.31	6.31	PCB (ND=DL)	0.153	0.153	0.173	0.173
DF+PCB (< J-level=0)	0	0.0000289	PCB (< J-level = 0)	0	0.00000964	0	0.0000289
	ITEF + WHO-1998						
DF+PCB (ND=0)	0.00391	0.00392	DF+PCB (ND=0)	0.00391	0.00392	0.0014	0.00142
DF+PCB (ND=DL/2)	3.15	3.15	DF+PCB (ND=DL/2)	3.86	3.86	3.66	3.66
DF+PCB (ND=DL)	6.29	6.29	DF+PCB (ND=DL)	7.71	7.71	7.31	7.31
DF+PCB (< J-level=0)	0	0.00000964	DF+PCB (< J-level=0)	0	0.00000964	0	0.0000289

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: 794-3919); Toll-Free 866 846-8290 www.ultratrace.com

Sample ID: Train Blank — TEQ Summary — Method WHO-2

Client Project Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Sample ID:	A3309_8795_W2_001-RJ2
Cliend Project ID:	511150	Weight/Volume:	1	QC Batch No.:	8795
Date Collected:	16-Jun-2011	Split:	2	Date Extracted:	30-Jun-2011
Date Received:	22-Jun-2011	Dilution:	-	Date Analyzed:	19-Jul-2011 18:11
Lab Project No:	A3309	Units	pg		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	(2.23)		2.23	(2.23)	(2.23)	(2.23)
12378-PeCDD	(2.86)		2.86	(1.43)	(2.86)	(2.86)
123478-HxCDD	(1.86)		1.86	(0.186)	(0.186)	(0.186)
123678-HxCDD	(1.9)		1.9	(0.19)	(0.19)	(0.19)
123789-HxCDD	(1.97)		1.97	(0.197)	(0.197)	(0.197)
1234678-HpCDD	(3.13)		3.13	(0.0313)	(0.0313)	(0.0313)
OCDD	(6.1)		6.1	(0.0061)	(0.00061)	(0.00183)
2378-TCDF	(1.68)		1.68	(0.168)	(0.168)	(0.168)
12378-PeCDF	(2.07)		2.07	(0.104)	(0.104)	(0.0621)
23478-PeCDF	(1.91)		1.91	(0.955)	(0.955)	(0.573)
123478-HxCDF	(1.39)		1.39	(0.139)	(0.139)	(0.139)
123678-HxCDF	(1.38)		1.38	(0.138)	(0.138)	(0.138)
234678-HxCDF	(1.35)		1.35	(0.135)	(0.135)	(0.135)
123789-HxCDF	(1.76)		1.76	(0.176)	(0.176)	(0.176)
1234678-HpCDF	(1.97)		1.97	(0.0197)	(0.0197)	(0.0197)
1234789-HpCDF	(2.83)		2.83	(0.0283)	(0.0283)	(0.0283)
OCDF	(6.51)		6.51	(0.00651)	(0.000651)	(0.00195)

TEQ Summaries			
EMPC = 0, ND = 0	0	0	0
EMPC = 0, ND = DL / 2	3.07	3.78	3.57
EMPC = 0, ND = DL	6.14	7.56	7.14
EMPC = 0, < J-level = 0	0	0	0
EMPC = EMPC, ND = 0	0	0	0
EMPC = EMPC, ND = DL / 2	3.07	3.78	3.57
EMPC = EMPC, ND = DL	6.14	7.56	7.14
EMPC = EMPC, < J-level = 0	0	0	0

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405, USA
Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

Checkcode: 853-676-VMN

Sample ID: Run 1

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID	A3309_8795_W2_002-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	18:59:52

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	3.19			ES 2378-TCDD	99.7	
12378-PeCDD	ND	4.12			ES 12378-PeCDD	97	
123478-HxCDD	ND	3.76			ES 123478-HxCDD	98.7	
123678-HxCDD	ND	3.71			ES 123678-HxCDD	96.2	
123789-HxCDD	ND	3.76			ES 123789-HxCDD	99.5	
1234678-HpCDD	ND	3.9			ES 1234678-HpCDD	97.8	
OCDD	10.5			J	ES OCDD	95.3	
2378-TCDF	ND	2.42			ES 2378-TCDF	97.5	
12378-PeCDF	ND	2.3			ES 12378-PeCDF	103	
23478-PeCDF	ND	2.28			ES 23478-PeCDF	94.1	
123478-HxCDF	ND	2.15			ES 123478-HxCDF	96.2	
123678-HxCDF	ND	2.12			ES 123678-HxCDF	94.1	
234678-HxCDF	ND	2.18			ES 234678-HxCDF	97.6	
123789-HxCDF	ND	2.41			ES 123789-HxCDF	95.6	
1234678-HpCDF	ND	3.16			ES 1234678-HpCDF	94.6	
1234789-HpCDF	ND	4.69			ES 1234789-HpCDF	95.9	
OCDF	ND	8.09			ES OCDF	90.4	
Totals					**Standard**	**SS Recoveries**	
					SS 37Cl-2378-TCDD	97.8	
Total TCDD	ND	3.19	ND		SS 12347-PeCDD	103	
Total PeCDD	ND	4.12	ND		SS 12346-PeCDF	89.7	
Total HxCDD	ND	3.73	ND		SS 123469-HxCDF	102	
Total HpCDD	ND	3.9	ND		SS 1234689-HpCDF	105	
Total TCDF	14		20.6				
Total PeCDF	ND	2.29	ND				
Total HxCDF	ND	2.21	ND				
Total HpCDF	ND	3.85	ND				
Total PCDD/Fs	**24.5**		**31.1**				
ITEF TEQs							
TEQ: ND=0	0.0105		0.0105				
TEQ: ND=DL/2	4.45	4.44	4.45				
TEQ: ND=DL	8.89	8.88	8.89				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290
www.ultratrace.com

Checkcode: 889-058-QCW AP WHO-2 2010 Rev. A Report Created: 21-Jul-2011 11:26 Analyst: AP

Sample ID: Run 1

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID:	A3309_8795_W2_002-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	18:59:52

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recovery
PCB-77 33'44'-TeCB	EMPC		7.41	J	ES PCB-77	110
PCB-81 344'5-TeCB	ND	1.47			ES PCB-81	102
PCB-105 233'44'-PeCB	18.3			J	ES PCB-105	114
PCB-114 2344'5-PeCB	ND	1.51			ES PCB-114	107
PCB-118 23'44'5-PeCB	42.6			B	ES PCB-118	110
PCB-123 2'344'5-PeCB	EMPC		2.88	J	ES PCB-123	110
PCB-126 33'44'5-PeCB	ND	2.01			ES PCB-126	112
PCB-156 233'44'5-HxCB	4.09			J	ES PCB-156	99.3
PCB-157 233'44'5'-HxCB	1.17			J	ES PCB-157	101
PCB-167 23'44'55'-HxCB	2.18			J	ES PCB-167	104
PCB-169 33'44'55'-HxCB	ND	1.54			ES PCB-169	105
PCB-189 233'44'55'-HpCB	ND	2.17			ES PCB-189	104

TEQs	ITEF + WHO-2005			WHO-1998		WHO-2005	
	Conc.	EMPC		Conc.	EMPC	Conc.	EMPC
DF+PCB (ND=0)	0.0126	0.0134	PCB (ND=0)	0.00875	0.00978	0.00205	0.00288
DF+PCB (ND=DL/2)	4.58	4.58	PCB (ND=DL/2)	0.118	0.119	0.126	0.127
DF+PCB (ND=DL)	9.14	9.14	PCB (ND=DL)	0.227	0.227	0.25	0.251
DF+PCB (< J-level=0)	0.00128	0.00211	PCB (< J-level = 0)	0.00426	0.00529	0.00128	0.00211
	ITEF + WHO-1998						
DF+PCB (ND=0)	0.0192	0.0203	DF+PCB (ND=0)	0.0098	0.0108	0.0052	0.00603
DF+PCB (ND=DL/2)	4.57	4.57	DF+PCB (ND=DL/2)	5.59	5.59	5.35	5.35
DF+PCB (ND=DL)	9.12	9.12	DF+PCB (ND=DL)	11.2	11.2	10.7	10.7
DF+PCB (< J-level=0)	0.00426	0.00529	DF+PCB (< J-level=0)	0.00426	0.00529	0.00128	0.00211

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: 794-3919); Toll-Free 866 846-8290
www.ultratrace.com

Checkcode: 889-058-QCW

AP WHO-2 2010 Rev. A

Report Created: 21-Jul-2011 11:26 Analyst: AP

Sample ID: Run 1 — TEQ Summary — Method WHO-2

Client Project Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Sample ID:	A3309_8795_W2_002-RJ2
Cliend Project ID:	511150	Weight/Volume:	1	QC Batch No.:	8795
Date Collected:	16-Jun-2011	Split:	2	Date Extracted:	30-Jun-2011
Date Received:	22-Jun-2011	Dilution:	-	Date Analyzed:	19-Jul-2011 18:59
Lab Project No:	A3309	Units	pg		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	(3.19)		3.19	(3.19)	(3.19)	(3.19)
12378-PeCDD	(4.12)		4.12	(2.06)	(4.12)	(4.12)
123478-HxCDD	(3.76)		3.76	(0.376)	(0.376)	(0.376)
123678-HxCDD	(3.71)		3.71	(0.371)	(0.371)	(0.371)
123789-HxCDD	(3.76)		3.76	(0.376)	(0.376)	(0.376)
1234678-HpCDD	(3.9)		3.9	(0.039)	(0.039)	(0.039)
OCDD	10.5	J	7.68	0.0105	0.00105	0.00315
2378-TCDF	(2.42)		2.42	(0.242)	(0.242)	(0.242)
12378-PeCDF	(2.3)		2.3	(0.115)	(0.115)	(0.069)
23478-PeCDF	(2.28)		2.28	(1.14)	(1.14)	(0.684)
123478-HxCDF	(2.15)		2.15	(0.215)	(0.215)	(0.215)
123678-HxCDF	(2.12)		2.12	(0.212)	(0.212)	(0.212)
234678-HxCDF	(2.18)		2.18	(0.218)	(0.218)	(0.218)
123789-HxCDF	(2.41)		2.41	(0.241)	(0.241)	(0.241)
1234678-HpCDF	(3.16)		3.16	(0.0316)	(0.0316)	(0.0316)
1234789-HpCDF	(4.69)		4.69	(0.0469)	(0.0469)	(0.0469)
OCDF	(8.09)		8.09	(0.00809)	(0.000809)	(0.00243)

TEQ Summaries			
EMPC = 0, ND = 0	0.0105	0.00105	0.00315
EMPC = 0, ND = DL / 2	4.45	5.47	5.22
EMPC = 0, ND = DL	8.89	10.9	10.4
EMPC = 0, < J-level = 0	0	0	0
EMPC = EMPC, ND = 0	0.0105	0.00105	0.00315
EMPC = EMPC, ND = DL / 2	4.45	5.47	5.22
EMPC = EMPC, ND = DL	8.89	10.9	10.4
EMPC = EMPC, < J-level = 0	0	0	0

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405, USA
Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

Checkcode: 889-058-QCW

AP WHO-2 2010 Rev. A

Sample ID: Run 2

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID	A3309_8795_W2_003-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	19:47:51

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.42			ES 2378-TCDD	104	
12378-PeCDD	ND	3.85			ES 12378-PeCDD	107	
123478-HxCDD	ND	3.96			ES 123478-HxCDD	96	
123678-HxCDD	ND	3.83			ES 123678-HxCDD	96.4	
123789-HxCDD	ND	4.01			ES 123789-HxCDD	95	
1234678-HpCDD	ND	3.71			ES 1234678-HpCDD	96.8	
OCDD	ND	7.11			ES OCDD	91.9	
2378-TCDF	ND	1.75			ES 2378-TCDF	98	
12378-PeCDF	ND	2.69			ES 12378-PeCDF	105	
23478-PeCDF	ND	2.73			ES 23478-PeCDF	97.4	
123478-HxCDF	ND	2.25			ES 123478-HxCDF	95.1	
123678-HxCDF	ND	2.16			ES 123678-HxCDF	94.7	
234678-HxCDF	ND	2.06			ES 234678-HxCDF	96.8	
123789-HxCDF	ND	2.56			ES 123789-HxCDF	93.3	
1234678-HpCDF	ND	3			ES 1234678-HpCDF	92.7	
1234789-HpCDF	ND	4.19			ES 1234789-HpCDF	93.1	
OCDF	ND	6.79			ES OCDF	86.4	
Totals					**Standard**	**SS Recoveries**	
					SS 37Cl-2378-TCDD	99.7	
Total TCDD	5.25		5.25		SS 12347-PeCDD	101	
Total PeCDD	ND	3.85	ND		SS 12346-PeCDF	89.8	
Total HxCDD	ND	3.92	ND		SS 123469-HxCDF	100	
Total HpCDD	ND	3.71	ND		SS 1234689-HpCDF	106	
Total TCDF	18		22.4				
Total PeCDF	ND	2.7	ND				
Total HxCDF	ND	2.25	ND				
Total HpCDF	ND	3.54	ND				
Total PCDD/Fs	**23.2**		**27.6**				
ITEF TEQs							
TEQ: ND=0	0		0				
TEQ: ND=DL/2	4.11	4.11	4.11				
TEQ: ND=DL	8.22	8.22	8.22				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290
www.ultratrace.com

Sample ID: Run 2

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID:	A3309_8795_W2_003-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	16-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	19:47:51

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recovery
PCB-77 33'44'-TeCB	73.1				ES PCB-77	106
PCB-81 344'5-TeCB	5.05			J	ES PCB-81	101
PCB-105 233'44'-PeCB	45.3				ES PCB-105	124
PCB-114 2344'5-PeCB	EMPC		3.43	J	ES PCB-114	126
PCB-118 23'44'5-PeCB	102				ES PCB-118	121
PCB-123 2'344'5-PeCB	4.7			J	ES PCB-123	125
PCB-126 33'44'5-PeCB	ND	2.25			ES PCB-126	126
PCB-156 233'44'5-HxCB	2.47			J	ES PCB-156	102
PCB-157 233'44'5'-HxCB	ND	1.19			ES PCB-157	104
PCB-167 23'44'55'-HxCB	EMPC		1.52	J	ES PCB-167	122
PCB-169 33'44'55'-HxCB	ND	1.63			ES PCB-169	107
PCB-189 233'44'55'-HpCB	ND	1.76			ES PCB-189	104

TEQs	ITEF + WHO-2005			WHO-1998		WHO-2005	
	Conc.	EMPC		Conc.	EMPC	Conc.	EMPC
DF+PCB (ND=0)	0.0134	0.0136	PCB (ND=0)	0.0242	0.0259	0.0134	0.0136
DF+PCB (ND=DL/2)	4.26	4.26	PCB (ND=DL/2)	0.146	0.147	0.15	0.151
DF+PCB (ND=DL)	8.51	8.51	PCB (ND=DL)	0.267	0.268	0.288	0.288
DF+PCB (< J-level=0)	0.0117	0.0119	PCB (< J-level = 0)	0.022	0.0237	0.0117	0.0119
	ITEF + WHO-1998						
DF+PCB (ND=0)	0.0242	0.0259	DF+PCB (ND=0)	0.0242	0.0259	0.0134	0.0136
DF+PCB (ND=DL/2)	4.26	4.26	DF+PCB (ND=DL/2)	5.21	5.22	4.92	4.92
DF+PCB (ND=DL)	8.49	8.49	DF+PCB (ND=DL)	10.4	10.4	9.83	9.83
DF+PCB (< J-level=0)	0 022	0.0237	DF+PCB (< J-level=0)	0.022	0.0237	0.0117	0.0119

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: 794-3919); Toll-Free 866 846-8290
www.ultratrace.com

Checkcode: 032-060-JVW AP WHO-2 2010 Rev. A Report Created: 21-Jul-2011 11:27 Analyst: AP

Sample ID: Run 2 — TEQ Summary — Method WHO-2

Client Project Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Sample ID:	A3309_8795_W2_003-RJ2
Cliend Project ID:	511150	Weight/Volume:	1	QC Batch No.:	8795
Date Collected:	16-Jun-2011	Split:	2	Date Extracted:	30-Jun-2011
Date Received:	22-Jun-2011	Dilution:	-	Date Analyzed:	19-Jul-2011 19:47
Lab Project No:	A3309	Units	pg		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	(2.42)		2.42	(2.42)	(2.42)	(2.42)
12378-PeCDD	(3.85)		3.85	(1.93)	(3.85)	(3.85)
123478-HxCDD	(3.96)		3.96	(0.396)	(0.396)	(0.396)
123678-HxCDD	(3.83)		3.83	(0.383)	(0.383)	(0.383)
123789-HxCDD	(4.01)		4.01	(0.401)	(0.401)	(0.401)
1234678-HpCDD	(3.71)		3.71	(0.0371)	(0.0371)	(0.0371)
OCDD	(7.11)		7.11	(0.00711)	(0.000711)	(0.00213)
2378-TCDF	(1.75)		1.75	(0.175)	(0.175)	(0.175)
12378-PeCDF	(2.69)		2.69	(0.135)	(0.135)	(0.0807)
23478-PeCDF	(2.73)		2.73	(1.37)	(1.37)	(0.819)
123478-HxCDF	(2.25)		2.25	(0.225)	(0.225)	(0.225)
123678-HxCDF	(2.16)		2.16	(0.216)	(0.216)	(0.216)
234678-HxCDF	(2.06)		2.06	(0.206)	(0.206)	(0.206)
123789-HxCDF	(2.56)		2.56	(0.256)	(0.256)	(0.256)
1234678-HpCDF	(3)		3	(0.03)	(0.03)	(0.03)
1234789-HpCDF	(4.19)		4.19	(0.0419)	(0.0419)	(0.0419)
OCDF	(6.79)		6.79	(0.00679)	(0.000679)	(0.00204)

TEQ Summaries			
EMPC = 0, ND = 0	0	0	0
EMPC = 0, ND = DL / 2	4.11	5.07	4.77
EMPC = 0, ND = DL	8.23	10.1	9.54
EMPC = 0, < J-level = 0	0	0	0
EMPC = EMPC, ND = 0	0	0	0
EMPC = EMPC, ND = DL / 2	4.11	5.07	4.77
EMPC = EMPC, ND = DL	8.23	10.1	9.54
EMPC = EMPC, < J-level = 0	0	0	0

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405, USA
Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

Checkcode: 032-060-JVW

AP WHO-2 2010 Rev. A

Sample ID: Run 3

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID	A3309_8795_W2_004-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	17-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	20:35:50

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers
2378-TCDD	ND	4.22		
12378-PeCDD	ND	5.27		
123478-HxCDD	ND	5.28		
123678-HxCDD	ND	5.24		
123789-HxCDD	ND	5.24		
1234678-HpCDD	ND	6.42		
OCDD	10.9			J
2378-TCDF	ND	2.97		
12378-PeCDF	ND	2.82		
23478-PeCDF	ND	3.09		
123478-HxCDF	ND	2.87		
123678-HxCDF	ND	2.83		
234678-HxCDF	ND	2.72		
123789-HxCDF	ND	3.28		
1234678-HpCDF	ND	3.7		
1234789-HpCDF	ND	5.14		
OCDF	ND	8.42		
Totals				
Total TCDD	ND	4.22	ND	
Total PeCDD	ND	5.27	ND	
Total HxCDD	ND	5.24	ND	
Total HpCDD	ND	6.42	ND	
Total TCDF	ND	2.97	ND	
Total PeCDF	ND	2.95	ND	
Total HxCDF	ND	2.91	ND	
Total HpCDF	ND	4.36	ND	
Total PCDD/Fs	**10.9**		**10.9**	
ITEF TEQs				
TEQ: ND=0	0.0109		0.0109	
TEQ: ND=DL/2	5.88	5.88	5.88	
TEQ: ND=DL	11.8	11.8	11.8	

Standard	ES Recoveries	Qualifiers
ES 2378-TCDD	98.1	
ES 12378-PeCDD	98	
ES 123478-HxCDD	99.2	
ES 123678-HxCDD	101	
ES 123789-HxCDD	101	
ES 1234678-HpCDD	104	
ES OCDD	104	
ES 2378-TCDF	95	
ES 12378-PeCDF	104	
ES 23478-PeCDF	96.2	
ES 123478-HxCDF	96.9	
ES 123678-HxCDF	95.8	
ES 234678-HxCDF	101	
ES 123789-HxCDF	98.7	
ES 1234678-HpCDF	101	
ES 1234789-HpCDF	104	
ES OCDF	99.1	

Standard	SS Recoveries
SS 37Cl-2378-TCDD	98.6
SS 12347-PeCDD	105
SS 12346-PeCDF	88.8
SS 123469-HxCDF	102
SS 1234689-HpCDF	106

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290
www.ultratrace.com

Checkcode: 282-915-VYD

AP WHO-2 2010 Rev. A

Report Created: 21-Jul-2011 11:27 Analyst: AP

Sample ID: Run 3

Method WHO-2

Client Data		Sample Data		Laboratory Data			
Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Project ID:	A3309	Date Received:	22-Jun-2011
Project ID:	511150	Weight/Volume:	1	Lab Sample ID:	A3309_8795_W2_004-RJ2	Date Extracted:	30-Jun-2011
Date Collected:	17-Jun-2011			QC Batch No:	8795	Date Analyzed:	19-Jul-2011
		Split:	2	Dilution:	-	Time Analyzed:	20:35:50

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recovery
PCB-77 33'44'-TeCB	EMPC		5.02	J	ES PCB-77	114
PCB-81 344'5-TeCB	ND	2			ES PCB-81	106
PCB-105 233'44'-PeCB	EMPC		10.9	J	ES PCB-105	119
PCB-114 2344'5-PeCB	ND	1.46			ES PCB-114	115
PCB-118 23'44'5-PeCB	27.6			B	ES PCB-118	111
PCB-123 2'344'5-PeCB	ND	1.36			ES PCB-123	115
PCB-126 33'44'5-PeCB	ND	1.97			ES PCB-126	118
PCB-156 233'44'5-HxCB	2.53			J	ES PCB-156	100
PCB-157 233'44'5'-HxCB	ND	1.07			ES PCB-157	103
PCB-167 23'44'55'-HxCB	1.03			J	ES PCB-167	108
PCB-169 33'44'55'-HxCB	ND	1.46			ES PCB-169	104
PCB-189 233'44'55'-HpCB	ND	1.75			ES PCB-189	101

TEQs	ITEF + WHO-2005			WHO-1998		WHO-2005	
	Conc.	EMPC		Conc.	EMPC	Conc.	EMPC
DF+PCB (ND=0)	0.0118	0.0127	PCB (ND=0)	0.00404	0.00563	0.000936	0.00177
DF+PCB (ND=DL/2)	6.01	6.01	PCB (ND=DL/2)	0.111	0.112	0.122	0.123
DF+PCB (ND=DL)	12	12	PCB (ND=DL)	0.218	0.219	0.243	0.243
DF+PCB (< J-level=0)	0.000829	0.00166	PCB (< J-level = 0)	0.00276	0.00436	0.000829	0.00166
	ITEF + WHO-1998						
DF+PCB (ND=0)	0.0149	0.0165	DF+PCB (ND=0)	0.00513	0.00672	0.0042	0.00503
DF+PCB (ND=DL/2)	5.99	6	DF+PCB (ND=DL/2)	7.3	7.3	6.97	6.98
DF+PCB (ND=DL)	12	12	DF+PCB (ND=DL)	14.6	14.6	13.9	13.9
DF+PCB (< J-level=0)	0.00276	0.00436	DF+PCB (< J-level=0)	0.00276	0.00436	0.000829	0.00166

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
Tel: +1 910 794-1613 (Fax: 794-3919); Toll-Free 866 846-8290
www.ultratrace.com

Sample ID: Run 3 — TEQ Summary — Method WHO-2

Client Project Name:	ENTEC Services, Inc.	Matrix:	Air	Lab Sample ID:	A3309_8795_W2_004-RJ2
Cliend Project ID:	511150	Weight/Volume:	1	QC Batch No.:	8795
Date Collected:	17-Jun-2011	Split:	2	Date Extracted:	30-Jun-2011
Date Received:	22-Jun-2011	Dilution:	-	Date Analyzed:	19-Jul-2011 20:35
Lab Project No:	A3309	Units	pg		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	(4.22)		4.22	(4.22)	(4.22)	(4.22)
12378-PeCDD	(5.27)		5.27	(2.64)	(5.27)	(5.27)
123478-HxCDD	(5.28)		5.28	(0.528)	(0.528)	(0.528)
123678-HxCDD	(5.24)		5.24	(0.524)	(0.524)	(0.524)
123789-HxCDD	(5.24)		5.24	(0.524)	(0.524)	(0.524)
1234678-HpCDD	(6.42)		6.42	(0.0642)	(0.0642)	(0.0642)
OCDD	10.9	J	9.35	0.0109	0.00109	0.00327
2378-TCDF	(2.97)		2.97	(0.297)	(0.297)	(0.297)
12378-PeCDF	(2.82)		2.82	(0.141)	(0.141)	(0.0846)
23478-PeCDF	(3.09)		3.09	(1.55)	(1.55)	(0.927)
123478-HxCDF	(2.87)		2.87	(0.287)	(0.287)	(0.287)
123678-HxCDF	(2.83)		2.83	(0.283)	(0.283)	(0.283)
234678-HxCDF	(2.72)		2.72	(0.272)	(0.272)	(0.272)
123789-HxCDF	(3.28)		3.28	(0.328)	(0.328)	(0.328)
1234678-HpCDF	(3.7)		3.7	(0.037)	(0.037)	(0.037)
1234789-HpCDF	(5.14)		5.14	(0.0514)	(0.0514)	(0.0514)
OCDF	(8.42)		8.42	(0.00842)	(0.000842)	(0.00253)

TEQ Summaries			
EMPC = 0, ND = 0	0.0109	0.00109	0.00327
EMPC = 0, ND = DL / 2	5.88	7.19	6.85
EMPC = 0, ND = DL	11.8	14.4	13.7
EMPC = 0, < J-level = 0	0	0	0
EMPC = EMPC, ND = 0	0.0109	0.00109	0.00327
EMPC = EMPC, ND = DL / 2	5.88	7.19	6.85
EMPC = EMPC, ND = DL	11.8	14.4	13.7
EMPC = EMPC, < J-level = 0	0	0	0

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405, USA
Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

Checkcode: 282-915-VYD

AP WHO-2 2010 Rev. A

APPENDIX C.4

LABORATORY DATA

METHOD 29 – METALS

Entec Services, Inc.

9420 Holly Springs Road
Apex, NC 27539

Project No: 511150

Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Nickel and Selenium

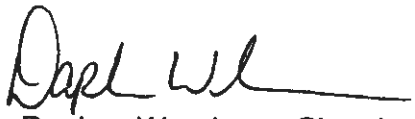
EPA Method 29 Analysis

Analytical Report
16878

Element One, Inc.
5022-C Wrightsville Av., Wilmington, NC 28403
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 16878
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:



Daphne Woodman, Chemist
July 7, 2011

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
July 7, 2011

SUMMARY OF RESULTS

Summary of Analysis

Summary of Method 29 Metals Analysis

Element	Run 1 e16878-1 Total µg	Run 2 e16878-2 Total µg	Run 2 e16878-2 dup Total µg	Run 3 e16878-3 Total µg	Train Blank e16878-4 Total µg
Antimony	8.50	7.14	7.08	6.77	2.71
Arsenic	0.937	0.985	0.943	0.658	< 0.2
Beryllium	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium	1.12	0.563	0.559	0.413	< 0.2
Chromium	6.13	3.28	3.28	6.37	2.93
Cobalt	8.13	1.85	1.86	1.85	0.414
Lead	9.88	4.63	4.60	6.90	0.817
Manganese	46.2	12.5	12.7	13.6	4.98
Nickel	22.7	18.6	18.6	19.1	4.01
Selenium	5.48	5.37	5.34	4.70	< 0.2

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Entec Services, Inc.	Element One #:	16878
Client ID:	511150/Hovensa	Analyst:	KMS
Method:	Method 29	Dates Received:	06/24/11
Analytes:	Sb, As, Be, Cd, Cr, Co, Pb, Mn, Ni & Se	Dates Analyzed:	06/29/11

Summary of Analysis

The Method 29 samples were digested, prepared, and analyzed according to Method 29 protocol. Samples were analyzed for metals using a PerkinElmer ELAN 6100 ICP-MS.

Detection Limits

The ICP-MS instrument reporting limits were 0.25µg/L for beryllium and 1.0µg/L for the other metals.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD), spike sample recovery and second source calibration verification data are summarized in the Quality Control Section. All QA/QC data was within the criteria of the method.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Metals Duplicate Analysis RPD

(Method 29 QC limits: < 20% for RPD)

Element	Run 2 RPD
Antimony	0.8%
Arsenic	4.4%
Beryllium	NA
Cadmium	0.7%
Chromium	0.2%
Cobalt	1.0%
Lead	0.7%
Manganese	2.1%
Nickel	0.1%
Selenium	0.6%

Metals Analysis Spike Recoveries

(Method 29 QC limits: ± 25% for Spike Recoveries)

Element	Run 3 Recovery
Antimony	83%
Arsenic	90%
Beryllium	80%
Cadmium	90%
Chromium	100%
Cobalt	109%
Lead	104%
Manganese	115%
Nickel	97%
Selenium	82%

Summary of Quality Control Data

Second Source Calibration Check Recoveries

(Method 29 QC limits: ± 10% for Second Source Continuing Check Standard)*

Element	0.25 ppb	1 ppb	50 ppb	100 ppb*	250 ppb
Antimony		106%	100%	102%	99%
Arsenic		112%	97%	101%	99%
Beryllium	84%	102%	97%	101%	98%
Cadmium		106%	95%	99%	98%
Chromium		104%	97%	98%	98%
Cobalt		121%	111%	112%	110%
Lead		117%	111%	108%	100%
Manganese		118%	112%	112%	100%
Nickel		104%	102%	103%	100%
Selenium		101%	95%	100%	97%

SAMPLE CUSTODY

16878

CHAIN OF CUSTODY

Element One, Inc.
5022-C Wrightsville Av.
Wilmington, NC 28403

Phone: 910-793-0128
FAX: 910-792-6853
Email: e1lab@e1lab.com

Client	Entec Services Inc
Project No	511150
Project ID:	MACT Testing
PO No	

Sampling Site	FCCU Stack
Date:	6-21-11
Plant Name:	Hovensa
Plant City, State	St. Croix USVI

Contact	Chuck Duncan	Address:
Phone:	Cell 919-244-7777	
Fax:	email CDuncan@entecservices.com	

Sample ID	Custody Seal #	Date	Unit / Run Number	Sample Fraction	Filter ID	Filter Tare
Filter Run 1		6-18	Run 1	Filter R-1		
1N HNO3 Rinse		6-18	Run 1	Probe wash R-1		
Acetone Rinse		6-18	Run 1	Probe wash R1		
Imp Catch		6-18	Run 1	Impinger Catch / Rinse		
Filter R2		6-18	Run 2	Filter Run 2		
1N HNO3 R2		6-18	Run 2	Probe Rinse Run 2		
Acetone R2		6-18	Run 2	Probe Rinse Run 2		
Imp Catch R2		6-18	Run 2	Impinger Catch / Rinse		
Filter R3		6-19	Run 3	Filter Run 3		
1N HNO3 R3		6-19	Run 3	Probe Rinse Run 3		
Acetone R3		6-19	Run 3	Probe Rinse Run 3		
Imp Catch		6-19	Run 3	Impinger Catch Rinse R3		
Blank		6-19	Blank	Field train Blank (Imp)		
Blank		6-19	Blank	1N HNO3 front H2O Blank		
Blank		6-19	Blank	1N HNO3 Blank (Reagent)		
Blank		6-19	Blank	5% HNO3 / 10% H2O2 Blank		
Blank		6-19	Blank	Quartz Filter		
Blank		6-19	Blank	Acetone Reagent Blk		
Blank		6-19	Blank	Field Train Blank Acetone		
Blank		6-19	Blank	Probe Blank Acetone		
Blank		6-19	Blank			

Analysis Requested.

Method	M-29
Analytical Parameters	Metals MACT Testing

	Signature	Company	Date	Time
Collected by:	[signature]	Entec	6-21-11	
COC Completed by:	Tim Draheim	Entec	6-21-11	
Relinquished by:	[signature]	Entec	6-21-11	
Received by:				
Relinquished by:				
Received by:				
Relinquished by:				
Received by:	[signature]	Element One Inc	6-24-11	1005
Sample Condition Upon Receipt	Good	Temperature Upon Receipt		

No empty container received.

Element One, Inc. Form 120 - Revision 0.1

Make Copies for 2nd Box 1 of 1

ANALYTICAL DATA

Analytical Calculations

Metals-

Element Results (µg) =ICP Results (µg/L)*Dilution*Final Volume (L)

Where-

ICP Results= Raw sample concentration (ppb)--*ICP-Data Sheet*

Dilution= Diluted Volume--*ICP-MS Run Sheet*
Aliquot

Final Volume=FH=Final Volume (FV)--*Sample Submission*
BH=Received Volume (BV).*Final Volume (FV)--*Sample Submission*
Aliquot (Used)
Combined Results=FH+BH

Analytical Calculations

Spike Recovery-

$$\text{Spike (\%)} = \frac{\text{(Spiked Result (µg/L) – Sample Result (µg/L))}}{\text{Spike Amount (µg/L)}} \quad \text{X100}$$

Where-

Spike Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Sample Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Spike Amount--*ICP-MS Spike Table*

Duplicate Analysis RPD-

$$\text{RPD (\%)} = \frac{\text{(Duplicate Result (µg/L) - Sample Result (µg/L))}}{\text{Average (µg/L)}} \quad \text{X100}$$

Where-

Sample Result and Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

$$\text{Average} = \frac{\text{(Duplicate + Sample Results)}}{2}$$

elementOne **AIR TESTING SAMPLE SUBMISSION FORM . Lab ID 16878**

FH /BH Combined Analysis

Analysis Due Date 07.05.11
QA/QC/Report Due Date 07.06.11

Client	Entec Services, Inc
Project ID	511150

Date Rec	06.24.11
Time Rec	1005

HNO_3 Lot: 50300	HF Lot: S110690	HCl Lot: S1035	**Ref. Method:**
Volume Marked Y / N	Volume Loss Y / N ?		**29**

Sample Identification

1	M29-R1	4	Train Blank		
2	M29-R2	5	Reagent Blank (Archive)		
	M29-R2 Duplicate	6	Probe Blank (Archive)		
3	M29-R3				
	M29-R3 Spike				

Analyses Requested	Samples 1-4	Sb, As, Be, Cd, Cr, Co, Pb, Mn, Ni, Se
	Samples 5-6	Archive
	NOTE:	**No PM---FH / BH Combined**

Runs / FB	Fil / Ace (FH)		HNO_3 (FH)		5% HNO_3/10% H_2O_2 (BH)			HNO_3 (A)		$KMnO_4$ (B)		HCl (C)	
			pH <2.0 Y / N		pH <2.0 Y / N			pH <2.0 Y / N		pH <2.0 Y / N		pH <2.0 Y / N	
Lab ID	Fil ID	BV ml	BV ml	FV ml	BV ml	Used	FV ml	BV ml	FV ml	BV ml	FV ml	BV ml	FV ml
1	100		225	100	1000	500	50						
2.D	73		90	↓	1000	500	↓						
3.S	75		105		1000	500							
4	40		65		400	200							

M-29 Reagent Blank

Lab ID	Fraction			BV, ml	FV, ml	Comments
	C 7	FH	Acetone Blank			
	C 8A	FH	0.1N HNO_3			
	C 8A	A	0.1N HNO_3			
	C 8B	B	DI H_2O			
	C 9	BH	5% HNO_3/10% H_2O_2			
	C 10	B	4% $KMnO_4$/10%H_2SO_4			
	C 11	C	8N HCl DI H_2O			
	C 12	FH	Filter			

Lab Communications

M29 Fractions Received:C1, C2, C3, C4---LLB 06.24.11

SS Page 1 of 2
6/28/2011 12:06:40 PM
SS Form By
Labeled By/Date RLS 6.28.11

FH Prep By/Date 6/24/11
BH Prep By/Date 6/24/11
BH/FH Prep By/Date 6/24/11
PM Prep By/Date 6.28.11
A Prep By/Date
B Prep By/Date
C Prep By/Date
ID Verification By / Date 6/24/11

elementOne **Method 29 Microwave Worksheet** **Lab ID # e**

Client:

Date Digested: 6/24/11 Initials: PMH Worksheet Prepared by: PMH

Auto Sample Loc.	Sample Lab ID	Sample Weight (g)	# of filters digested	Spike	Prep Volume (ml)	Weight In Micro / Weight Out Micro	Units
1	16818-LRB		0		100		
2	16878-LFB+		↓				
3	-1		1				
#5	-2						
#6	-3						
#7	-4		↓		↓		
#9	Total-LRB		0		40		
#10	-LFB+		↓				
#11	16820-1	.3122	0				
#13	16877-1	.3504	↓		↓		
#14	BLANK						
15	BLANK						

Element One, Inc. Form 104 - Revision 1.0

Sample/Batch Report

User Name: icp
Computer Name: D8D4DWD1
Sample File: C:\elandata_icp\Sample\xx17.sam
Report Date/Time: Thursday, June 30, 2011 08:39:22

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
20		16880-1		Sample					
21	d	16880-1		Duplicate of 2					
22		16895-1		Sample					
23	s	16895-1		Spike - 1 of 4					
24		16895-2		Sample					
25	x5	LRB		Sample					
26	x5s	LRB		Spike - 3 of 7					
27	x5	16889-1		Sample					
28	x5	16889-2		Sample					
29	x5d	16889-2		Sample					
30	x5	16889-3		Sample					
31	x5s	16889-3		Spike - 3 of 12					
32	x5	16889-4		Sample					
33	x5	16889-5		Sample					
34	x5	16889-6		Sample					
35	x5	16889-7		Sample					
36	x5	16889-8		Sample					
1		QC Std 1		Sample					
3		QC Std 4		Sample					
5		QC Std 2	Entec	Sample					
39		16878-1	Entec	Sample					
40		16878-2	Entec	Sample					
41	d	16878-2	Entec	Duplicate of 23					
42		16878-3	Entec	Sample					
43	s	16878-3	Entec	Spike - 1 of 25					
44		16878-4	Entec	Sample					

Dataset Report

User Name: icp
Computer Name: D8D4DWD1
Dataset File Path: C:\elandata_icp\DataSet\062911-3\
Report Date/Time: Thursday, June 30, 2011 08:39:18

Autosampler Position: 44

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol	Aliquot. Vol.	Diluted V
20:16:12 Wed 29-Jun-11	Blank		Blank					
20:18:48 Wed 29-Jun-11	Standard 1		Standard #1					
20:21:26 Wed 29-Jun-11	Standard 2		Standard #2					
20:24:04 Wed 29-Jun-11	Standard 3		Standard #3					
20:26:41 Wed 29-Jun-11	QC Std 1		QC Std #1					
20:29:19 Wed 29-Jun-11	QC Std 2		QC Std #2					
20:31:56 Wed 29-Jun-11	QC Std 3		QC Std #3					
20:34:33 Wed 29-Jun-11	QC Std 4		QC Std #4					
20:37:10 Wed 29-Jun-11	QC Std 5		QC Std #5					
20:39:47 Wed 29-Jun-11	QC Std 6		QC Std #6					
20:42:26 Wed 29-Jun-11	QC Std 7		QC Std #7					
20:45:04 Wed 29-Jun-11	QC Std 8		QC Std #8					
20:47:42 Wed 29-Jun-11	QC Std 9		QC Std #9					
20:50:19 Wed 29-Jun-11	QC Std 10		QC Std #10					
20:52:57 Wed 29-Jun-11	QC Std 2		Sample					
20:55:35 Wed 29-Jun-11	16880-1		Sample					
20:58:13 Wed 29-Jun-11	16880-1	d	Duplicate of 1					
21:00:51 Wed 29-Jun-11	16895-1		Sample					
21:03:29 Wed 29-Jun-11	16895-1	s	Spike - 1 of 1					
21:06:08 Wed 29-Jun-11	16895-2		Sample					
21:08:47 Wed 29-Jun-11	LRB	x5	Sample					
21:11:25 Wed 29-Jun-11	LRB	x5s	Spike - 3 of 2					
21:14:02 Wed 29-Jun-11	16889-1	x5	Sample					
21:16:39 Wed 29-Jun-11	16889-2	x5	Sample					
21:19:16 Wed 29-Jun-11	QC Std 1		QC Std #1					
21:21:53 Wed 29-Jun-11	QC Std 4		QC Std #4					
21:24:30 Wed 29-Jun-11	16889-2	x5d	Sample					
21:27:07 Wed 29-Jun-11	16889-3	x5	Sample					
21:29:45 Wed 29-Jun-11	16889-3	x5s	Spike - 3 of 2					
21:32:22 Wed 29-Jun-11	16889-4	x5	Sample					
21:35:00 Wed 29-Jun-11	16889-5	x5	Sample					
21:37:38 Wed 29-Jun-11	16889-6	x5	Sample					
21:40:16 Wed 29-Jun-11	16889-7	x5	Sample					
21:42:55 Wed 29-Jun-11	16889-8	x5	Sample					
21:45:32 Wed 29-Jun-11	QC Std 1		Sample					
21:48:09 Wed 29-Jun-11	QC Std 4		Sample					
21:50:46 Wed 29-Jun-11	QC Std 1		QC Std #1					
21:53:23 Wed 29-Jun-11	QC Std 4		QC Std #4					
21:56:00 Wed 29-Jun-11	Blank		Blank					
21:58:33 Wed 29-Jun-11	Standard 1		Standard #1					
22:01:07 Wed 29-Jun-11	Standard 2		Standard #2					
22:03:42 Wed 29-Jun-11	Standard 3		Standard #3					
22:06:16 Wed 29-Jun-11	QC Std 1		QC Std #1					

Page 1

22:08:50 Wed 29-Jun-11	QC Std 2		QC Std #2	
22:11:24 Wed 29-Jun-11	QC Std 3		QC Std #3	
22:13:58 Wed 29-Jun-11	QC Std 4		QC Std #4	
22:16:32 Wed 29-Jun-11	QC Std 5		QC Std #5	
22:19:06 Wed 29-Jun-11	QC Std 7		QC Std #7	
22:21:41 Wed 29-Jun-11	QC Std 8		QC Std #8	
22:24:16 Wed 29-Jun-11	QC Std 9		QC Std #9	
22:26:51 Wed 29-Jun-11	QC Std 10		QC Std #10	
22:29:27 Wed 29-Jun-11	QC Std 2		Sample	Entec
22:32:02 Wed 29-Jun-11	16878-1		Sample	Entec
22:34:36 Wed 29-Jun-11	16878-2		Sample	Entec
22:37:10 Wed 29-Jun-11	16878-2	d	Duplicate of 54	Entec
22:39:45 Wed 29-Jun-11	16878-3		Sample	Entec
22:42:19 Wed 29-Jun-11	16878-3	s	Spike - 1 of 56	Entec
22:44:54 Wed 29-Jun-11	16878-4		Sample	Entec
22:47:27 Wed 29-Jun-11	QC Std 1		QC Std #1	
22:50:01 Wed 29-Jun-11	QC Std 4		QC Std #4	

elementOne
Analyst:--kms--

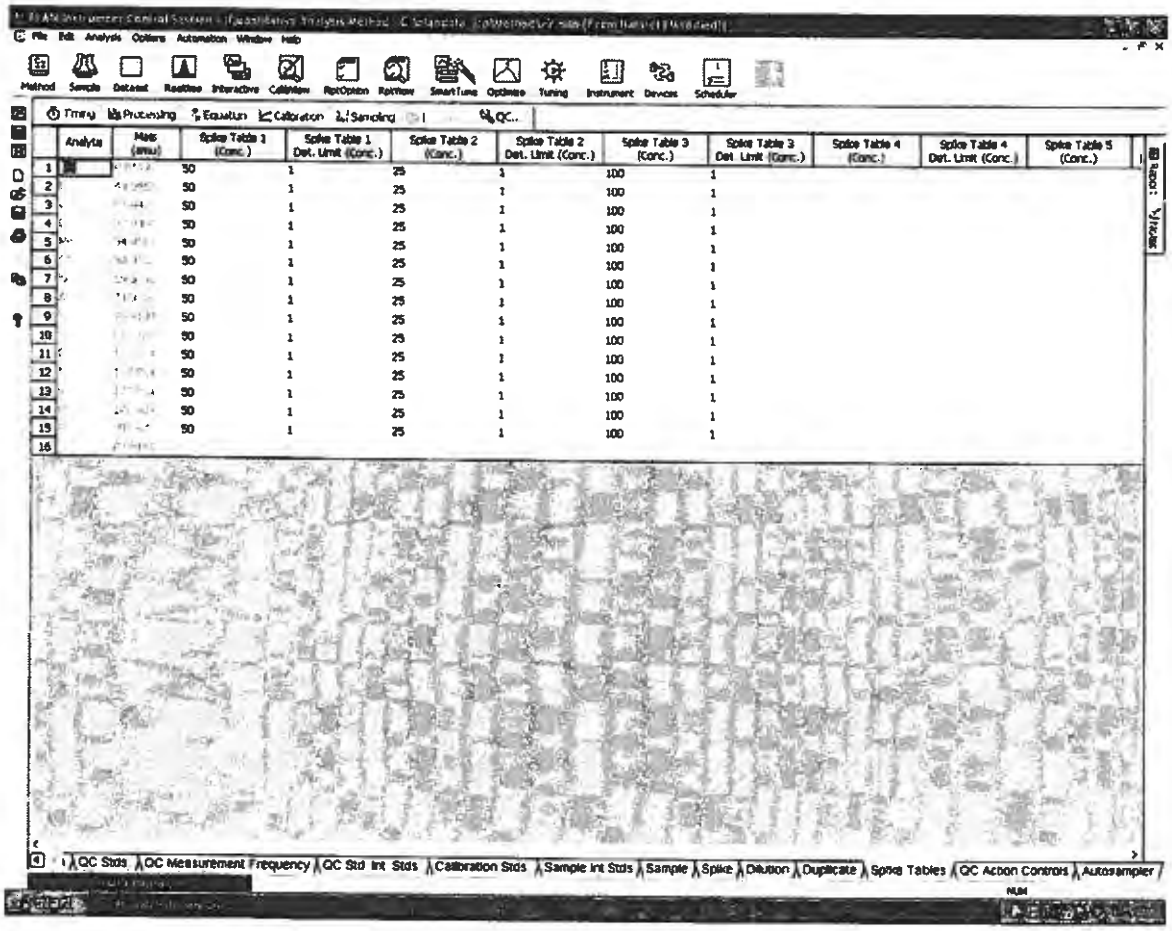
ICP-MS RUN SHEET
6/30/2011

Job Number:

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2	Entec	Sample		
39		16878-1	Entec	Sample		100x2
40		16878-2	Entec	Sample		100x2
41	d	16878-2	Entec	Duplicate of 23		100x2
42		16878-3	Entec	Sample		100x2
43	s	16878-3	Entec	Spike - 1 of 25		100x2
44		16878-4	Entec	Sample		100x2

Spikes are post at 0.02mL of 25ppm spiking solutions lot 021410-ABCD & F in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
kms	6/30/11 8:42		DJB	6/30/11 0910	
Re-Test Required:	No: ✓	Yes:	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:



Thursday, Jun 30, 2011 08:39 AM

ICP Standards and QC Standards Values Table

Element or Test	Mass	Symbol	Std.#1 ppb	Std.#2 ppb	Std.#3 ppb	QC #1	QC #2	QC #3	QC #4	QC #6 A	QC #7 AB	QC #8 .25	QC #9 LRB	QC #10 LRB+	QC #11 LRB+
Lithium	6	*Li*													
Lithium	7	Li	1	100	500	0	1	250	100				0	50	100
Beryllium	9	Be	1	100	500	0	1	250	100			0.25	0	50	100
Boron	10	*B*	1	50	100	0	1	250	100				0	50	100
Boron	11	B	1	50	100	0	1	250	100				0	50	100
Sodium	23	Na	20	1100	5500	0	21	2500	1100				0	718	
Magnesium	24	Mg	20	1100	5500	0	21	2500	1100				0	550	
Magnesium	25	*Mg*	20	1100	5500	0	21	2500	1100				0	550	
Aluminum	27	Al	1	100	500	0	1	250	100				0	50	100
Phosphorus	31	P	20	1000	5000	0	20	2500	1000				0	200	
Potassium	39	K	20	1100	5500	0	21	2500	1100				0	500	
Calcium	44	Ca	50	1100	5500	0	21	2500	1100				0	550	
Scandium	45														
Titanium	47	Ti	1	100	500	0	1	250	100				0	50	100
Titanium	49	Ti	1	100	500	0	1	250	100				0	50	100
Vanadium	51	V	1	100	500	0	1	250	100	0	20		0	50	100
Vanadium	51	V	1	100	500	0	1	250	100	0	20		0	50	100
Chromium	52	Cr	1	100	500	0	1	250	100		10		0	50	100
Chromium	53	*Cr*	1	100	500	0	1	250	100		10		0	50	100
Iron	54	*Fe*	20	1100	5500	0	21	2500	1100	0			0		
Manganese	55	Mn	1	100	500	0	1	250	100	0	10		0	50	100
Iron	57	Fe	20	1100	5500	0	21	2500	1100	0			0		
Cobalt	59	Co	1	100	500	0	1	250	100	0	20		0	50	100
Nickel	60	Ni	1	100	500	0	1	250	100	0	20		0	50	100
Copper	63	Cu	1	100	500	0	1	250	100	0	10		0	50	100
Copper	65	Cu	1	100	500	0	1	250	100	0	10		0	50	100
Zinc	66	Zn	1	100	500	0	1	250	100	0	10		0	50	100
Zinc	67	*Zn*	1	100	500	0	1	250	100	0	10		0	50	100
Zinc	68	*Zn*	1	100	500	0	1	250	100	0	10		0	50	100
Germanium	72	Ge	1	100	500	0	1	250	100				0	50	100
Arsenic	75	As	1	100	500	0	1	250	100	0	10		0	50	100
Selenium	77	*Se*	1	100	500	0	1	250	100	0	10		0	50	100
Selenium	82	Se	1	100	500	0	1	250	100	0	10		0	50	100
Strontium	88	Sr	1	100	500	0	1	250	100	0			0	50	100
Molybdenum	95	*Mo*	1	100	500	0	1	250	100				0	50	100
Molybdenum	97	*Mo*	1	100	500	0	1	250	100				0	50	100
Molybdenum	98	Mo	1	100	500	0	1	200	100				0	50	100
Rhodium	103														
Silver	107	Ag	1	100	500	0	1	250	100	0	10		0	50	100
Silver	109	*Ag*	1	100	500	0	1	250	100	0	10		0	50	100
Cadmium	111	Cd	1	100	500	0	1	250	100	0	5		0	50	100
Cadmium	114	*Cd*	1	100	500	0	1	250	100	0	5		0	50	100
Tin	118	Sn	1	100	500	0	1	250	100	0			0	50	100
Antimony	121	*Sb*	1	100	500	0	1	250	100	0			0	50	100
Antimony	123	Sb	1	100	500	0	1	250	100	0			0	50	100
Tellurium	128	Te	1	100	500	0	1	250	100				0	50	100
Cesium	133														
Barium	135	*Ba*	1	100	500	0	1	250	100	0			0	50	100
Barium	137	Ba	1	100	500	0	1	250	100	0			0	50	100
Lanthanum	139	La	1	100	500	0	1	250	100				0	50	100
Tantalum	159	Ta	1	100	500	0	1	250	100				0	50	100
Platinum	195	Pt	1	100	500	0	1	250	100				0	50	100
Gold	181	Au	1	100	500	0	1	250	100				0	50	100
Thallium	205	Tl	1	100	500	0	1	250	100	0			0	50	100
Lead	208	Pb	1	100	500	0	1	250	100	0			0	50	100
Bismuth	209	Bi	1	100	500	0	1	250	100				0	50	100
Thorium	232	Th	1	100	500	0	1	250	100				0	50	100
Uranium	238	U	1	100	500	0	1	250	100				0	50	100
Krypton	83														

elementOne

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Da Wednesday, June 29, 2011 21:56:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	37454.7		ppb
|-	Be	9	6		ppb
|-	Sc	45	131136.1		ppb
|	Cr	52	10053.9		ppb
|	Cr	53	26144.2		ppb
|	Mn	55	1353.4		ppb
|	Co	59	290.7		ppb
|	Ni	60	231		ppb
|	As	75	-982.9		ppb
|	Se	77	3073.2		ppb
|	Se	82	51.8		ppb
|>	Rh	103	426789		ppb
|	Cd	111	120.5		ppb
|-	Cd	114	294.6		ppb
|-	Sb	121	399.7		ppb
|	Sb	123	281.2		ppb
|>	Ho	165	1052827		ppb
|-	Pb	208	10208.6		ppb
	Kr	83	50.6		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Da Wednesday, June 29, 2011 21:58:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	38469.8		ppb
|-	Be	9	257.3	1.01253	ppb
|-	Sc	45	132328		ppb
|	Cr	52	17031.6	1.09823	ppb
|	Cr	53	27814.2	1.88836	ppb
|	Mn	55	12085	1.17711	ppb
|	Co	59	8996.8	1.1749	ppb
|	Ni	60	1997.2	1.01224	ppb
|	As	75	320.1	0.93895	ppb
|	Se	77	3228.6	0.94456	ppb
|	Se	82	227.8	0.97754	ppb
|>	Rh	103	431938.5		ppb
|	Cd	111	2666.6	1.03504	ppb
|-	Cd	114	6435.4	1.14466	ppb
|-	Sb	121	8320.5	1.17099	ppb
|	Sb	123	6473.3	1.04028	ppb
|>	Ho	165	1070394.1		ppb
|-	Pb	208	58675	1.08341	ppb
	Kr	83	-83.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample Da Wednesday, June 29, 2011 22:01:07
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	37288.3		ppb
|-	Be	9	24242.3	100.75857	ppb
|-	Sc	45	130651.7		ppb
|	Cr	52	636386.3	99.99902	ppb
|	Cr	53	99189.2	100.93853	ppb
|	Mn	55	1041998.4	113.97593	ppb
|	Co	59	836594.6	112.51474	ppb
|	Ni	60	178699.6	102.09962	ppb
|	As	75	140355	100.44627	ppb
|	Se	77	15617.1	99.9217	ppb
|	Se	82	18295.9	101.37506	ppb
|>	Rh	103	433349.1		ppb
|	Cd	111	249478.3	101.0773	ppb
|-	Cd	114	605402.4	112.51016	ppb
|-	Sb	121	777825.3	113.16397	ppb
|	Sb	123	604942.5	99.9996	ppb
|>	Ho	165	1088213.3		ppb
|-	Pb	208	4879035.2	107.43706	ppb
	Kr	83	-12681.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Da Wednesday, June 29, 2011 22:03:42
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	33784.6		ppb
|-	Be	9	108946.6	499.84826	ppb
|-	Sc	45	123402.4		ppb
|	Cr	52	2621433.6	432.23197	ppb
|	Cr	53	372790.3	499.81052	ppb
|	Mn	55	4382916.3	497.20446	ppb
|	Co	59	3569115.1	497.4967	ppb
|	Ni	60	842888.3	499.58005	ppb
|	As	75	677922.3	499.91087	ppb
|	Se	77	63358.4	500.01577	ppb
|	Se	82	86830.5	499.72503	ppb
|>	Rh	103	418193.4		ppb
|	Cd	111	1189964.3	499.78447	ppb
|-	Cd	114	2583181.6	497.49768	ppb
|-	Sb	121	3375384.5	497.36686	ppb
|	Sb	123	2637499.2	441.60712	ppb
|>	Ho	165	1074758.9		ppb
|-	Pb	208	22321911	498.51242	ppb
	Kr	83	-59311.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Wednesday, June 29, 2011 22:06:16
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	35124.9		ppb
|-	Be	9	15	0.04184	ppb
|-	Sc	45	128137.9		ppb
|	Cr	52	9482.9	-0.11924	ppb
|	Cr	53	22994.1	-5.01746	ppb
|	Mn	55	1646.5	0.02977	ppb
|	Co	59	618.7	0.04366	ppb
|	Ni	60	276.7	0.02396	ppb
|	As	75	-665.3	0.23871	ppb
|	Se	77	2732.1	-3.15387	ppb
|	Se	82	77.8	0.13891	ppb
|>	Rh	103	434432.5		ppb
|	Cd	111	222.6	0.04075	ppb
|-	Cd	114	512.1	0.0398	ppb
|-	Sb	121	581.7	0.02696	ppb
|	Sb	123	450.8	0.02865	ppb
|>	Ho	165	1060072.6		ppb
|-	Pb	208	13123.4	0.06455	ppb
	Kr	83	35		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Da Wednesday, June 29, 2011 22:08:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	37121.2		ppb
|-	Be	9	276.7	1.13059	ppb
|-	Sc	45	134230.5		ppb
|	Cr	52	17246.3	1.03479	ppb
|	Cr	53	25274.1	-2.90042	ppb
|	Mn	55	12605.7	1.1851	ppb
|	Co	59	9575.7	1.20665	ppb
|	Ni	60	2122.2	1.03996	ppb
|	As	75	590.9	1.11663	ppb
|	Se	77	3025.2	-1.54795	ppb
|	Se	82	211.7	0.84636	ppb
|>	Rh	103	447947.8		ppb
|	Cd	111	2832.8	1.06078	ppb
|-	Cd	114	6937.4	1.19236	ppb
|-	Sb	121	8836	1.23332	ppb
|	Sb	123	6809.9	1.08463	ppb
|>	Ho	165	1082111.1		ppb
|-	Pb	208	63409.1	1.17433	ppb
	Kr	83	-82.3		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample Da Wednesday, June 29, 2011 22:11:24
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	33362.4		ppb
|-	Be	9	52494.1	243.87014	ppb
|-	Sc	45	120784.4		ppb
|	Cr	52	1469288.4	244.62149	ppb
|	Cr	53	199265.7	253.64102	ppb
|	Mn	55	2165225.5	248.71914	ppb
|	Co	59	1953033	275.73904	ppb
|	Ni	60	418437.3	251.11829	ppb
|	As	75	332118.8	248.3791	ppb
|	Se	77	32183.9	245.15807	ppb
|	Se	82	41682.1	242.73697	ppb
|>	Rh	103	412838		ppb
|	Cd	111	572827.8	243.65993	ppb
|-	Cd	114	1394877.4	272.11112	ppb
|-	Sb	121	1791705.7	280.61067	ppb
|	Sb	123	1391625.7	247.65713	ppb
|>	Ho	165	1011185.2		ppb
|-	Pb	208	10555913	250.46579	ppb
	Kr	83	-28963.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Wednesday, June 29, 2011 22:13:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	37428.1		ppb
|-	Be	9	24383.3	100.96495	ppb
|-	Sc	45	135519.1		ppb
|	Cr	52	670513.4	98.36711	ppb
|	Cr	53	102202.6	95.7274	ppb
|	Mn	55	1095313.2	111.86986	ppb
|	Co	59	892195.5	112.04846	ppb
|	Ni	60	192354.9	102.63657	ppb
|	As	75	151701.3	101.38635	ppb
|	Se	77	16440.2	97.81877	ppb
|	Se	82	19399.5	100.38753	ppb
|>	Rh	103	463961.1		ppb
|	Cd	111	260693.6	98.67169	ppb
|-	Cd	114	630854.2	109.51941	ppb
|-	Sb	121	811984.8	116.15004	ppb
|	Sb	123	629258.2	102.27883	ppb
|>	Ho	165	1106758.7		ppb
|-	Pb	208	4981499	107.85567	ppb
	Kr	83	-13107.3		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample Da Wednesday, June 29, 2011 22:16:32
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	37531.9		ppb
|-	Be	9	11783	48.61973	ppb
|-	Sc	45	135044.4		ppb
|	Cr	52	328855.3	48.33069	ppb
|	Cr	53	62306.5	45.4698	ppb
|	Mn	55	538263.9	55.93326	ppb
|	Co	59	432693	55.35457	ppb
|	Ni	60	93743.6	50.90174	ppb
|	As	75	70967.6	48.68753	ppb
|	Se	77	9242.7	45.35044	ppb
|	Se	82	9055.3	47.58286	ppb
|>	Rh	103	455449.9		ppb
|	Cd	111	123253	47.48538	ppb
|-	Cd	114	301166.5	53.21705	ppb
|-	Sb	121	391281.7	56.5258	ppb
|	Sb	123	303827.4	49.8804	ppb
|>	Ho	165	1095465.7		ppb
|-	Pb	208	2539787.9	55.44687	ppb
	Kr	83	61.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample Da Wednesday, June 29, 2011 22:21:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	44357.3		ppb
|-	Be	9	67.3	0.21053	ppb
|-	Sc	45	157539.4		ppb
|	Cr	52	15738.3	0.45038	ppb
|	Cr	53	27370.8	-5.39879	ppb
|	Mn	55	7423	0.52244	ppb
|	Co	59	2930.1	0.28659	ppb
|	Ni	60	1230.4	0.44852	ppb
|	As	75	-653.9	0.32379	ppb
|	Se	77	3461	-2.04146	ppb
|	Se	82	94.3	0.14188	ppb
|>	Rh	103	523487.9		ppb
|	Cd	111	847.8	0.23485	ppb
|-	Cd	114	2120.9	0.27078	ppb
|-	Sb	121	2857.8	0.31048	ppb
|	Sb	123	2221.7	0.27936	ppb
|>	Ho	165	1221609.8		ppb
|-	Pb	208	25764	0.27374	ppb
	Kr	83	22		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 9
Sample Da Wednesday, June 29, 2011 22:24:16
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	36079.6		ppb
|-	Be	9	4.3	-0.00616	ppb
|-	Sc	45	129663.8		ppb
|	Cr	52	189662.4	27.065	ppb
|	Cr	53	29257.7	1.65533	ppb
|	Mn	55	276695.5	28.56557	ppb
|	Co	59	1723.2	0.18001	ppb
|	Ni	60	22878.4	12.26961	ppb
|	As	75	-221.1	0.56081	ppb
|	Se	77	412.3	-21.81742	ppb
|	Se	82	44.8	-0.05487	ppb
|>	Rh	103	457349.4		ppb
|	Cd	111	351.9	0.08531	ppb
|-	Cd	114	772.4	0.08019	ppb
|-	Sb	121	1067.1	0.08731	ppb
|	Sb	123	829.2	0.08191	ppb
|>	Ho	165	1147257.5		ppb
|-	Pb	208	69368.8	1.21932	ppb
	Kr	83	-4.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 10
Sample Da Wednesday, June 29, 2011 22:26:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	33159		ppb
|-	Be	9	8876.7	41.48546	ppb
|-	Sc	45	111601.6		ppb
|	Cr	52	309585.7	56.8393	ppb
|	Cr	53	41251.5	30.93636	ppb
|	Mn	55	539121.4	69.70578	ppb
|	Co	59	336637	53.55213	ppb
|	Ni	60	78622.2	53.08743	ppb
|	As	75	47551.3	40.67649	ppb
|	Se	77	4016.9	13.06277	ppb
|	Se	82	5472.6	35.68206	ppb
|>	Rh	103	366245.8		ppb
|	Cd	111	89629.7	42.91887	ppb
|-	Cd	114	218899.8	48.08118	ppb
|-	Sb	121	428269	67.33662	ppb
|	Sb	123	335078.5	59.85791	ppb
|>	Ho	165	1006703.6		ppb
|-	Pb	208	2415261.7	57.39557	ppb
	Kr	83	-170.3		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Da Wednesday, June 29, 2011 22:29:27
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	40871.6		ppb
|-	Be	9	276.7	1.02459	ppb
|-	Sc	45	139809.1		ppb
|	Cr	52	18039.6	1.08112	ppb
|	Cr	53	24728.6	-4.54533	ppb
|	Mn	55	12945.5	1.18423	ppb
|	Co	59	9875.7	1.21117	ppb
|	Ni	60	2202.9	1.05273	ppb
|	As	75	575.5	1.09417	ppb
|	Se	77	3004.8	-2.34057	ppb
|	Se	82	248.1	1.0059	ppb
|>	Rh	103	460353.8		ppb
|	Cd	111	2960.8	1.08031	ppb
|-	Cd	114	6975.9	1.16559	ppb
|-	Sb	121	9123.9	1.22944	ppb
|	Sb	123	6914.6	1.06237	ppb
|>	Ho	165	1120880.1		ppb
|-	Pb	208	65972.2	1.18064	ppb
	Kr	83	-90.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-1
Sample Da Wednesday, June 29, 2011 22:32:02
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	32630.3		ppb
|-	Be	9	8.3	0.0145	ppb
|-	Sc	45	104894		ppb
|	Cr	52	154731.2	30.64752	ppb
|	Cr	53	22300.4	3.6299	ppb
|	Mn	55	1617192.4	231.21689	ppb
|	Co	59	231334.5	40.63232	ppb
|	Ni	60	152188.7	113.57537	ppb
|	As	75	4279.8	4.68328	ppb
|	Se	77	2984.2	6.22135	ppb
|	Se	82	3809.8	27.37896	ppb
|>	Rh	103	331744		ppb
|	Cd	111	10685	5.61047	ppb
|-	Cd	114	23824.3	5.73196	ppb
|	Sb	121	293932.5	48.03749	ppb
|	Sb	123	228741.5	42.47563	ppb
|>	Ho	165	967742.8		ppb
|-	Pb	208	1999196.5	49.38089	ppb
	Kr	83	-1885.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-2
Sample Da Wednesday, June 29, 2011 22:34:36
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	35890.8		ppb
|-	Be	9	15.3	0.04144	ppb
|-	Sc	45	126684.8		ppb
|	Cr	52	106563.6	16.38597	ppb
|	Cr	53	17290.4	-11.42008	ppb
|	Mn	55	538497.7	62.28741	ppb
|	Co	59	65057.3	9.2261	ppb
|	Ni	60	153822.3	93.011	ppb
|	As	75	5607	4.92524	ppb
|	Se	77	3690.4	6.30881	ppb
|	Se	82	4611.1	26.84714	ppb
|>	Rh	103	409241.5		ppb
|	Cd	111	6678.1	2.81665	ppb
|-	Cd	114	13369.4	2.57681	ppb
|-	Sb	121	267785.8	40.38195	ppb
|	Sb	123	208219.1	35.67689	ppb
|>	Ho	165	1049138.7		ppb
|-	Pb	208	1020989.7	23.1453	ppb
	Kr	83	-1815		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-2
Sample Da Wednesday, June 29, 2011 22:37:10
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	36076.8		ppb
|-	Be	9	12.7	0.02923	ppb
|-	Sc	45	128371.6		ppb
|	Cr	52	106369.9	16.42462	ppb
|	Cr	53	17322.5	-11.2815	ppb
|	Mn	55	547905.9	63.63186	ppb
|	Co	59	65461.8	9.32148	ppb
|	Ni	60	153375.2	93.15003	ppb
|	As	75	5305.2	4.71424	ppb
|	Se	77	3657.1	6.15512	ppb
|	Se	82	4568.5	26.69125	ppb
|>	Rh	103	407628.5		ppb
|	Cd	111	6603.7	2.79693	ppb
|-	Cd	114	13202.8	2.55423	ppb
|-	Sb	121	263722.2	40.19402	ppb
|	Sb	123	204252.6	35.37633	ppb
|>	Ho	165	1037907.7		ppb
|-	Pb	208	1003714.5	22.99323	ppb
	Kr	83	-1788.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-3
Sample Da Wednesday, June 29, 2011 22:39:45
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	34179.9		ppb
|-	Be	9	7.3	0.00836	ppb
|-	Sc	45	119427.9		ppb
|	Cr	52	181658.4	31.83894	ppb
|	Cr	53	25562.6	4.10505	ppb
|	Mn	55	540337.8	68.12044	ppb
|	Co	59	59951.7	9.26455	ppb
|	Ni	60	145151.4	95.67573	ppb
|	As	75	3149.9	3.28808	ppb
|	Se	77	2887.8	1.70143	ppb
|	Se	82	3708.6	23.4789	ppb
|>	Rh	103	375494.5		ppb
|	Cd	111	4515.4	2.06257	ppb
|-	Cd	114	8642	1.7987	ppb
|-	Sb	121	246475.3	38.44847	ppb
|	Sb	123	191021.6	33.85911	ppb
|>	Ho	165	1013814.1		ppb
|-	Pb	208	1466871.4	34.51506	ppb
	Kr	83	-1230		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-3
Sample Da Wednesday, June 29, 2011 22:42:19
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	34209.3		ppb
|-	Be	9	8848.3	40.06758	ppb
|-	Sc	45	119115.6		ppb
|	Cr	52	441780.1	81.57532	ppb
|	Cr	53	56944.9	56.43992	ppb
|	Mn	55	972506.9	125.46415	ppb
|	Co	59	400804.1	63.54576	ppb
|	Ni	60	214048.4	144.24628	ppb
|	As	75	56737.5	48.25337	ppb
|	Se	77	7483.7	45.62906	ppb
|	Se	82	9860	64.34391	ppb
|>	Rh	103	367401.6		ppb
|	Cd	111	98510.1	47.05928	ppb
|-	Cd	114	237115	51.95435	ppb
|-	Sb	121	554307.8	86.10549	ppb
|	Sb	123	427840.7	75.51367	ppb
|>	Ho	165	1019134.7		ppb
|-	Pb	208	3671466.7	86.32731	ppb
	Kr	83	-1161.3		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 16878-4
Sample Da Wednesday, June 29, 2011 22:44:54
Sample De Entec
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	33459.6		ppb
|-	Be	9	5.7	0.00183	ppb
|-	Sc	45	112005		ppb
|	Cr	52	86699.7	14.63926	ppb
|	Cr	53	13515	-14.78073	ppb
|	Mn	55	194423.2	24.88045	ppb
|	Co	59	13337.5	2.07016	ppb
|	Ni	60	30034.6	20.06643	ppb
|	As	75	85	0.77848	ppb
|	Se	77	378.3	-21.37278	ppb
|	Se	82	152.2	0.69983	ppb
|>	Rh	103	368627.5		ppb
|	Cd	111	1689.5	0.75452	ppb
|-	Cd	114	2384.4	0.46451	ppb
|-	Sb	121	99010.6	15.47545	ppb
|	Sb	123	76162.8	13.53434	ppb
|>	Ho	165	1009311.1		ppb
|-	Pb	208	181354.8	4.08374	ppb
	Kr	83	-479.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Wednesday, June 29, 2011 22:47:27
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	41958.9		ppb
|-	Be	9	5.7	-0.00379	ppb
|-	Sc	45	137163.4		ppb
|	Cr	52	11752.3	0.29132	ppb
|	Cr	53	24076.5	-2.63113	ppb
|	Mn	55	1327.1	-0.00161	ppb
|	Co	59	259.7	-0.00388	ppb
|	Ni	60	216.3	-0.00762	ppb
|	As	75	-1055.2	-0.05791	ppb
|	Se	77	3249.2	1.66202	ppb
|	Se	82	24.1	-0.15441	ppb
|>	Rh	103	423148.2		ppb
|	Cd	111	127.1	0.0032	ppb
|-	Cd	114	279.9	-0.00219	ppb
|-	Sb	121	433.3	0.00541	ppb
|	Sb	123	346.1	0.01136	ppb
|>	Ho	165	1047210.8		ppb
|-	Pb	208	10512.4	0.00826	ppb
	Kr	83	45.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Wednesday, June 29, 2011 22:50:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	40573		ppb
|-	Be	9	25237	96.38476	ppb
|-	Sc	45	134172.2		ppb
|	Cr	52	646497.3	102.34012	ppb
|	Cr	53	97410.5	99.40474	ppb
|	Mn	55	1042361.2	111.92077	ppb
|	Co	59	828459.4	112.21286	ppb
|	Ni	60	177592.3	102.19842	ppb
|	As	75	142243.2	102.49772	ppb
|	Se	77	15982	103.73257	ppb
|	Se	82	18387.8	102.5982	ppb
|>	Rh	103	430294.1		ppb
|	Cd	111	247952.9	101.16515	ppb
|-	Cd	114	602196	112.68274	ppb
|-	Sb	121	772502.7	111.22823	ppb
|	Sb	123	601733	98.45017	ppb
|>	Ho	165	1099525.1		ppb
|-	Pb	208	5004042.2	109.06072	ppb
	Kr	83	-12727.4		mg/L

APPENDIX C.5

LABORATORY DATA

METHOD 0061 – HEXAVALENT CHROMIUM

Entec Services, Inc.

9420 Holly Springs Road
Apex, NC 27539

Project No: 511150

Chromium (VI)

EPA Method 0061 Analysis

Analytical Report
16878

Element One, Inc.
5022-C Wrightsville Av., Wilmington, NC 28403
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 16878
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Linda Larson, MS Chemist
July 11, 2011

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
July 11, 2011

SUMMARY OF RESULTS

Summary of Analysis

Summary of Chromium (VI) Analysis

Element	Run 1 e16878-7 Total µg	Run 2 e16878-8 Total µg	Run 3 e16878-9 Total µg	Field Blank e16878-10 Total µg
Chromium(VI)	*3.30	< 0.528	*5.32	< 0.215
Duplicate RPD, %	----------	NA	----------	NA
Spike Recovery, %	91%	93%	103%	----------

*See Analytical Narrative, page 6.

Element	0.1N NaOH Blank e16878-11 Total µg	3N NaOH Blank e16878-12 Total µg	6N NaOH Blank e16878-13 Total µg
Chromium(VI)	< 0.015	< 0.046	< 0.078
Duplicate RPD, %	NA	NA	NA

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Entec Services, Inc.	Element One #:	16878
Client ID:	511150/Hovensa	Analyst:	LAL
Method:	M0061	Dates Received:	06/24/11
Analytes:	Chromium (VI)	Dates Analyzed:	06/28/11-07/07/11

Summary of Analysis

The samples were prepared and analyzed according to SW-846 Method 0061 protocol. Samples were analyzed for chromium (VI) using a Shimadzu 2010 HPLC unit and a Timberline RDR-1 Reaction Module.

Detection Limits

The Shimadzu 2010 HPLC instrument detection limit for chromium (VI) was 0.1µg/L.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD) and spike sample recovery data are summarized with the results.

*Ref page 4: Samples, Run 1, Run 2 and Run 3 were analyzed at a five-fold dilution due to potentially high contents of CO_3 and/or SO_2 gases trapped in the matrix. This was initially observed when the samples were being pH balanced for HPLC analysis and violent bubbling occurred with a small addition of 10% H_2SO_4. The addition of acid did not sufficiently purge the samples of trapped gases and interfered with spike recovery. Wet lab techniques were applied to the Cr^{6+} samples to discern if there were colloidal matrix interferences that also could inhibit spike recovery. Duplicate aliquots (5mL) of raw sample from 16878-7, 8 and 9 mixed with a small amount of DI water and one of each of the duplicates was spiked with 400uL of 500ppb Cr^{6+} standard. A small amount of H_2SO_4 and 0.5mL of diphenylcarbazide was added to all aliquots. The same procedure was carried out in two aliquots of DI used as LRB and LRB spike. A pink color was visible in the LRB spike aliquot as well as the three sample spiked aliquots. This test was conclusive as a screening diagnostic that the matrix of this sample did not possess components that are causing Cr^{6+} to convert to trivalent chromium, therefore spike recovery should be possible.

The final run that achieved spike recovery was done at a five-fold dilution with slight acidification to release bubbles and then approximately 10 to 15 minutes of purging each sample with N_2 gas. This data produced data with spike recoveries within laboratory guidelines, however the results were obtained outside of the 14 day sample hold time. All other QA/QC data was within the criteria of the method.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values. It was necessary to analyze the samples at a minimum five-fold dilution to reduce matrix interference.

SAMPLE CUSTODY

16878

CHAIN OF CUSTODY

el1 Element One, Inc.
5022-C Wrightsville Av.
Wilmington, NC 28403

Phone: 910-793-0128
FAX: 910-792-6853
Email: e1lab@e1lab.com

Client	Entec Services Inc
Project No	511150
Project ID:	MACT Testing FCCU stack
PO No	

Sampling Site	Hovensa FCCU stack
Date:	6-21-11
Plant Name:	Hovensa
Plant City, State	St. Croix US VI

Contact	Chuck Duncan	Address:
Phone:	Cell 919-244-7777	
Fax:	email cduncan@entecservices.com	

Sample ID	Custody Seal #	Date	Unit / Run Number	Sample Fraction	Filter ID	Filter Tare
Run 1-1		6-18	Run 1-1	Combined Fractions		
Run 1-2		6-18	Run 1-2	3N NAOH		
Run 2-1		6-18	Run 2-1	Combine fractions		
Run 2-2		6-18	Run 2-2	6N NAOH		
Run 3-1		6-19	Run 3-1	Combine fractions		
Run 3-2		6-19	Run 3-2	6N NAOH		
Run 3-3		6-19	Run 3-3			
Field Blank		6-19	Blank	Field Blank		
Blank		6-19	"	.1N NAOH		
Blank		6-19	"	3N NAOH		
Blank		6-19	"	6N NAOH		
* Per Discussion with Lab Changed from KOH to NAOH						

Analysis Requested.

Method	0061
Analytical Parameters	Hexavalent Chrome

	Signature	Company	Date	Time
Collected by:	[signature]	Entec Services	6-18/6-19	—
COC Completed by:	Tim Drabein	Entec		
Relinquished by:	[signature]	Entec		
Received by:				
Relinquished by:				
Received by:				
Relinquished by:				
Received by:	Lisa Burton	Element One Inc.	6-24-11	1005
Sample Condition Upon Receipt	Good	Temperature Upon Receipt		

Element One, Inc. Form 120 - Revision 0.1

ANALYTICAL DATA

Analytical Calculations

Cr (VI)-

Total Cr^{+6} (ug) =Cr^{+6} Results (µg/L)*Dilution*Final Volume (mL)/1000

Where-

Cr^{+6} Results= Raw sample concentration (ppb)—*HPLC Data Sheet*

Dilution= $\frac{\text{Diluted Volume}}{\text{Aliquot}}$—*IC Run Sheet*

Final Volume--*Sample Submission*

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 16878**

Collected June 18-19

Analysis Due Date 07.05.11
QA/QC/Report Due Date 07.06.11

Client	Entec Services, Inc
Project No	511150

Date Rec	06.24.11
Time Rec	1005

KOH Lot:	~~HNO_3 Rinse pH < 2.0 Y / N~~	Volume Marked Y / N	**Ref. Method:**
~~HNO_3 Lot:~~		Volume Loss Y / N / ?	**M0061**

Sample Identification

7	M0061-R1	10	Field Blank		
8	M0061-R2	11	Reagent Blank 0.1N NaOH		
	M0061-R2 Duplicate	12	Reagent Blank 3N NaOH		
9	M0061-R3	13	Reagent Blank 6N NaOH		
	M0061-R3 Spike				

Analyses Requested Samples 7-13 Hexavalent Chromium
NOTE Read with meter & record pH

Runs / FB

Lab ID	KOH (Imp 1-3)		KOH (Imp 1-3)		HNO_3 (Rinse)		NOTE
	BV, ml	BV, ml	BV, ml	pH	BV, ml	FV, ml	
7	1) 440	2) 385		9.32			
8.D	1) 555	2) 500		8.86			
9.S	1) 570	2) 570	3) 130	8.84			
10	430			12.95			
11	76			12.85			
12	92			13.05			
13	78			13.57			

Lab Communications

Received two containers for Runs 1 & 2 and three containers for Run 3. Take the beginning volume for each container of the run then combine for pH and analysis

Collected in NaOH rather than KOH

~~QC std LCI~~
10% H_2SO_4 Lot # (WCI-130-3)
4N NaOH Lot # (LCI-130-1)
.025N NaOH Lot # (LCI-62-3)

SS Page 2 of 2
6/24/2011 2:46:52 PM
SS Form By PDS
Labeled by PDS 6-24-11

Cr^{+6} Prep By/Date 6-24-11
T. Cr Prep By/Date
ID Verification By/Date LAL 6-24-11

Shimadzu 2010 HPLC

elementOne

HPLC Data Sheet

Lab ID #:16878

Client:Entec
Date: 06/28-30/11
Analyst:LAL

Client Project #:511150
Detection Limit, (µg/L): 0.1
Method ID : EPA Method 0061

Sample ID	Cr+6, µg/L	Dilution	Final Vol, ml	Cr+6, Total ug/L	Spike, µg/L	% Recovery	Data Filename
blank	0.00	1	1	< 0.0001			062811-900.dat
blank	0.00	1	1	< 0.0001			062811-901.dat
16878-7	0.27	5	825	1.11			062811-16.dat
16878-7 dup	0.27	5	825	1.11		0.0%	062811-17.dat
16878-8	0.09	5	1055	< 0.5275			062811-18.dat
16878-8 dup	0.07	5	1055	< 0.5275		NA	062811-19.dat
16878-8 D	0.08	5	1055	< 0.5275			062811-18.dat
16878-D dup	0.07	5	1055	< 0.5275		NA	062811-19.dat
16878-9	0.15	5	1270	0.953			062811-112.dat
16878-9 dup	0.16	5	1270	1.02		6.5%	062811-113.dat
16878-9 spk	0.00	5	1270	< 0.635	5.00	-3%	063011-18.dat
16878-9 spk dup	0.00	5	1270	< 0.635	5.00	-3%	063011-19.dat
16878-10	0.00	5	430	< 0.215			062811-118.dat
16878-10 dup	0.00	5	430	< 0.215		NA	062811-119.dat
16878-11	0.00	2	76	< 0.0152			062811-120.dat
16878-11 dup	0.00	2	76	< 0.0152		NA	062811-121.dat
16878-12	0.00	5	92	< 0.046			062811-116.dat
16878-12 dup	0.00	5	92	< 0.046		NA	062811-117.dat
16878-13	0.00	10	78	< 0.078			062811-124.dat
16878-13 dup	0.00	10	78	< 0.078		NA	062811-125.dat

Data for Report

The samples below were analyzed out of hold time.

16878-9	0.00	10	1270	< 1.27			070511-16.dat
16878-9 dup	0.00	10	1270	< 1.27			070511-17.dat
16878-9 spk 10x	0.00	10	1270	< 1.27	5.00	0%	070511-18.dat
16878-9 spk dup 10:	0.00	10	1270	< 1.27	5.00	0%	070511-19.dat
16878-9 spk 50 x	5.00	50	1270	317.50	5.00	100%	070511-112.dat
16878-9 spk 50 x du	5.08	50	1270	322.58	5.00	102%	070511-113.dat
16878-7 spk 50 x	5.19	50	825	214.09	5.00	104%	070511-116.dat
16878-7 spk 50x du	5.00	50	825	206.25	5.00	100%	070511-117.dat
16878-7	0.80	5	825	3.30			070711-
16878-7 spk	5.34	5	825	22.02	5.00	91%	070711-
16878-8	0.00	5	1055	< 0.5275			070811-
16878-8 spk	4.67	5	1055	24.61	5.00	93%	070811-
16878-9	0.84	5	1270	5.32			070811-
16878-9 spk	5.99	5	1270	38.04	5.00	103%	070811-

Data for Report

Shimadzu 2010 HPLC

elementOne

HPLC Data Sheet

Lab ID #:16878

Client:Entec
Date: 06/28-30/11
Analyst:LAL

Client Project #:511150
Detection Limit, (µg/L): 0.1
Method ID : EPA Method 0061

Sample ID	Cr+6, µg/L	Dilution	Final Vol, ml	Cr+6, Total ug/L	Spike, µg/L	% Recovery	Data Filename
Standards							
Sample ID	ESTD				0		
0.0 ppb STD	0.000				0		Cal_062811-902.dat
0.1 ppb STD	0.100				0.1		Cal_062811-903.dat
1.0 ppb STD	1.00				1		Cal_062811-904.dat
5.0 ppb STD	5.00				5		Cal_062811-905.dat
10.0 ppb STD	10.00				10		Cal_062811-906.dat
Correlation-	0.999518						
Second Source Check Standards							
QC	4.96				5.0	99%	062811-11.dat
QC	5.00				5.0	100%	062811-114.dat
QC	4.90				5.0	98%	062811-126.dat
QC	5.09				5.0	102%	070511-12.dat
QC	4.87				5.0	97%	070511-505.dat
QC	5.02				5.0	100%	063011-11.dat

HPLC-Data 2 of 2

elementOne
e 16878-Cr(VI)

analyst: LAL

$R^2 = .999518$

HPLC-Run Sheet

Analyst: LAL, A **Std. Lot #:** VC1-61-2 **Lab ID:** 16878
Batch ID: Cr2811-1 **QC Lot#:** VC1-61-3 **Date:** 6-28-11

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	~~Weight~~ AREA	~~Comments~~ CONC	
1	~~16878~~ Blank					~~0~~	0.00	
2	Blank					—	0.00	
3	0.0					—	0.00	
4	0.1					2741	0.100	
5	1.0					14786	1.000	
6	5.0					55441	5.000	
7	10.0					109092	10.000	
8	QC					55492	4.963	
9	Blank					—	0.00	
10	DL					3804	0.102	
11	LRB					—	0.00	
12	LRB spk					56472	5.056	
13	16878-7	Entec	5x			5638	0.274	Bubbles in baseline
14	-7 dup					5605	0.271	
15	-8					3691	0.086	
16	-8 dup					3495	0.072	
17	-8 D					3526	0.075	
18	-8 D dup					3518	0.075	
19	-9					~~4489~~ 4484	0.152	~~No spike recovery~~
20	-9 dup					4411	0.159	
21	QC					55919	5.004	
22	Blank					—	0.00	
23	-9 spk					40 3580	32.734	Redo Redo > Bubbles in baseline
24	-9 spk dup		2			41 2497	36.591	
25	-10		5x			—	0.520	
26	-10 dup		↓			—	0.00	
27	-11		2x			—	0.00	
28	-11 dup	↓	↓			—	0.00	
29	-12		5x			—	0.00	

F164 Cr+6 Run Sheet 1 of 1

HPLC-Run Sheet

Analyst: LAL Std. Lot #: LC1-61-2 Lab ID: 16878
Batch ID: 062811-1 QC Lot#: LC1-61-3 Date: 6-28-11

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	Area ~~Weight~~	Conc ppb Comments
30	-12 dup		↓			—	0.00
31	-13		10x			—	0.00
32	-13 dup		↓			—	0.00
33	QC				Initial Area	54818	4900
34	Blank				↓	—	0.00
~~35~~ 37	0.1				2741 ~	~~2155~~ 2314	—
~~36~~ 38	1.0				14786 ~	9675	—
~~37~~ 39	5.0				55441 ~	50807	—
~~38~~ 40	10.0				109092 ~	98064	—
	Insert Sequence						
35	16850-3					—	0.00
36	16850-3					—	0.00

F164 Cr+6 Run Sheet 1 of 1

Sequence Summary Report

Sequence name: 062811-1.seq
Analyst: System

UV Detector Ch1-540nm — **Chromium** (ppb)

Data Filename	Sample ID	ESTD
062811-900.dat	blank	0.00
062811-901.dat	blank	0.00
Cal_062811-902.dat	0.0	0.00
Cal_062811-903.dat	0 1	0.10
Cal_062811-904.dat	1.0	1.00
Cal_062811-905.dat	5.0	5.00
Cal_062811-906.dat	10.0	10.00
062811-11.dat	QC	4.96
062811-12.dat	blank	0.00
062811-13.dat	DL	0.10
062811-14.dat	LRB	0.00
062811-15.dat	LRB spk	5.06
062811-16.dat	16878-7	0.27
062811-17.dat	16878-7 dup	0.27
062811-18.dat	16878-8	0.09
062811-19.dat	16878-8 dup	0.07
062811-110.dat	16878-8 D	0.08
062811-111.dat	16878-D dup	0.07
062811-112.dat	16878-9	0.15
062811-113.dat	16878-9 dup	0 16
062811-114.dat	QC	5.00
062811-115.dat	blank	0.00
062811-116.dat	16878-9 spk	37.73
062811-117.dat	16878-9 spk dup	38.59
062811-118.dat	16878-10	0.00
062811-119.dat	16878-10 dup	0.00
062811-120.dat	16878-11	0.00
062811-121.dat	16878-11 dup	0.00
062811-122.dat	16878-12	0.00
062811-123.dat	16878-12 dup	0.00
062811-124.dat	16878-13	0.00
062811-125.dat	16878-13 dup	0.00
062811-126.dat	QC	4.90
062811-127.dat	blank	0.00
062811-800.dat	16850-3	0 00
062811-801.dat	16850-3 dup	0.00
062811-128.dat	0.1	0.00
062811-129.dat	1.0	0.00
062811-130.dat	5.0	0.00

Bubbles in baseline

Bubbles in baseline causing large peak

Integration didn't show Area comparable on report to initial curve

6/29/2011 2:17:08 PM 1/2 - 1

R2= 999706

HPLC-Run Sheet

Analyst: LAL Std. Lot #: LC1-61-2 Lab ID: 16878
Batch ID: 063011-1 QC Lot#: LC1-61-3 Date: 6-30-11

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	AREA Weight	CONC RD Comments
1	Blank					—	0.00
2	Blank					—	0.00
3	0.0					—	0.00
4	0.1					1631	0.100
5	1.0					4178	1.000
6	5.0					13375	5.000
7	10.0					25016	10.000
8	QC					13376	5.018
9	Blank					—	0.00
10	DL					—	0.00
11	LRB					—	0.00
12	LRB spk					13360	5.010
13	16878-9	Entec			Interfering early peak	4575361	0.00
14	-9 dup		5x			4555946	0.00
15	-9 spk					4680191	0.00
16	-9 spk dup					4513246	0.00
17	-9 spk rd2					32654	0.00
18	-9 spk rd4 dup					34717	0.00
19	QC					15919	6.102
20	Blank					—	0.00
21	0.1					1897	0.121
22	1.0					44080	1.031
23	5.0					13987	5.278
24	10.0					26467	10.600

Tried to get rid of interference of base line and bubbles

F164 Cr+6 Run Sheet 1 of 1

Sequence Summary Report

Sequence name: 063011-1 063011-1.seq
Analyst: [illegible] System

UV Detector Ch1-540nm

Data Filename	Sample ID	ppb Chromium ESTD
063011-929.dat	blank	0.00
063011-930.dat	blank	0.00
Cal_063011-11.dat	0.0	0.00
Cal_063011-12.dat	0.1	0.10
Cal_063011-13.dat	1.0	1.00
Cal_063011-14.dat	5.0	5.00
Cal_063011-15.dat	10.0	10.00
063011-11.dat	QC	5.02
063011-12.dat	blank	0.00
063011-13.dat	DL	0.00
063011-14.dat	LRB	0.00
063011-15.dat	LRB spk	5.01
063011-16.dat	16878-9	0.00
063011-17.dat	16878-9 dup	0.00
063011-18.dat	16878-9 spk	0.00
063011-19.dat	16878-9 spk dup	0.00
063011-110.dat	16878 spk ph	0.00
063011-111.dat	16878 spk ph dup	0.00
063011-112.dat	QC	6.10
063011-113.dat	blank	0.00
063011-114.dat	0.1	0.12
063011-115.dat	1.0	1.03
063011-116.dat	5.0	5.28

Tried to get rid of interference in baseline causing spike recovery issue Sample matrix is very gaseous

063011-117.dat

7/5/2011 3:19:48 PM 1/1 - 1

$R^2 = .999753$

HPLC-Run Sheet → for spike recovery

Analyst: LAL | Std. Lot #: LCI-61-2 | Lab ID: 16878
Batch ID: 060511-1 | QC Lot#: LCI-61-3 | Date: 7-5-2011

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	Weight (Area)	Comments (CONC ppb)
1	Blank					—	0.000
2	Blank					—	0.00
3	0.0					3252	0.00
4	0.1					2472	0.100
5	1.0					12449	1.000
6	5.0					52062	5.000
7	10.00					100703	10.000
8	QC					52498	5.093
9	Blank					—	0.00
10	DL					38591	0.111
11	LRB					—	0.00
12	LRB spk					45418	4.361
13	16878-9	Entec	10x			913	0.000
14	-9 dup		↓			5071	0.000
15	-9 spk					100750	0.000
16	-9 spk dup		↓			66338	0.000
17	-7 spk		10x			94541	0.000
18	-7 spk dup		↓			93603	0.000
19	-9 spk		50x			51660	4.996
20	-9 spk		50x			52496	5.081
21	~~QC = 7 spk~~		50x			49104	4.634
22	~~Blank 7 sp~~					—	0.00
23	-7 spk		50x			53600	5.193
24	-7 spk dup		50x			51669	4.997
25	QC	~~→ Insert QC check~~			Redo vial 28	50391	4.867 → see back
26	Blank					—	0.00
27	0.1					3626	0.114
28	1.0					11157	0.879
29	5.0					45370	4.356
30	10.0					92219	8.107

F164 Cr+6 Run Sheet — 1 of 1

out of hold time (over holiday weekend) only had samples 6 days prior to want to revalidate previous results with unit with 7, 89

Dilution is 50x will try with lower dilution again

HPLC-Run Sheet

Analyst: LAL **Std. Lot #:** LCI-61-2 **Lab ID:** 16878
Batch ID: 070511-1 **QC Lot#:** LCI-61-3 **Date:** 7-5-2011

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	Weight AREA	Comments CONC
26	QC					42974	4.113
27	QC					42193	4.034
27	QC					49193	4.745
28	QC					50391	4.867

F164 Cr+6 Run Sheet 1 of 1

Sequence Summary Report

Sequence name: 070511-1 070511-1.seq
Analyst: LAC System

UV Detector Ch1-540nm

Data Filename	Sample ID	ppb Chromium ESTD
070511-500.dat	blank	0.00
070511-501.dat	blank	0.00
Cal_070511-11.dat	0.0	0.00
Cal_070511-12.dat	0.1	0.10
Cal_070511-13.dat	1.0	1.00
Cal_070511-14.dat	5.0	5.00
Cal_070511-15.dat	10.0	10.00
070511-11.dat	QC	5.09
070511-12.dat	blank	0.00
070511-13.dat	DL	0.11
070511-14.dat	LRB	0.00
070511-15.dat	LRB spk	4.36
070511-16.dat	16878-9	0.00
070511-17.dat	16878-9 dup	0.00
070511-18.dat	16878-9 spk 10x	0.00
070511-19.dat	16878-9 spk dup 10x	0.00
070511-110.dat	16878 -7 spk 10x	0.00
070511-111.dat	16878-7 spk dup 10x	0.00
070511-112.dat	16878-9 spk 50 x	5.00
070511-113.dat	16878-9 spk 50 x dup	5.08
070511-114.dat	QC	4.63
070511-115.dat	blank	0.00
070511-116.dat	16878-7 spk 50 x	5.19
070511-117.dat	16878-7 spk 50x dup	5.00
070511-118.dat	QC	4.11
070511-502.dat	QC	4.11
070511-504.dat	QC	4.74
070511-505.dat	QC	4.87
070511-503.dat	QC	4.03
070511-119.dat	blank	0.00
070511-120.dat	0.1	0.11
070511-121.dat	1.0	0.88
070511-122.dat	5.0	4.36

7/5/2011 2:53:14 PM 1/2 - 1

HPLC-Run Sheet

ENTEC

Analyst: LAL Std. Lot #: LC1-61-2 Lab ID: 16878 rechecks

Batch ID: C70711-1 QC Lot#: LC1-65-4 Date: 7-7-11

Report Data

Vial #	Sample ID	Client	Dilutions	Spk Conc.	Final Vol.	~~EQ/AREA~~ Weight	CONC ppb Comments
C70711-1							
28	16878-7	Entec	5X	5ppb			.799
29	16878-7spk					45284	5.339
C70811-1							
13	-8					6436	C.00
14	-8spk					45422	4.665
15	-9					7641	0.838
16	-9spk						5.990
							~~5.099~~
9	QC			5ppb			5.099

F164 Cr+6 Run Sheet 1 of 1

Sequence Summary Report

Sequence name: 070711-1.seq
Analyst: System

UV Detector Ch1-540nm

Data Filename	Sample ID	Chromium ESTD
070711-700.dat	blank	0.00
070711-701.dat	blank	0.00
Cal_070711-11.dat	0.0	0.00
Cal_070711-12.dat	0.1	0.10
Cal_070711-13.dat	1.0	1.00
Cal_070711-14.dat	5.0	5.00
Cal_070711-15.dat	10.0	10.00
070711-11.dat	QC	0.00
070711-12.dat	blank	5.10
070711-13.dat	LRB	0.00
070711-14.dat	LRB spk	5.06
070711-15.dat	16934-15	0.46
070711-16.dat	16934-16	0 50
070711-17.dat	16934-16 dup	0.47
070711-18.dat	16934-17	0.00
070711-19.dat	16934-17 spk	0.00
070711-110.dat	16934-18	0.32
070711-111.dat	16934-19 NaOH	0 00
070711-112.dat	16934-19 DI	0.00
070711-113.dat	QC	5.11
070711-114.dat	blank	0.00
070711-703.dat	16878-7	0.00
070711-704.dat	16878-7 spk	3 75
070711-705.dat	16878-7	0.00
070711-706.dat	16878-7 spk	3.89
070711-707.dat	16878-7	0.00
070711-708.dat	16878-7 spk	0.00
070711-709.dat	16878-7 ~~spk~~ Sample	0.80
070711-800.dat	16878-7 spk	5.34
070711-115.dat	0.1	0.18
070711-116.dat	1.0	1.01
070711-117.dat	5.0	4.78

Report Data

recheck at 5x dilution w/ N_2 purge

070711-118.dat

7/8/2011 3:19:43 PM

1/1 - 1

Sequence Summary Report

Sequence name: 070811-1.seq
Analyst: System

UV Detector Ch1-540nm

Data Filename	Sample ID	Chromium ESTD
070811-200.dat	blank	0.00
070811-201.dat	blank	0.00
Cal_070811-11.dat	0.0	0.00
Cal_070811-12.dat	0.1	0.10
Cal_070811-13.dat	1.0	1.00
Cal_070811-14.dat	5.0	5.00
Cal_070811-15.dat	10.0	10.00
070811-11.dat	QC	4.82
070811-12.dat	blank	0.00
070811-13.dat	DL	0.13
070811-14.dat	LRB	0.00
070811-15.dat	LRB spk	4.97
070811-16.dat	16878-8	0.00
070811-17.dat	16878-8 spk	4.68
070811-18.dat	16878-9	0.84
~~070811-19.dat~~	~~16878-9 spk~~	~~0.00~~ → need to purge longer
070811-300.dat	16878-9 spk	5.99 → spike recovery
070811-110.dat	16934-15	0.57
070811-111.dat	16934-17	0.16
070811-112.dat	16934-17 spk	5.14
070811-113.dat	QC	5.01
070811-114.dat	blank	0.00
070811-115.dat	0.1	0.14
070811-116.dat	1.0	1.01
070811-117.dat	5.0	4.56

Report Data

revalidation of 7,8,9 unit w/ 5x dilution

070811-118.dat

7/8/2011 2:57:46 PM

1/1 - 1

APPENDIX C.6

LABORATORY DATA

METHOD 18

MEMORANDUM

AIR TECH

Mailing Address:
P. O. Box 12353 ◻ Research Triangle Park, NC 27709-2353

Shipping Address:
3216 S. Alston Avenue ◻ Durham, NC 27713

919-544-6338 ◻ Fax: 919-572-2203

email: answers@ipass.net
web: air-tech-environmental.com

To: **Keith Poole**
cc: **Lynn Beane / Charles Duncan**

From: Darrell H. Doerle

Date: August 1, 2011

Subject: Hovensa Method 18 Results

Keith:

Below are the calculated detection limits of the Method 18 testing conducted at the Hovensa facility in St. Croix, VI. No compounds were found.

Compound	*Detection Limit (ppm)*
Acetone	1.7
Acetonitrile	2.0
Acrylonitrile	0.01
Benzene	2.0
1,3 Butadiene	2.5
Chlorobenzene	2.1
Cumene	0.3
1,2 Dibromomethane	3.1
Ethylbenzene	0.1
Hexane	0.5
Methanol	2.0
Methy isobutyl ketone	1.7
Methyl t-butyl ether	1.7
Methylene chloride	1.9
2-Nitropentane	0.8
Pentane	0.5
Styrene	0.3
Tetrachloroethene	0.1
Toluene	0.1
Trichloroethene	1.2
2,2,4 Trimethylpentane	1.3
Xylenes	0.1
Methane	0.5
Ethane	0.5

Please call me at 919-544-6338 if you have any questions.

Darrell H. Doerle
Senior Staff Scientist
(AT11-0600-ENTEC)

APPENDIX C.7

LABORATORY DATA

METHODS CTM 027, 26A, 0011, OTM 029, 5B, 202, AND D-5907

Entec Services, Inc.

9420 Holly Springs Rd
Apex, NC 27539

Hovensa - FCCU Stack: St Croix, US VI

Project# 511150

Analytical Report
(0611-35)

EPA CTM-027

Ammonia

EPA Method 26A

Chloride, Hydrogen chloride, Hydrogen fluoride

EPA SW-846 Method 0011

Acetaldehyde, Formaldehyde, Propionaldehyde

OTM-029

Hydrogen cyanide

EPA Method 5B

Non-Sulfate Particulate Matter

ASTM D-5907-Type

Total Dissolved Solids

EPA Method 202

Condensable Particulate Matter

Enthalpy Analytical, Inc.

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

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

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 46 pages.

Valgena Respass

QA Review Performed by – Valgena Respass

Report Issued: 07/28/2011

Summary of Results

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA Method 26A

Client #	511150
Job #	0611-35
# Samples	3 runs & 2 blanks

Compound	Sample ID / Catch Weight (ug)		
	Run 1 H2SO4	***Run 2 H2SO4***	***Run 3 H2SO4***
Hydrogen Fluoride	93.9 ND	101.1 ND	95.1 ND
Hydrogen Chloride	2,588	3,660	2,882
	H2SO4 FB	***H2SO4 TB***	
Hydrogen Fluoride	30.5 ND	8.74 ND	
Hydrogen Chloride	29.8 ND	8.53 ND	

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA Method 26A

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

Compound	Sample ID / Catch Weight (ug)		
	Run 1 NaOH	***Run 2 NaOH***	***Run 3 NaOH***
Chloride	28.0 ND	32.4 ND	31.8 ND
	NaOH FB		
Chloride	77.1 J		

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA CTM-027

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

Compound	Sample ID / Catch Weight (ug)		
	Run 1	***Run 2***	***Run 3***
Ammonia	36,699	29,596	19,119
	FB		
Ammonia	228		

Company	Entec Services, Inc.
Analyst	KHB
Parameters	OTM-29

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

Compound	Sample ID / Catch Weight (ug)		
	OTM29 R1	***OTM29 R2***	***OTM29 R3***
Hydrogen Cyanide	126,832	141,579	138,886
	OTM29 Field Train Blk		
Hydrogen Cyanide	336		

Company	Entec Services, Inc.
Analyst	KHB
Parameters	EPA SW-846 M0011

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

Compound	Sample ID / Catch Weight (ug)		
	M0011 R1	***M0011 R2***	***M0011 R3***
Formaldehyde	1.22 ND	738	1.01 ND
Acetaldehyde	43.7	40.5	36.3
Propionaldehyde	1.99 ND	1.80 ND	1.65 ND
	M0011 Field Train Blk		
Formaldehyde	17.0		
Acetaldehyde	1.01 ND		
Propionaldehyde	1.00 ND		

Company	Entec Services, Inc.
Analyst	KTH / JDB
Parameters	EPA Method 5B

Client #	511150
Job #	0611-35
# Samples	3 + Blanks

Compound	Sample ID / Particulate Matter Weight (mg)		
	Run 1	***Run 2***	***Run 3***
Net Filter	33.0	41.9	49.4
Net Front Rinse	6.2	10.8	6.2
Total Particulate	39.2	52.7	55.6

Company	Entec Services, Inc.
Analyst	KTH
Parameters	EPA Method 202

Client #	511150
Job #	0611-35
# Samples	3 + Blanks

Compound	Sample ID / Condensible Particulate Matter (CPM) Weight (mg)		
	Run 1	***Run 2***	***Run 3***
Net Organic Catch	4.5	8.5	7.7
Corrected Inorganic	50.4	58.0	94.5
TB Corrected CPM	52.9	64.5	100.3

	Train Blank	
Organic Catch	0.9	If Train Blank Corrected CPM is >2.0 mg,
Inorganic Catch	1.9	then sample correction is 2.0 mg.
CPM	2.8	

Company	Entec Services, Inc.
Analyst	KTH
Parameters	ASTM D-5907-Type

Client #	511150
Job #	0611-35
# Samples	3 Runs

Fraction	Sample ID / Condensible Particulate Catch Weight (mg)		
	Run 1	***Run 2***	***Run 3***
Total Dissolved Solids	5,689.3	7,721.0	7,819.3

Results

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA Method 26A

Client #	511150
Job #	0611-35
# Samples	3 runs & 2 blanks

MDL 0.0100 (ug/mL)
LOQ 0.200 (ug/mL)
Compound Hydrogen Fluoride as Fluoride

Lower Curve Limit 0.200 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

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)	CF	HF Catch Weight (ug)	Qual
Run 1 H2SO4	021-2401.D	021-2402.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	892	1.053	93.9	ND
Run 2 H2SO4	022-2501.D	022-2502.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	960	1.053	101	ND
Run 3 H2SO4	023-2601.D	023-2602.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	903	1.053	95.1	ND
H2SO4 FB	024-2701.D	024-2702.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	290	1.053	30.5	ND
H2SO4 TB	025-2801.D	025-2802.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	83	1.053	8.7	ND
MS / Run 1 Acid	015-1601.D	015-1602.D	HPLC55PG168.M	2.82	2.82	0.0	3.35	3.34	0.1	3.34	1	10.0	1.053	35.2	
													Spike Amount (ug)	31.6	
													Native Amount (ug)	0.00	
													Spike Recovery (%)	111%	
MSD / Run 1 Acid	016-1901.D	016-1902.D	HPLC55PG168.M	2.82	2.82	0.0	3.36	3.37	0.1	3.36	1	10.0	1.053	35.4	
													Spike Amount (ug)	31.6	
													Native Amount (ug)	0.00	
													Spike Recovery (%)	112%	
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	1.053	0.0105	ND
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG168.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	1.053	0.0105	ND
HPLC55pg168 #SS	006-0701.D	006-0702.D	HPLC55PG166.M	2.81	2.82	0.0	1.34	1.34	0.1	1.34	1	1.00	1.053	1.41	
													Tag Amount (ug)	1.32	
													Recovery (%)	107%	
HPLC55pg166 #SS	006-0701.D	006-0702.D	HPLC55PG168.M	2.81	2.81	0.0	1.35	1.34	0.1	1.34	1	1.00	1.053	1.42	
													Tag Amount (ug)	1.32	
													Recovery (%)	108%	

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA Method 26A

Client #	511150
Job #	0611-35
# Samples	3 runs & 2 blanks

MDL 0.0100 (ug/mL)
LOQ 0.200 (ug/mL)
Compound Hydrogen Chloride as Chloride

Lower Curve Limit 0.200 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

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)	CF	HCl Catch Weight (ug)	Qual
Run 1 H2SO4	021-2401.D	021-2402.D	HPLC55PG166.M	3.82	3.82	0.0	0.282	0.282	0.0	0.282	10	892	1.028	2,588	
Run 2 H2SO4	022-2501.D	022-2502.D	HPLC55PG166.M	3.82	3.82	0.0	0.370	0.372	0.2	0.371	10	960	1.028	3,660	
Run 3 H2SO4	023-2601.D	023-2602.D	HPLC55PG166.M	3.82	3.82	0.0	0.311	0.310	0.2	0.310	10	903	1.028	2,882	
H2SO4 FB	024-2701.D	024-2702.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	290	1.028	29.8	ND
H2SO4 TB	025-2801.D	025-2802.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	83	1.028	8.5	ND
MS / Run 1 Acid	015-1601.D	015-1602.D	HPLC55PG168.M	3.82	3.82	0.0	3.11	3.11	0.1	3.11	1	10.0	1.028	32.0	
													Spike Amount (ug)	30.8	
													Native Amount (ug)	2.90	
													Spike Recovery (%)	94.3%	
MSD / Run 1 Acid	016-1901.D	016-1902.D	HPLC55PG168.M	3.82	3.83	0.0	3.14	3.14	0.0	3.14	1	10.0	1.028	32.3	
													Spike Amount (ug)	30.8	
													Native Amount (ug)	2.90	
													Spike Recovery (%)	95.3%	
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	1.028	0.0103	ND
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG168.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	1.028	0.0103	ND
HPLC55pg168 #SS	006-0701.D	006-0702.D	HPLC55PG166.M	3.82	3.82	0.0	2.41	2.41	0.0	2.41	1	1.00	1.028	2.48	
													Tag Amount (ug)	2.57	
													Recovery (%)	96.5%	
HPLC55pg166 #SS	006-0701.D	006-0702.D	HPLC55PG168.M	3.82	3.81	0.1	2.42	2.42	0.0	2.42	1	1.00	1.028	2.49	
													Tag Amount (ug)	2.57	
													Recovery (%)	96.8%	

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA Method 26A

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.0100 (ug/mL)
LOQ 0.200 (ug/mL)
Compound Chloride

Lower Curve Limit 0.200 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

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
Run 1 NaOH	015-1601.D	015-1602.D	HPLC55PG166CL.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	280	28.0	ND
Run 2 NaOH	018-2101.D	018-2102.D	HPLC55PG166CL.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	324	32.4	ND
Run 3 NaOH	019-2201.D	019-2202.D	HPLC55PG166CL.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	10	318	31.8	ND
NaOH FB	020-2301.D	020-2302.D	HPLC55PG166CL.M	3.87	3.88	0.2	0.0892	0.0861	1.8	0.0876	10	88.0	77.1	J
MS / Run 1 NaOH	016-1901.D	016-1902.D	HPLC55PG166CL.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	10.0	0.100	ND
MSD / Run 1 NaOH	017-2001.D	017-2002.D	HPLC55PG166CL.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	10.0	0.100	ND
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG166.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	0.0100	ND
H2SO4 / NaOH RB	007-0801.D	007-0802.D	HPLC55PG168.M	NA	NA	NA	0.0100	0.0100	0.0	0.0100	1	1.00	0.0100	ND
HPLC55pg168 #SS	006-0701.D	006-0702.D	HPLC55PG166.M	3.82	3.82	0.0	2.41	2.41	0.0	2.41	1	1.00	2.41	
												Tag Amount (ug)		2.50	
												Recovery (%)		96.5%	
HPLC55pg166 #SS	006-0701.D	006-0702.D	HPLC55PG168.M	3.82	3.81	0.1	2.42	2.42	0.0	2.42	1	1.00	2.42	
												Tag Amount (ug)		2.50	
												Recovery (%)		96.8%	

Company	Entec Services, Inc.
Analyst	EO
Parameters	EPA CTM-027

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.0118 (ug/mL)
LOQ 0.235 (ug/mL)
Compound Ammonia

Lower Curve Limit 0.235 (ug/mL)
Upper Curve Limit 11.1 (ug/mL)

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
Run 1	050-1001.D	050-1002.D	HPLC59PG114.D	4.72	4.73	0.1	3.85	3.87	0.2	3.86	10	950	36,699	
Run 2	053-1301.D	053-1302.D	HPLC59PG114.D	4.73	4.75	0.3	3.06	3.06	0.1	3.06	10	967	29,596	
Run 3	054-1401.D	054-1402.D	HPLC59PG114.D	4.75	4.75	0.0	1.98	1.98	0.2	1.98	10	965	19,119	
FB	055-1501.D	055-1502.D	HPLC59PG114.D	4.71	4.73	0.2	0.771	0.777	0.3	0.774	1	295	228	
0.04N H2SO4 RB	049-0901.D	049-0902.D	HPLC59PG114.D	4.72	NA	NA	0.0213	0.0118	28.7	0.0166	1	1.00	0.0166	J
MS / Run 1	051-1101.D	051-1102.D	HPLC59PG114.D	4.74	4.74	0.1	7.36	7.34	0.2	7.35	1	0.800	5.88	
												Spike Amount (ug)	2.83	
												Native Amount (ug)	2.97	
												Spike Recovery (%)	103%	
MSD / Run 1	052-1201.D	052-1202.D	HPLC59PG114.D	4.73	4.73	0.0	7.36	7.34	0.2	7.35	1	0.800	5.88	
												Spike Amount (ug)	2.83	
												Native Amount (ug)	2.97	
												Spike Recovery (%)	103%	
HPLC59pg114 #SS	048-0801.D	048-0802.D	HPLC59PG114.D	4.72	4.72	0.1	5.42	5.42	0.0	5.42	1	1.00	5.42	
												Tag Amount (ug)	5.55	
												Recovery (%)	97.7%	

Company	Entec Services, Inc.
Analyst	KHB
Parameters	OTM-29

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.0103 (ug/mL)
LOQ 0.103 (ug/mL)
Compound Hydrogen Cyanide

Lower Curve Limit 0.103 (ug/mL)
Upper Curve Limit 2.08 (ug/mL)

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
OTM29 R1	011-1401.D	011-1402.D	HPLC56PG52.M	7.86	7.84	0.2	0.728	0.750	1.5	0.739	200	858	126,832	
OTM29 R2	014-1701.D	014-1702.D	HPLC56PG52.M	7.87	7.85	0.2	0.752	0.755	0.2	0.753	200	940	141,579	
OTM29 R3	015-1801.D	015-1802.D	HPLC56PG52.M	7.85	7.85	0.1	0.736	0.730	0.4	0.733	200	947	138,886	
OTM29 Field Train Blk	016-2101.D	016-2102.D	HPLC56PG52.M	7.87	7.86	0.1	0.124	0.116	3.0	0.120	5	560	336	
MB / 0.1N NaOH	010-1101.D	010-1102.D	HPLC56PG52.M	NA	NA	NA	0.0103	0.0103	0.0	0.0103	1	1.00	0.0103	ND
MS / OTM29 R1	012-1501.D	012-1502.D	HPLC56PG52.M	7.83	7.86	0.4	1.61	1.60	0.1	1.60	1	0.525	0.842	
												Spike Amount (ug)	0.520	
												Native Amount (ug)	0.370	
												Spike Recovery (%)	90.9%	
MSD / OTM29 R1	013-1601.D	013-1602.D	HPLC56PG52.M	7.88	7.87	0.2	1.65	1.65	0.2	1.65	1	0.525	0.867	
												Spike Amount (ug)	0.520	
												Native Amount (ug)	0.370	
												Spike Recovery (%)	95.7%	
LCS 1	006-0701.D	006-0702.D	HPLC56PG52.M	7.85	7.88	0.4	1.08	1.07	0.2	1.08	100	10.0	1,076	
												Spike Amount (ug)	1,000	
												Spike Recovery (%)	108%	
LCS 2	007-0801.D	007-0802.D	HPLC56PG52.M	7.88	7.87	0.1	1.07	1.06	0.1	1.07	100	10.0	1,066	
												Spike Amount (ug)	1,000	
												Spike Recovery (%)	107%	

Company	Entec Services, Inc.
Analyst	KHB
Parameters	EPA SW-846 M0011

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.00271 (ug/mL)
LOQ 0.0747 (ug/mL)
Compound Formaldehyde

Lower Curve Limit 0.0747 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

Sample ID	Lab ID	Analysis Method	Ret Time (min)	Conc (ug/mL)	AF	Vol (mL)	Catch Weight (ug)	Qual
M0011 R1	038-3601.D	HPLC54PG120ICR.M	NA	0.00271	2	225	1.22	ND
M0011 R1	038-3701.D	HPLC54PG120ICR.M	NA	0.00271	2	225	1.22	ND
LD / M0011 R1	039-3801.D	HPLC54PG120ICR.M	NA	0.00271	2	191	1.04	ND
						% Difference	NA	
M0011 R2	040-3901.D	HPLC54PG120ICR.M	4.84	1.81	2	203	738	
M0011 R3	041-4001.D	HPLC54PG120ICR.M	NA	0.00271	1	374	1.01	ND
M0011 Field Train Blk	042-4101.D	HPLC54PG120ICR.M	4.85	0.0752	1	226	17.0	
MB-1	043-4201.D	HPLC54PG120ICR.M	NA	0.00271	1	143	0.388	ND
MB-2	056-3701.D	HPLC54PG120ICR.M	4.90	0.0102	1	142	1.44	J
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00271	1	1.00	0.00271	ND
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00271	1	1.00	0.00271	ND
MS / R2	054-3501.D	HPLC54PG120ICR.M	4.91	3.11	1	126	393	
						Spike Amount (ug)	301	
						Native Amount (ug)	123	
						Spike Recovery (%)	89.9%	
MSD / R2	055-3601.D	HPLC54PG120ICR.M	4.91	2.90	1	128	372	
						Spike Amount (ug)	301	
						Native Amount (ug)	123	
						Spike Recovery (%)	82.7%	
LCS-1	044-4301.D	HPLC54PG120ICR.M	4.85	2.01	1	143	288	
						Spike Amount (ug)	301	
						Spike Recovery (%)	95.8%	
LCS-2	057-3801.D	HPLC54PG120ICR.M	4.91	6.33	1	142	896	
						Spike Amount (ug)	1,002	
						Spike Recovery (%)	89.5%	

Company	Entec Services, Inc.
Analyst	KHB
Parameters	EPA SW-846 M0011

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.00448 (ug/mL)
LOQ 0.0747 (ug/mL)
Compound Acetaldehyde

Lower Curve Limit 0.0747 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

Sample ID	Lab ID	Analysis Method	Ret Time (min)	Conc (ug/mL)	AF	Vol (mL)	Catch Weight (ug)	Qual
M0011 R1	038-3601.D	HPLC54PG120ICR.M	6.16	0.0982	2	225	44.2	
M0011 R1	038-3701.D	HPLC54PG120ICR.M	6.13	0.0963	2	225	43.3	
LD / M0011 R1	039-3801.D	HPLC54PG120ICR.M	6.15	0.0900	2	191	34.4	
						% Difference	22.0%	
M0011 R2	040-3901.D	HPLC54PG120ICR.M	6.13	0.0996	2	203	40.5	
M0011 R3	041-4001.D	HPLC54PG120ICR.M	6.14	0.0970	1	374	36.3	
M0011 Field Train Blk	042-4101.D	HPLC54PG120ICR.M	NA	0.00448	1	226	1.01	ND
MB-1	043-4201.D	HPLC54PG120ICR.M	NA	0.00448	1	143	0.641	ND
MB-2	056-3701.D	HPLC54PG120ICR.M	NA	0.00448	1	142	0.634	ND
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00448	1	1.00	0.00448	ND
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00448	1	1.00	0.00448	ND
MS / R2	054-3501.D	HPLC54PG120ICR.M	6.21	2.16	1	126	273	
						Spike Amount (ug)	293	
						Native Amount (ug)	6.75	
						Spike Recovery (%)	90.7%	
MSD / R2	055-3601.D	HPLC54PG120ICR.M	6.21	2.02	1	128	259	
						Spike Amount (ug)	293	
						Native Amount (ug)	6.75	
						Spike Recovery (%)	85.9%	
LCS-1	044-4301.D	HPLC54PG120ICR.M	6.13	1.83	1	143	261	
						Spike Amount (ug)	293	
						Spike Recovery (%)	89.0%	
LCS-2	057-3801.D	HPLC54PG120ICR.M	6.21	1.86	1	142	263	
						Spike Amount (ug)	293	
						Spike Recovery (%)	89.5%	

Company	Entec Services, Inc.
Analyst	KHB
Parameters	EPA SW-846 M0011

Client #	511150
Job #	0611-35
# Samples	3 runs & 1 blank

MDL 0.00442 (ug/mL)
LOQ 0.0746 (ug/mL)
Compound Propionaldehyde

Lower Curve Limit 0.0746 (ug/mL)
Upper Curve Limit 15.0 (ug/mL)

Sample ID	Lab ID	Analysis Method	Ret Time (min)	Conc (ug/mL)	AF	Vol (mL)	Catch Weight (ug)	Qual
M0011 R1	038-3601.D	HPLC54PG120ICR.M	NA	0.00442	2	225	1.99	ND
M0011 R1	038-3701.D	HPLC54PG120ICR.M	NA	0.00442	2	225	1.99	ND
LD / M0011 R1	039-3801.D	HPLC54PG120ICR.M	NA	0.00442	2	191	1.69	ND
						% Difference	NA	
M0011 R2	040-3901.D	HPLC54PG120ICR.M	NA	0.00442	2	203	1.80	ND
M0011 R3	041-4001.D	HPLC54PG120ICR.M	NA	0.00442	1	374	1.65	ND
M0011 Field Train Blk	042-4101.D	HPLC54PG120ICR.M	NA	0.00442	1	226	1.00	ND
MB-1	043-4201.D	HPLC54PG120ICR.M	NA	0.00442	1	143	0.632	ND
MB-2	056-3701.D	HPLC54PG120ICR.M	NA	0.00442	1	142	0.625	ND
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00442	1	1.00	0.00442	ND
RB / 100% ACN	002-0301.D	HPLC54PG120ICR.M	NA	0.00442	1	1.00	0.00442	ND
MS / R2	054-3501.D	HPLC54PG120ICR.M	8.43	1.82	1	126	230	
						Spike Amount (ug)	289	
						Native Amount (ug)	0.300	
						Spike Recovery (%)	79.7%	
MSD / R2	055-3601.D	HPLC54PG120ICR.M	8.42	1.74	1	128	222	
						Spike Amount (ug)	289	
						Native Amount (ug)	0.300	
						Spike Recovery (%)	76.9%	
LCS-1	044-4301.D	HPLC54PG120ICR.M	8.33	1.83	1	143	261	
						Spike Amount (ug)	289	
						Spike Recovery (%)	90.4%	
LCS-2	057-3801.D	HPLC54PG120ICR.M	8.42	1.52	1	142	215	
						Spike Amount (ug)	289	
						Spike Recovery (%)	74.4%	

Company	Entec Services, Inc.
Analyst	KTH
Parameters	EPA Method 202

Client #	511150
Job #	0611-35
# Samples	3 + Blanks

Analysis of Condensible Particulate Recovery

Sample ID Number	Train Blank		Run 1		Run 2		Run 3	
Organic								
Beaker Number	*1187*		*1184*		*1185*		*1186*	
Initial Hexane/Acetone Volume, mL	74.0		92.0		80.0		102	
Lab Hexane Volume, mL	165	Dates	165	Dates	165	Dates	165	Dates
Final Weight, g	2.2393	7/20/11 A	2.2541	7/20/11 A	2.2524	7/20/11 A	2.2478	7/20/11 A
Reweigh, Final, g	2.2393	7/20/11 P	2.2541	7/20/11 P	2.2523	7/20/11 P	2.2478	7/20/11 P
Beaker Tare, g	2.2385	6/28/11	2.2495	6/28/11	2.2438	6/28/11	2.2401	6/28/11
Net Organic Catch, mg	0.9		4.5		8.5		7.7	
Inorganic								
Beaker Number	*1230*	Dates	*1227/1405*	Dates	*1228*	Dates	*1229*	Dates
Final Weight, g	2.2684	7/20/11 A	4.5600	7/20/11 A	2.3157	7/20/11 A	2.3463	7/20/11 A
Reweigh, Final, g	2.2684	7/20/11 P	4.5601	7/20/11 P	2.3156	7/20/11 P	2.3466	7/20/11 P
Beaker Tare, g	2.2665	6/30/11	4.5099	6/30/11	2.2579	6/30/11	2.2524	6/30/11
Sample H2O volume, mL	56.0		870		840		850	
Added H2O, Filter Extraction, mL	75.0		75.0		75.0		75.0	
Removed Pre-aliquot, mL	0.5		0.5		0.5		0.5	
Pre-aliquot CF	1.004		1.001		1.001		1.001	
Resuspended Volume, mL	100		100		100		100	
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		50.5		58.1		94.7	
Ammonium Correction, mg	0.0		0.1		0.1		0.1	
Corrected Inorganic, mg	1.9		50.4		58.0		94.5	
Condensible Particulate Matter, mg	2.8		54.9		66.5		102.3	
TB Corrected CPM, mg			52.9		64.5		100.3	

Client Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	*1188*	Dates	Beaker Number	*1231*	Dates	Beaker Number	*1190*	Dates
Tare weight, g	2.2348	6/28/11	Tare weight, g	2.2677	6/30/11	Tare weight, g	2.2371	6/28/11
Dry Residue Weight, g	2.2348	7/20/11 A	Dry Residue Weight, g	2.2686	7/20/11 A	Dry Residue Weight, g	2.2379	7/20/11 A
Reweigh, Final, g	2.2348	7/20/11 P	Reweigh, Final, g	2.2686	7/20/11 P	Reweigh, Final, g	2.2379	7/20/11 P
Hexane Residue, g	-0.0001		Water Residue, g	0.0009		Acetone Residue, g	0.0008	
Hexane Volume, mL	225		Water Volume, mL	200		Acetone Volume, mL	134	
Max. Hexane Residue, g	0.0022		Max. Water Residue, g	0.0020		Max. Acetone Residue, g	0.0011	

In-House Blank Analyses

Type Blank	Hexane		Type Blank	H2O Blank		Type Blank	Acetone	
Beaker Number	*1189*	Dates	Beaker Number	*1232*	Dates	Beaker Number	*1191*	Dates
Tare weight, g	2.2373	6/28/11	Tare weight, g	2.2211	6/30/11	Tare weight, g	2.2343	6/28/11
Dry Residue Weight, g	2.2375	7/20/11 A	Dry Residue Weight, g	2.2213	7/20/11 A	Dry Residue Weight, g	2.2343	7/20/11 A
Reweigh, Final, g	2.2375	7/20/11 P	Reweigh, Final, g	2.2213	7/20/11 P	Reweigh, Final, g	2.2343	7/20/11 P
Hexane Residue, g	0.0003		Water Residue, g	0.0002		Acetone Residue, g	0.0000	
Hexane Volume, mL	200		Water Volume, mL	250		Acetone Volume, mL	200	
Max. Hexane Residue, g	0.0020		Max. Water Residue, g	0.0025		Max. Acetone Residue, g	0.0016	

Company	Entec Services, Inc.
Analyst	KTH
Parameters	EPA Method 202

Client #	511150
Job #	0611-35
# Samples	3 + Blanks

MDL 0.09 (mg Ammonium)
MDL 0.26 (mg Sulfate)
Blank titrant amount (Vtb) 0.04
NH4OH normality 0.1

Lot # Sigma Aldrich 318620

Sample ID.	Volume Resuspended (mL)	Titration Aliquot Vol (mL)	NH_4OH Titration Vol (mL)	Aliquot Factor (mL rec'd/aliq mL)	SO4 Catch (mg)	Ammonium equivalent (mg)
Train Blank	100	99.5	0.08	1.01	0.26 ND	0.09 ND
Run 1	100	99.5	0.10	1.01	0.29	0.10
Run 2	100	99.5	0.12	1.01	0.39	0.14
Run 3	100	99.5	0.11	1.01	0.34	0.12

EPA Method 5B - Particulate Determination - Data Analysis

Company	Entec Services, Inc.
Analyst	KTH / JDB
Parameters	EPA Method 5B

Client #	511150
Job #	0611-35
# Samples	3 + Blanks

Analysis of Particulate Recovery

Sample ID	Run 1		Run 2		Run 3	
Filter ID	*3643*		*3644*		*3645*	
Filter tare (g)	0.4722		0.4731		0.4609	
Total tare (g)	0.4722	Dates	0.4731	Dates	0.4609	Dates
Final wt. (g) 1st	0.5057	7/8/11	0.5155	7/8/11	0.5107	7/8/11
Final wt. (g) 2nd	0.5052	7/20/11	0.5150	7/20/11	0.5103	7/20/11
Net filter catch (mg)	33.0		41.9		49.4	
Beaker number	*1192*	Dates	*1193*	Dates	*1194*	Dates
Final wt (g) 1st	2.2493	7/20/11 A	2.2554	7/20/11 A	2.2441	7/20/11 A
Final wt (g) 2nd	2.2494	7/20/11 P	2.2554	7/20/11 P	2.2441	7/20/11 P
Beaker tare (g)	2.2427		2.2441		2.2373	
Acetone blank (g)	0.0005		0.0005		0.0006	
Acetone vol (mL)	80.0		94.0		98.0	
Net front rinse (mg)	6.2		10.8		6.2	
Total particulate (mg)	39.2		52.7		55.6	

Blank Acetone Analysis

Blank beaker number	*1190*		Dates
Blank volume (mL)	134	Final wt (g) 1st	2.2379 7/20/11 A
Beaker tare (g)	2.2371	Final wt (g) 2nd	2.2379 7/20/11 P
Max acetone residue (g)	0.0011	Acetone residue (g)	0.0008

In-House Blank Acetone Analysis

Blank beaker number	*1191*		Dates
Blank volume (mL)	200	Final wt (g) 1st	2.2343 7/20/11 A
Beaker tare (g)	2.2343	Final wt (g) 2nd	2.2343 7/20/11 P
Max acetone residue (g)	0.0016	Acetone residue (g)	0.0000

Company	Entec Services, Inc.
Analyst	KTH
Parameters	ASTM D-5907-Type

Client #	511150
Job #	0611-35
Report Date	3 Runs

Analysis of Particulate Recovery

Sample ID Number	**Run 1**		**Run 2**		**Run 3**	
Inorganic						
Beaker Number	*1224*	Dates	*1225*	Dates	*1226*	Dates
Final Weight, g	7.9272	7/20/11 A	9.9619	7/20/11 A	10.0376	7/20/11 A
Reweigh, Final, g	7.9270	7/20/11 P	9.9615	7/20/11 P	10.0373	7/20/11 P
Beaker Tare Weight, g	2.2378	6/30/11	2.2405	6/30/11	2.2181	6/30/11
Sample Final Volume, mL	390		520		530	
Net Inorganic, mg	5,689.3		7,721.0		7,819.3	

In-House Blank Analysis

Sample ID Number	**H2O Blank**	
Beaker Number	*1231*	Dates
Final Weight, g	2.2686	7/20/11 A
Reweigh, Final, g	2.2686	7/20/11 P
Initial Beaker Tare Weight, g	2.2677	6/30/11
Water Residue, g	0.0009	
Water Volume, mL	250	
Max. Water Residue, g	0.0025	

Sample Custody

Chain of Custody Record

ENTHALPY analytical, inc.

Page 1 of 1

Special Handling:
- ☒ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time -- Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services Inc
Project Manager: Chuck Duncan III
Report To: Chuck Duncan III

Project Number: 511150
Site Name: Hovensa
Location: FCCU Stack

PO#:
Telephone#: 919-244-7777
Email: CDuncan@entecservices.com

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: M-26A

A=Air 1=H2SO4 2=NaOH 3=Acetone 4=_____
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	26A								Notes:
Run 1 A	6-15	✓	✓	C	1			1													HCL / HF
Run 1 B	6-15	✓	✓	C	2			1													Cl2
Run 2 A	6-15	✓	✓	C	1			1													HCL / HF
Run 2 B	6-15	✓	✓	C	2			1													Cl2
Run 3 A	6-15	✓	✓	C	1			1													HCL / HF
Run 3 B	6-15	✓	✓	C	2			1													Cl2
.1N H2SO4 Blank	6-15	✓	✓	Q	1		1														Train Blank
3N NaOH Blank	6-15	✓	✓	Q	2		1														Blank
.1N NaOH Blank	6-15	✓	✓	Q	2		1														Blank
Acetone Blank	6-15	✓	✓	Q	3		1														Blank
Field train Blank	6-15	✓	✓	Q	1			1													.1N H2SO4 field train Blank
Field train Blank	6-15	✓	✓	Q	2			1													.1N NaOH field train Blank

Samples received in glass HLT 6/24/11

[signature]		[signature]	6/24/11 HLT	3:55pm	☐ Iced ☐ Ambient ☒ °C 24.2°C Rayleigh gun #2
					☐ Iced ☐ Ambient ☐ °C_____
					☐ Iced ☐ Ambient ☐ °C_____

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

multiple Boxes

Chain of Custody Record

ENTHALPY analytical, inc.

Page 1 of 1

Special Handling:
- [x] Standard Turn Around Time (10 business days)
- [ ] Rush Turn Around Time -- Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services
Project Manager: Chuck Duncan
Report To: Chuck Duncan

Project Number: 511150
Site Name: Hovensa
Location: St Croix USVI

PO#:
Telephone#: 919-544-7777
Email: CDuncan@entecservices.com

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: CTM-027

A=Air 1=H2SO4 2=NaOH 3=H2O 4=_____
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# of Other	CTM-027		TSS	TOS					Notes:
Run1 1of2	6-18	✓	~500ml	C	2			1					✓								NH3
Run1 2of2	6-18	✓	~500ml	C	2			1					✓								"
Run2 1of2	6-18	✓	~500ml	C	2			1					✓								"
Run2 2of2	6-18	✓	~500ml	C	2			1					✓								"
Run3 1of2	6-19	✓	~500ml	C	2			1					✓								"
Run3 2of2	6-19	✓	~500ml	C	2			1					✓								"
Field Blank	6-19	✓	~500ml	Q	2			1					✓								" Blank(Field)
Run1	6-18	✓	500ml	C	3			1							✓	✓					Meth 2540B
Run2	6-18	✓	500ml	C	3			1							✓	✓					"
Run3	6-19	✓	500ml	C	3			1							✓	✓					"

Collected w/PM sampling one for Run

1=Dave	6-21-11	Heather M	6/24/11	3:55	☐ Iced ☐ Ambient ☒ °C 24.2°C Polytetrafluoroethylene
					☐ Iced ☐ Ambient ☐ °C_____
					☐ Iced ☐ Ambient ☐ °C_____

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

Chain of Custody Record

ENTHALPY analytical, inc.

Page 1 of 1

Special Handling:
- ☑ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time – Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entech Services Inc
Project Manager: Chuck Duncan III
Report To: Chuck Duncan III

Project Number: 511150
Site Name: Hovensa
Location: FCCU Stack

PO#:
Telephone#: 919-244-7777
Email: CDuncan@entechservices.com

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: OTM-02a Hydrogen Cyanide

A=Air 1=H2SO4 2=NaOH 3=6 N NaOH 4=0.1 N NaOH
X=XAD C=Charcoal SG=Silica Gel 5= Field trans blk
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	OTM 02a	Notes:
Run 1	6-15	/	/	C	3		1							Hydrogen Cyanide
Run 2	6-15	/	/	C	3		1							"
Run 3	6-15	/	/	C	3		1							"
Blank-Field Trans	6-15	/	/	Q	5		1							Field Trans Blank
Blank - 6 N NaOH	6-15	/	/	Q	3		1							6.0 N Blank NaOH
Blank - 0.1 N NaOH	6-15	/	/	Q	4		1							0.1 N Blank NaOH
Rec'd .1N NaOH Blank w/no date on it HLT 6/24/11														

pH
10.07
10.85
10.68

14
CHB
7-8-11

1	6-15-11		6/24/11	3:55pm	☐ Iced ☐ Ambient ☒ °C 24.2°C (Raytek gun #2)
					☐ Iced ☐ Ambient ☐ °C_____
					☐ Iced ☐ Ambient ☐ °C_____

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTHALPY analytical, inc.

Chain of Custody Record

Page 1 of 1

Special Handling:
- ☒ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time – Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec
Project Manager: Chuck Duncan
Report To: Chuck Duncan

Project Number: 511150
Site Name: FCCU Stack
Location: St. Croix USVI

PO#:
Telephone#: 919-244-7777
Email:

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: Meth- 0011

A=Air 1=H2SO4 2=NaOH 3= DNPH 4=_____
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	0011								Notes:
Run 1 1of2	6-17	—	—	C	3		1						✓								DPNH
Run 1 2of2	"	—	—	C	3		1						✓								"
Run 2 1of2	"	—	—	C	3		1						✓								"
Run 2 2of2	"	—	—	C	3		1						✓								"
Run 3 1of2	"	—	—	C	3		1						✓								"
Run 3 2of2	"	—	—	C	3		1						✓								"
Blank	6-17	—	—	Q	3		1						✓								field train blank

[signature]	6-22-11	[signature]	6/24/11	3:55pm	☐ Iced ☐ Ambient ☒ °C 24.2°C Ray tek gun
					☐ Iced ☐ Ambient ☐ °C_____
					☐ Iced ☐ Ambient ☐ °C_____

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTHALPY analytical, inc.

Chain of Custody Record

Page 1 of 2

Special Handling:
- ☒ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time -- Date Needed _____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services
Project Manager: Chuck Duncan
Report To: Chuck Duncan

Project Number: 511150
Site Name: FCCU Stack
Location: St. Croix USVI

PO#:
Telephone#: 919-244-7777
Email: CDuncan@entecservices.com

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions: Method 5B/202

A=Air 1=H2SO4 2=NaOH 3=Acetone/Hexane 4=Acetone 5-H2O 6-Hexane
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

	Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	5B/202								Notes:
Front Half	Run 1 Front Half	6-18	/	/	C	4		1						✓								
	Run 2 Front Half	6-18	/	/	C	4		1						✓								
	Run 3 Front Half	6-19	/	/	C	4		1						✓								
Back Half	Run 1 Ace/Hex	6-18	/	/	C	3		1						✓								
	Run 2 Ace/Hex	6-18	/	/	C	3		1						✓								
	Run 3 Ace/Hex	6-19	/	/	C	3		1						✓								
Back Half	Run 1 H2O	6-18	/	/	C	5		1						✓								
	Run 2 H2O	6-18	/	/	C	5		1						✓								
	Run 3 H2O	6-19	/	/	C	5		1						✓								
	Train Blank	6-19	/	/	Q	5		1						✓								Train H2O Blank
	Blank	6-19	/	/	Q	5		1						✓								Water Blank
	Train Blank	6-19	/	/	Q	3		1						✓								Train Ace/Hex Blank
	Blank	6-19	/	/	Q	6		1						✓								Hexane Blank
	Blank	6-19	/	/	Q	4		1						✓								Acetone Blank

[signature]	6-22-11	Brad Bullock	6/24/11	1000	☐ Iced ☒ Ambient ☐ °C
Brad Bullock	6/24/11	[signature]	6/27/11	3:04 pm	☐ Iced ☐ Ambient ☒ °C 23.6°C Rayleigh gun #2
					☐ Iced ☐ Ambient ☐ °C

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTHALPY analytical, inc.

Chain of Custody Record

Page 2 of 2

Special Handling:
- ☐ Standard Turn Around Time (10 business days)
- ☐ Rush Turn Around Time – Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of After 1 Month Unless Otherwise Instructed.
- All Other Samples Disposed of After 6 months Unless Otherwise Instructed.

Client Name: Entec Services
Project Manager: Chuck Duncan
Report To: Chuck Duncan

Project Number: 511150
Site Name:
Location:

PO#:
Telephone#:
Email:

For Collocated spike trains: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH 3= filter 4=
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	SR/202								Notes:
Run 1	6-18	/	/	C	3			1					✓								SB
Run 2	6-18	/	/	C	3			1					✓								SB
Run 3	6-19	/	/	C	3			1					✓								SB
Run 1	6-18	/	/	C	3		1						✓								CPM
Run 2	6-18	/	/	C	3		1						✓								CPM
Run 3	6-19	/	/	C	3		1						✓								CPM
Blank	6-19	/	/	Q	3		1						✓								Blank filter CPM

[illegible]	6-22-11	Brad Bullock	6/24/11	1000	☐ Iced ☑ Ambient ☐ °C
Brad Bullock	6/24/11	Heather Jones	6/24/11	3:00pm	☐ Iced ☐ Ambient ☒ °C 23.6°C Raytek gusted
					☐ Iced ☐ Ambient ☐ °C

2202 Ellis Road, Suite A • Durham, NC 27703-5518 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTEC SERVICES, INC.

METHOD 26A HCl / HF / Cl_2 - SAMPLE RECOVERY DATA SHEET

Client / Location: Hovensa **Sampling Date(s):** 6-15-11

Run No.: 1 **Recovery Date:** 6-15-11 **Recovered By:** DLS

Imp. Type	(M) 50 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml	(M) 100 ml		
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)	4 (3.0N NaOH)	5 (3.0N NaOH)		(5) Silica Gel
Final Wt.	951.3	950.2	758.8	732.1	725.1		1005.1
Initial Wt.	662.2	709.2	701.1	718.0	714.8		975.6
Net Weight	289.1	241.0	57.7	14.01	10.3		29.5

TS 8-1-11 TS 8-1-11

Moisture Imp.: 612.2 (Grams) **Moisture Gel.:** 29.5 (Grams)

Description of Impinger Contents: CLOUDY, WHITE YELLOW THICK

Description of Particulate on Filter: N/A **Sealed:** (Y) N

Silica Gel Color: MIXED **Percent Spent:** 50 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N

Impinger Contents Container No.: Run 1 **Liquid Level Marked / Sealed:** (Y) N

Run No.: 2 **Recovery Date:** 6/15/11 **Recovered By:** MH

Imp. Type	(M) 50 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml	(M) 100 ml		
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)	4 (3.0N NaOH)	5 (3.0N NaOH)		(5) Silica Gel
Final Wt.	964.0	957.8	717.3	740.9	727.7		994.2
Initial Wt.	663.7	706.0	685.9	727.4	717.7		963.8
Net Weight	300.3	251.8	31.4	13.5	10.0		30.4

Moisture Imp.: 607.0 Grams **Moisture Gel.:** 30.4 Grams

Description of Impinger Contents: CLOUDY, WHITE YELLOW THICK

Description of Particulate on Filter: N/A **Sealed:** (Y) N

Silica Gel Color: MIXED **Percent Spent:** 50 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N

Impinger Contents Container No.: Run 2 **Liquid Level Marked / Sealed:** (Y) N

Run No.: 3 **Recovery Date:** 6/15/11 **Recovered By:** MH

Imp. Type	(M) 50 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml	(M) 100 ml		
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)	4 (3.0N NaOH)	5 (3.0N NaOH)		(5) Silica Gel
Final Wt.	950.4	949.4	761.6	734.4	729.6		1032.5
Initial Wt.	654.8	709.8	714.7	721.3	717.8		1004.4
Net Weight	295.6	239.6	46.9	13.1	11.8		28.1

Moisture Imp.: 607.0 Grams **Moisture Gel.:** 28.1 Grams

Description of Impinger Contents: Cloudy white yellow thick

Description of Particulate on Filter: N/A **Sealed:** (Y) N

Silica Gel Color: Pink/Blue **Percent Spent:** 90 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N

Impinger Contents Container No.: Run 3 **Liquid Level Marked / Sealed:** (Y) N

Field Reagent Blanks (100 ml)

DI H2O: N/A Acetone: N/A Sulfuric Acid: ✓ NaOH: ✓ Teflon Filter: N/A

Field Audits Provided: NO

ENTEC SERVICES, INC.

METHOD 30B SPECIATED MERCURY SAMPLE RECOVERY DATA SHEET

Client / Location: Hovensa - FCCU Stack Sampling Date(s): 6-15-11

Run No.: 1 Recovery Date: 6/15/11 Recovered By: CDT

Imp. Type	Empty	Empty		Sorbent Tube Information	
Impingers	1 (Jar)	2 (Jar)	3 (Silica Gel)	Trap A	Trap B
Final Wt.				Tube ID: 014067	011367
Initial Wt.				Spike Level:	50.ng
Net Weight				Total Liters: 60.095	60.310

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Silica Gel Color: Mixed

Run No.: 2 Recovery Date: 6/15/11 Recovered By: CDT

Imp. Type	Empty	Empty		Sorbent Tube Information	
Impingers	1 (Jar)	2 (Jar)	3 (Silica Gel)	Trap A	Trap B
Final Wt.				Tube ID: 014086	009342
Initial Wt.				Spike Level:	50.2ng
Net Weight				Total Liters: 59.974	59.824

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Silica Gel Color: Mixed

Run No.: 3 Recovery Date: 6/15/11 Recovered By: CDT

Imp. Type	Empty	Empty		Sorbent Tube Information	
Impingers	1 (Jar)	2 (Jar)	3 (Silica Gel)	Trap A	Trap B
Final Wt.				Tube ID: 013960	011220
Initial Wt.				Spike Level: ~~011220~~	50.ng
Net Weight				Total Liters: 60.191	59.598

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Silica Gel Color: mixed

Run No.: _____ Recovery Date: _____ Recovered By: _____

Imp. Type	Empty	Empty		Sorbent Tube Information	
Impingers	1 (Jar)	2 (Jar)	3 (Silica Gel)	Trap A	Trap B
Final Wt.				Tube ID:	
Initial Wt.				Spike Level:	
Net Weight				Total Liters:	

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Silica Gel Color: _____

ENTEC SERVICES, INC.

METHOD OTM029 HCN - SAMPLE RECOVERY DATA SHEET

Client / Location: Hovensa **Sampling Date(s):** 6-15-11

Run No.: 1 **Recovery Date:** 6-15-11 **Recovered By:** JLW

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) Empty			
Impingers	1 (6.0N NaOH)	2 (6.0N NaOH)	3 (6.0N NaOH)	4			(5) Silica Gel
Final Wt.	947.5	774.4	923.6	535.8			1023.3
Initial Wt.	720.0	722.7	901.2	534.0			1010.3
Net Weight	227.5	51.7	22.4	1.8			13.0

Moisture Imp.: 303.4 (Grams) **Moisture Gel.:** 13.0 (Grams)
Description of Impinger Contents: pH Last Imp 13 / Imp Total 12+
Description of Particulate on Filter: N/A **Sealed:** (Y) N
Silica Gel Color: MIXED **Percent Spent:** 20 %
Filter I.D. Number: N/A **Filter Container No.:** N/A
Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N
Impinger Contents Container No.: Run 1 **Liquid Level Marked / Sealed:** (Y) N

Run No.: 2 **Recovery Date:** 6.15.11 **Recovered By:** MH

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 250 ml			
Impingers	1 (6.0N NaOH)	2 (6.0N NaOH)	3 (6.0N NaOH)	4 (6.0N NaOH)			(5) Silica Gel
Final Wt.	941.2	758.0	736.5	922.9			941.0
Initial Wt.	704.1	712.8	719.6	844.4			927.1
Net Weight	237.1	45.2	16.9	78.5			13.9

Moisture Imp.: 377.7 Grams **Moisture Gel.:** 13.9 Grams
Description of Impinger Contents: pH Last Imp 13 / Imp. Total 12+
Description of Particulate on Filter: N/A **Sealed:** (Y) N
Silica Gel Color: MIXED **Percent Spent:** 40 %
Filter I.D. Number: N/A **Filter Container No.:** N/A
Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N
Impinger Contents Container No.: Run 2 **Liquid Level Marked / Sealed:** (Y) N

Run No.: 3 **Recovery Date:** 6.15.11 **Recovered By:** MH

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 250 ml			
Impingers	1 (6.0N NaOH)	2 (6.0N NaOH)	3 (6.0N NaOH)	4 (6.0N NaOH)			(5) Silica Gel
Final Wt.	953.6	769.8	759.7	870.0			1035.2
Initial Wt.	721.5	721.9	741.7	836.1			1022.9
Net Weight	232.1	47.9	18.0	33.9			12.3

Moisture Imp.: 331.9 Grams **Moisture Gel.:** 12.3 Grams
Description of Impinger Contents: pH Last Imp. 13 / Imp. Total 12+
Description of Particulate on Filter: N/A **Sealed:** (Y) N
Silica Gel Color: MIXED **Percent Spent:** 40 %
Filter I.D. Number: N/A **Filter Container No.:** N/A
Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N
Impinger Contents Container No.: Run 3 **Liquid Level Marked / Sealed:** (Y) N

Field Reagent Blanks (100 ml)
Acetone: N/A 0.1 NaOH: ✓ 6.0N NaOH: ✓ Quartz Filter: N/A

Field Audits Provided: _____

ENTEC SERVICES, INC.

METHOD 0010 SAMPLE RECOVERY DATA SHEET - Page 1

Client / Location: HOVENSA Sampling Date(s): 6/15/11

Run No.: 1 Recovery Date: 6/15 Recovered By: _____

Imp. Type	(DI) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Empty			
Impingers	1	2 (H2O)	3 (H2O)	4			5 (Silica Gel)
Final Wt.	1023.6	905.1	704.6	606.7	/	/	984.9
Initial Wt.	349.7	707.4	702.9	606.0	/	/	939.7
Net Weight	673.9	197.7	1.7	0.7	/	/	45.2

Moisture Imp.: ~~876.000~~ Grams Moisture Gel.: ~~300~~ 45.2 Grams 20 % Spent

Description of Particulate on filter: _____ Silica Gel Color: MIXED

Run No.: 2 Recovery Date: 6/15 Recovered By: _____

Imp. Type	(DI) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Empty			
Impingers	1	2 (H2O)	3 (H2O)	4			5 (Silica Gel)
TOT ~~Final~~ Wt. *	557.7	5.4	307.0	6.3	/	/	35.9
FN ~~Initial~~ Wt.	923.5	711.5	1010.8	543.8	/	/	948.6
IN ~~Net~~ Weight	365.8	706.1	703.8	537.5	/	/	907.7
	2ND	3RD	1ST	4TH			

Moisture Imp.: 876.4 Grams Moisture Gel.: 35.9 Grams 5D % Spent

Description of Particulate on filter: _____ Silica Gel Color: MIXED

Run No.: 3 Recovery Date: 6/15 Recovered By: MH

Imp. Type	(DI) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Empty			
Impingers	1	2 (H2O)	3 (H2O)	4			5 (Silica Gel)
Final Wt.	1021.9	947.5	779.0	610.9	/	/	965.6
Initial Wt.	351.3	702.7	723.2	606.7	/	/	926.2
Net Weight	670.6	244.6	55.8	4.2	/	/	39.4

Moisture Imp.: 975.2 Grams Moisture Gel.: 39.4 Grams 4D % Spent

Description of Particulate on filter: _____ Silica Gel Color: MIXED

Run No.: TRIP BLANK Recovery Date: _____ Recovered By: _____

Imp. Type	(DI) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Empty			
Impingers	1	2 (H2O)	3 (H2O)	4			5 (Silica Gel)
Final Wt.							
Initial Wt.							
Net Weight							

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Description of Particulate on filter: _____ Silica Gel Color: _____

RECORDED

ENTEC SERVICES, INC.

Method 0011 SAMPLE RECOVERY DATA SHEET - Page 1

Client / Location: Hovensa Sampling Date(s): 6-18-11

Run No.: 1 Recovery Date: 6-18-11 Recovered By: MH

Imp. Type	(Mod G.S.) 200ml	(G.S.) 100ml	(Mod G.S.) 100 ml	(Mod G.S.) Empty			(Mod G.S.)
Impingers	1 (DNPH)	2 (DNPH)	3 (DNPH)	4			4 (Silica Gel)
Final Wt.	906.4	827.9	720.7	556.8	/	/	905.3
Initial Wt.	742.8	686.3	716.1	556.7	/	/	894.1
Net Weight	163.6	141.6	4.6	0.1			11.2

Moisture Imp.: 309.9 Grams Moisture Gel.: 11.2 Grams 40 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: 2 Recovery Date: 6-18-11 Recovered By: MH

SPIKE 0611-35 SPIKED 4mL of 1000.171 ug/ml.

Imp. Type	(Mod G.S.) 200ml	(G.S.) 100ml	(Mod G.S.) 100 ml	(Mod G.S.) Empty			(Mod G.S.)
Impingers	1 (DNPH)	2 (DNPH)	3 (DNPH)	4			4 (Silica Gel)
Final Wt.	936.0	852.4	722.7	572.6	/	/	950.0
Initial Wt.	778.6	703.4	709.9	568.3	/	/	939.1
Net Weight	157.4	149.0	12.8	4.3			10.9

Moisture Imp.: 323.5 Grams Moisture Gel.: 10.9 Grams 20 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: 3 Recovery Date: 6-18-11 Recovered By: MH

Imp. Type	(Mod G.S.) 200ml	(G.S.) 100ml	(Mod G.S.) 100 ml	(Mod G.S.) Empty			(Mod G.S.)
Impingers	1 (DNPH)	2 (DNPH)	3 (DNPH)	4			4 (Silica Gel)
Final Wt.	897.3	885.6	719.4	557.4	/	/	916.4
Initial Wt.	762.5	689.0	715.7	559.6	/	/	905.3
Net Weight	134.8	196.6	3.7	2.2			13.1

Moisture Imp.: 337.3 Grams Moisture Gel.: 13.1 Grams 35 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: FIELD BLANK Recovery Date: 6-18-11 Recovered By:

Imp. Type	(Mod G.S.) 200ml	(G.S.) 100ml	(Mod G.S.) 100 ml	(Mod G.S.) Empty			(Mod G.S.)
Impingers	1 (DNPH)	2 (DNPH)	3 (DNPH)	4			4 (Silica Gel)
Final Wt.	200	100	100	—			—
Initial Wt.							
Net Weight							

Moisture Imp.: _____ Grams Moisture Gel.: _____ Grams _____ % Spent

Description of Particulate on filter: LIGHT TAN BLUE Silica Gel Color: _____

ENTEC SERVICES, INC.

METHOD 23 Dioxins / Furans - SAMPLE RECOVERY DATA SHEET

Client / Location: HOVENSA FCCU **Sampling Date(s):** 6-17-11

Run No.: 1 **Recovery Date:** 6-17 **Recovered By:** MH

Impingers:	XAD-2 Trap	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Knockout		
XAD Trap ID:		1 (Duncan Imp.)	2 (H2O)	3 (H2O)	4 (Empty)		5 (Silical Gel)
Final Weight *		625.0	69.0	18.5	3.8		32.1
~~Initial~~ Weight 2ND		984.3	788.4	717.8	615.1		940.9
~~Net~~ Weight 1ST		359.3	719.4	699.3	611.3		908.8

Moisture Imp.: 716.3 (Grams) Moisture Gel.: 32.1 (Grams) 40 % Spent

XAD Filter I.D.: _____ Silica Gel Color: MIXED

Description of impinger contents: FRAGMENT LIGHT YELLOW HUE

Description of Particulate on Filter: LIGHT BROWN

Filter Container No. (1) RUN 1 Sealed: Y N

Acetone & MeCl Rinse Container No. (2) RUN 1 Liquid Level Marked / Sealed: Y N

Toluene Rinse Container No. (3) RUN 1 Liquid Level Marked / Sealed: Y N

Run No.: 2 **Recovery Date:** 6-17 **Recovered By:** MH

Impingers:	XAD-2 Trap	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Knockout		
XAD Trap ID:		1 (Duncan Imp.)	2 (H2O)	3 (H2O)	4 (Empty)		5 (Silical Gel)
Final Weight		997.9	789.6	710.5	614.7		960.0
Initial Weight		364.4	712.0	709.9	610.0		926.7
Net Weight		633.5	77.6	0.6	4.7		33.3

Moisture Imp.: 716.4 (Grams) Moisture Gel.: 33.3 (Grams) 40 % Spent

XAD Filter I.D.: _____ Silica Gel Color: MIXED

Description of impinger contents: FRAGMENT LIGHT YELLOW HUE

Description of Particulate on Filter: LIGHT BROWN

Filter Container No. (1) RUN 2 Sealed: Y N

Acetone & MeCl Rinse Container No. (2) RUN 2 Liquid Level Marked / Sealed: Y N

Toluene Rinse Container No. (3) RUN 2 Liquid Level Marked / Sealed: Y N

Run No.: 3 **Recovery Date:** 6-17 **Recovered By:** MH

Impingers:	XAD-2 Trap	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	(M) Knockout		
XAD Trap ID:		1 (Duncan Imp.)	2 (H2O)	3 (H2O)	4 (Empty)		5 (Silical Gel)
Final Weight		999.8	852.2	710.3	610.7		962.8
Initial Weight		360.7	730.4	710.0	607.8		940.6
Net Weight		639.1	121.8	0.3	2.9		22.2

Moisture Imp.: 764.1 (Grams) Moisture Gel.: 22.2 (Grams) 80 % Spent

XAD Filter I.D.: _____ Silica Gel Color: MIXED

Description of impinger contents: FRAGMENT LIGHT YELLOW HUE

Description of Particulate on Filter: LIGHT BROWN

Filter Container No. (1) RUN 3 Sealed: Y N

Acetone & MeCl Rinse Container No. (2) RUN 3 Liquid Level Marked / Sealed: Y N

Toluene Rinse Container No. (3) RUN 3 Liquid Level Marked / Sealed: Y N

Field Reagent Blanks

Acetone:	MeCl2 :	Toluene:	Filter:
_____ (100 ml)	_____ (100 ml)	_____ (100 ml)	_____ (Glass Fiber)

1/200

ENTEC SERVICES, INC.
SAMPLE RECOVERY DATA SHEET

Client / Location: Hovensa, St Croix, VI (2) Sampling Date(s): June 18, 2011

0.75/min purge @ 1232 1345

Run No.: 1 Recovery Date: 6/18 Recovered By: CFD

Impingers	1	2	3	4	5	6	Silical Gel
Final Wt.	937.2	633.7		(2)Used 2		735.6	1003.5
Initial Wt.	→	←		CPM		→	→
Net Weight	356.6	605.9		Filters		710.9	969.3
Net	580.6	27.8				24.7	34.2

Total Moisture = 1667.3 Grams (1633.1 / 34.2)

Description of Impinger Contents: yellowish
Description of Particulate on Filter: light brown CPM - yellowish Sealed: (Y) N
Silica Gel Color: Blue-Pink Percent Spent: 70 %
Filter I.D. Number: 3643 0.47219 gm Filter Container No.: R1-3643
Probe Rinse Container No.: R1-FHA Liquid Level Marked / Sealed: (Y) N
Impinger Contents Container No.: R1-Imp. Liquid Level Marked / Sealed: (Y) N
R1-Ace/Hexane " " " " (Y) N

purge @ 0.75/min Bockhoff Acetone & Hexane

Run No.: 2 Recovery Date: 6/18 Recovered By: CFD

Impingers	1	2	3	4	5	6	Silical Gel
Final Wt.	953.0	710.7		CPM		745.9	1018.5
Initial Wt.	363.3	703.6		Filter		714.9	984.2
Net Weight	589.7	7.1		Rough side up		31.0	34.3

1610 1715

Total Moisture = 6602.1 Grams (6627.8 / 34.3)

Description of Impinger Contents: yellowish
Description of Particulate on Filter: light brown Sealed: (Y) N
Silica Gel Color: Blue-Pink Percent Spent: 75 %
Filter I.D. Number: 3644 0.47310 gm Filter Container No.: R2-3644
Probe Rinse Container No.: R2-FHA Liquid Level Marked / Sealed: (Y) N
Impinger Contents Container No.: R2-Imp Liquid Level Marked / Sealed: (Y) N
R2-Ace/Hexane " " " " (Y) N

purge 1120 Bock 1/2 Ace. & Hexane

Run No.: 3 Recovery Date: 6/19 Recovered By: CFD

Impingers	1	2 (2)	3	4	5	6	Silical Gel
Final Wt.	972.3	570.4	570.4	CPM		766.4	934.3
Initial Wt.	356.1	604.1 (2)	562.0	Filter		735.6	904.2
Net Weight	616.2		8.4	Rough side up		30.8	30.1

Total Moisture = 685.5 Grams (655.4 / 30.1)

Description of Impinger Contents: yellowish
Description of Particulate on Filter: light brown Sealed: (Y) N
Silica Gel Color: Blue Pink Percent Spent: 85 %
Filter I.D. Number: 3645 0.46089 gm Filter Container No.: R3-3645
Probe Rinse Container No.: RB-FHA Liquid Level Marked / Sealed: (Y) N
Impinger Contents Container No.: R3-Imp Liquid Level Marked / Sealed: (Y) N
R3-Ace/Hexane " " " " (Y) N

Bock 1/2 Ace & Hexane

BLANKS: Probe Rinse: _____ Impinger: Train ✓ Filter: _____

DI H2O ✓ Hexane ✓ Acetone ✓ CPM Filter ✓

ENTEC SERVICES, INC.

METHOD 29 SAMPLE RECOVERY DATA SHEET - Page 1

Client / Location: Hovensa Sampling Date(s): 6-18-11

Run No.: 1 Recovery Date: 6-18-11 Recovered By: MJA

Imp. Type	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	Empty			
Impingers	1 (Optional)	2 (HNO3/H2O2)	3 (HNO3/H2O2)				4 (Silica Gel)
Final Wt.	976.0	936.1	798.5	512.9			925.6
Initial Wt.	603.4	688.0	633.1	509.0			898.0
Net Weight	372.6	248.1	165.4	3.9			27.6

Moisture Imp.: ~~790.0~~ 786.4 Grams Moisture Gel.: 27.6 Grams 30 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: 2 Recovery Date: 6-18-11 Recovered By: MJA

Imp. Type	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	Empty			
Impingers	1 (Optional)	2 (HNO3/H2O2)	3 (HNO3/H2O2)				4 (Silica Gel)
Final Wt.	953.3	970.7	883.6	606.2			948.0
Initial Wt.	610.1	717.0	700.8	602.6			919.7
Net Weight	343.2	253.7	182.8	3.6			28.3

Moisture Imp.: 783.3 Grams Moisture Gel.: 28.3 Grams 30 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: 3 Recovery Date: 6-19-11 Recovered By: MJA

Imp. Type	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml	Empty			
Impingers	1 (Optional)	2 (HNO3/H2O2)	3 (HNO3/H2O2)				4 (Silica Gel)
Final Wt.	976.7	922.9	811.1	514.3			900.4
Initial Wt. 6036	~~711.3~~	686.9	632.1	511.4			880.4
Net Weight	373.4	236.0	179.0	2.9			20.0

Moisture Imp.: 790.9 Grams Moisture Gel.: 20.0 Grams 30 % Spent

Description of Particulate on filter: LIGHT TAN Silica Gel Color: MIXED

Run No.: ____ Recovery Date: ____ Recovered By: ____

Imp. Type	(M) Empty	(M) 100 ml	(w/ Tip) 100 ml				
Impingers	1 (Optional)	2 (HNO3/H2O2)	3 (HNO3/H2O2)				4 (Silica Gel)
Final Wt.							
Initial Wt.							
Net Weight							

Moisture Imp.: ____ Grams Moisture Gel.: ____ Grams ____ % Spent

Description of Particulate on filter: ____ Silica Gel Color: ____

Field Reagent Blanks

Parameter	PM Only				Mercury Only		
	Acetone Blank (7)	0.1 N HNO_3 Blank (8A)	H_2O Blank (8B)	HNO_3/H_2O_2 Blank (9)	$KMnO_4$ Blank (10)	8 N HCl Blank (11)	Filter Blank (12)
Volume:	100ml	300ml	100ml	200ml	100ml	200ml	
Container No.					N/A	N/A	
Sealed ?							
Level Marked?							

ENTEC SERVICES, INC.

CTM 027

METHOD ~~OTM027~~ - SAMPLE RECOVERY DATA SHEET

Client / Location: Hovensa FCCU **Sampling Date(s):** 6/17-18/11

Run No.: 1 **Recovery Date:** 6-18-11 **Recovered By:** MH

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml				
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)				(4) Silica Gel
Final Wt.	960.2	978.1	713.7				880.8
Initial Wt.	665.4	706.6	703.6				851.0
Net Weight	294.8	277.5	10.1				29.8

Moisture Imp.: 582.4 (Grams) **Moisture Gel.:** 29.8 (Grams)

Description of Impinger Contents: YELLOWISH ALL IMPINGERS

Description of Particulate on Filter: N/A **Sealed:** (Y) N

Silica Gel Color: MIXED **Percent Spent:** 80 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N

Impinger Contents Container No.: RUN 1 **Liquid Level Marked / Sealed:** (Y) N

Run No.: 2 **Recovery Date:** 6-18-11 **Recovered By:** MH

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml				
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)				(4) Silica Gel
Final Wt.	945.0	961.6	785.3				875.6
Initial Wt.	695.6	721.2	702.5				842.3
Net Weight	249.4	240.4	80.8				33.3

Moisture Imp.: 572.6 (Grams) **Moisture Gel.:** 33.3 (Grams)

Description of Impinger Contents: YELLOWISH ALL IMPINGERS

Description of Particulate on Filter: N/A **Sealed:** Y N

Silica Gel Color: MIXED **Percent Spent:** 40 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** Y N

Impinger Contents Container No.: RUN 2 **Liquid Level Marked / Sealed:** Y N

Run No.: 3 **Recovery Date:** 6-19-11 **Recovered By:** MH

Imp. Type	(w/ Tip) 100 ml	(w/ Tip) 100 ml	(M) 100 ml				
Impingers	1 (0.1N H_2SO_4)	2 (0.1N H_2SO_4)	3 (0.1N H_2SO_4)				(4) Silica Gel
Final Wt.	946.8	907.9	866.9				941.7
Initial Wt.	708.5	706.5	711.8				914.9
Net Weight	238.3	201.4	155.1				~~26.3~~ 26.8 KR

Moisture Imp.: 594.8 (Grams) **Moisture Gel.:** ~~26.3~~ 26.8 KR (Grams)

Description of Impinger Contents: YELLOWISH ALL IMPINGERS

Description of Particulate on Filter: N/A **Sealed:** (Y) N

Silica Gel Color: MIXED **Percent Spent:** 40 %

Filter I.D. Number: N/A **Filter Container No.:** N/A

Probe Rinse Container No.: N/A **Liquid Level Marked / Sealed:** (Y) N

Impinger Contents Container No.: RUN 3 **Liquid Level Marked / Sealed:** (Y) N

Field Reagent Blanks (100 ml)

DI H2O: ✓ Acetone: ✓ Sulfuric Acid: _____ Teflon Filter: _____

Field Audits Provided: N/A

APPENDIX C.8

LABORATORY DATA

FUEL SAMPLE RESULTS

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-001 **Sample ID D8535-1** **Date Sampled 6/15/11 1:10:00**
Coker Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	6	ppm v / v			
Methyl Mercaptan	10	ppm v / v			
Ethyl Mercaptan	1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	20	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	2	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-001 **Sample ID D8535-1** **Date Sampled 6/15/11 1:10:00**
Coker Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	2	ppm v / v			
Reformed Gas Analysis					
Hydrogen	8.69	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.09	Mol %	ASTM D-1946		
Carbon Monoxide	0.75	Mol %	ASTM D-1946		
Carbon Dioxide	0.03	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	62.41	Mol %	ASTM D-1946		
Ethylene	2.41	Mol %	ASTM D-1946		
Ethane	19.70	Mol %	ASTM D-1946		
Propylene	1.78	Mol %	UOP-539		
Propane	2.41	Mol %	ASTM D-1945		
Isobutane	0.23	Mol %	ASTM D-1945		
Isobutylene	0.25	Mol %	UOP-539		
1-Butene	0.06	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	0.69	Mol %	ASTM D-1945		
trans-2-Butene	0.14	Mol %	UOP-539		
cis-2-Butene	0.19	Mol %	UOP-539		
Isopentane	0.06	Mol %	ASTM D-1945		
n-Pentane	0.03	Mol %	ASTM D-1945		
Hexanes Plus	0.06	Mol %	ASTM D-1945		
Benzene	<0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.68597		ASTM D-3588		
Gross Heating Value (Dry)	1206.5	MMBTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	19.9	g/mol	ASTM D-3588		
Carbon Content	76.82	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-002 **Sample ID D8535-2** **Date Sampled 6/15/11 2:10:00**
Coker Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	2	ppm v / v			
Methyl Mercaptan	1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	10	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-002 **Sample ID D8535-2** **Date Sampled 6/15/11 2:10:00**
Coker Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	8.58	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.09	Mol %	ASTM D-1946		
Carbon Monoxide	0.74	Mol %	ASTM D-1946		
Carbon Dioxide	0.03	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	60.73	Mol %	ASTM D-1946		
Ethylene	2.38	Mol %	ASTM D-1946		
Ethane	20.13	Mol %	ASTM D-1946		
Propylene	2.05	Mol %	UOP-539		
Propane	3.61	Mol %	ASTM D-1945		
Isobutane	0.22	Mol %	ASTM D-1945		
Isobutylene	0.23	Mol %	UOP-539		
1-Butene	0.06	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	0.67	Mol %	ASTM D-1945		
trans-2-Butene	0.14	Mol %	UOP-539		
cis-2-Butene	0.17	Mol %	UOP-539		
Isopentane	0.06	Mol %	ASTM D-1945		
n-Pentane	0.03	Mol %	ASTM D-1945		
Hexanes Plus	0.06	Mol %	ASTM D-1945		
Benzene	<0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.70148		ASTM D-3588		
Gross Heating Value (Dry)	1230.6	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	20.3	g/mol	ASTM D-3588		
Carbon Content	77.04	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-003 **Sample ID D8535-3** **Date Sampled 6/15/11 3:30:00**
Coker Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	18	ppm v / v			
Methyl Mercaptan	44	ppm v / v			
Ethyl Mercaptan	4	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	16	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	3	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-003 **Sample ID D8535-3** **Date Sampled 6/15/11 3:30:00**
Coker Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	8.71	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.11	Mol %	ASTM D-1946		
Carbon Monoxide	0.74	Mol %	ASTM D-1946		
Carbon Dioxide	0.02	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	61.10	Mol %	ASTM D-1946		
Ethylene	2.33	Mol %	ASTM D-1946		
Ethane	19.64	Mol %	ASTM D-1946		
Propylene	2.04	Mol %	UOP-539		
Propane	3.70	Mol %	ASTM D-1945		
Isobutane	0.22	Mol %	ASTM D-1945		
Isobutylene	0.22	Mol %	UOP-539		
1-Butene	0.06	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	0.66	Mol %	ASTM D-1945		
trans-2-Butene	0.14	Mol %	UOP-539		
cis-2-Butene	0.17	Mol %	UOP-539		
Isopentane	0.05	Mol %	ASTM D-1945		
n-Pentane	0.02	Mol %	ASTM D-1945		
Benzene		Mol %	GPA-2286		
Hexanes Plus	0.05	Mol %	ASTM D-1945		
Total	100.00	Mol %			
Molar Mass Ratio	0.69810		ASTM D-3588		
Gross Heating Value (Dry)	1225.4	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	20.2	g/mol	ASTM D-3588		
Carbon Content	76.98	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-004 **Sample ID D905-1** **Date Sampled 6/14/11 2:12:00**
West Area 2 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	2	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-004 **Sample ID D905-1** **Date Sampled 6/14/11 2:12:00**

West Area 2 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	46.76	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.06	Mol %	ASTM D-1946		
Nitrogen	1.96	Mol %	ASTM D-1946		
Carbon Monoxide	0.11	Mol %	ASTM D-1946		
Carbon Dioxide	0.10	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	17.33	Mol %	ASTM D-1946		
Ethylene	1.00	Mol %	ASTM D-1946		
Ethane	13.52	Mol %	ASTM D-1946		
Propylene	0.12	Mol %	UOP-539		
Propane	10.09	Mol %	ASTM D-1945		
Isobutane	3.02	Mol %	ASTM D-1945		
Isobutylene	0.02	Mol %	UOP-539		
1-Butene	0.09	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.54	Mol %	ASTM D-1945		
trans-2-Butene	0.65	Mol %	UOP-539		
cis-2-Butene	0.08	Mol %	UOP-539		
Isopentane	0.06	Mol %	ASTM D-1945		
n-Pentane	0.03	Mol %	ASTM D-1945		
Benzene	0.03	Mol %	GPA 2286		
Hexanes Plus	0.46	Mol %	ASTM D-1945		
Total	100.00	Mol %			
Molar Mass Ratio	0.64099		ASTM D-3588		
Gross Heating Value (Dry)	1137.9	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	18.6	g/mol	ASTM D-3588		
Carbon Content	73.90	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-005 **Sample ID D905-2** **Date Sampled 6/14/11 4:10:00**
West Area 2 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	2	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-005 **Sample ID D905-2** **Date Sampled 6/14/11 4:10:00**

West Area 2 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	46.47	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	1.10	Mol %	ASTM D-1946		
Carbon Monoxide	0.12	Mol %	ASTM D-1946		
Carbon Dioxide	0.10	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	17.91	Mol %	ASTM D-1946		
Ethylene	1.97	Mol %	ASTM D-1946		
Ethane	13.02	Mol %	ASTM D-1946		
Propylene	0.38	Mol %	UOP-539		
Propane	8.80	Mol %	ASTM D-1945		
Isobutane	2.69	Mol %	ASTM D-1945		
Isobutylene	0.01	Mol %	UOP-539		
1-Butene	0.08	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.37	Mol %	ASTM D-1945		
trans-2-Butene	0.55	Mol %	UOP-539		
cis-2-Butene	0.07	Mol %	UOP-539		
Isopentane	1.22	Mol %	ASTM D-1945		
n-Pentane	0.72	Mol %	ASTM D-1945		
Hexanes Plus	0.40	Mol %	ASTM D-1945		
Bezene	0.03	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.65531		ASTM D-3588		
Gross Heating Value (Dry)	1173.9	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	19.0	g/mol	ASTM D-3588		
Carbon Content	75.32	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-006 **Sample ID D905-3** **Date Sampled 6/15/11 9:25:00**
West Area 2 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	4	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-006 **Sample ID D905-3** **Date Sampled 6/15/11 9:25:00**

West Area 2 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	38.08	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.01	Mol %	ASTM D-1946		
Nitrogen	0.57	Mol %	ASTM D-1946		
Carbon Monoxide	0.13	Mol %	ASTM D-1946		
Carbon Dioxide	0.02	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	17.94	Mol %	ASTM D-1946		
Ethylene	0.04	Mol %	ASTM D-1946		
Ethane	14.66	Mol %	ASTM D-1946		
Propylene	0.13	Mol %	UOP-539		
Propane	11.96	Mol %	ASTM D-1945		
Isobutane	4.50	Mol %	ASTM D-1945		
Isobutylene	0.02	Mol %	UOP-539		
1-Butene	0.01	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	7.89	Mol %	ASTM D-1945		
trans-2-Butene	0.16	Mol %	UOP-539		
cis-2-Butene	0.59	Mol %	UOP-539		
Isopentane	1.70	Mol %	ASTM D-1945		
n-Pentane	1.07	Mol %	ASTM D-1945		
Hexanes Plus	0.52	Mol %	ASTM D-1945		
Benzene	0.04	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.81890		ASTM D-3588		
Gross Heating Value (Dry)	1434.0	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	23.7	g/mol	ASTM D-3588		
Carbon Content	77.80	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-007 **Sample ID D1110-1** **Date Sampled 6/14/11 2:19:00**

West Area 1 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-007 **Sample ID D1110-1** **Date Sampled 6/14/11 2:19:00**
West Area 1 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	48.57	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.03	Mol %	ASTM D-1946		
Nitrogen	1.39	Mol %	ASTM D-1946		
Carbon Monoxide	0.09	Mol %	ASTM D-1946		
Carbon Dioxide	0.11	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	15.31	Mol %	ASTM D-1946		
Ethylene	0.25	Mol %	ASTM D-1946		
Ethane	12.62	Mol %	ASTM D-1946		
Propylene	0.06	Mol %	UOP-539		
Propane	9.86	Mol %	ASTM D-1945		
Isobutane	3.06	Mol %	ASTM D-1945		
Isobutylene	0.04	Mol %	UOP-539		
1-Butene	0.06	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.86	Mol %	ASTM D-1945		
trans-2-Butene	0.49	Mol %	UOP-539		
cis-2-Butene	0.05	Mol %	UOP-539		
Isopentane	2.05	Mol %	ASTM D-1945		
n-Pentane	0.75	Mol %	ASTM D-1945		
Hexanes Plus	0.35	Mol %	ASTM D-1945		
Benzene	0.03	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.67156		ASTM D-3588		
Gross Heating Value (Dry)	1196.7	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	19.5	g/mol	ASTM D-3588		
Carbon Content	75.04	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-008 **Sample ID D1110-2** **Date Sampled 6/14/11 3:55:00**
West Area 1 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-008 **Sample ID D1110-2** **Date Sampled 6/14/11 3:55:00**
West Area 1 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	50.80	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.45	Mol %	ASTM D-1946		
Carbon Monoxide	0.09	Mol %	ASTM D-1946		
Carbon Dioxide	0.04	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	15.37	Mol %	ASTM D-1946		
Ethylene	0.56	Mol %	ASTM D-1946		
Ethane	11.91	Mol %	ASTM D-1946		
Propylene	0.31	Mol %	UOP-539		
Propane	8.90	Mol %	ASTM D-1945		
Isobutane	2.83	Mol %	ASTM D-1945		
Isobutylene	0.04	Mol %	UOP-539		
1-Butene	0.07	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.74	Mol %	ASTM D-1945		
trans-2-Butene	0.53	Mol %	UOP-539		
cis-2-Butene	0.05	Mol %	UOP-539		
Isopentane	2.05	Mol %	ASTM D-1945		
n-Pentane	0.77	Mol %	ASTM D-1945		
Hexanes Plus	0.47	Mol %	ASTM D-1945		
Benzene	0.03	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.64608		ASTM D-3588		
Gross Heating Value (Dry)	1175.6	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	18.7	g/mol	ASTM D-3588		
Carbon Content	75.90	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-008 **Sample ID D1110-2** **Date Sampled 6/14/11 3:55:00**
West Area 1 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Natural Gas Analysis					
Oxygen		Mol %	GP2261ASTM1945		
Nitrogen		Mol %			
Carbon Dioxide		Mol %			
Methane		Mol %			
Ethane		Mol %			
Propane		Mol %			
Isobutane		Mol %			
n-Butane		Mol %			
Isopentane		Mol %			
n-Pentane		Mol %			
Hexanes Plus		Mol %			
Total		Mol %			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-009 **Sample ID D1110-3** **Date Sampled 6/15/11 9:20:00**
West Area 1 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	6/27/11	JB
Carbonyl Sulfide	2	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-009 **Sample ID D1110-3** **Date Sampled 6/15/11 9:20:00**
West Area 1 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	39.44	Mol %	ASTM D-1946	6/28/11	KTN
Oxygen	0.01	Mol %	ASTM D-1946		
Nitrogen	0.32	Mol %	ASTM D-1946		
Carbon Monoxide	0.09	Mol %	ASTM D-1946		
Carbon Dioxide	0.06	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	15.47	Mol %	ASTM D-1946		
Ethylene	0.03	Mol %	ASTM D-1946		
Ethane	12.74	Mol %	ASTM D-1946		
Propylene	0.10	Mol %	UOP-539		
Propane	10.55	Mol %	ASTM D-1945		
Isobutane	6.13	Mol %	ASTM D-1945		
Isobutylene	0.01	Mol %	UOP-539		
1-Butene	0.10	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	11.98	Mol %	ASTM D-1945		
cis-2-Butene	0.59	Mol %	UOP-539		
Isopentane	0.09	Mol %	ASTM D-1945		
n-Pentane	1.22	Mol %	ASTM D-1945		
Hexanes Plus	0.74	Mol %	ASTM D-1945		
Benzene	0.02	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.85080		ASTM D-3588		
Gross Heating Value (Dry)	1487.7	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	24.6	g/mol	ASTM D-3588		
Carbon Content	78.30	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-010 **Sample ID D2112-1** **Date Sampled 6/14/11 3:30:00**
West Area 2 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/6/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-010 **Sample ID D2112-1** **Date Sampled 6/14/11 3:30:00**

West Area 2 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	48.19	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.33	Mol %	ASTM D-1946		
Nitrogen	1.62	Mol %	ASTM D-1946		
Carbon Monoxide	0.10	Mol %	ASTM D-1946		
Carbon Dioxide	0.04	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	15.91	Mol %	ASTM D-1946		
Ethylene	0.07	Mol %	ASTM D-1946		
Ethane	12.60	Mol %	ASTM D-1946		
Propylene	0.06	Mol %	UOP-539		
Propane	10.02	Mol %	ASTM D-1945		
Isobutane	2.98	Mol %	ASTM D-1945		
Isobutylene	0.01	Mol %	UOP-539		
1-Butene	0.07	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.76	Mol %	ASTM D-1945		
trans-2-Butene	0.57	Mol %	UOP-539		
cis-2-Butene	0.06	Mol %	UOP-539		
Isopentane	1.36	Mol %	ASTM D-1945		
n-Pentane	0.83	Mol %	ASTM D-1945		
Hexanes Plus	0.42	Mol %	ASTM D-1945		
Benzene	0.03	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.66445		ASTM D-3588		
Gross Heating Value (Dry)	1177.8	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	19.2	g/mol	ASTM D-3588		
Carbon Content	74.32	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-011 **Sample ID D2112-2** **Date Sampled 6/14/11 4:30:00**

West Area 2 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/6/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-011 **Sample ID D2112-2** **Date Sampled 6/14/11 4:30:00**
West Area 2 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	48.40	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.06	Mol %	ASTM D-1946		
Nitrogen	0.54	Mol %	ASTM D-1946		
Carbon Monoxide	0.10	Mol %	ASTM D-1946		
Carbon Dioxide	0.03	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	16.16	Mol %	ASTM D-1946		
Ethylene	0.18	Mol %	ASTM D-1946		
Ethane	12.87	Mol %	ASTM D-1946		
Propylene	0.08	Mol %	UOP-539		
Propane	10.12	Mol %	ASTM D-1945		
Isobutane	3.03	Mol %	ASTM D-1945		
Isobutylene	0.01	Mol %	UOP-539		
1-Butene	0.08	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.87	Mol %	ASTM D-1945		
trans-2-Butene	0.57	Mol %	UOP-539		
cis-2-Butene	0.06	Mol %	UOP-539		
Isopentane	1.47	Mol %	ASTM D-1945		
n-Pentane	0.90	Mol %	ASTM D-1945		
Hexanes Plus	0.47	Mol %	ASTM D-1945		
Benzene	0.04	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.66756		ASTM D-3588		
Gross Heating Value (Dry)	1205.8	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	19.3	g/mol	ASTM D-3588		
Carbon Content	76.01	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-012 **Sample ID D2112-3** **Date Sampled 6/15/11 8:35:00**
West Area 2 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/6/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-012 **Sample ID D2112-3** **Date Sampled 6/15/11 8:35:00**
West Area 2 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	39.78	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.06	Mol %	ASTM D-1946		
Nitrogen	0.37	Mol %	ASTM D-1946		
Carbon Monoxide	0.15	Mol %	ASTM D-1946		
Carbon Dioxide	0.01	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	17.37	Mol %	ASTM D-1946		
Ethylene	0.02	Mol %	ASTM D-1946		
Ethane	14.91	Mol %	ASTM D-1946		
Propylene	0.12	Mol %	UOP-539		
Propane	12.19	Mol %	ASTM D-1945		
Isobutane	3.84	Mol %	ASTM D-1945		
Isobutylene	0.02	Mol %	UOP-539		
1-Butene	0.12	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	6.55	Mol %	ASTM D-1945		
trans-2-Butene	0.74	Mol %	UOP-539		
cis-2-Butene	0.12	Mol %	UOP-539		
Isopentane	1.82	Mol %	ASTM D-1945		
n-Pentane	1.17	Mol %	ASTM D-1945		
Hexanes Plus	0.64	Mol %	ASTM D-1945		
Benzene	0.06	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.79476		ASTM D-3588		
Gross Heating Value (Dry)	1400.0	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	23.0	g/mol	ASTM D-3588		
Carbon Content	77.73	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-013 **Sample ID D7939-1** **Date Sampled 6/14/11 2:00:00**
FCCU Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	6	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	5	ppm v / v			
Methyl Mercaptan	8	ppm v / v			
Ethyl Mercaptan	8	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	4	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-013 **Sample ID D7939-1** **Date Sampled 6/14/11 2:00:00**
FCCU Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	4.79	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.74	Mol %	ASTM D-1946		
Carbon Monoxide	0.03	Mol %	ASTM D-1946		
Carbon Dioxide	0.10	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	4.52	Mol %	ASTM D-1946		
Ethylene	1.92	Mol %	ASTM D-1946		
Ethane	2.25	Mol %	ASTM D-1946		
Propylene	50.90	Mol %	UOP-539		
Propane	14.64	Mol %	ASTM D-1945		
Isobutane	5.88	Mol %	ASTM D-1945		
Isobutylene	3.19	Mol %	UOP-539		
1-Butene	1.93	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	3.98	Mol %	ASTM D-1945		
trans-2-Butene	1.74	Mol %	UOP-539		
cis-2-Butene	3.00	Mol %	UOP-539		
Isopentane	0.25	Mol %	ASTM D-1945		
n-Pentane	0.01	Mol %	ASTM D-1945		
Hexanes Plus	0.11	Mol %	ASTM D-1945		
Benzene	<0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	1.44079		ASTM D-3588		
Gross Heating Value (Dry)	2327.3	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	41.7	g/mol	ASTM D-3588		
Carbon Content	83.70	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-014 **Sample ID D7939-2** **Date Sampled 6/14/11 3:00:00**
FCCU Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	7	ppm v / v			
Ethyl Mercaptan	2	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-014 **Sample ID D7939-2** **Date Sampled 6/14/11 3:00:00**
FCCU Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	5.83	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.02	Mol %	ASTM D-1946		
Nitrogen	0.88	Mol %	ASTM D-1946		
Carbon Monoxide	0.05	Mol %	ASTM D-1946		
Carbon Dioxide	0.12	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	5.14	Mol %	ASTM D-1946		
Ethylene	2.28	Mol %	ASTM D-1946		
Ethane	2.63	Mol %	ASTM D-1946		
Propylene	49.32	Mol %	UOP-539		
Propane	14.05	Mol %	ASTM D-1945		
Isobutane	5.83	Mol %	ASTM D-1945		
Isobutylene	3.12	Mol %	UOP-539		
1-Butene	1.85	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	3.96	Mol %	ASTM D-1945		
trans-2-Butene	1.53	Mol %	UOP-539		
cis-2-Butene	2.94	Mol %	UOP-539		
Isopentane	0.28	Mol %	ASTM D-1945		
n-Pentane	0.01	Mol %	ASTM D-1945		
Hexanes Plus	0.16	Mol %	ASTM D-1945		
Benzene	<0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	1.41509		ASTM D-3588		
Gross Heating Value (Dry)	2286.3	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	41.0	g/mol	ASTM D-3588		
Carbon Content	83.50	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-015 **Sample ID D7939-3** **Date Sampled 6/14/11 4:00:00**
FCCU Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	1	ppm v / v			
Methyl Mercaptan	2	ppm v / v			
Ethyl Mercaptan	1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	2	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-015 **Sample ID D7939-3** **Date Sampled 6/14/11 4:00:00**
FCCU Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	5.81	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.03	Mol %	ASTM D-1946		
Nitrogen	0.77	Mol %	ASTM D-1946		
Carbon Monoxide	0.04	Mol %	ASTM D-1946		
Carbon Dioxide	0.10	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	4.36	Mol %	ASTM D-1946		
Ethylene	1.81	Mol %	ASTM D-1946		
Ethane	2.25	Mol %	ASTM D-1946		
Propylene	51.04	Mol %	UOP-539		
Propane	14.71	Mol %	ASTM D-1945		
Isobutane	5.70	Mol %	ASTM D-1945		
Isobutylene	3.04	Mol %	UOP-539		
1-Butene	1.82	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	3.85	Mol %	ASTM D-1945		
trans-2-Butene	1.38	Mol %	UOP-539		
cis-2-Butene	2.91	Mol %	UOP-539		
Isopentane	0.24	Mol %	ASTM D-1945		
n-Pentane	0.01	Mol %	ASTM D-1945		
Hexanes Plus	0.13	Mol %	ASTM D-1945		
Benzene	<0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	1.42356		ASTM D-3588		
Gross Heating Value (Dry)	2301.0	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	41.2	g/mol	ASTM D-3588		
Carbon Content	83.62	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-016 **Sample ID D3307-1** **Date Sampled 6/14/11 2:15:00**
East Area 3 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	5	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	4	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-016 **Sample ID D3307-1** **Date Sampled 6/14/11 2:15:00**
East Area 3 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	24.45	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.95	Mol %	ASTM D-1946		
Nitrogen	5.21	Mol %	ASTM D-1946		
Carbon Monoxide	0.31	Mol %	ASTM D-1946		
Carbon Dioxide	0.26	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	27.22	Mol %	ASTM D-1946		
Ethylene	5.19	Mol %	ASTM D-1946		
Ethane	15.20	Mol %	ASTM D-1946		
Propylene	0.90	Mol %	UOP-539		
Propane	8.74	Mol %	ASTM D-1945		
Isobutane	3.08	Mol %	ASTM D-1945		
Isobutylene	0.02	Mol %	UOP-539		
1-Butene	0.10	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	4.95	Mol %	ASTM D-1945		
trans-2-Butene	0.35	Mol %	UOP-539		
cis-2-Butene	0.08	Mol %	UOP-539		
Isopentane	1.66	Mol %	ASTM D-1945		
n-Pentane	0.81	Mol %	ASTM D-1945		
Hexanes Plus	0.52	Mol %	ASTM D-1945		
Benzene	0.02	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.83969		ASTM D-3588		
Gross Heating Value (Dry)	1351.9	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	24.3	g/mol	ASTM D-3588		
Carbon Content	72.85	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-017 **Sample ID D3307-2** **Date Sampled 6/14/11 3:15:00**
East Area 3 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	6	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	2	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-017 **Sample ID D3307-2**
East Area 3 Fuel Gas Run 2
Date Sampled 6/14/11 3:15:00

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	20.26	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	4.25	Mol %	ASTM D-1946		
Nitrogen	16.81	Mol %	ASTM D-1946		
Carbon Monoxide	0.24	Mol %	ASTM D-1946		
Carbon Dioxide	0.20	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	22.01	Mol %	ASTM D-1946		
Ethylene	3.95	Mol %	ASTM D-1946		
Ethane	12.19	Mol %	ASTM D-1946		
Propylene	0.69	Mol %	UOP-539		
Propane	7.09	Mol %	ASTM D-1945		
Isobutane	2.64	Mol %	ASTM D-1945		
Isobutylene	<0.01	Mol %	UOP-539		
1-Butene	0.25	Mol %	UOP-539		
1,3-Butadiene	<0.01	Mol %	UOP-539		
n-Butane	5.53	Mol %	ASTM D-1945		
trans-2-Butene	1.00	Mol %	UOP-539		
cis-2-Butene	0.32	Mol %	UOP-539		
Isopentane	1.48	Mol %	ASTM D-1945		
n-Pentane	0.67	Mol %	ASTM D-1945		
Hexanes Plus	0.42	Mol %	ASTM D-1945		
Benzene	0.02	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.89497		ASTM D-3588		
Gross Heating Value (Dry)	1184.0	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	25.9	g/mol	ASTM D-3588		
Carbon Content	60.47	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-018 **Sample ID D3307-3** **Date Sampled 6/14/11 4:15:00**
East Area 3 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	22	ppm v / v			
Methyl Mercaptan	6	ppm v / v			
Ethyl Mercaptan	1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-018 **Sample ID D3307-3** **Date Sampled 6/14/11 4:15:00**
East Area 3 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	25.23	Mol %	ASTM D-1946	6/29/11	KTN
Oxygen	0.05	Mol %	ASTM D-1946		
Nitrogen	1.95	Mol %	ASTM D-1946		
Carbon Monoxide	0.33	Mol %	ASTM D-1946		
Carbon Dioxide	0.20	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	28.67	Mol %	ASTM D-1946		
Ethylene	4.24	Mol %	ASTM D-1946		
Ethane	14.83	Mol %	ASTM D-1946		
Propylene	0.64	Mol %	UOP-539		
Propane	8.04	Mol %	ASTM D-1945		
Isobutane	2.76	Mol %	ASTM D-1945		
Isobutylene	0.10	Mol %	UOP-539		
1-Butene	0.34	Mol %	UOP-539		
1,3-Butadiene	0.01	Mol %	UOP-539		
n-Butane	7.89	Mol %	ASTM D-1945		
trans-2-Butene	1.70	Mol %	UOP-539		
cis-2-Butene	0.46	Mol %	UOP-539		
Isopentane	1.55	Mol %	ASTM D-1945		
n-Pentane	0.64	Mol %	ASTM D-1945		
Hexanes Plus	0.37	Mol %	ASTM D-1945		
Benzene	0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.85934		ASTM D-3588		
Gross Heating Value (Dry)	1453.6	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	24.9	g/mol	ASTM D-3588		
Carbon Content	77.12	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-019 **Sample ID D3354-1** **Date Sampled 6/14/11 2:10:00**

East Area 3 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	5	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	3	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-019 **Sample ID D3354-1** **Date Sampled 6/14/11 2:10:00**

East Area 3 Fuel Gas Run 1

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	22.48	Mol %	ASTM D-1946	6/30/11	KTN
Oxygen	0.30	Mol %	ASTM D-1946		
Nitrogen	2.73	Mol %	ASTM D-1946		
Carbon Monoxide	0.28	Mol %	ASTM D-1946		
Carbon Dioxide	0.22	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	25.15	Mol %	ASTM D-1946		
Ethylene	4.78	Mol %	ASTM D-1946		
Ethane	13.78	Mol %	ASTM D-1946		
Propylene	0.81	Mol %	UOP-539		
Propane	7.88	Mol %	ASTM D-1945		
Isobutane	3.40	Mol %	ASTM D-1945		
Isobutylene	0.18	Mol %	UOP-539		
1-Butene	0.75	Mol %	UOP-539		
1,3-Butadiene	0.01	Mol %	UOP-539		
n-Butane	10.58	Mol %	ASTM D-1945		
trans-2-Butene	2.46	Mol %	UOP-539		
cis-2-Butene	1.08	Mol %	UOP-539		
Isopentane	1.89	Mol %	ASTM D-1945		
n-Pentane	0.71	Mol %	ASTM D-1945		
Hexanes Plus	0.53	Mol %	ASTM D-1945		
Benzene	0.02	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.96076		ASTM D-3588		
Gross Heating Value (Dry)	1589.5	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	27.8	g/mol	ASTM D-3588		
Carbon Content	77.34	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-020 **Sample ID D3354-2** **Date Sampled 6/14/11 3:10:00**
East Area 3 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	4	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-020 **Sample ID D3354-2** **Date Sampled 6/14/11 3:10:00**
East Area 3 Fuel Gas Run 2

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	22.49	Mol %	ASTM D-1946	6/30/11	KTN
Oxygen	1.04	Mol %	ASTM D-1946		
Nitrogen	5.27	Mol %	ASTM D-1946		
Carbon Monoxide	0.27	Mol %	ASTM D-1946		
Carbon Dioxide	0.21	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	24.56	Mol %	ASTM D-1946		
Ethylene	4.63	Mol %	ASTM D-1946		
Ethane	13.47	Mol %	ASTM D-1946		
Propylene	0.79	Mol %	UOP-539		
Propane	7.66	Mol %	ASTM D-1945		
Isobutane	3.20	Mol %	ASTM D-1945		
Isobutylene	0.18	Mol %	UOP-539		
1-Butene	0.66	Mol %	UOP-539		
1,3-Butadiene	0.01	Mol %	UOP-539		
n-Butane	9.52	Mol %	ASTM D-1945		
trans-2-Butene	2.24	Mol %	UOP-539		
cis-2-Butene	0.90	Mol %	UOP-539		
Isopentane	1.77	Mol %	ASTM D-1945		
n-Pentane	0.66	Mol %	ASTM D-1945		
Hexanes Plus	0.47	Mol %	ASTM D-1945		
Benzene	0.02	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.94077		ASTM D-3588		
Gross Heating Value (Dry)	1503.6	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	27.2	g/mol	ASTM D-3588		
Carbon Content	74.36	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-021 **Sample ID D3354-3** **Date Sampled 6/14/11 4:10:00**
East Area 3 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/7/11	JB
Carbonyl Sulfide	7	ppm v / v			
Methyl Mercaptan	2	ppm v / v			
Ethyl Mercaptan	1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-021 **Sample ID D3354-3** **Date Sampled 6/14/11 4:10:00**
East Area 3 Fuel Gas Run 3

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			
Reformed Gas Analysis					
Hydrogen	23.71	Mol %	ASTM D-1946	6/30/11	KTN
Oxygen	0.04	Mol %	ASTM D-1946		
Nitrogen	1.54	Mol %	ASTM D-1946		
Carbon Monoxide	0.31	Mol %	ASTM D-1946		
Carbon Dioxide	0.20	Mol %	ASTM D-1946		
Hydrogen Sulfide	<0.01	Mol %	ASTM D-1946		
Methane	26.87	Mol %	ASTM D-1946		
Ethylene	3.90	Mol %	ASTM D-1946		
Ethane	14.16	Mol %	ASTM D-1946		
Propylene	0.59	Mol %	UOP-539		
Propane	7.70	Mol %	ASTM D-1945		
Isobutane	2.81	Mol %	ASTM D-1945		
Isobutylene	0.18	Mol %	UOP-539		
1-Butene	0.70	Mol %	UOP-539		
1,3-Butadiene	0.01	Mol %	UOP-539		
n-Butane	10.58	Mol %	ASTM D-1945		
trans-2-Butene	2.89	Mol %	UOP-539		
cis-2-Butene	1.12	Mol %	UOP-539		
Isopentane	1.72	Mol %	ASTM D-1945		
n-Pentane	0.56	Mol %	ASTM D-1945		
Hexanes Plus	0.41	Mol %	ASTM D-1945		
Benzene	0.01	Mol %	GPA 2286		
Total	100.00	Mol %			
Molar Mass Ratio	0.93075		ASTM D-3588		
Gross Heating Value (Dry)	1568.7	BTU/CF (Ideal)	ASTM D-3588		
Pressure Base	14.696	psia			
Average Molecular Weight	27.0	g/mol	ASTM D-3588		
Carbon Content	78.27	WT %	ASTM D-1945		

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-022 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	20	ppm v / v	ASTM D-5504	7/24/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	20	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	22	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-022 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 1 - 9.

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-023 **Sample ID RECOVERY STD AIRGAS CYL # CC356619** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	7/24/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	21	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-023 **Sample ID RECOVERY STD AIRGAS CYL # CC356619** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 1 - 9.

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-024 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	21	ppm v / v	ASTM D-5504	8/2/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	23	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	24	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-024 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 10 - 12.

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-025 **Sample ID RECOVERY STD** **Date Sampled 7/19/11**
AIRGAS CYL # CC356619

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	8/2/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	18	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-025 **Sample ID RECOVERY STD AIRGAS CYL # CC356619** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 10 - 12.

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-026 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	20	ppm v / v	ASTM D-5504	8/3/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	20	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	20	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	<1	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-026 **Sample ID RECOVERY STD AIRGAS CYL # XC032082B** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 13 - 21.

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-027 **Sample ID RECOVERY STD AIRGAS CYL # CC356619** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Sulfur Speciation					
Hydrogen Sulfide	<1	ppm v / v	ASTM D-5504	8/3/11	JB
Carbonyl Sulfide	<1	ppm v / v			
Methyl Mercaptan	<1	ppm v / v			
Ethyl Mercaptan	<1	ppm v / v			
Dimethyl Sulfide	<1	ppm v / v			
Carbon Disulfide	<1	ppm v / v			
Isopropyl Mercaptan	<1	ppm v / v			
tert-Butyl Mercaptan	<1	ppm v / v			
n-Propyl Mercaptan	<1	ppm v / v			
Ethyl Methyl Sulfide	<1	ppm v / v			
Thiophene	<1	ppm v / v			
sec-Butyl Mercaptan	<1	ppm v / v			
Methyl Isopropyl Sulfide	<1	ppm v / v			
Isobutyl Mercaptan	<1	ppm v / v			
Ethyl Sulfide	<1	ppm v / v			
n-Butyl Mercaptan	<1	ppm v / v			
Dimethyl Disulfide	19	ppm v / v			
2-Methyl Thiophene	<1	ppm v / v			
3-Methyl Thiophene	<1	ppm v / v			
tetra-Hydro Thiophene	<1	ppm v / v			
Ethyl Methyl Disulfide	<1	ppm v / v			
2-Ethyl Thiophene	<1	ppm v / v			
2,5-Dimethyl Thiophene	<1	ppm v / v			
3-Ethyl Thiophene	<1	ppm v / v			
2,4- & 2,3-Dimethylthiophene	<1	ppm v / v			
3,4-Dimethylthiophene	<1	ppm v / v			
Diethyl Disulfide	<1	ppm v / v			
Methyl Ethyl Thiophenes	<1	ppm v / v			
Trimethyl Thiophenes	<1	ppm v / v			
Tetramethyl Thiophenes	<1	ppm v / v			
Benzothiophene	<1	ppm v / v			

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

CORE LABORATORIES

201 Deerwood Glen Dr.
Deer Park, TX 77536
281-478-1300

Entec Services Inc.
Troy Burrows
30 Monroe Drive
Pelham, AL 35124

Report Number : 57801 111928
Date Reported: 8/8/11
Date Received: 6/24/11

Analytical Report

Sample No. 111928-027 **Sample ID RECOVERY STD AIRGAS CYL # CC356619** **Date Sampled 7/19/11**

Test	Result	Units	Method	Date	Analyst
Unid Volatile Sulfur Compounds	<1	ppm v / v			

Recovery standard for Core sample numbers : 13 - 21.

Approved By: M. Jean Waits

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgement of Core Laboratories. Core Laboratories, however, makes no warrant or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operation or profitableness of any oil, gas, or other mineral property, well or sand in conjunction with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the approval of Core Laboratories.

APPENDIX D

QA / QC DOCUMENTS AND CHECKLISTS

ENTEC SERVICES, INC

Method 26A HCl/HF/Cl_2 - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix

SOURCE TESTED: FCC MODIFICATIONS TO METHOD: none

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check ___	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass, or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? Y or N Noted Visual Defects? none	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece stack temp < 410) w/ **Teflon Probe Union** Filter Holder must be Teflon	✓	
7 Was **Filter Outlet Temperature** maintained greater than 248 ° F? If not, explain ___	✓	
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading ___% Ambient CO2 Reading___%	—	—
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	✓	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain ___ Were they leak-checked? Y or N	—	—
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? Y or N - Noted Visual Defects? none	✓	
12 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed? Same as Method 5	✓	
13 Was **PM combined with HCl/HF Determination**? If not Filter does not have to be weighed If PM Determination Teflon Filter Support must be used w/ Teflon Filter		✓
14 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
15 Was all **Samples Stored** in Poly Jars w/ Teflon lined lids?	✓	
16 Was the Following **Impinger System** Used? **Imp. 1** - 50 ml 0.1N H_2SO_4, **Imp. 2 & 3** - 0.1N H_2SO_4, **Imp. 4 & 5** 3.0N NaOH, **Imp. 6** Silicia Gel	✓	
17 Was all **Reagent Field Blanks** collected as required? (**DI H_2O & Filter** also required) **DI H_2O**_____, **Acetone**_____, **0.1N H_2SO_4**_____, **NaOH**_____, Teflon FIlter_____	✓	
18 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection_____, Gloves_____, Protective Clothing_____	✓	

Signature (Field Project Manager or Test Team Leader): K. Rey Date: 6-15-11

ENTEC SERVICES, INC

Method 30B Speciated Mercury - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix, USVI.

SOURCE TESTED: FCCU Stack MODIFICATIONS TO METHOD: 2 hr Runs

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	X	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check _____	X	
3 Was all **Thermocouple Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer? (Probe, Heated Line, Chiller, DGM A & B)	X	
4 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading_____%	N/A	
5 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero		
6 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	N/A	
7 Was **Probe & Heated Line Temperatures** maintained at 230 +/- 25° F? If not, explain _____	X	
8 Was **Sample Rate** maintained at 0.5 lpm for both sampling trains during the entire test?	X	
9 Was all **Field Data** recorded (temperatures, pressures, volumes, dgm reading) every 5 minutes?	X	
10 Was Both A & B Mercury **Sorbent Trap ID's** recorded on Field Data Sheets?	X	
11 Was **Spiked Sorbent Tube** Information recorded on Field Data Sheets?	X	
12 Was **Preleak check** preformed at ~15" Hg and less then 4% of target sampling rate?	X	
13 Was **Postleak check** preformed at ~15" Hg and less then 4% of sampling rate at the highest vacuum achieved during test runs?	X	
14 Was all **Sorbent traps** capped wiped free of dust and PM and Stored in appropriate Containers?	X	
15 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection ✓, Gloves ✓, Protective Clothing ✓	X	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6-15-11

ENTEC SERVICES, INC

Method OTM029 HCN - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix, VI

SOURCE TESTED: FCC Stack MODIFICATIONS TO METHOD: 1hr test

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check a/c	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass, or Quartz Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? (Y) or N Noted Visual Defects? No	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece stack temp < 410) w/ **Teflon Probe Union** Filter Holder must be Teflon if PM is being determined	✓	
7 Was **Filter Outlet Temperature** maintained greater than 248 ° F? If not, explain	✓	
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading CEMS % Ambient CO2 Reading CEMS %	N/A	
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	CEMS	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain Plant CEMS Were they leak-checked? Y or N		✓
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? No	✓	
12 Was **All Glassware Verified to be Cleaned** - Washed, Rinsed w Tap Water & DI Water? Same as Method 5	✓	
13 Was **PM combined with HCN Determination?** If not Filter does not have to be weighed If PM Determination Teflon Filter Support must be used w/ Quartz Filter		✓
14 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
15 Was all **Samples Stored** in Glass Jars w/ Teflon lined lids?	✓	
16 Was the Following **Impinger System** Used? (Impingers 4 not required) **Imp. 1** - 100 ml 6.0N NaOH, Imp. 2 - 100 ml 6.0N NaOH, Imp. 3 - 100 ml 6.0N NaOH, **4** &Optional, **Imp. 5** Silicia Gel	✓	
17 Was **pH Verified** in last impingers prior to sample recovery and indicated greater than 12 Adjust pH level during sample recover by adding 10ml of 6N NaOH until pH greater than 12	✓	
18 Was CO2 greater than 5%? If so additional K factor adjustments must be made.	✓ K factor from Beaver.	
19 Was all **Reagent Field Blanks** collected as required? (**DI H2O & Filter** also required) **Acetone** ✓, **0.1N NaOH:** ✓, **6.0N NaOH** ✓, **Quartz Filter** ✓	✓	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6/15/11

ENTEC SERVICES, INC

Method 0010 Semi Vols - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St Croix, USVI

SOURCE TESTED: FCCU Stack MODIFICATIONS TO METHOD: 3 hr test runs

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	X	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check _____	X	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	X	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	X	
5 Was **Glass or Stainless Steel Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? Y or N Noted Visual Defects? None	X	
6 Was **Glass or Quartz Probe Liner** used (single piece optional) w/ **Teflon Probe Union** All open connections must be sealed with Teflon Tape	X	
7 Was **Filter Outlet Temperature** maintained at 248 +/- 25° F? If not, explain Not done		X
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading_____%	N/A	
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	Plant Reqs	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	N/A	
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? Y or N - Noted Visual Defects? None	X	
12 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed?	X	
13 Was Filter stored in glass petri dish		
14 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	X	
15 Was all **Samples Stored** in Glass Jars w/ Teflon lined lids?	X	
16 Was filters stored in a glass petri dish?	X	
17 Was the Following **Impinger System** Used? **Duncan Impinger, Imp. 1** - Empty, **Imp. 2 & 3** - H2O / **Imp. 4** - Empty / **Imp. 5** Silicia Gel	X	
18 Was the Sorbent trap capped and stored on ice?	X	
19 Was all **Reagent Field Blanks** collected as required? (**DI H2O & Filter** also required) **Acetone**_____, **0.1N HNO3**_____, **5% HNO3/10%H2O2**_____, **KMnO4**_____, **8N HCl**_____	N/A	
20 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection_____, Gloves_____, Protective Clothing_____	X	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6-17-11

ENTEC SERVICES, INC
FIELD QA / QC CHECKLIST
Method 25A - Total Gaseous Hydrocarbons

CLIENT: Hovensa LOCATION: St. Croix USVI

SOURCE TESTED: FCCU TYPE CONTROL DEVICE: Scrubber

TEST METHODS USED: 25A MODIFICATIONS TO METHOD: None

	YES	NO
1 Was valid **Certificate of all Protocol 1 calibration gases** on site?	+	
2 Was Air used as the balance gas for **all Protocol 1 calibration gases** on site?	+	
3 Was the **High-level gas** equivalent to 80 to 90 % of span value ?	+	
4 Was the **Mid-level gas** equivalent to 45 and 55 % of the span value ?	+	
5 Was the **Low-level gas** equivalent to 25 and 35 % of the span value ?	+	
6 Was the **Zero-level gas** < 0.1 % of the span value ?	+	
7 Was the sample kept above the dew point by heating prior to the analyzer ?	+	
8 Was the **Analyzer Calibration Error** within +/-5 % of the bottle values ?	+	
9 Was the **System Response Time** Calculated during the initial sampling system bias check?	+	
What was the average System Response Time ? 30 Seconds		
10 Was the **Drift** within +/-3 % of the calibration span for the zero and upscale gases ?	+	
11 Was the sampling system **purged** > 2 times the system response time before each test run?	+	
12 Were all data points recorded in at least **1 minute averages**?	+	
13 Was the **average concentration** for each run < the calibration span ?	+	

Signature (Test Team Leader): _____ Date: 6-17-11

ENTEC SERVICES, INC

Method 0011 Aldehydes - FIELD QA / QC CHECKLIST

CLIENT: Hovensa **LOCATION:** St. Croix

SOURCE TESTED: FCC **MODIFICATIONS TO METHOD:** —

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	—	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check _____	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass, or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? (Y) or N Noted Visual Defects? None	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece stack temp < 410) w/ **Teflon Probe Union** Filter Holder must be Teflon	✓	
7 Was **Filter Outlet Temperature** maintained greater than 248 ° F? If not, explain _____	✓	
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading_____%	—	—
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	—	—
10 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	—	—
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? None	✓	
12 Was **DNPH used** within 5 days of being prepaired by laboratory? Once opened must be used within 48 hours.	✓	
13 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
14 Was all **Samples Stored** in Glass Amber Jars w/ Teflon lined lids?	✓	
15 Was the Following **Impinger System** Used? **Imp. 1** - 200 ml DNPH, **Imp. 2 & 3** - 100ml DNPH, **Imp. 4 Empty, Imp. 5** Silicia Gel	✓	
16 Was all **Reagent Field Blanks** collected as required? **DI H2O**_____, **Methylene Chloride** _____, **DNPH** _____,	✓	
17 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System✓, Eye Protection✓, Gloves✓, Protective Clothing✓	✓	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6-17-11

ENTEC SERVICES, INC

Method 23 Dioxins & Furans - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix

SOURCE TESTED: FCC MODIFICATIONS TO METHOD: —

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check Good	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? (Y) or N Noted Visual Defects? none	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece optional) w/ **Teflon Probe Union** All open connections must be sealed with Teflon Tape	✓	
7 Was **XAD-2 Outlet Temperature** maintained below 68 F? Verify submerged water pump is circulating water prior to starting testing?	✓	
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading_____%	—	—
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	—	—
10 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	—	—
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? none	✓	
12 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed? (Section 4.1.1.1 - All glassware cleaned per Manual Analytical Methods.... In Environmental Samples)	✓	
13 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
14 **Container 1:** Was filter holder sealed or removed using clean tweezers into a glass petri dish?	✓	
15 **Container 2 - Front Half:** Was prove, nozzle, and front half of filter brused or rinsed 3 times with **Acetone then Methylene Chloride** and storing sample in an amber glass wash bottle?	✓	
16 **Container 2 - Back Half:** Was back half rinsed 3 times with **Acetone** followed by soaking with **MeCl2** w/ three separate rinses? (Section 4.2.3)	✓	
17 **Container 3:** Was a Toulene rinse repeated 3 times and stored in an amber glass wash bottle?	✓	
18 Was all **Samples Stored** in Glass Jars w/ Teflon lined lids?	✓	
19 Was all **Reagent Field Blanks** were collected as required? (DI H2O & Filter also required) **Acetone:**_____, **MeCl:**_____, **Toluene:**_____, **Glass Filter:**_____,	✓	
20 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection_____, Gloves_____, Protective Clothing_____	✓	

Signature (Field Project Manager or Test Team Leader): K. Rog Date: 6-17-11

ENTEC SERVICES, INC

METHOD 5/202 TOTAL PARTICULATE - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix, VI

SOURCE TESTED: FCC Stack MODIFICATIONS TO METHOD: 2.5 hr test

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check ok	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass, or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? Y or N Noted Visual Defects?	N/A	
6 Was **Glass or Quartz Probe Liner** used (single piece stack temp < 410) w/ **Teflon Probe Union** Filter Holder must be Teflon	✓	
7 Was **Filter Outlet Temperature** maintained greater than 248 ° F? If not, explain I25 for 248°F		✓
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading CEMS % Ambient CO2 Reading CEMS %	N/A	
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	✓	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain Plant CEM Were they leak-checked? Y or N		✓
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? No	✓	
12 Was **All Glassware Verified to be Cleaned** and Baked as required?	✓	
13 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
14 Was **moisture collected** in first impinger? Was **Nitrogen Sample Purge** conducted?	✓	
15 Was **all Samples Stored** in Poly Jars w/ Teflon lined lids?		✓ Glass
17 Was all **Reagent Field Blanks** collected as required? **DI H2O** ✓, **Acetone** ✓, **Hexane** ✓, **Teflon Filter** ✓, **Other**	✓	
18 Was on site Sample Recovery Conducted with **All Required Safety Supplies?** Hood System ✓, Eye Protection ✓, Gloves ✓, Protective Clothing ✓	✓	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6/19/11

ENTEC SERVICES, INC

Method 29 METALS - FIELD QA / QC CHECKLIST

CLIENT: Hovensa LOCATION: St. Croix, VI

SOURCE TESTED: FCC Stack MODIFICATIONS TO METHOD: 2.5 hr Runs

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check ✓	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? Y or N Noted Visual Defects? No	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece optional) w/ **Teflon Probe Union** All open connections must be sealed with Teflon Tape	✓	
7 Was **Filter Outlet Temperature** maintained at 248 +/- 25° F? If not, explain	✓	
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading CEMS % Ambient CO2 Reading CEMS %	N/A	
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	CEMS	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain Plant CEMS Were they leak-checked? Y or N		✓
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? Y or N - Noted Visual Defects? No	✓	
12 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed? (Section 8.1.1 - Hot Soapy Water / Rinse / Soak in 10% HNO3 / Rinse DI Water & Acetone)	✓	
13 Was **PM combined with Metals Determination**? If not Filter does not have to be weighed If PM Determination Teflon Filter Support must be used w/ Glass Fiber Filters w/o Organic Binders		✓
14 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
15 Was all **Samples Stored** in Glass Jars w/ Teflon lined lids?	✓	
16 Was **Mercury (Hg) Required** with Metals Determination? Was following Impinger System Used?		✓
17 Was the Following **Impinger System** Used? (Impingers 4, 5 & 6 not required if Hg is not required) **Imp. 1** - Empty, **Imp. 2 & 3** - HNO3/H2O2 / **Imp. 4** - Empty / **Imp. 5 & 6** - KMnO4 / **Imp. 7** Silicia Gel	✓	
18 Was **KMnO4 Absorbing Solution** made fresh daily? 40g of KMnO4 into 10% H2SO4 bring to to volume - 1L, filter if needed.	✓	
19 Was all **Reagent Field Blanks** collected as required? (DI H2O & Filter also required) **Acetone** ✓, **0.1N HNO3** ✓, **5% HNO3/10%H2O2** ✓, **KMnO4** ✓, **8N HCl** ✓	✓	
20 Was on site Sample Recovery Conducted with **All Required Safety Supplies?** Hood System ✓, Eye Protection ✓, Gloves ✓, Protective Clothing ✓	✓	

Signature (Field Project Manager or Test Team Leader): [signature] Date: 6/17/11

ENTEC SERVICES, INC

Method 0061 Hexavalent Chromium - FIELD QA / QC CHECKLIST

CLIENT: Hovensa **LOCATION:** St. Croix

SOURCE TESTED: FCC **MODIFICATIONS TO METHOD:** —

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check Good	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass or teflon (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? (Y) or N Noted Visual Defects? none	✓	
6 Was **Glass, (teflon) or Quartz Probe Liner** used (single piece optional) w/ **Teflon Probe Union** All open connections must be sealed with Teflon Tape	✓	
7 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading _____%	—	—
8 Was **Method 3A Oxygen -** CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	✓	✓ KR
9 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	—	—
10 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? (Y) or N - Noted Visual Defects? none	✓	
11 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed? Clean all sampling and storage items by rinsing in hot tap water followed by hot soapy water. Follow those rinses with reagent water and rinse 3 times with reagent water. Follow the water rinse by soaking the items in a 10% Nitric Acid and solution for 4 hours then rinse with reagent water	✓	
12 Was the PH measured at the end of the sampling run from the first impinger What was the measured PH? Run 1_____ Run 2 _____ Run 3 _____ Special Note - if the PH of the solution in the first impinger SHALL be greater then 8.5 if it is not greater then 8.5, discard the run and do over.	✓	
13 Was the Post Run Nitrogen Purge Completed? N2 Post run purge - 10 lpm for 30 minutes. Purges SO2 from the sample train impingers and safeguards against the converswion of hexavalent chromium to the tivalent oxidation state.	✓	
14 Was all **Samples Stored** in Polyethylene 500 ml or 1000 ml Bottles?	✓	
15 Was the teflon aspirator or pump / sprayer assemble capable of recirculating absorbing reagent at 50 ml/min while operating at 0.75 cfm?	✓	
16 Were teflon impingers used (1 - 4) and a glass impinger for silica gel?	✓	
17 Was the Following **Impinger System** Used? **Imp. 1** - 150 ml 0.1 N KOH, **Imp. 2 & 3** - 75 ml of 0.1 N KOH / **Imp. 4** - Empty / **Imp. 5** Silicia Gel **Sources with high concentrations of acids and or SO2 the KOH solution should be increased to 0.5 N KOH**	✓	
19 Was all **Reagent Field Blanks** collected as required? **Cont 4 - 0.1 N KOH_____, Cont 5 - Reagent Water_____, Cont 6 - 0.1 N Nitric Acid_____**	✓	
20 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection_____, Gloves_____, Protective Clothing_____	✓	

Signature (Field Project Manager or Test Team Leader): _____ Date: 6-19-2011

ENTEC SERVICES, INC

CTM-027 - FIELD QA / QC CHECKLIST

CLIENT: Hovensa **LOCATION:** St. Croix

SOURCE TESTED: FCC **MODIFICATIONS TO METHOD:** —

	YES	NO
1 Was **Stack Diameter / Area & Traverse Points** verified on field data sheets?	✓	
2 Was a 10-minute **Meter Orifice Check** performed? (Was support calibration data on site) Results of check Good	✓	
3 Were **Temperatures Verified** (Pre & Post) w/ NIST Traceable Thermometer?	✓	
4 Was **Preliminary Traverse w/ Cyclonic Flow** verification performed?	✓	
5 Was **Glass or Quartz (Required) Nozzle Diameter** measured & recorded on field data sheets? Nozzle inspected? Y or N Noted Visual Defects? none	✓	
6 Was **Glass or Quartz Probe Liner** used (single piece optional) w/ **Teflon Probe Union** All open connections must be sealed with Teflon Tape	✓	
7 Was **Filter Outlet Temperature** maintained at ~~248 +/- 25~~ F? If not, explain	✗	✓
8 **Orsat or Fyrite** leak checked and standardization performed as required? Ambient O2 Reading _____% Ambient CO2 Reading_____%	—	—
9 Was **Method 3A Oxygen** - CEM's required for data correction & final reporting in lbs/mmBTU? Was Protocol 1 Calibration Gases used - Span (High), Mid (40-60% of Span), and Zero	✓	
10 Was **Tedlar Gas Sampling Bags** used? If not, explain _____ Were they leak-checked? Y or N	—	—
11 Was **Pitot Leak Checks** & **Meter Leak Checks** performed & recorded on each field data sheet? Pitot inspected? Y or N - Noted Visual Defects? none	✓	
12 Was **All Glassware Verified to be Cleaned** as required - Washed, Soaked, & Rinsed?	✓	
14 Was **Teflon Nozzle Brush** and **Teflon Probe Brush** used for sample recovery?	✓	
15 Was all **Samples Stored** clean high density polyethylene bottles with 250 or 500 ml capacity?	✓	
17 Was the Following **Impinger System** Used? **Imp. 1, 2, and 3 100ml .1 H2SO4, Imp. 4** Silicia Gel	✓	
19 Was all **Reagent Field Blanks** collected as required? **DI H2O** .1 N H2SO4	✓	
20 Was on site Sample Recovery Conducted with **All Required Safety Supplies**? Hood System_____, Eye Protection_____, Gloves_____, Protective Clothing_____	✓	

Signature (Field Project Manager or Test Team Leader): K. Re Date: _____

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Hovensa
Location: St. Croix
Source: FCC
Date: 6-14-11

Meter Box Number: NC-MS-3
Original ΔH@ : 1.894 Y: 0.985
Calibration Date: 12-20-10
Barometric Pressure: ~~29.77~~ 29.63" Hg KR

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft³		Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Readings:	Initial	Final	Initial	Final
ΔH @ = 1.894	201.900	209.373	85	86
	Total Volume:	7.473	Average:	85.5

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$

$= 10/(\ 7.473\ ) \times \sqrt{\{0.0319 \times (545.5\ )/(\ \frac{29.77}{29.63}\ )\}}$ KR

$= (\ 1.338\ ) \times (\ 0.766\ ) =$ 1.025

Needs postcal

Is Y_c < +/- 3% of Original Y ? no

Meter Calibration % Difference < 3%

Thermocouple Check: NIST Traceable ID 101564406 **Expiration** 3-24-12

Thermocouples / I.D.	Ambient Temp. °F	Reference Temp. °F	Acceptance Range	OK?
Stack (Post Required) / 1105291	88 / 89	89 / 91	+/- 7.5 °	✓
Probe / 1105291	88	88	+/- 5.4 °	✓
Filter Box / HB-14	88	89	+/- 5.4 °	✓
Filter Exit / TCG-003	90	90	+/- 2.0 °	✓
Meter Outlet / NC-MS-3	88	89	+/- 5.4 °	✓
Impinger Exit / GN-29	90	90	+/- 2.0 °	✓
Other /			+/- 5.4 °	

Field Checks Performed By (Signature): K. RO

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Hovensa
Location: St. Croix
Source: FCC Stack
Date: 6-14-2011

Meter Box Number: Apex C
Original ΔH@ : 1.905 Y: 1.010
Calibration Date: 8/24/2010
Barometric Pressure: 29.63 " Hg

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft^3		Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Readings:	Initial	Final	Initial	Final
ΔH @ = 1.905	793.900	801.486	84	86
	Total Volume:	7.586	Average:	85

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$

$= 10/(\ 7.586\ ) \times \sqrt{\{0.0319 \times (\ 545\ )/(\ 29.63\ )\}}$

$= (\ 1.31822\ ) \times (\ 0.76600\ ) =$ 1.010

Is Y_c < +/- 3% of Original Y ? yes

Meter Calibration % Difference 0.02%

Thermocouple Check: NIST Traceable ID 101564416 **Expiration** 3-24-12

Thermocouples / I.D.	Ambient Temp. °F	Reference Temp. °F	Acceptance Range	OK?
Stack (Post Required) / 1105290	87 / 88	87 / 89	+/- 7.5 °	✓
Probe / 1105290	87	87	+/- 5.4 °	✓
Filter Box / HB-10	87	87	+/- 5.4 °	✓
Filter Exit / TCD-005	86	87	+/- 2.0 °	✓
Meter Outlet / Apex C	87	87	+/- 5.4 °	✓
Impinger Exit / GN-8	87	88	+/- 2.0 °	✓
Other /			+/- 5.4 °	

Field Checks Performed By (Signature): K-DO

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Hovensa
Location: St. Croix
Source: FCC
Date: 6-14-11

Meter Box Number: NC-MS-1
Original ΔH@ : 1.840 Y: 0.986
Calibration Date: 12-20-10
Barometric Pressure: 29.63 " Hg

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft^3		Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Readings:	Initial	Final	Initial	Final
ΔH @ = 1.840	175.000	182.708	86	87
	Total Volume:	7.708	Average:	86.5

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$

$= 10/(\ 7.708\ ) \times \sqrt{\{0.0319 \times (\ 546.5\ )/(\ 29.63\ )\}}$

$= (\ 1.297\ ) \times (\ 0.767\ ) =$ 0.995

Is Y_c < +/- 3% of Original Y ? yes

Meter Calibration % Difference -0.93%

Thermocouple Check: NIST Traceable ID 101564416 **Expiration** 3-24-12

Thermocouples / I.D.	Ambient Temp. °F	Reference Temp. °F	Acceptance Range	OK?
Stack (Post Required) / 1105292	87 / 89	87 / 89	+/- 7.5 °	✓
Probe / 1105292	87	87	+/- 5.4 °	✓
Filter Box / —	—	—	+/- 5.4 °	—
Filter Exit / —	—	—	+/- 2.0 °	—
Meter Outlet / NC-MS-1	87	87	+/- 5.4 °	✓
Impinger Exit / GN-29	87	88	+/- 2.0 °	✓
Other /			+/- 5.4 °	

Field Checks Performed By (Signature): K. R. O

ENTEC SERVICES, INC.
METER ORIFICE AND TEMPERATURE CHECKS

Client: Hovensa
Location: St. Croix
Source: FCC
Date: 6-17-2011

Meter Box Number: NC-MS-2
Original ΔH@ : 1.825 Y: 0.996
Calibration Date: 12-20-20
Barometric Pressure: 29.74 "Hg

RUN METER FOR EXACTLY 10.0 MINUTES

Orifice Manometer Reading ΔH equal to ΔH @	Dry Gas Volume, ft^3		Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Readings:	**Initial**	**Final**	**Initial**	**Final**
ΔH @ = 1.825	459.000	466.510	90	89
	Total Volume:	7.510	**Average:**	89.5

V_m= Volume of Dry Gas Meter

T_m= Average Temperature of Dry Gas Meter in degrees Rankin (+460)

P_{Barm} = Barometric Pressure

$Y_c = 10/V_m \times \sqrt{\{0.0319 \times T_m/P_{Barm}\}}$

$= 10/(\ 7.510\ ) \times \sqrt{\{0.0319 \times (\ 549.5\ )/(\ 29.74\ )\}}$

$= (\ 1.332\ ) \times (\ 0.768\ ) =$ 1.022

Is Y_c < +/- 3% of Original Y ? yes

Meter Calibration % Difference -2.64%

Thermocouple Check: NIST Traceable ID 101564416 **Expiration** 3-24-12

Thermocouples / I.D.	Ambient Temp. °F	Reference Temp. °F	Acceptance Range	OK?
Stack **(Post Required)** / ESP-51B	94 / 96	94 / 96	+/- 7.5 °	—
Probe / ESP-51B	95	94	+/- 5.4 °	—
Filter Box / NCHC1	95	94	+/- 5.4 °	✓
Filter Exit / —	—	—	+/- 2.0 °	
Meter Outlet / NC-MS-2	91	91	+/- 5.4 °	—
Impinger Exit / GN-8	93	94	+/- 2.0 °	—
Other /			+/- 5.4 °	

Field Checks Performed By (Signature): L. Rel

Calibration complies with ISO 9001 ISO/IEC 17025 AND ANSI/NCSL Z540-1

Calibration Certificate No. 1750.01

Cert. No.: 4371-2811411

Traceable® Certificate of Calibration for Lollipop Thermometer

Manufactured for and distributed by: Fisher Scientific, P.O. Box 1768, Pittsburgh, PA 15230

Instrument Identification:

Model: 14-648-44 S/N: 101564416 Manufacturer : Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-231	A79341		
Temperature Probe	3039	12/10/10	A9B23080-1
Thermistor Module	A17118	11/19/10	A9B21010
Temperature Calibration Bath TC-256	B01375		
Thermistor Module	A27129	7/09/10	1000264338
Temperature Probe	157	7/27/10	A9708011-4

Certificate Information:

Technician: 104 Procedure: CAL-03 Cal Date: 3/24/10 Cal Due: 3/24/12

Test Conditions: 24.0°C 40.0 %RH 1014 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C		N.A.		0.001	-0.1	Y	-1.0	1.0	0.059	>4:1
°C		N.A.		100.001	99.5	Y	99.0	101.0	0.059	>4:1

This instrument was calibrated using instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±uc=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = Nominal(Rounded) - Tolerance; Max = Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez, Quality Manager

Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Lollipop Thermometer should maintain its accuracy There is no exact way to determine how long calibration will be maintained. Lollipop Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2008-AQ-HOU-ANAB.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Traceable® is a registered trademark of Control Company © 2009 Control Company

Laboratory Data

Acetone Gravimetric Analysis

			Final Weight 1	Final Weight 2
Client:	**In House Checks**	Analyst:	**L. Nichols**	**B. Bullock**
City/State:	**Hueytown, AL**	Bar. Press, In hg:	**29.73**	**29.70**
Source:	**Acetone Can C039920**	Log Book Page No.	**L5p120**	**L5p120**
Condition	**None**	Lab Amb. Temp, °F:	**71**	**75**
Balance :	**Denver Instrument**	Lab Rel. Humidity, %:	**31**	**28**
Balance ID:	**215D**	Calibration (100000 mg)	**100000.2 mg**	**100000.2 mg**

Acetone Blanks

		Beaker ID No.	**M-4**	**M-20**	**M-31**
		Volume of Acetone, ml	200	200	200
		Initial Weight, mg	93,911.0	100,202.8	98,748.6
		Average	**93,911.0**	**100,202.8**	**98,748.6**
1/19/11	16:00	Final Weight, mg	93,911.0	100,202.8	98,748.6
1/20/11	11:00	Final Weight, mg	93,911.0	100,202.8	98,748.6
		Average	**93,911.0**	**100,202.8**	**98,748.6**

Total Weight Collected

Weight of Acetone Blank, mg	0.00	0.00	0.00
Density of Acetone	0.7848	0.7848	0.7848
Acetone Blank Residue Concentration, mg/g	0.0000	0.0000	0.0000
Percent of Acetone Blank Weight	0.0000%	0.0000%	0.0000%
Allowable Percent of Acetone Blank	0.001%	0.001%	0.001%
	Ok	**Ok**	**Ok**

In no case shall a blank residue greater than 0.01 mg/g or 0.001% of the weight of the blank be subtracted from the sample weight

GFS Chemicals, Inc.
Columbus, Ohio 43223

LOT ANALYSIS

ITEM: 828 ACETONE, REAGENT (ACS) LOT#:C039920

Test	PASS/FAIL	NUMERICAL RESULT
Assay (GLC) 99.5% min	PASS	99.78%
Residue after evaporation 0.001%	PASS	<0.001%
Solubility in water - Pass Test	PASS	Passes
Titrable acid 0.0003 meq/g	PASS	<0.0003
Titrable base 0.0006 meq/g	PASS	<0.0006
Aldehyde (as HCHO) 0.002%	PASS	<0.002%
Color (APHA) 10 max	PASS	<10
Isopropanol 0.05%	PASS	<0.05%
Methanol 0.05%	PASS	<0.05%
Substances reducing permanganate - Pass Test	PASS	Passes
Water 0.5%	PASS	0.19%

TRACEABLE TO N.I.S.T. (Y/N)? N
Comment:
Reported by: Daniel Ewald QC Supervisor: Daniel Ewald
Quality Assured to Retest Point: 60 months from shipment
C/A Print Date: 01/20/2011

Not for direct use in food, cosmetics, finished pharmaceuticals or drug products. Supplier is not responsible for compliance with FDA Current Good Manufacturing Practice (CGMP) requirements, including without limitation those for finished drug products in 21 C.F.R Parts 210 and 211. Consult warranty limitations at www.gfschemicals.com/statics/documents/aboutus/termsandconditions.html For resale by GFS authorized distributors only.

GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 * Signed Orig. Doc. on File
800-858-9682 (U.S. and Canada) 740-881-5501(International) 740-881-5989 (Fax)

APPENDIX E

CALIBRATION DATA

ENTEC Services, Inc.

EPA Method 5

Meter Box Calibration

Pre-Test Calibration Orifice Method

Model #: 522

Serial #: APEX - C (Formerly NC-5)

Date: 08/24/10

Barometric Pressure: 29.60

Theoretical Critical Vacuum: 13.96

DRY GAS METER READINGS									-CRITICAL ORIFICE READINGS-					
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Final (deg F)	Average (deg F)
3.60	5.11	135.002	140.518	5.516	87.0	88.0	87.0	88.0	73	0.817	17.0	87.0	88.0	87.5
1.90	6.48	140.518	145.528	5.010	88.0	89.0	88.0	89.0	63	0.590	19.0	88.0	88.0	88.0
1.20	8.33	145.528	150.529	5.001	89.0	90.0	89.0	90.0	55	0.459	22.0	87.0	88.0	87.5
0.71	10.97	150.529	155.532	5.003	90.0	91.0	90.0	91.0	48	0.347	23.0	88.0	87.0	87.5
0.35	15.90	155.532	160.534	5.002	91.0	91.0	91.0	91.0	40	0.240	24.0	87.0	87.0	87.0

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

DRY GAS METER		ORIFICE			DRY GAS METER		ORIFICE			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y Value (number)	CALIBRATION FACTOR Y Variation (number)	CALIBRATION FACTOR dH@ Value (in H2O)	CALIBRATION FACTOR dH@ Value (mm H2O)	CALIBRATION FACTOR dH@ Variation (in H2O)
5.308	150.3	5.281	149.6	5.538	0.995	-0.015	1.807	45.90	-0.098
4.792	135.7	4.834	136.9	5.074	1.009	-0.001	1.827	46.41	-0.078
4.766	135.0	4.837	137.0	5.072	1.015	0.005	1.901	48.30	-0.003
4.754	134.6	4.815	136.4	5.049	1.013	0.003	1.965	49.91	0.060
4.744	134.4	4.830	136.8	5.059	1.018	0.008	2.023	51.38	0.118
		Average Y			1.010		1.905	48.38	Average dH@

Calibrated By: Lalan Kirby

CONTROL BOX CALIBRATION FORM

Model No.:	2010 Stack Sampler	Barometric Pressure:	30.00
Control Box ID.:	NC-M5-3(formaly NC-1)	Signature of Operator:	AJI
Calibration Date:	12/20/10	Theoretical Critical Vacuum:	15.00
Previous Calibration:	Gamma: 0.985 Delta H@ 1.992	Positive Leak Check Performed:	YES
Manometer Leveled:	YES	Negative Leak Check Performed	YES
Manometer Zeroed:	YES	Traceable Thermometer #:	91209662
Timer Check:	YES	DGM Temperature Check	Ambient: 33.5 DGM: 32.0

Orifice ΔH Setting (in. H_2O)	Dry Gas Meter Readings								Critical Orifice Readings						Run Time
	Gas Meter Volume			Gas Meter Temperature								Ambient Temperature			
	Initial Vm ft^3	Final Vm ft^3	Total Vm ft^3	Inlet		Outlet			Serial No. ID	Coeff. No.	Maintained Orifice Vacuum	Initial	Final	Avg.	θ (Min)
				Initial	Final	Initial	Final	Avg							
4.00	791.605	809.12	17.515	35.0	39.0	35.0	39.0	37.0	AH-73	0.8107	18.0	35.5	35.4	35.5	17.00
2.10	826.673	839.792	13.119	38.0	41.0	38.0	41.0	39.5	AH-63	0.6042	20.0	37.0	38.0	37.5	17.00
0.30	852.951	858.116	5.165	41.0	41.0	41.0	41.0	41.0	AH-40	0.2352	24.0	39.6	39.8	39.7	17.00
0.67	870.871	878.356	7.485	42.0	42.0	42.0	42.0	42.0	AH-48	0.3420	23.0	42.2	42.1	42.2	17.00
1.15	888.269	898.227	9.958	43.0	43.0	43.0	43.0	43.0	AH-55	0.4536	21.5	41.8	41.9	41.9	17.00

Orifice ΔH H_2O)	Volumes Corrected Standard Conditions, ft^3		Control Box Correction Factors			
	Dry Gas Meter	Orifice Device	Y - Meter Factor	tolerance	ΔH@ - Orifice Factor	tolerance
4.00	18.83261558	18.57506887	0.98632	0.00117	2.03428	0.1407
2.10	13.97058787	13.81511023	0.98887	0.00372	1.90001	0.0065
0.30	5.459736113	5.36602657	0.98284	-0.0023	1.78306	-0.1105
0.67	7.903519293	7.783582781	0.98482	-0.0003	1.90328	0.0097
1.15	10.50621696	10.32657391	0.9829	-0.0023	1.84706	-0.0465
		Average:	**0.98515**		**1.89354**	

Maintained Orifice Vacuum - Actual vacuum must be greater than 2 in. Hg than the *Theoretical Critical Vacuum*.

Y = Ratio of reading of orifice device to dry test meter; tolerance for individual values ±0.02 from average.

Delta H@ - Orifice pressure differential that equates to 0.75 cfm of air @ 68°F and 29.92 inches of mercury, acceptable tolerance for individual values ±0 20 from average

Positive leak check performed at greater than 3.0" H2O with no movement for 60 seconds

Negative leak check performed at greater than 15 0" H2O with no movement for 60 seconds

Minimum volume of five cubic feet must be obtained at each orifice setting

Prior to calibration, run the metering system pump for 15 minutes to condition the metering system

AUDIT REPORT DRY GAS METER USING CRITICAL ORIFICE

DATE: 7-26-11

CLIENT: Hovensa

BAROMETRIC PRESSURE (P_{bar}): 29.35 in

METER BOX NO: NC-M5-3

ORIFICE NO: AH-G3

PRETEST Y: 0.985

ORIFICE K[1] FACTOR: 0.6042

AUDITOR: AJI

Orifice Manometer Reading ΔH H_2O	Dry Gas Meter Reading ft 3	Duration of Run Θ Min.	Temperature		
			Ambient deg F	Dry Gas Meter	
2.1	initial 344.100	10	inital 79.6	inital 71	inital 71
	final 351.775		final 77	final 74	final 74

Orifice Manometer Reading ΔH H_2O	Dry Gas Meter Reading ft 3	Duration of Run Θ Min.	Temperature		
			Ambient deg F	Dry Gas Meter	
2.1	initial 351.775	10	inital 75.6	inital 75	inital 75
	final 359.497		final 75.8	final 77	final 77

Orifice Manometer Reading ΔH H_2O	Dry Gas Meter Reading ft 3	Duration of Run Θ Min.	Temperature		
			Ambient deg F	Dry Gas Meter	
2.1	initial 359.500	10	inital 75.8	inital 77	inital 77
	final 367.206		final 76.6	final 79	final 79

d:\tables\drygas1.ori

Dry Gas Meter Volume Vm ft3	Average Temperatures		Vm_{std} ft3	Vcr_{std} ft3	Audit Y	Y Deviation %
	Ambient T_a deg F	Dry Gas T_m deg F				
7.675	78.3	72.5	7.504	7.643	1.019	3.337

Dry Gas Meter Volume Vm ft3	Average Temperatures		Vm_{std} ft3	Vcr_{std} ft3	Audit Y	Y Deviation %
	Ambient T_a deg F	Dry Gas T_m deg F				
7.697	75.7	76	7.477	7.662	1.025	3.874

Dry Gas Meter Volume Vm ft3	Average Temperatures		Vm_{std} ft3	Vcr_{std} ft3	Audit Y	Y Deviation %
	Ambient T_a deg F	Dry Gas T_m deg F				
7.706	76.2	78	7.458	7.658	1.027	4.090

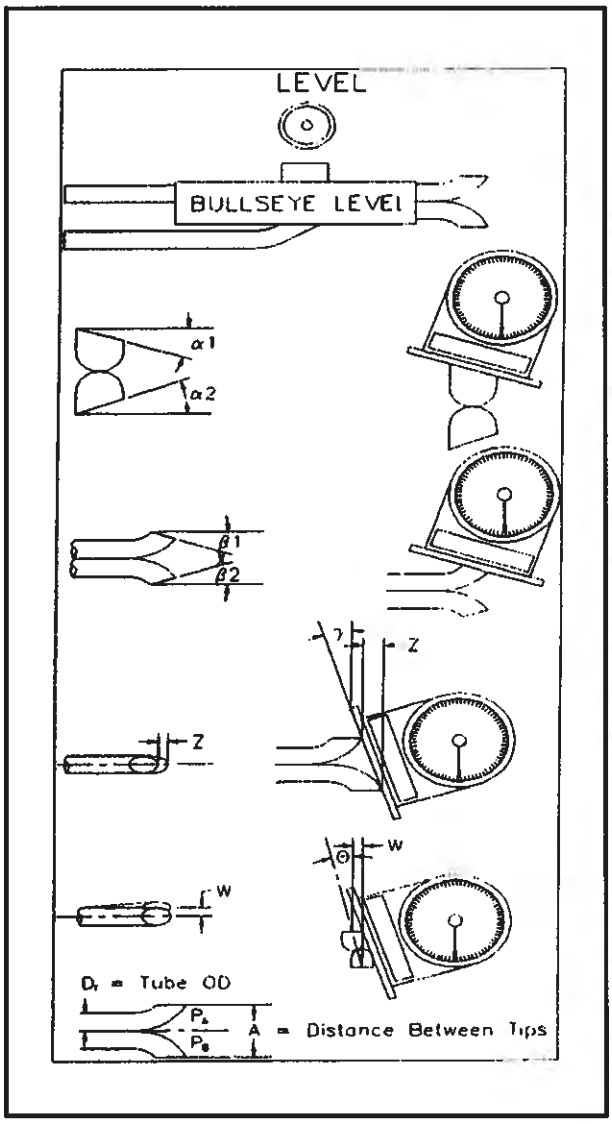
Vm_{std}	Vcr_{std}
$\frac{(17.647)\ (Vm)\ (P_{bar} + \Delta H/13.6)}{(T_m + 460)}$	$\frac{(\Theta)\ (K')\ (P_{bar})}{\sqrt{(T_a + 460)}}$

Audit Y	Y Deviation %
$\frac{Vcr_{std}}{Vm_{std}}$	$\frac{(Y\ audit - Y\ pretest)\ (100\%)}{Y\ audit}$

Audit Y must be in the range of pretest Y +/-5%

d:\tables\drygas1.ori

TYPE S PITOT TUBE INSPECTION DATA SHEET



Parameter	Value	Allowable Range
Assembly Level?	Yes	Yes
Holes Damaged?	No	No
Obstructed?	No	No
$\alpha 1$	0	$-10° < \alpha 1 < +10°$
$\alpha 2$	0	$-10° < \alpha 2 < +10°$
$\beta 1$	0	$-5° < \beta 1 < +5°$
$\beta 2$	0	$-5° < \beta 2 < +5°$
γ	90	
θ	90	
A	.950	for 1/4" OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125
$Z = A \sin \gamma$	0	$Z = \leq 0.125$"
$W = A \sin \theta$	0	$W = \leq 0.031$"
P_A	.475	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
P_B	.475	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
$P_A - P_B$	0	-0.063 to 0.063"
D_T	.375	0.188 to 0.375"
Thermocouple Cal.	79	Reference temp.
Thermocouple Cal.	79	Probe Thermocouple

Certification

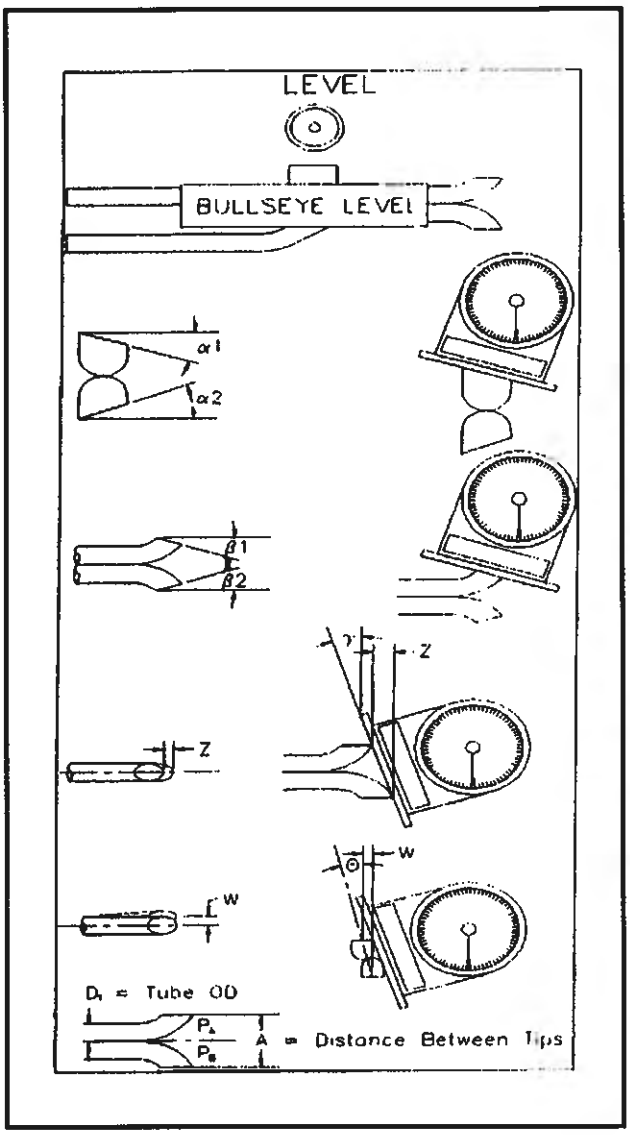
I certify that the Type S pitot tube/probe ID **# ESP- 51B** meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84

Certified and Calibrated By: Lalan R. Kirby

Date Certified: 4/20/2010

Initial Calibration

TYPE S PITOT TUBE INSPECTION DATA SHEET



Parameter	Value	Allowable Range
Assembly Level?	Yes	Yes
Holes Damaged?	No	No
Obstructed?	No	No
$\alpha 1$	0	$-10° < \alpha 1 < +10°$
$\alpha 2$	0	$-10° < \alpha 2 < +10°$
$\beta 1$	0	$-5° < \beta 1 < +5°$
$\beta 2$	0	$-5° < \beta 2 < +5°$
γ	90	
θ	90	
A	.916	for 1/4" OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125
$Z = A \sin \gamma$	0	$Z = \leq 0.125$"
$W = A \sin \theta$	0	$W = \leq 0.031$"
P_A	.458	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
P_B	.458	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
$P_A - P_B$	0	-0.063 to 0.063"
D_T	.375	0.188 to 0.375"
Thermocouple Cal.	N/A	Reference temp.
Thermocouple Cal.	N/A	Probe Thermocouple

Certification

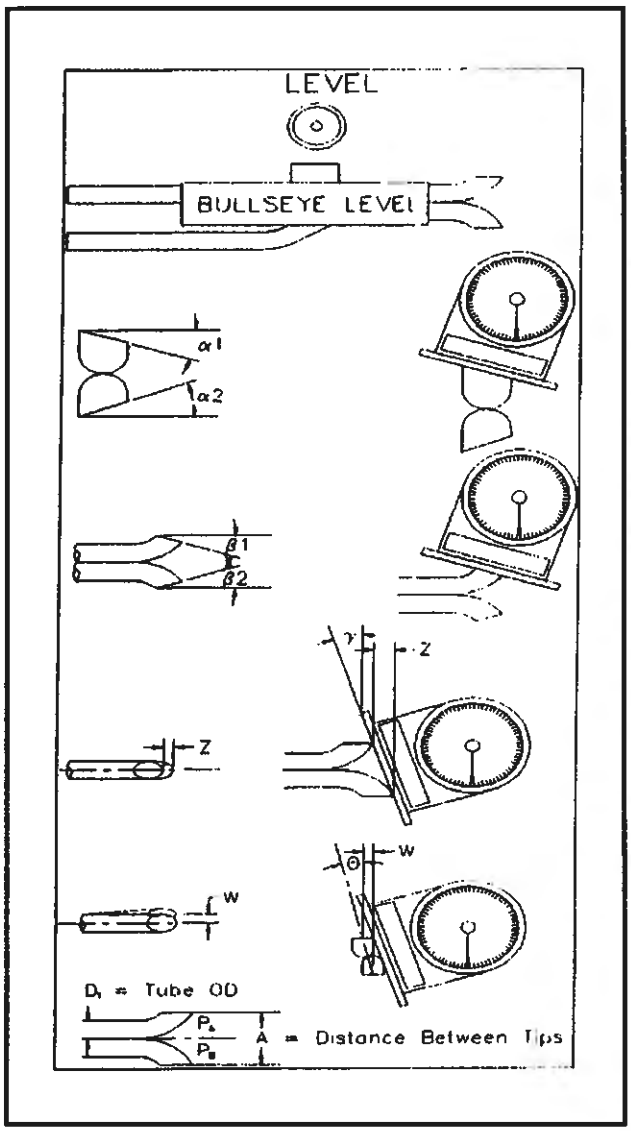
I certify that the Type S pitot tube/probe ID **NC-64-C** meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84

Certified and Calibrated By: Ben Rogers

Date Certified: 8/9/2011

Initial Calibration

TYPE S PITOT TUBE INSPECTION DATA SHEET



Parameter	Value	Allowable Range
Assembly Level?	Yes	Yes
Holes Damaged?	No	No
Obstructed?	No	No
$\alpha 1$	0	$-10° < \alpha 1 < +10°$
$\alpha 2$	0	$-10° < \alpha 2 < +10°$
$\beta 1$	0	$-5° < \beta 1 < +5°$
$\beta 2$	0	$-5° < \beta 2 < +5°$
γ	90	
θ	90	
A	.909	for 1/4" OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125
$Z = A \sin \gamma$	0	$Z = \leq 0.125$"
$W = A \sin \theta$	0	$W = \leq 0.031$"
P_A	.4545	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
P_B	.4545	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
$P_A - P_B$	0	-0.063 to 0.063"
D_T	.375	0.188 to 0.375"
Thermocouple Cal.	N/A	Reference temp.
Thermocouple Cal.	N/A	Probe Thermocouple

Certification

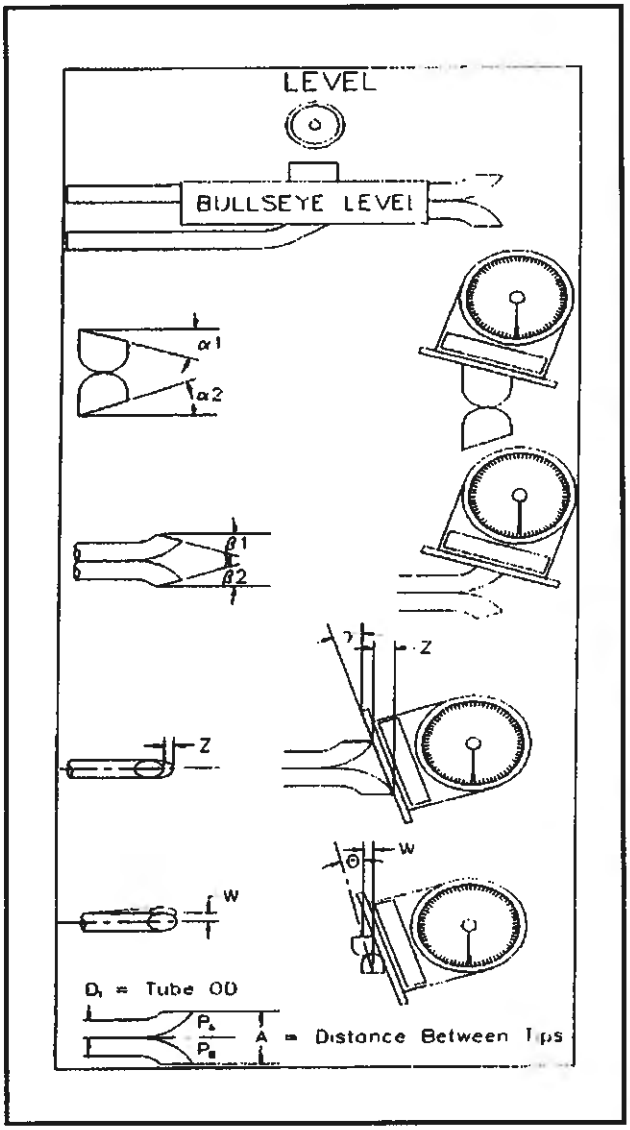
I certify that the Type S pitot tube/probe ID **NC-64-A** meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84

Certified and Calibrated By: Ben Rogers

Date Certified: 8/9/2011

Initial Calibration

TYPE S PITOT TUBE INSPECTION DATA SHEET



Parameter	Value	Allowable Range
Assembly Level?	Yes	Yes
Holes Damaged?	No	No
Obstructed?	No	No
$\alpha 1$	0	$-10° < \alpha 1 < +10°$
$\alpha 2$	0	$-10° < \alpha 2 < +10°$
$\beta 1$	0	$-5° < \beta 1 < +5°$
$\beta 2$	0	$-5° < \beta 2 < +5°$
γ	90	
θ	90	
A	.907	for 1/4" OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125
$Z = A \sin \gamma$	0	$Z = \leq 0.125$"
$W = A \sin \theta$	0	$W = \leq 0.031$"
P_A	.4535	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
P_B	.4535	for 1/4" OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563
$P_A - P_B$	0	-0.063 to 0.063"
D_T	.375	0.188 to 0.375"
Thermocouple Cal.	N/A	Reference temp.
Thermocouple Cal.	N/A	Probe Thermocouple

Certification

I certify that the Type S pitot tube/probe ID **NC-64-B** meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84

Certified and Calibrated By: Ben Rogers

Date Certified: 8/9/2011

Initial Calibration

Entec Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Calibration Date: 8/25/2010 Calibrated By: Lalan Kirby

Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
TC-1	ambient	89	90	1	Yes
TC-2	ambient	89	90	1	Yes
TC-3	ambient	89	90	1	Yes
TC-4	ambient	89	91	2	Yes
TC-6	ambient	90	90	0	Yes
TC-7	ambient	90	92	2	Yes
TC-8	ambient	90	91	1	Yes
TC-11	ambient	91	90	1	Yes
TC-12	ambient	92	92	0	Yes
TC-13	ambient	92	92	0	Yes
TC-14	ambient	92	90	2	Yes
TC-15	ambient	90	91	1	Yes
TC-16	ambient	91	91	0	Yes
TC-17	ambient	91	90	1	Yes
TC-19	ambient	90	92	2	Yes
TC-20	ambient	92	90	2	Yes
TC-21	ambient	92	90	2	Yes
TC-22	ambient	91	90	1	Yes
TC-23	ambient	91	92	1	Yes
TC-24	ambient	91	92	1	Yes
TCS-1	ambient	91	92	1	Yes
TCS-2	ambient	92	91	1	Yes
TCS-3	ambient	92	91	1	Yes
TCS-4	ambient	92	90	2	Yes
TCS-5	ambient	92	90	2	Yes
TCS-7	ambient	91	90	1	Yes
TSC-8	ambient	91	92	1	Yes
TSC-9	ambient	91	91	0	Yes
TSC-10	ambient	90	92	2	Yes
TSC-11	ambient	90	92	2	Yes
TSC-12	ambient	90	91	1	Yes
TSC-13	ambient	92	91	1	Yes
TSC-14	ambient	91	91	0	Yes
TSC-15	ambient	91	91	0	Yes
TSC-16	ambient	91	90	1	Yes
Fluke Hand Held 1	ambient	91	92	1	Yes
Fluke Hand Held 2	ambient	91	91	0	Yes
Fluke Hand Held 3	ambient	91	91	0	Yes

Temperature tolerance within $\pm$ 2° F of acceptable ranges for all thermocouples.

**Note: NIST Traceable Digital Thermometer Serial Number 101564424 was used as reference temperature.

Entec Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Calibration Date: 8/31/2010

Calibrated By: Lalan Kirby

Hot Box Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
HOTBOX-1	ambient	88	89	1	Yes
HOTBOX-2	ambient	88	90	2	Yes
HOTBOX-3	ambient	88	89	1	Yes
HOTBOX-4	ambient	88	89	1	Yes
HOTBOX-5	ambient	88	89	1	Yes
HOTBOX-6	ambient	88	88	0	Yes
HOTBOX-7	ambient	88	87	1	Yes
HOTBOX-8	ambient	88	89	1	Yes
HOTBOX-9	ambient	88	90	2	Yes
HOTBOX-10	ambient	88	89	1	Yes
HOTBOX-11	ambient	88	88	0	Yes
HOTBOX-12	ambient	88	88	0	Yes
HOTBOX-13	ambient	88	89	1	Yes
HOTBOX-14	ambient	88	88	0	Yes

Temperature tolerance within $\pm$ 2° F of acceptable ranges for all thermocouples.

**Note: NIST Traceable Digital Thermometer Serial Number 101564424 was used as reference temperature.

Entec Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Calibration Date: 8/24/2010 Calibrated By: Lalan Kirby

Gooseneck Thermocouple Calibrations

Entec Services ID Number	Temperature Source	**Reference Temperature	Thermocouple Temperature	Difference Degrees F	Within Tolerance
GN-1	ambient	89	88	1	Yes
GN-2	ambient	89	89	0	Yes
GN-3	ambient	89	89	0	Yes
GN-4	ambient	89	87	2	Yes
GN-5	ambient	90	90	0	Yes
GN-6	ambient	90	90	0	Yes
GN-7	ambient	90	88	2	Yes
GN-8	ambient	90	89	1	Yes
GN-9	ambient	90	89	1	Yes
GN-10	ambient	90	88	2	Yes
GN-11	ambient	90	89	1	Yes
GN-12	ambient	89	87	2	Yes
GN-13	ambient	89	88	1	Yes
GN-14	ambient	90	90	0	Yes
GN-15 (Mini HB)	ambient	90	88	2	Yes
GN-16 (Mini HB)	ambient	90	88	2	Yes
GN-17	ambient	90	88	2	Yes
GN-18 (Mini HB)	ambient	89	89	0	Yes
GN-19 (Mini HB)	ambient	89	89	0	Yes
GN-20 (Mini HB)	ambient	90	89	1	Yes
GN-21	ambient	90	88	2	Yes
GN-22 (Mini HB)	ambient	90	88	2	Yes
GN-23	ambient	90	88	2	Yes
GN-24	ambient	90	88	2	Yes

Temperature tolerance within $\pm$ 2° F of acceptable ranges for all thermocouples.

**Note: NIST Traceable Digital Thermometer Serial Number 101564424 was used as reference temperature.

SCALE TEST REPORT

ALABAMA SCALE SYSTEMS
2401 PAWNEE VILLAGE ROAD
BIRMINGHAM, AL 35217
TEL: 205-849-2212 FAX: 205-849-2228

CUSTOMER: ENTEC SERVICES
ADDRESS: 16 D COMMERCE AVENUE
CITY/STATE/ZIP: ALEXTOWN AL 35023

JOB #: _____ TEST DATE: 1-17-2010 2011 LAST TEST DATE: 1-18-2010

EQUIPMENT DESCRIPTION: LAB SCALE MANUFACTURER: DENVER

MAKE/TYPE: TB 215 D SERIAL NUMBER: 1920555

SCALE LOCATION: LAB		ZERO AS FOUND: 0	SCALE CAP.: 210 g	MIN. GRADS: 0.0001
BEFORE SHIFT TEST	NO. 1: 99.9986 49.9994	NO. 2: 99.9986	NO. 3: 99.9986	NO. 4: 99.9986
AFTER SHIFT TEST	NO. 1: 100.0000	NO. 2: 100.0000	NO. 3: 100.0000	NO. 4: 100.0000

BEFORE ADJUSTMENT / AFTER ADJUSTMENT

KNOWN TEST LOAD	SUBST. LOAD	SCALE INDICATION	ERROR	REMARKS	KNOWN TEST LOAD	SUBST. LOAD	SCALE INDICATION	ERROR	REMARKS
0		0.0000	0		0		0.0000	0	
50		49.9994	0006		50		50.0000		TEST
100		99.9986	0014		100		100.0000		ZN
150		149.9979	0021		150		150.0000		GRAMS
200		199.9975	0025	CAL	200		200.0000		
210		209.9973	0027	ADJUST	210		210.0000		
200		199.9975	0025		200		200.0000		TEST PER
100		99.9984	0016		100		100.0000		SOP
50		49.9994	0006		50		50.0000		5.4.1.002
0		0.0000	0		0		0.0000	0	

EQUIPMENT DESCRIPTION: LAB SCALE MANUFACTURER: SARTORIUS

MAKE/TYPE: A200 SERIAL NUMBER: 4100200447

SCALE LOCATION: LAB		ZERO AS FOUND: 0	SCALE CAP.: 210 g	MIN. GRADS: 0.0001
BEFORE SHIFT TEST	NO. 1: 100.0000	NO. 2: 100.0000	NO. 3: 100.0001	NO. 4: 100.0000
AFTER SHIFT TEST	NO. 1: 100.0000	NO. 2: 100.0000	NO. 3: 100.0000	NO. 4: 100.0000

BEFORE ADJUSTMENT / AFTER ADJUSTMENT

KNOWN TEST LOAD	SUBST. LOAD	SCALE INDICATION	ERROR	REMARKS	KNOWN TEST LOAD	SUBST. LOAD	SCALE INDICATION	ERROR	REMARKS
0		0.0000	0		0		0.0000	0	
50		50.0000			50		50.0000		
100		100.0000			100		100.0000		
150		150.0000			150		150.0000		
200		200.0000		TEST	200		200.0000		TEST PER
210		210.0000		ZN	210		210.0000		SOP
200		200.0000		GRAMS	200		200.0000		5.4.1.002
100		100.0000			100		100.0000		
50		50.0000			50		50.0000		
0		0.0000			0		0.0000	0	

MARK SPENCER
TECHNICIAN

Brad Bullock
CUSTOMER

STRJ 05/08/06

ENTEC Services, Inc.

30 Monroe Drive - Pelham, Alabama 35124

Calibration Date: 1/20/2011 **Calibrated by:** Lalan Kirby

Barometer Calibrations

Entec Services ID Number	Reference Barometer Reading	Barometer Reading	Pre-adjusted Variation	Barometer Adjusted?	Post-adjusted Barometer Reading	Post-adjusted Variation	Barometer Tolerance (0.1 ±mm Hg) ?
Lalan's Forester Watch	29.7	29.70	0.00	No	29.70	0.00	Yes
Palm Unit	29.7	29.71	-0.01	No	29.71	-0.01	Yes
Lab 20328697	29.7	29.72	-0.02	No	29.72	-0.02	Yes
La Crosse (1)	29.7	29.70	0.00	No	29.70	0.00	Yes
La Crosse (2)	29.7	29.69	0.01	No	29.69	0.01	Yes
Davis Instruments	29.7	29.70	0.00	No	29.70	0.00	Yes

*** Reference Barometer Procedures and Calculations made using Entec's Princo Instruments Model No. 469 Metallic Mercury Barometer**

Calibrated By: Lalan Kirby

APPENDIX F

TEST PROTOCOL

ENTEC Services Inc.
Pollution Control System Evaluation and Source Emissions Testing

May 18, 2011

Mr. Bernd Haneke - Senior Environmental Specialist
Hovensa LLC
St. Croix
1 Estate Hope
Christiansted, US Virgin Islands 00820-5652

Re: Petroleum Refinery Emissions ICR - Site Specific Test Plan
- Fluid Catalytic Cracking Unit (FCCU)
- Fuel Gas Systems
Hovensa LLC – Christiansted, US Virgin Islands Facility

Dear Mr. Haneke,

Please find attached the requested test plan for the upcoming Refinery ICR testing requirements at your facility located in Christiansted, US Virgin Islands. The following test plan provides a project overview, detailed scope of work, facility information, test procedures, analytical requirements, QA/QC requirements, and other support documentation that will be utilized and followed for the duration of this test program.

Hovensa will be responsible to supply all facility operational information to meet final reporting as required. If you should have any additional questions about the test plan please call me at 1.800.429.8445.

Sincerely,
Entec Services Inc.

D. Lynn Beane
Operations Manager

Entec Services, Inc.

30 Monroe Drive
Pelham, Alabama 35124
Telephone: 205.358-1011 / Fax: 205.358-1036

Refinery ICR Request - Site Specific Test Plan

Emission Testing at the

Hovensa Refinery St. Croix Facility

Christiansted, US Virgin Islands

Submitted to:

Hovensa LLC

1 Estate Hope
Christiansted, US Virgin Islands 00820-5652

Attention: Mr. Bernd Haneke

Senior Environmental Specialist

Protocol Submitted: April 18, 2011

Reviewed By:

Mr. Chuck Duncan
NC Area Operations Manager
919.267.9691 (w)
919.244.7777 (c)
cduncan@entecservices.com

Completed By:

Mr. Lynn Beane
Birmingham Operations Manager
205-491-6676 (w)
205-613-5473 (c)
lbeane@entecservices.com

Table of Contents

1.0 Introduction - Scope of Work

2.0 Facility / Source Description

- 2.1 Fuel Gas Systems Description
- 2.2 Fluid Catalytic Cracking Unit Description

3.0 Test Procedures

- Table 1.1 – Fuel Gas System Test Matrix
- Table 1.2 – Fluid Catalytic Cracking Unit Test Matrix

4.0 Alternative Sampling Procedures – Comments

- 4.1 Fuel Gas System
- 4.2 Fluid Catalytic Cracking Unit

5.0 Sampling & Analytical Procedures

6.0 Analytical Summary

- 6.1 Lab Contact Details

7.0 Quality Assurance / Quality Control Procedures

8.0 Safety Considerations

9.0 Reporting Procedures

Appendices

- Appendix A.1 – Fuel Gas System Detailed Test Matrix
- Appendix A.2 – Catalytic Cracking Unit Detailed Test Matrix
- Appendix B – Stack Schematic w/ Point Determination
- Appendix C – ICR Table 1.6 (C1-C6 Hydrocarbon List w/ Benzene)
- Appendix D – ICR Table 1.8 (Analytes for Inorganics / Other in Fuel)

1.0 Introduction – Scope of Work

Entec Services, Inc will conduct testing per the requirements as specified in the EPA's Section 114 Petroleum Refinery Emissions Information Collection Request (ICR) dated April 4, 2011 per the direction of Hovensa' RFQ dated March 10, 2011. The purpose of the testing is to provide emissions data to the EPA for their use in the development of a new Petroleum Refineries National Emission Standard for Hazardous Air Pollutants (NESHAP) regulations. Testing will be conducted at the Hovensa LLC, St. Croix facility located in Christiansted, US Virgin Islands. Testing will be conducted on the Fluid Catalytic Cracking Unit (FCCU), and multiple (7) Fuel Gas Systems (Mix Drums) requiring specific test methods over multiple days as specified in ***Appendix A.1*** *Test Summary – Fuel Gas Systems and* ***Appendix A.2*** *Test Summary- Fluid Catalytic Cracking Unit,* and

Testing will be conducted on the identified unit(s) based on information provided in the ICR request Table 1.2, and table 1.7, in accordance to EPA Test Methods and or other approved Alternative Test Methods. Entec has provided a detailed description of our sampling approach in Section 3, including all test methods, approximate sampling duration, minimum sample requirements, reporting requirements (units), etc...

All testing, sampling, analytical, and calibration procedures that will be used for this test program will be performed as described in US EPA Title 40, Code of Federal Regulations, Part 60 (40CFR60), Appendix A, Appendix M, EPA SW-846 Test Methods, EPA Other Test Methods, EPA Conditional Test Methods, ASTM Test Methods, (Aldehydes alternative) Test Methods, with the latest revisions for each identified method for the complete test program. Where applicable, the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Stationary Source Specific Methods, United States Environmental Protection Agency (USEPA) will be used to supplement procedures.

Based on time requirements of the ICR, testing has been scheduled to begin at the facility during the week of June 13, 2011. As required Hovensa must certify that the units tested are operated in a normal and representative manner during the performance testing. Hovensa must also certify that it operated the pollution control equipment, if any, on the unit tested in accordance with manufactures' specifications and requirements for proper operation during the emissions testing.

Entec will complete a final test report to submit to Hovensa, as well provide the EPA Electronic Reporting Tool (ERT) requirements for the emissions test program. Entec has provided all timelines and detailed oriented reporting requirements are identified in Section 9.0 of this protocol.

2.0 Facility Description

Hovensa is a joint venture between a subsidiary of Hess Corporation and a subsidiary of Petroleos de Venezuela, S.A. (PDVSA). The company operates a petroleum refinery in the south-central Estate Hope region of St. Croix, which is located in the United States Virgin Islands (USVI). The facility is one of the most modern refineries in the United States and, and has a crude oil processing capacity of 350,000 barrels per day (BPD).

The refinery is strategically located to serve gasoline and heating oil markets in both the United States Gulf Coast and along the eastern seaboard, providing a ready market for finished products. The refinery is capable of receiving and processing crudes from all over the world, although the majority of crude is supplied from Venezuela.

The refinery also operates a state-of-the-art Fluid Catalytic Cracking Unit (FCCU). In addition to the FCCU, Hovensa operates a Delayed Coker Unit (Coker) that was commissioned in August 2002. The Coker allows for the manufacture of gasoline and heating oil using lower cost heavy crudes.

2.1 Fuel Gas System Unit(s) Description

The fuel system provides refinery fuel gas to the process users typically heaters and boilers and the fuel gas is a common header which connects both the east and west refineries. The main producers of refinery gas are the FCC Unit and Coker Units which pass through amine scrubbers to remove H2S to below fuel gas permit levels. The other refinery process unit off gases are routed through either the HP Treater or Low Pressure Treater to remove H2S prior to be routed to the fuel gas header. To maintain a stable fuel gas distribution header pressure nominally between 50 to 55 psig, vaporized propane or butane is added to supplement the header pressure. There are four vaporizers in the east refinery and three vaporizers in the west refinery. Prior to the fuel gas being distributed to fuel gas consumers, the refinery gas is mixed in fuel gas balance drums (see below list). Typically fuel gas flows from the east refinery to the west refinery, since the major fuel gas producers are in the east refinery. After the fuel gas is mixed in the fuel gas drums, the gas is routed to the fuel gas consumers. The fuel gas drums to be tested include:

- West Refinery Area 1 – D-1110
- West Refinery Area 2 – D-905
- West Refinery Area 2 – D-2112
- East Refinery Area 3 – D-3307
- East Refinery Area 3 – D-3354
- FCC – D-7939
- Coker – D-8535

2.2 Fluid Catalytic Cracking Unit Description (Area V)

The FCCU converts heavy oils into wide boiling range material from which lower molecular weight products such as naphtha and middle distillates are fractionated by distillation. The feedstock is generally a heavy distillate or gas oil with a boiling range of about 500 to 1,000 ºF. The FCCU consists of a catalyst section and a fractionating section which operate as an integrated processing unit. The catalyst section consists of a reactor, regenerator, standpipes, and risers. The catalyst is in the form of very small spherical particles that behave as a fluid when aerated. The reactor effluent is separated by distillation in the fractionator into recycle oil, middle distillate, naphtha, liquefied petroleum gas (LPG), and off-gas.

A low sulfur content feedstock (≤ 0.6 weight percent) and a high efficiency venturi wet gas scrubber (WGS) is used to reduce sulfur dioxide (SO_2) emissions from the FCCU complex. Oxides of nitrogen (NO_x) emissions from the FCCU complex are controlled using temperature controls and by minimizing the oxidation conditions.

The major components of the particulate matter (PM) emissions consist essentially of catalyst fines and sodium sulfate salts emitted with the FCCU regenerator flue gas. PM regenerator emissions are controlled by the high efficiency scrubber. Carbon monoxide (CO) is emitted during the regeneration of the catalyst in the FCCU. CO emissions are reduced using a high temperature regenerator. Volatile organic compounds (VOCs) are emitted from the FCCU during the regeneration of the catalyst. Combustion controls (e.g., temperature and excess air) are used to reduce VOC emissions.

3.0 Test Procedures

Entec will conduct testing per the requirements as specified in the ICR. Testing will be conducted on the identified unit(s) to include EPA Test Methods, SW-846 Test Methods, EPA Other Test Methods, EPA Conditional Test Methods, ASTM Test Methods, and or other approved test methods. Test Methods 1-4 (Flows & Moistures), 5B/202 (Total PM – Dry Impinger), 18 (Speciated Volatile Organic HAP's, Methane, & Ethane), 23 (Dioxins & Furans), 25A, (Total Hydrocarbons), 26A (Hydrogen Chloride / Fluoride, & Chloride), 29 (Metals), 30B (Mercury), 0010 (Speciated Semi-volatile Organic HAP's), 0011 (Aldehydes), 0061 (Hexavalent Chromium), OTM029 (Hydrogen Cyanide), CTM027 (Ammonia) .

Flows and moistures will be conducted concurrently with each isokinetic test method. All CEM's data (O2, CO2, SOx, NOx, & CO) requirements will be met by Hovensa instrumentation (excluding THC) and provided to Entec for final reporting and data corrections as required. Hovensa will provide gas flow data for the Fuel Gas Systems due to safety concerns. The identified constituents (Table 1.1 Fuel Gas Systems & Table 1.2- FCCU Unit &) will be monitored as required for each run as indicated.

Table 1.1 – Test Matrix Fuel Gas Systems (7) Requirements

Proposed Test Methodology

Parameters	40 CFR, Appendix A or Approved Test Method	Sample Technique	Minimum Duration (minutes)	Frequency (Minimum)	Additional Information
C1 – C5 Hydrocarbons w/ Benzene [1]	ASTM 1945-03	Constant rate extractive sampling	60	3 Runs	Silonite Sample Container
H2S, COS, & CS2	ASTM D5504	Constant rate extractive sampling	60	3 Runs	Silonite Sample Container
TRS	ASTM D5504	Constant rate extractive sampling	60	3 Runs	Silonite Sample Container
Inorganic [2]	ASTM D1945-03	Constant rate extractive sampling	60	3 Runs	Silonite Sample Container
Higher Heating Value	ASTM D3588-98	Constant rate extractive sampling	60	3 Runs	Silonite Sample Container
Gas Flow [3]	Client will Provide	As required	N/A	N/A	Hovensa
Moistures [4]	Method 4	Calculated	60	3 Runs	Calculated

Test Notes:

1. C1-C5 Hydrocarbons w/ Benzene – ICR Table 1.6 – Appendix C
2. Inorganics – ICR Table 1.8 - Appendix D
3. Flow – Determination will be provided by facility calibrated flow monitors
4. Moisture will be determined by alternative measurements as required (wet buld-dry bulb, or stoichiometric calculations.

*** See Section 4.1** for Alternative Sampling Procedures for detailed discussion on Entec's sample and analytical approach.

Table 1.2 – Test Matrix FCCU Requirements

Proposed Test Methodology

Parameters	40 CFR, Appendix A or Approved Test Method	Sample Technique	Minimum & Approximate Duration (minutes)	Frequency (Minimum)	Additional Information
Speciated Volatiles Organic HAP's, Methane & Ethane [5]	M. 18	Semi – Continuous	60	3 Runs	On-Site GC – Minimum 4 Injections / run
Speciated Semi-Volatile Organic HAP's	M. 0010	Isokinetic extractive sampling	180[A]	3 Runs	141 DSCF
Aldehydes	M. 0011	Isokinetic extractive sampling	120[A]	3 Runs	46 DSCF
Total Hydrocarbons (THC)	M. 25A	Constant rate extractive sampling	60	3 Runs	Calibration w/ Propane
D/F w/ PCB Congeners [6]	M. 23	Isokinetic extractive sampling	180[A]	3 Runs	106 DSCF
Hydrogen Chloride / Fluoride & Cl2	M. 26A	Isokinetic extractive sampling	120[A]	3 Runs	71 DSCF
Mercury	M. 30B	Isokinetic extractive sampling	120[A]	3 Runs	60 liters
Hexavalent Chromium	M. 0061	Isokinetic extractive sampling	180[A]	3 Runs	106 DSCF
Metals[7]	M. 29	Isokinetic extractive sampling	180[A]	3 Runs	106 DSCF
Hydrogen Cyanide	OTM029	Isokinetic extractive sampling	60[A]	3 Runs	32 DSCF
Total PM[8]	M. 5B / 202	Isokinetic extractive sampling	120[A]	3 Runs	71 DSCF
Ammonia	CTM027	Isokinetic extractive sampling	120[A]	3 Runs	71 DSCF
Flows, Moisture, & Molecular Weight [9]	M. 1-4	Extractive sampling	As required	3 Runs	w/ Isokinetic Sampling

[A] – Approximate Test Duration

*** See Section 4.2** for Alternative Sampling Procedures for detailed discussion on Entec's sample and analytical approach.

Test Notes:

[5] Method 18 – Nitro Benzene will be added to the Method 0010 train with the required spike and recovery procedures.

[6] Method 23 - Just the 12 "dioxin like" PCB congeners PCB congeners

[7] Method 29 Metals to include – Antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se)

[8] Method 5B / 202 – Possible entrained water droplets. PM filter exit 320 to included Dry Impinger Condensable

[9] Molecular Weight - Oxygen and Carbon Dioxide information will be collected from calibrated CEM's for molecular weight determination and final reporting requirements.

4.0 Alternative Sampling Procedures Discussion

4.1 Fuel Gas Sampling

Based on information reviewed and approved by EPA due to safety concerns related to high pressure fuel gas sampling, EPA is extending the sampling containers for refinery fuel gas to include high pressure Silonite coated sampling containers. To meet EPA requirements the following conditions must be met with the Silonite coated steel container. With the following extra quality control check is required in order to test for degradation of the reduced sulfur compounds.

- Prepare a field quality control sample by pressurizing an empty sampling container with reduced sulfur compounds from a vendor certified gas cylinder containing a mixture of the target compounds from Table 1.7 of Component 4 of the ICR.
- Prepare one field quality control sample for every 10 field samples collected.
- The concentration of each field quality control sample must be in the range of 10 to 25 ppm.
- The holding time of each field quality control sample must be at least as long as the holding time of the refinery fuel gas samples.
- Acceptance criteria for the analysis of the field quality control sample is between 70 and 130% of the certified cylinder value. Field data for reduced sulfur compounds and TRS should be flagged for samples sets where the associated field quality control fails to meet this criteria.

Documentation of the certified cylinder value must be submitted with the test report

4. 2 Fluid Catalytic Cracking Unit

Part of this ICR request, the identified FCCU source will be required to test for volatile organics listed in ICR Table 1.3. There are 25 separate compounds on this table with various boiling points (the highest is 202°F). The method to be used is 1) SW 846-0031 (VOST) or 2) US EPA Method 18. The upper limit of VOST tubes is 1.5 ppmv total volatiles, and some of the compounds on the Table 1.3 list are not recommended for characterization by Method 18 tube approach. Some analytical labs are modifying the Method 18 tube sampling approach, but each compound must be spiked and recovered from the tubes. If the lab recovery efficiencies are not met, the test may be required by EPA to be repeated.

Our test approach will be to use Method 18 with the on-site GC direct injections option. In this manner, the QA/QC is completed prior to sampling and the quality and validity of the sample is known while on-site. It also provides the actual values. This will help to assure that testing will not need to be repeated due to QA/QC failure. Entec will utilize three (3) GC's on site including a GC/FID with a Volcal column or equivalent, the second will be a GC/FID with Supelco wax 10 column or equivalent, and the last will be GC/FPD to determine the reduced sulfur compounds.

The GC operators (Mike Hartman and/or Darrel Doerle) have more than 20 years of experience in on-site GC operations. In preparing for this approach, they have consulted the EPA, the analytical laboratories, and the column manufacturers. Most of this work has not been performed at a refinery before and EPA would like to see a dynamic spike of the highest boiling point compound for each column. We also agree this would be a good QC check. All the QA/QC will be done on-site prior to sampling.

- Discuss the component in target list not meeting requirements – Nitro Benzene and other – these may have been updated on March ICR update as long as lab is aware.....

5.0 Sampling and Analytical Procedures

5.1 Fuel Gas System Analysis – Test Approach

A gaseous pollutant sample is withdrawn from an emissions source at a contestant rate and is collected in a specialized non reactive high pressure Silonite coated sampling container. Since the gas is under high pressure the sample container is purged to remove air and then filled. This grab sample is conducted in triplicate. The sample line will be purged prior to opening the cylinder valve to eliminate air interference from the sample line. The valve will be opened and sample will be collected up to 1800 psi. **(Discuss test duration requirements????)**

ASTM Method D5504 sampling approach will be used provided the TRS is reported as the sum of the concentration of all of the chromatographic peaks recorded by the method. This modification will require and incorporate Method 18 requirements for spiked target compound recovery standards to validate the analysis procedure.

The above description is based on the identified Organic Compounds listed in ICR Table 1.7 (w/ Table 1.6 and 1.8 references). The compounds have been listed below for reference.

- **C1 – C5 Hydrocarbons w/ Benzene (ICR Table 1.6 - Full list in Appendix C)**
- **Hydrogen Sulfide (H_2S), Carbonyl Sulfide (COS), & Carbon Disulfide (CS_2)**
- **Total Reduced Sulfur Compounds (TRS)**
- **Inorganic Others (ICR Table 1.8 – Full list in Appendix D)**
- **Higher Heating Value**

5.2 Fluid Catalytic Cracking Unit – Test Approach

Method 1 - Sampling Point Determination

The sample point selection and traverse points will be selected and performed according to EPA Reference Method 1. The method will provide a representative measurement site of pollutant emissions from a stationary source. The cross section of the source is divided into a number of equal areas, and the traverse points are then located within the center of each of these areas. Physical measurements (if possible) are taken on-site to determine the actual stack diameter including upstream and downstream disturbance locations. These measurements will calculate traverse point locations based on the tables supplied in the method. **Appendix C** has been included with Stack Diagram including point determination.

Method 2 - Stack Gas Volumetric Flow

The velocity of the gas stream will be determined according to EPA Reference Method 2 by reading the instantaneous velocity head with an inclined manometer at each sampling point with a calibrated S-type pitot tube attached adjacent to the sample nozzle. The stack pressure will be measured with the static side of an S-type pitot tube. A calibrated pyrometer will be used to measure stack temperature at each sampling point. The verification of the absence of cyclonic flow will be conducted during the initial preliminary velocity measurements as required.

Method 3 - Stack Gas Molecular Weight (Fyrite Verification Only)

The carbon dioxide and oxygen concentrations will be determined using EPA Reference Method 3 (Fyrite). A sample of the flue gas will be extracted from the gas stream during each test. These samples will be analyzed with a hand held instrument. The molecular weight of the gas will be calculated using the moisture, oxygen and carbon dioxide content and the measured stack gas temperature.

*** Test Note:** Oxygen and Carbon Dioxide data will be provided for the certified CEM's data for final reporting requirements.

Method 4 - Moisture Content

The moisture content used for calculating the gas stream (dry basis) flow rate will be determined by measuring the amount of condensed moisture in the series of impingers or stainless steel condensing system in the sampling train as described in EPA Reference Method 4 at the completion of each test. The moisture content will be conducted in conjunction with isokinetic sampling. Ice will be placed around the impingers, with the outlet temperature of the impingers monitored and recorded throughout the duration of the testing to verify the temperature is less than 68° F.

Method 5B / 202 Total Particulate Determination (Non-Sulfuric / Dry Impinger)

Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature of 160 ± 14 °C (320 ± 25 °F). The elevated temperature is for the determination of non-sulfuric acid particulate matter. The collected sample, both the filter and the probe rinse should be dried at ambient temperature and then heated in an oven at 160 °C (320 °F) for 6 hours to volatilize any condensed sulfuric acid that may have been collected, and the non-sulfuric acid particulate mass is determined gravimetrically.

The condensable particulate matter (CPM) portion is collected in the dry impingers after the filterable PM has been collected on a filter (CPM Filter) maintained between 65°F - 85°F. The total of the impinger fractions and the CPM filter represents the CPM. This method eliminates the use of water as the collection media in impingers and includes the addition of a condenser followed by a water dropout impinger immediately after the heated 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 (SO2) gases from the impingers. 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 (Dry Impinger and Additional Filter). The potential artifacts from SO2 are reduced using a condenser and water dropout impinger to separate CPM from reactive gases. No water is added to the impingers prior to the start of sampling. To improve the collection efficiency of CPM, an additional filter (the "CPM filter") is placed between the second and third impingers.

Method 18 - Speciated Volatile Organic HAP's w/ Methane & Ethane

A gas sample is extracted using the direct interface option from the emission source and diluted with clean dry air. An aliquot of the diluted sample is then analyzed for the target compounds by GC/FID. The targeted organic components of the gas mixture are separated by gas chromatography (GC) and individually quantified by flame ionization detection principles. The retention times of each separated component are compared with those of known compounds under identical conditions. Therefore, the analyst confirms the identity and approximate concentrations of the organic emission components beforehand. With this information, the analyst then prepares or purchases commercially available standard mixtures to calibrate the GC under conditions identical to those of the samples. The analyst also determines the need for sample dilution to avoid detector saturation, gas stream filtration to eliminate particulate matter, and prevention of moisture condensation. We will be using two separate columns in order to separate the compounds prior to analysis. We will follow method 18 with no deviations except

where the ICR has added their own quality assurance.

Method 23 - Dioxin & Furan Determination w/ PCB Congeners)

This method will be applicable to the determination of polychlorinated dibenzo-p-dioxins (PCDD's) and polychlorinated dibenzofurans (PCDF's) from stationary sources. A sample will be withdrawn from the gas stream isokinetically and collected in the sample probe, on a glass fiber filter, and on a packed column (XAD Trap) of adsorbent material. The sample cannot be separated into a particle vapor fraction. The PCDD's and PCDF's are extracted from the sample, separated by high resolution gas chromatography, and measured by high resolution mass spectrometry.

Method 25A - Total Hydrocarbons (THC)

Total hydrocarbons will be continuously measured using a California Analytical Model 300 (or equivalent) flame ionization detector. A sample will be extracted from the sources being tested through a heated sample line and pumped into a flame ionization detector. An electrometer coupled with a potentiometer recorder detected the increase in ion intensity resulting from the introduction into a hydrogen flame of a sample of air containing organic compounds. The analyzer will be calibrated using propane. The analyzers have a digital readout, as well as 0-10 volt output terminals. The full scale of the instrument will be set as required throughout the duration of the test period.

Method 26A - Hydrogen Chloride, Fluoride, & Chlorine

Gaseous and particulate pollutants are withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. The cyclone collects any liquid droplets and is not necessary if the source emissions do not contain them; however, it is preferable to include the cyclone in the sampling train to protect the filter from any liquid present. The filter collects particulate matter including halide salts but is not routinely recovered or analyzed. Acidic and alkaline absorbing solutions collect the gaseous hydrogen halides and halogens, respectively. Following sampling of emissions containing liquid droplets, any halides/halogens dissolved in the liquid in the cyclone and on the filter are vaporized to gas and collected in the impingers by pulling conditioned ambient air through the sampling train. The hydrogen halides are solubilized in the acidic solution and form chloride (Cl-), bromide (Br-), and fluoride (F-) 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+), the halide ion, and the hypohalous acid (HClO or HBrO). 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 halide ions in the separate solutions are measured by ion chromatography (IC).

Method 29 - Metals Determination (Non-Mercury)

A stack sample is withdrawn isokinetically from the source, particulate emissions are collected in the probe and on a heated filter, and gaseous emissions are then collected in an aqueous acidic solution of hydrogen peroxide (analyzed for the targeted HAP Metals). The recovered samples are digested, and appropriate fractions are analyzed for Sb, As, Be, Cd, Cr, Co, Pb, Mn, Ni, and Se by inductively coupled argon plasma emission spectroscopy (ICAP) or atomic absorption spectroscopy (AAS). Graphite furnace atomic absorption spectroscopy (GFAAS) is used for analysis of Sb, As, Cd, Pb, and Se if these elements require greater analytical sensitivity than can be obtained by ICAP. If one so chooses, AAS may be used for analysis of all listed metals if the resulting in-stack method detection limits meet the goal of the testing program. Similarly, inductively coupled plasma-mass spectroscopy (ICP-MS) may be used for analysis of Sb, As, Be, Cd, Cr, Pb, Mn, and Ni.

Method 30B – Speciated Mercury)

Known volumes of flue gas are extracted from a stack or duct through paired, instack sorbent media traps at an appropriate flow rate. Collection of speciated (oxidized and elemental) mercury on the sorbent media in the stack mitigates potential loss of mercury during transport through a probe/sample line. For each test run, paired train sampling is required to determine measurement precision and verify acceptability of the measured emissions data. A field recovery test which assesses recovery of an elemental Hg spike to determine measurement bias is also used to verify data acceptability. The sorbent traps are recovered from the sampling system, prepared for analysis as needed, and analyzed by any suitable determinative technique that can meet the performance criteria.

Entec has discussed the 30B approach with Mr. Rob Keeney of Aura Scientific who has submitted to EPA in May 2011 an SOP detailing the advantages of utilizing this approach. With a two (2) hour run time an expected detection limit of 0.25 micro-grams / dscf will be met. At the time of this protocol submission EPA has not yet responded or posted this information to the Refinery ICR FAQ. Additional support information in **Appendix E**

Test Note: Due to port limitations and simultaneous sample trains a separate port has been identified to conduct single port traverse for this sampling system.

Method 0010 - Speciated Semi-Volatile Organic HAP's

Gaseous and particulate pollutants are withdrawn from an emission source at an isokinetic sampling rate and are collected in a multi-component sampling train. Principal components of the train include a high-efficiency glass- or quartz-fiber filter and a packed bed of porous polymeric adsorbent resin (XAD-2). The filter is used to collect organic-laden particulate

materials and the porous polymeric resin to adsorb semi-volatile organic species. Semi-volatile species are defined as compounds with boiling points >100°C.

Method 0011 - Aldehydes

Gaseous and particulate pollutants are withdrawn isokinetically from an emission source and are collected in aqueous acidic 2,4-dinitrophenylhydrazine. Formaldehyde present in the emissions reacts with the 2,4-dinitrophenylhydrazine to form the formaldehyde dinitrophenylhydrazone derivative. The dinitrophenylhydrazone derivative is extracted, solvent-exchanged, concentrated, and then analyzed by high performance liquid chromatography (HPLC) according to Method 8315 or other appropriate technique.

Method 0061 - Hexavalent Chromium

The sampling system will collect the Cr+6 emissions isokinetically from the source. To eliminate the possibility of Cr+6 reduction between the nozzle and impinger, the emission samples are collected with a re-circulatory train where the impinger reagent is continuously re-circulated to the nozzle. Recovery procedures include a post-sampling purge and filtration. The impinger train samples are analyzed for Cr+6 by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The IC/PCR separates the Cr+6 as chromate (CrO =) from 4 other diphenylcarbazide reactions that occur in the post-column reactor. To increase sensitivity for trace levels of chromium, a pre-concentration system may also be used in conjunction with the IC/PCR.

Method OTM 029 - Hydrogen Cyanide

Gaseous and particulate pollutants are withdrawn from an emission source at an isokinetic sampling rate and are collected in a multi-component sampling train. The primary components of the sampling train include a heated probe, a heated filter, three impingers containing sodium hydroxide (NaOH) solution, and an impinger containing silica gel. Hydrogen cyanide present in the stack gas stream reacts with the NaOH to form a cyanide ion, which is retained in the alkaline solution until analyzed by ion chromatography (IC). Particulate cyanide salts are retained on the filter, and are not analyzed during routine execution of the method. Sampling is conducted isokinetically because of the significant solubility of HCN in water droplets which may be present in combustion stacks, especially those equipped with wet scrubber systems. Analysis is performed by liquid chromatography using an ion chromatograph equipped with an appropriate electrochemical detector.

Method CTM 027 - Ammonia

A stack gas sample is withdrawn isokinetically from the source and must be collected at the actual stack temperature, or slightly above, in order to minimize either negative or positive reactions that would bias the ammonia results. Samples pass through an in-stack filter and are collected in impingers containing sulfuric acid solution. All collected sample fractions are analyzed using ion chromatography.

6.0 Analytical Summary

The analytical requirements for each identified method will meet all QA/QC sampling and analytical requirements. Chemical reagents will be made by internal and external labs for this test program, all holding times, and shelf life will not exceed those specified in the above mentioned methods. In addition, those reagents having a shelf life of one week or less will be prepared daily at the jobsite by the test team. All required sampling blanks, duplicates, spike and recovery will be conducted as required.

6.1 Lab Contact Details

Entec will utilize our internal lab as well as other labs to conduct and meet the analytical sampling requirements. The following labs have been identified with each constituent, and contact listed.

- Air Tech Environmental – Speciated Volatile Organic HAP's w/ Methane & Ethane
  Mr. Mike Hartman – Principal Scientist 919.544.6338
- Analytical Perspective – Dioxins / Furans
  Mr. Yves Tonduer 910.794.1613
- Aura Scientific – Mercury
  Mr. Rob Keeney 919.387.0090
- Element One - Metals, Chromium,
  Mr. Ken Smith – 910.793.0128
- Empact Analytical Systems, Inc – Detailed Refinery Gas Analysis, Sulfur Speciation
  Mr. Burl McEndree 303.637.0150
- Enthalpy Analytical – Aldehydes, HCl/HF/Cl_2, HCN, PM, Ammonia, Semi Volatile HAP's
  Mr. Jordan Laster 919.850.4392
- Entec Services, Inc - PM
  Mr. Brad Bullock 205.358.1011

7.0 QA / QC Procedures

The calibration and quality assurance procedures of all EPA or other approved test methods will be used in this test program with additional support from the "Quality Assurance Handbook for Air Pollution Measurement System" Volume III Stationary Source-Specific Methods will be followed throughout the duration of all field testing, sampling, analytical and calibration requirements. The most current CFR revision of each method will be used.

Entec understands that the listed reference methods are extremely technical, an experienced test team will be used that understands the specific quality assurance / quality control procedures which will be adhered to during this test project to provide valid and scientifically defensible data. For any environmental field and laboratory measurement, a degree of uncertainty exists in the data due to inherent limitations of the measurement systems employed. The objective of a QA/QC program is to produce data of known precision, accuracy, representation, completeness and comparability. The objective in this test project is to determine compliance with applicable air permit requirements. The final data user in this project will be EPA. Entec will provide sample blanks, field blanks, and chemical blanks as required and identified by each test method.

All calibration gases will be certified in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards for the identified methods as required.

8.0 Safety Considerations

Entec understands and values safety requirements and has a current **EMR rating of 0.93**. Entec has a corporate safety director, Mr. Jeff Dennis, who manages all aspects of Entec's safety program. Entec employees are involved in monthly safety meetings/safety training and maintain ongoing certifications in Hazmat Shipping, Man-Lift, MSHA, OSHA, TWIC, and DOT. The on-site project manager will conduct a daily toolbox safety meeting for job specific hazards in addition to any site specific safety requirements which will be completed upon arriving on site. The test team will conduct additional Hovensa Site Specific requirements as required.

Entec's test team also understands that the listed methods involve hazardous materials, operations, and equipment. All work performed will meet the appropriate safety and health practices for the duration of the sampling program. All personnel will meet site specific PPE requirements to include Hard Hat, Steel toe Boots, Safety Glasses, Ear Plugs, and Fire Protective Clothing.

9.0 Reporting Procedures

Entec will submit a final draft test report containing all results will be submitted to Hovensa for initial review and comment in the form of emissions summary report (including, emissions summary, input data sheets, calculated data pages with supporting field data) specific for each test method. Due to the large number of methods not support by EDT these will be uploaded for final submission into the ERT upon approval. EPA Test Methods support by the EDT will be completed after the initial emissions summary reports (method specific) have been approved.

After approval of the draft, final data will be completed in the ERT and submitted to EPA electronically as required by August 31, 2011. Hovensa will be responsible for supplying all required facility operational parameters (process data, 30 day monitoring, etc...) to meet final reporting requirements. It is anticipated that plant production data will be treated as Confidential Business Information (CBI) and submitted to the EPA by separate correspondence as required.

The initial draft report will be ready for initial review by August 1, 2011 (approximately 30 business days upon completion of the field testing). Hovensa review is expected to take an additional ten (100) days and expected back to Entec by August 15, 2011. The final ERT will be submitted as soon as completion meeting the August 31, 2011 deadline.

Mr. Chuck Duncan, Carolina Area Operations Manager will be the Project Manager and the responsible individual for the duration of the test program and will coordinate with Mr. Bernd Haneke of Hovensa and other personnel as required. Other key personnel are listed for additional support and resources as needed.

Mr. Lynn Beane – Birmingham Operations Manger – On-Site Data Management
Mr. Troy Burrows – Corporate QA/QC Manger
Mr. Keith Poole – Corporate Technical Writer
Mr. Dan McCombs – Kannapolis Manager – ERT Support

Appendix A.1 – Detailed Test Matrix
Flue Gas System Units (7)

Appendix A.2 – Detailed Test Matrix
Fluid Catalytic Cracking Unit

Appendix B – Stack Schematic
Point Determination

Appendix C - ICR Table 1.6

C1 through C5 Hydrocarbons & Benzene

Description	Compound	CAS No.
C1 Alkanes	Methane	74-82-8
C2 Alkanes	Ethane	74-84-0
C3 Alkanes	Propane	74-98-6
C4 Alkanes	n-Butane	106-97-8
	Isobutane	75-28-5
C5 Alkanes	n-Pentane	109-66-0
	2-Methylbutane	78-78-4
	Cyclopentane	287-92-3
C2 Olefins	Ethylene	74-85-1
C2 Alkynes	Acetylene	74-86-2
C3 Olefins	Propylene	115-07-1
C4 Olefins	1-Butene	106-98-9
	2-Butene	107-01-7
	Isobutene	115-11-7
C5 Olefins	1-Pentene	109-67-1
	Cis-2-pentene	627-20-3
	Trans-2-pentene	646-04-8
	2-Methyl-1-butene	563-46-2
	3-Methyl-1-butene	563-45-1
	2-Methyl-2-butene	513-35-9
	Cylcopentene	142-29-0
C3 Alkadienes	Propadiene	463-49-0
C4 Alkadienes	1,2-Butadiene	590-19-2
	1,3-Butadiene	106-99-0
C5 Alkadienes	1,2-Pentadiene	591-95-7
	1-cis-3-Pentadiene	1574-41-0
	1-trans-3-Pentadiene	2004-70-8
	1,4-Pentadiene	591-93-5
	2,3-Pentadiene	591-96-8
	3-Methyl-1,2-butadiene	598-25-4
	2-Methyl-1,3-butadiene	78-79-5
	Cyclopentadiene	542-92-7
Benzene		71-43-02

Appendix D – ICR Table 1.8

Analytes for "Inorganics / Other" in Fuel

Compound	CAS No.
Hydrogen	1333-74-0
Carbon monoxide	630-08-0
Carbon dioxide	124-38-9
Nitrogen	7727-37-9
Oxygen	7782-44-7

APPENDIX G

QSTI CERTIFICATIONS

511150 Hovensa LLC

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

CHARLES F. DUNCAN III

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 12TH DAY OF MAY 2009 AND EFFECTIVE UNTIL MAY 11TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakahis, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2009-343

1996

511150 Hovensa LLC

Page 602 of 701

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

CHARLES F. DUNCAN III

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 12TH DAY OF MAY 2009 AND EFFECTIVE UNTIL MAY 11TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pahelnik, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2009-343

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

KEVIN M. ROSENBERG

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 3RD DAY OF FEBRUARY 2009 AND EFFECTIVE UNTIL FEBRUARY 2ND, 2014

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

APPLICATION NO. 2008-283

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

KEVIN M. ROSENBERG

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 8TH DAY OF JULY 2009 AND EFFECTIVE UNTIL JULY 7TH, 2014

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-283

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

KEVIN M. ROSENBERG

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 23RD OF FEBRUARY 2011 AND EFFECTIVE UNTIL FEBRUARY 22ND, 2016

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2008-283

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

KEVIN M. ROSENBERG

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

HAZARDOUS METALS MEASUREMENT SAMPLING METHODS

ISSUED THIS 23RD OF FEBRUARY 2011 AND EFFECTIVE UNTIL FEBRUARY 22ND , 2016

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2008-283

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

LYNN BEANE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 13TH DAY OF MARCH 2008 AND EFFECTIVE UNTIL MARCH 12TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2008-130

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

LYNN BEANE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 13TH DAY OF MARCH 2008 AND EFFECTIVE UNTIL MARCH 12TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

LeroyF. Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2008-130

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIMOTHY A. DRAHEIM

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 8TH DAY OF NOVEMBER 2007 AND EFFECTIVE UNTIL NOVEMBER 7TH, 2012

Peter R. Westlin, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTOReview Board

APPLICATION NO. 2007-079

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIMOTHY A. DRAHEIM

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS SOURCE SAMPLING METHODS

ISSUED THIS 8TH DAY OF NOVEMBER 2007 AND EFFECTIVE UNTIL NOVEMBER 7TH, 2012

Peter R. Westlin, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2007-079

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIMOTHY A. DRAHEIM

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 4TH DAY OF SEPTEMBER 2007 AND EFFECTIVE UNTIL SEPTEMBER 3RD, 2012

Peter R. Westlin, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2007-079

511150 Hovensa LLC

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIMOTHY A. DRAHEIM

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

HAZARDOUS METALS MEASUREMENT SAMPLING METHODS

ISSUED THIS 23RD OF FEBRUARY 2011 AND EFFECTIVE UNTIL FEBRUARY 22ND , 2016

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2007-079

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

WILLIAM KEITH POOLE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 30TH DAY OF DECEMBER 2008 AND EFFECTIVE UNTIL DECEMBER 29TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-276

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

WILLIAM KEITH POOLE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 30TH DAY OF DECEMBER 2008 AND EFFECTIVE UNTIL DECEMBER 29TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-276

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

WILLIAM KEITH POOLE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

HAZARDOUS METALS MEASUREMENT SAMPLING METHODS

ISSUED THIS 30TH DAY OF DECEMBER 2008 AND EFFECTIVE UNTIL DECEMBER 29TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-276

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

WILLIAM KEITH POOLE

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 30TH DAY OF DECEMBER 2008 AND EFFECTIVE UNTIL DECEMBER 29TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-276

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 20TH DAY OF FEBRUARY 2008 AND EFFECTIVE UNTIL FEBRUARY 19TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

Leroy P. Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 20TH DAY OF FEBRUARY 2008 AND EFFECTIVE UNTIL FEBRUARY 19TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Leroy F. Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 29TH DAY OF JANUARY 2008 AND EFFECTIVE UNTIL JANUARY 28TH, 2013

Peter R. Westlin, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

John R. Smith, QSTI/QSTO Review Board

Leroy P. Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

TROY M. BURROWS

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

HAZARDOUS METALS MEASUREMENT SAMPLING METHODS

ISSUED THIS 6TH DAY OF MAY 2010 AND EFFECTIVE UNTIL MAY 5TH, 2015

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakelnis, QSTI/QSTO Review Board

C. David Begwejl, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2008-113

APPENDIX H

NOMENCLATURE AND HAND CALCULATIONS

NOMENCLATURE

A_s	Cross-sectional area of stack, square feet
A_n	Cross-sectional area of nozzle, square feet
ACFM	Actual cubic feet of gas per minute at stack conditions
B_{ws}	Proportion by volume of water vapor in gas stream
C_s	Particulate concentration in stack gas, gr/dscf
C_a	Particulate concentration in stack gas, gr/acf
C_p	Pitot tube coefficient
Δ H	Pressure drop across orifice meter, inches water
Δ P	Velocity head of stack gas, inches water
dscf	Cubic feet of dry gas corrected to standard conditions
EA	Excess Air
E/Btu	Particulate Emission Rate, pounds/mmBtu
F	F-factor, 9640 dscf/MMBTU's of heat input
K_p	Constant (85.49)
M_n	Total particulate matter collected, mg
M_d	Molecular weight of stack gas; dry basis, lb/lb-mole
M_s	Molecular weight of stack gas; wet basis, lb/lb-mole
I	Percent of isokinetic sampling
P_{bar}	Barometric pressure, inches mercury
P_g	Stack static pressure, inches of water
P_m	Barometric pressure of dry gas meter, in. mercury
PMR	Particulate mass rate, pounds/hour
P_s	Absolute stack gas pressure, inches mercury
P_{std}	Barometric pressure, standard conditions, 29.92 inches Hg
Q_a	Volumetric flow rate, actual conditions, ACF/min
Q_s	Volumetric flow rate, standard conditions, scf/min
Q_{std}	Volumetric flow rate, dry standard conditions, dscf/min
TB_{ws}	Theoretical water vapor in the gas stream based on saturated stack conditions, proportion by volume (dimensionless)
TV_{lc}	Theoretical volume of water collected based on saturated stack conditions, ml
TV_{wstd}	Theoretical volume of water vapor in the gas sample based on saturated stack conditions, corrected to standard temperature and pressure, scf
T_m	Absolute average dry gas meter temperature, degree R (460)
T_s	Absolute average stack gas temperature, degree R (460)
T_{std}	Absolute temperature at standard conditions, 528 R
Θ	Total sampling time, minutes
V_{lc}	Total volume collected in impingers and silica gel, gr
V_m	Volume of gas sampled through gas meter, cubic feet
V_n	Volume collected at stack conditions through nozzle, ACF
V_{ma}	Stack gas volume sampled, ACF
V_{mstd}	Volume of gas sampled through gas meter, cubic feet
V_s	Average stack gas velocity, feet/sec
V_{wcstd}	Volume of water vapor in gas sampled from impingers, standard cubic feet
V_{wsgstd}	Volume of water vapor in gas sampled from silica gel, standard cubic feet
W_{imp}	Total volume collected in impingers, gr
W_{sg}	Total volume collected in silica gel, gr
Y	Dry gas meter calibration factor

TEST CALCULATIONS
METHOD 5 / 202 – RUN 1
511150 HOVENSA

EQUATIONS

1. $P_s = P_{bar} + (P_g/13.6)$ = (29.8) + (−.49 /13.6) = 29.764

2. $P_m = P_{bar} + (\Delta H/13.6)$ = (29.8) + (1.93 /13.6) = 29.9419

3. $V_{mstd} = 17.64 * V_m * Y * (P_m/T_m)$ = 17.64*(114.239)*(1.01)*(29.941939 / 551.75) = 1104516

4a. $V_{wc(std)} = 0.04706 * W_{imp}$ = 0.04706*(633.1) = 29.7937

4b. $V_{wsg(std)} = 0.04715 * W_{sg}$ = 0.04715*(34.2) = 1.6125

5. $B_{ws} = V_{wstd}/(V_{mstd} + V_{wstd})$ = (31.4062)/(110.4516 + 31.4062) = .2214

For saturated sources (No. 6 - 8 only):

6. $TB_{ws} = (10^{6.37-\{2827/(ts+365)\}} / P_s$ = $10^{6.37-\{2827/(}$ 140.85 $+364.8)\}$ / (29.764) = .2023

7. $TV_{wstd} = V_{mstd}*(TB_{ws} /1- TB_{ws})$ = (110.4516)*(.20206217)/(1 - .20206217) = 27.97

8. $TV_{lc} = TV_{wstd}/0.04707$ = (27.96971033) / 0.04707 = 594.2

9. $M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28((100-(\%CO_2 + \%O_2))$
= 0.44(14.11) + 0.32(1.76) + 0.28[100-(14.11 + 1.76)] = 30.328

10. $M_s = M_d (1- B_{ws}) + 18 B_{ws}$ = (30.328)*(1- .20206217)+18(.20206217) = 27.837

11. $V_s = 85.49 * C_p * \sqrt{\Delta P} * \sqrt{[T_s / (M_s * P_s)]}$
= 85.49*(0.84)*(1.063030406)*√(600.85 /(27.83677751)(29.764)) = 65.01

12. $Q_a = V_s * A_s * 60$ =(65.00797457)(95.033)(60) = 370,674

13. $Q_s = Q_a * (528/T_s)*(P_s/29.92)$ = (370674.1709)*(528/ 600.85)*(29.764 /29.92) = 324,033

14. $Q_{std} = Q_a (1- B_{ws}) * (528/T_s)*(P_s/29.92)$ = (370674.1709)(1- .2023)*(528/600.85)*(29.764 /29.92) = 258,482

15. $C_s = 0.01543* (M_n/ V_{mstd})$ = 0.01543*(39.2 / 110.4516) = .0055

21. $PMR = C_s * Q_{std} (60/7000)$ = (.005476209)*(258 482)*(60/7000) = 12.13

22. $V_n = T_s/P_s*\{(0.002669)\sqrt{V_{lc}} + (V_m * Y * P_m)/T_m)\}$
= (600.85 / 29.764)*{(0.002669)(√594.2)+(114.239)(1.01)(29.941939)/(551.75)} = 158.4155

23. $C_a = 0.01543* (M_n/ V_n)$ = 0.01543*(39.2 / 158.4154863) = .0038

24. $I = V_n 100/(60*\Theta*V_s*A_n)$ = (158.4154863)100 / (60)(150)(65.00797457)(.000276117) = 98.06

Calculation of Standard Sample Volume

1. Calculation of Sample Flow Rates Corrected to a Dry Basis:

$$S_c = S_u\left(\frac{BP-PW}{760}\right)\left(\frac{293}{273+t}\right)$$

where:

Sc = Corrected (dry standard) sampling flow rate, L/min
Su = Uncorrected sampling flow rte, L/min
BP = Barometric pressure at time of sampling, mm Hg
PW = Saturated partial pressure of water vapor, mm Hg at t
t = Ambient temperature at time of sampling, ° C

BP = 755.904

Client:	Hovensa
Location:	St. Croix, US Virgin Islands
Sampling Site:	Fluid Catalytic Cracking Unit (FCCU)
Sampling Date:	06/15/11

Description	*Run #*	Su, uncorrected flow rate, L/min	PW mm Hg[1]	Ambient Temperature, degrees C	Sc, corrected sampling flow rate, L/min	Length of Run, minutes	Total Sample Volume, Liters
	One-A	0.5008	30.0	28.89	0.4642	120	55.71
	One-B	0.5026	30.0	28.89	0.4659	120	55.91
	Two-A	0.4998	25.2	26.11	0.4707	120	56.48
	Two-B	0.4985	25.2	26.11	0.4695	120	56.34
	Three-A	0.5016	30.0	28.89	0.4650	120	55.80
	Three-B	0.4967	30.0	28.89	0.4604	120	55.25

BP (mm Hg) = BP (in. Hg x 25.4)
°C =0.556*(°F-32)
[1]Vapor Pressure of Liquid Water from 0 to 100o C-Table 3-5, page 3-45, *Perry's Chemical Engineers' Handbook Sixth Edition*

Calculation of Standard Sample Volume

Client: Hovensa

Location: St. Croix, US Virgin Islands

Sampling Site: Fluid Catalytic Cracking Unit (FCCU)

Sampling Date: 06/15/11 **Barometric Pressure:** 29.76

1. *Calculation of Sample Flow Rates Corrected to a Dry Basis:*

$$S_c = S_u\left(\frac{BP-PW}{760}\right)\left(\frac{293}{273+t}\right)$$

where:

Sc = Corrected (dry standard) sampling flow rate, L/min

Su = Uncorrected sampling flow rte, L/min

BP = Barometric pressure at time of sampling, mm Hg BP = 755.904

PW = Saturated partial pressure of water vapor, mm Hg at t

t = Ambient temperature at time of sampling, °C

Description	Run #	Su, uncorrected flow rate, L/min	PW mm Hg[1]	Ambient Temperature, degrees C	Sc, corrected sampling flow rate, L/min	Length of Run, minutes	Total Sample Volume, Liters
	One-A	0.5008	30.0	28.89	0.4642	120	55.71
	One-B	0.5026	30.0	28.89	0.4659	120	55.91
	Two-A	0.4998	25.2	26.11	0.4707	120	56.48
	Two-B	0.4985	25.2	26.11	0.4695	120	56.34
	Three-A	0.5016	30.0	28.89	0.4650	120	55.80
	Three-B	0.4967	30.0	28.89	0.4604	120	55.25

BP (mm Hg) = BP (in. Hg x 25.4)

°C =0.556*(°F-32)

[1]Vapor Pressure of Liquid Water from 0 to 100o C-Table 3-5, page 3-45, *Perry's Chemical Engineers' Handbook Sixth Edition*

APPENDIX I

EPA ICR DOCUMENTS

Form Approved 03/28/2011
OMB Control No. 2060-0657
Approval Expires 03/31/2014

PETROLEUM REFINERY EMISSIONS INFORMATION COLLECTION

Part VIII. Test Procedures, Methods and Reporting Requirements for the Information Collection Request for Petroleum Refineries

This document provides an overview of approved methods, target pollutants and units of measure, and reporting requirements for petroleum refineries. All recipients must complete and submit test results by August 31, 2011. The document is organized as follows:

1.0 Testing Procedures and Methods

2.0 How to Report Data

3.0 How to Submit Data

4.0 Contact Information for Questions on Test Plan and Reporting

1.0 Testing Procedures and Methods

The EPA requires emissions and other test data for several pollutants, including specific hazardous air pollutants (HAP), criteria pollutants, and potential surrogate groups. If EPA is requesting that you complete emissions testing, the cover letter of this packet (CAA section 114 letter) will include a list of emissions sources selected for testing at your refinery. For each petroleum refinery emissions source listed in your Section 114 letter, you must perform an emissions test for some combination of pollutants (*i.e.*, simultaneous or overlapping measurements per group) and diluents according to the test protocols presented in Sections 1.1 through 1.4 of this section.

Please refer to the ICR website (https://refineryicr.rti.org) for additional testing information. Please note that you do not have to submit a test plan to EPA for approval prior to testing; however, we recommend that you prepare a test plan for your own use to assist in the planning and to ensure that you address all of the testing and reporting requirements. Please note that you also must report your process and emissions testing data using the EPA Electronic Reporting Tool (ERT), where applicable. The ERT requires you to report most elements of a test plan. You are directed to the ERT (http://www.epa.gov/ttn/chief/ert/ert_tool.html) for a more complete and interactive description of these test plan elements.

You must follow all of the procedures as specified in the test methods, including the quality assurance and quality control measures, and document the results in the ERT and in any test report provided to EPA. For this program, you need not obtain audit materials from your state or local agency or from EPA. You may apply any third party audit materials you have on hand and document the results, but you are not required to do so.

You may have submitted test data for some of these pollutants already. If you have conducted any of the requested groups of tests (*i.e.*, any complete set of tests required to be conducted

simultaneously as described in Footnote 2 to Table 1.1) in the past 5 years and reported the data in Part IV of this ICR, you are not required to do additional testing for those pollutants.

1.1 Stack Test Methods

The following emissions sources must follow the stack test method procedures described in this section:

- Fluid catalytic cracking unit
- Thermal catalytic cracking unit
- Fluid coking unit
- Delayed coking unit
- Catalytic hydrocracking unit
- Hydrogen production unit
- Asphalt blowing still
- Sulfur recovery unit

For process data that you record during testing, make clear, using the Notes section of the ERT or spreadsheet, the correlation between emissions measurements and process data (*e.g.*, identify Method 23, run 1 for the associated process data on the process data details tab of the ERT).

In addition to the run-by-run process data recorded during testing, you should also collect and report relevant process data that is available from installed process monitors or recordkeeping during a 30-day period that includes the days of emissions testing and fuel analysis. Relevant process data includes parameters such as: total heat input; material description, composition, and feed rate; coke burn-off rate; emissions control devices in use during the test; control device operating or monitoring parameters (including, as appropriate to the control device, flue gas flow rate, pressure drop, scrubber liquor pH, scrubber liquor flow rate, sorbent type and sorbent injection rate, primary and secondary voltage and current, temperature); process parameters (such as type of crude, oxygen concentration, temperature); and any pollution prevention or other hazardous air pollutant emission reduction approaches being implemented during the test program. You should report the above process data as daily averages in the Process Data section of the Testing Tool; you can download this spreadsheet from the ICR website (https://refineryicr.rti.org).

The owner/operator of the petroleum refinery must certify that the unit tested was operating in a normal and representative manner during the performance test. The owner/operator must also certify that it operated the pollution control equipment, if any, on the unit tested in accordance with manufacturers' specifications and requirements for proper operation during the emissions testing.

1.1.1 Sample Location and Gas Composition Analysis Methods

You must use U.S. EPA Method 1 of Appendix A-1 to 40 CFR Part 60 to select the locations and number of traverse points for sampling for the tests in this section. See http://www.epa.gov/ttn/emc/methods/method1.html for a copy of the method and guidance information for sampling situations not meeting Method 1 criteria.

For analysis of flue gas composition, including oxygen concentration, you must use U.S. EPA Method 3A or 3B of Appendix A-2 to 40 CFR Part 60. See http://www.epa.gov/ttn/emc/methods/method3a.html for Method 3A or http://www.epa.gov/ttn/emc/methods/method3b.html for Method 3B information.

1.1.2 Emissions Measurement Methods

Table 1.1 summarizes the testing required to be performed for each type of process unit. Where indicated in the tables, you must conduct the tests for the indicated pollutants simultaneously for your process unit. If the table does not indicate simultaneous sampling is required for multiple pollutants, you may still choose to do so. For example, if you are asked to test your fluid catalytic cracking unit, you may conduct four separate sets of tests, one set that includes all pollutants indicated with an "a", another set that includes all pollutants marked with a "b," etc., or you may choose to conduct all the testing at the same time (if possible). For situations where simultaneous sampling may not be possible due to sampling port or duct diameter constraints, you may conduct series of tests with simultaneous sampling of pollutants indicated by the same letter and number (e.g., test for all "a1" pollutants for one set of test runs, then test for all "a2" pollutants, and so on). If you have a similar process unit at a different facility that is more amenable to testing, you may request to have the alternative unit tested. Please contact Brenda Shine [see Section 4.0 of this part (Part VIII)] with your recommended solution for approval.

Table 1.2 presents a list of the test methods to use for completing the tests required in Table 1.1. Tables 1.3 through 1.5 provide listings of target analytes for volatile and semi-volatile organic HAP and aldehyde test methods. Table 1.6 provides a listing of target analytes for C1 through C5 hydrocarbons. For copies of the U.S. EPA test methods, continuous emissions monitoring systems (CEMS) performance specifications, and additional information, please refer to EPA's Emission Measurement Center website, http://www.epa.gov/ttn/emc/, and EPA's Hazardous Waste website, http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm, as appropriate. If you would like to use a method not on this list, please contact EPA for approval of an alternative method. Please see Section 4.0 of this document for a list of persons to contact with questions regarding test methods and reporting.

Report all pollutant emission data as indicated in Table 1.2. Report the results of your emissions tests according to the directions provided in Section 2.0 of this enclosure.

Unless otherwise specified, each pollutant emissions test should consist of at least three test runs for the sampling duration and/or volume indicated for each specified unit or operation. You should collect emissions samples for the identified pollutants downstream of the last relevant emissions control device (*i.e.*, stack or other point representing the composition of the flue gases at the exit to the atmosphere), unless otherwise indicated.

You must keep the following records for 3 years:

- Documentation that each emissions test was conducted in accordance with the enclosed sampling protocol; and
- The results of each emissions test.

Table 1.1: Required Stack Testing Matrix for Process Units by Process Type

Pollutant[1]	Process Unit						
	Delayed Coking[2]	Fluid Catalytic Cracking, Thermal Catalytic Cracking, Fluid Coking, Catalytic Hydrocracking[2]	Catalytic Reforming		Hydrogen Production[2]	Asphalt Blowing[2]	Sulfur Recovery[2]
			Purge Vent(s)[2,3]	Coke Burn Vent[2,3]			
Speciated Volatile Organic HAP	a1	a1	a1	a	a1	a1	a1
Speciated Semi-volatile Organic HAP	a2	a2	a2		a2	a2	a2
Aldehydes	a1	a1	a1		a1	a1	a1
Total hydrocarbons (THC)	a3	a3	a3		a3	a3	a3
Methane and ethane	a3	a3	a3		a3		a3
C1 through C5 hydrocarbons						a3	
Carbon Monoxide (CO)	a3	a3	a3		a3	a3	a3
Dioxins and Furans (D/F), Polychlorinated biphenyls (PCB)		b		b			
Hydrogen chloride (HCl), chlorine gas (Cl_2), hydrogen fluoride (HF), and hydrogen cyanide (HCN)	c1	e		e			
Hydrogen sulfide (H_2S), carbonyl sulfide (COS), and carbon disulfide (CS_2)	c2					f	f
Total reduced sulfur compounds (TRS)	c2					f	f
Mercury (Hg)	d2	d2		d2			
Hexavalent chromium (Cr^{+6})		d3[4]					
Other Metals	d1	d1		d1			
PM/$PM_{2.5}$ (filterable)	d1	d1		d1			
$PM_{2.5}$ (condensable)	d1	d1		d1			
Ammonia (NH_3)		d1[4]					
Oxides of nitrogen (NO_X)	d4	d4		d4	g	g	
Sulfur dioxide (SO_2)	d4	d4		d4	g	g	
Gas flow rate	a, b, c, d	a, b, d, e	a, b, d, e		a, g	a, f, g	a, f
Oxygen (O_2) and Carbon dioxide (CO_2)	a, b, c, d	a, b, d, e	a, b, d, e		a, g	a, f, g	a, f
Moisture	a, b, c, d	a, b, d, e	a, b, d, e		a, g	a, f, g	a, f

[1] Three runs per test, unless otherwise noted

[2] For each process unit, conduct simultaneous sampling for pollutants marked with same letter. If an adequate number of sampling ports are not available to do all tests at the same time, the pollutant tests can be staggered according to the number. Simultaneous sampling for pollutants marked with same letter and number are required. That is, if organic sampling ("a" test series) is required, simultaneously sample for all "a" series pollutants if possible, but at a minimum, simultaneously sample for all "a1" pollutants, then simultaneously sample for all "a2" pollutants, and so on.

[3] Catalytic reforming purge vents include all atmospheric vents associated with catalyst regeneration other than the coke burn-off vent during the coke burn-off cycle. Catalytic reforming purge vents do not include gas streams directed to a fuel gas system, a process heater or boiler, or a flare. Catalytic reforming purge vents include the atmospheric vents associated with initial

depressurization and purging (including vacuum system exhausts, if used), catalyst rejuvenation, and reduction or activation purging. These vents differ between different reforming units and may use the same discharge vent used during the coke burn-off cycle, in which case this vent would also require testing for organics. If you have additional questions regarding what is or is not considered a purge vent, contact Brenda Shine (contact information provided in Section 4.0 of this Part VIII).

[4] For fluid catalytic cracking units and fluid coking units only

Table 1.2: Summary of Test Methods and Alternative Methods

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
Speciated Volatile Organic HAP[2]	U.S. EPA Method 18. Use a minimum sample time of 1 hour per run.		lb/hr and µg/dscm
Speciated Semi-volatile Organic HAP[3]	SW-846 Method 0010. Collect at least 4 cubic meters per each of three test runs. Use SW-846 Method 8270C or D for the analytical finish.		lb/hr and µg/dscm
Aldehydes[4]	SW-846 Method 0011 with SW-846 Method 8315A. Collect a minimum volume of 1.3 cubic meters	U.S. EPA Method 320. Use a minimum test run time of 2 hours. All compounds must be validated according to Section 13.0 at a concentration within 2-5 times the measured emission concentration or nominally 1 ppm.	lb/hr and µg/dscm
THC	U.S. EPA Method 25A. Use a minimum sampling time of 1 hour per run. Calibrate the measuring instrument with propane.	You may calibrate the measuring instrument with a mixture representing the organic compounds being emitted. Provide the chemical make-up and response factors for the alternative standards; report the results as the alternative organic mixture and as propane equivalent concentrations.	lb/hr and ppmvd as propane
Methane and ethane	U.S. EPA Method 18. Use a minimum sample time of 1 hour per run.	U.S. EPA Method 320. All compounds must be validated according to Section 13.0.	lb/hr and ppmvd
C1 through C5 hydrocarbons[5]	U.S. EPA Method 18. Use a minimum sample time of 1 hour per run.	U.S. EPA Method 320. All compounds must be validated according to Section 13.0.	lb/hr and ppmvd
CO[6]	U.S. EPA Method 10 or 10B. Collect a minimum volume of 60 liters over a minimum sample time of 1 hour per run.	None	lb/hr and ppmvd
D/F, PCB[7]	U.S. EPA Method 23. Collect a minimum volume of 3 cubic meters. Use high resolution GC/MS for the analytical finish.	None	lb/hr and pg/dscm
HCl, Cl_2, and HF	U.S. EPA Method 26A. Collect a minimum volume of 2 cubic meters.	U.S. EPA Method 26 or U.S. EPA Method 320 (excluding Cl_2) if there are no entrained water droplets in the emissions stream. All compounds must be validated according to Section 13.0.	lb/hr and mg/dscm

Table 1.2: Summary of Test Methods and Alternative Methods (cont.)

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
HCN	U.S. EPA Other Test Method 29. Collect a nominal volume of 0.9 cubic meters.	U.S. EPA Method 320 if there are no entrained water droplets in the emissions stream. All compounds must be validated according to Section 13.0.	lb/hr and µg/dscm
Hg	ASTM D6784-02 (Ontario-hydro method). Collect a maximum volume of 2.5 cubic meters.		lb/hr and µg/dscm as oxidized mercury lb/hr and µg/dscm as elemental mercury
Hexavalent Chromium (Cr^{+6})	SW-846 Method 0061. Collect a minimum sample volume of 3 cubic meters per run (or the maximum sample volume possible while maintaining the pH of first impinger solution above 8.5 if less than 3 cubic meters can be collected) and use a sample preconcentrator according to §4.4 and 4.5.	None	lb/hr and µg/dscm
Metals[8]	U.S. EPA Method 29. Collect a minimum volume of 3 cubic meters per run. Use ICAP/MS or GFAAS for the analytical finish. For stacks without entrained water droplets, determine filterable PM emissions according to §8.3.1.1 with a filter temperature of 320°F ± 25°F. For stacks with entrained water droplets, do not determine filterable PM with Method 29 (see $PM/PM_{2.5}$ below).	For stacks without entrained water droplets, you may opt to conduct a separate EPA Method 5 or 5F test with a filter temperature of 320°F ± 25°F in lieu of measuring PM with the Method 29 train (see $PM/PM_{2.5}$ below).	lb/hr and mg/dscm
$PM/PM_{2.5}$ (filterable plus condensable)[9] from stacks without entrained water droplets (*e.g.*, not from units with wet scrubbers)[9]	U.S. EPA Method 201A and Method 202. Collect a minimum volume of 2 cubic meters per run.	None	lb/hr and gr/dscf lb/hr and gr/dscf (if use Method 5F, report both total filterable catch and non-sulfate PM)

Table 1.2: Summary of Test Methods and Alternative Methods (cont.)

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
$PM/PM_{2.5}$ (filterable plus condensable)[9] from stacks with entrained water droplets	U.S. EPA Method 5 with a filter temperature of 320°F ± 25°F and Method 202. Collect a minimum volume of 2 cubic meters per run.		lb/hr and gr/dscf
AND	AND		AND
Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) from wet scrubber recirculation liquid[9]	ASTM D5907	For TDS and TSS, Standard Methods of the Examination of Water and Wastewater Method 2540B for solids in scrubber recirculation liquid (as fed to the wet scrubber)	mg solids per liter of scrubber recirculation liquid[10]
NH_3	South Coast AQMD Method 207.1	U.S. EPA Conditional Test Method 027 (CTM-027) or U.S. EPA Method 320	lb/hr and ppmvd
NO_X [11]	U.S. EPA Method 7E; 2-hr sample time	U.S. EPA Method 7	lb/hr and ppmvd
SO_2 [11]	U.S. EPA Method 6C; 2-hr sample time	U.S. EPA Method 6	lb/hr and ppmvd
H_2S, COS, CS_2	U.S. EPA Method 15. Per method, a minimum of 16 individual samples during a period of 3 to 6 hours, per run	U.S. EPA Method 18	lb/hr and ppmvd
TRS[12]	U.S. EPA Method 15A or 16A; 3-hr sample time per run; (one 3-hr sample per run or three 1-hr samples per run)	U.S. EPA Method 16B combined with the analysis procedures of U.S. EPA Method 15.	ppmvd
Gas flow rate	U.S. EPA Method 2	U.S. EPA Method 2A, 2B, 2C, 2D, 2F, or 2G, as appropriate	acfm, scfm, and dscfm
O_2/CO_2	U.S. EPA Method 3A	U.S. EPA Method 3B	percent volume, dry
Moisture	U.S. EPA Method 4	None	percent volume

[1] lb/hr = pounds per hour; µg/dscm = micrograms per dry standard cubic meter; ppmvd = parts per million by volume, dry basis; pg/dscm = picograms per dry standard cubic meter; mg/dscm = milligrams per dry standard cubic meter; gr/dscf = grains per dry standard cubic foot; acfm = actual cubic feet per minute; scfm = standard cubic feet per minute; dscfm = dry standard cubic feet per minute.

[2] Target analytes are given in Table 1.3; test runs must occur during the test runs for speciated semi-volatile organic HAP (*i.e.*, one volatile organic HAP run conducted per each semi-volatile organic HAP run). Method 0031 allows flexibility in the sample rate and sample time per trap pair to address sampling conditions; *e.g.*, lower sample rate and total volume collected per trap pair under conditions when less than maximum detection ability is needed. Additional trap pairs may be taken (*e.g.*, fourth pair) and retained as back/up archive set in case of breakage or other loss.

[3] Target analytes are given in Table 1.4; use either SW-846 Method 8270C or 8270D for the analysis of Method 0010 samples. Follow SW-846 Method 3542 for Method 0010 sample train components extraction and preparation for analyses. This procedure will result in three separate sample fractions for analyses – the front half (filter and front half rinse), the back half (XAD-2 and back half rinse), and condensate (first impinger and impinger rinse). You may combine the three analytical fractions collected in the Method 0010 sampling train and analyze as one sample. If you choose this option rather than analyzing the fractions separately, you must track the various fractional extraction and condensate volumes carefully in order

to calculate the relative in-stack concentrations correctly. You may use acetone followed by MeCl for the solvent rinse in lieu of the 50/50 MeCl/MeOH rinse (*i.e.*, no liquid/liquid extraction). In addition, the analytical finish for either method should also employ high resolution gas chromatography and either low resolution or high resolution mass spectrometry with selective ion monitoring (SIM) specifically for targeted polycyclic aromatic hydrocarbons (PAH).

[4] Target analytes are given in Table 1.5; test runs must occur during the test runs for speciated volatile and speciated semi-volatile organic HAP.

[5] Target analytes for C1 through C5 hydrocarbons are given in Table 1.6; test runs must occur during the test runs for speciated volatile and speciated semi-volatile organic HAP.

[6] If a unit has a certified CEMS installed for CO, you may report hourly averages from 30 days of CEMS data for the unit in lieu of conducting a CO stack test (same 30 days for which process data are provided). In order to correlate these emissions with other stack test emissions, a portion of the CEMS data submitted should contain the emissions data collected during performance of the other requested stack tests and hourly O_2 concentrations should also be provided, if continuously monitored. The CEMS must meet the requirements of Performance Specification 4 and 40 CFR 60.13 or the CEMS accuracy and ongoing QA/QC requirements of 40 CFR part 60, subpart J or Ja. Also provide the data of the most recent CEMS accuracy certification.

[7] Just the 12 "dioxin-like" PCB congeners (IUPAC Numbers PCB-77, -81, -105, -114, -118, -123, -126, -156, -157, -167, -169, and -189)

[8] Metals to be tested include antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se).

[9] Conduct either the test for PM/$PM_{2.5}$ (filterable) from stacks without entrained water droplets or the PM/$PM_{2.5}$ (filterable) from stacks with entrained water droplets (with the TDS and TSS analysis), whichever is appropriate for your stack.

[10] Also report scrubber recirculation liquid flow rate in liters/min.

[11] If a unit has a certified CEMS installed for NO_X and/or SO_2, you may report hourly averages from 30 days of CEMS data for the unit in lieu of conducting a NO_X and/or SO_2 stack test. Also provide hourly O_2 concentrations for the 30 days of CEMS data. In order to correlate these emissions with other stack test emissions, a portion of the CEMS data submitted should contain the emissions data collected during performance of the other requested stack tests. The CEMS must meet the requirements of Performance Specification 2 and 40 CFR 60.13 or the CEMS accuracy and ongoing QA/QC requirements of 40 CFR part 60, subpart J or Ja. Also provide the data of the most recent CEMS accuracy certification.

[12] If a unit has a certified CEMS installed for TRS, you may report hourly averages from 30 days of CEMS data for the unit in lieu of conducting a TRS stack test. In order to correlate these emissions with other stack test emissions, a portion of the CEMS data submitted should contain the emissions data collected during performance of the other requested stack tests. The CEMS must meet the requirements of Performance Specification 5 and 40 CFR 60.13 or the CEMS accuracy and ongoing QA/QC requirements of 40 CFR part 60, subpart J or Ja. Also provide the data of the most recent CEMS accuracy certification.

NOTE: Special criteria apply for simultaneous sampling, sampling run time, and sample volumes for the semi-continuous and batch processes related to the delayed coking unit and cyclic and semi-regenerative catalytic reforming units. Sampling should be conducted over the duration of the venting cycle. For vent cycles lasting less than 6 hours, testing over a vent cycle constitutes a single test run. For venting cycles shorter than the specified sampling time (or insufficient to allow collection of the required sample volume), sampling over the duration of the vent cycle shall constitute an acceptable test run (not including continuous catalytic reforming purge vents). If your delayed coking unit venting occurs for less than 20 minutes per cycle, you are not required to test. Please document the procedures used and the venting duration over the most recent 30 day period and submit that documentation in lieu of test reports. For semi-regenerative catalytic reforming units (only one cycle), the anticipated venting cycle should be divided into three roughly equivalent periods, and testing over each period would constitute a single run so that the three test runs would cover the duration of the entire venting event. Generally, you will need to apply U.S. EPA Method 1A in sampling these locations. If the venting cycles for specific catalytic reforming purge vents are very short, contact Brenda Shine (see Section 4.0 of this Part VIII) to see if performing a single test run is acceptable or if, for your unit, this purge vent does not need to be tested. For continuous catalytic reforming units, only small aliquots of catalyst are separated and purged prior to transfer to the regenerator portion at a given time, so

these purges may be very short. For continuous catalytic reforming units, you should sample over numerous catalyst transfer aliquots to obtain a sample for 1 hour of active atmospheric purging as a single test run. Contact the appropriate EPA representatives listed in Section 4.0 of this Part VIII to request a variance to 1 hour sampling requirement if the catalyst transfer cycle is such that 1 hour of active atmospheric purging would take longer than 8 hours to obtain.

Table 1.3: Target Volatile Analytes

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[2]	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	2,2,4 Trimethylpentane[2]	540-84-1
Hexane	110-54-3	Xylenes (mixed isomers)	1330-20-7
Methanol	67-56-1		

Table 1.4: Target Semi-volatile Analytes

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	α,α-Dimethylphenethylamine	122-09-8
Benzidine[1]	92-87-5	2,4-Dimethylphenol	105-67-9
Benz[a]anthracene	56-55-3	Fluoranthene	206-44-0
Benzo[b]fluoranthene	205-99-2	Fluorene	86-73-7
Benzo[k]fluoranthene	207-08-9	Indeno(1,2,3-cd)pyrene	193-39-5
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[2]	192-97-2	2-Methylnaphthalene	91-57-6
Biphenyl[2]	92-52-4	Naphthalene	91-20-3
Cresol (mixed isomers)	1319-77-3	Perylene[2]	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

[1] Notes non-reproducible chromatographic performance in SW-846 Method 8270D

[2] Not specifically listed as an analyte for SW-846 Method 8270D

Table 1.5: Aldehydes

Compound	CAS Number
Formaldehyde	100-41-4
Acetaldehyde	106-99-0
Propanal	123-38-6

Table 1.6: C1 through C5 Hydrocarbons

Description	Compound	CAS No.
C1 Alkanes	Methane	74-82-8
C2 Alkanes	Ethane	74-84-0
C3 Alkanes	Propane	74-98-6
C4 Alkanes	n-Butane	106-97-8
	Isobutane	75-28-5
C5 Alkanes	n-Pentane	109-66-0
	2-Methylbutane	78-78-4
	Cyclopentane	287-92-3
C2 Olefins	Ethylene	74-85-1
C2 Alkynes	Acetylene	74-86-2
C3 Olefins	Propylene	115-07-1
C4 Olefins	1-Butene	106-98-9
	2-Butene	107-01-7
	Isobutene	115-11-7
C5 Olefins	1-Pentene	109-67-1
	Cis-2-pentene	627-20-3
	Trans-2-pentene	646-04-8
	2-Methyl-1-butene	563-46-2
	3-Methyl-1-butene	563-45-1
	2-Methyl-2-butene	513-35-9
	Cylcopentene	142-29-0
C3 Alkadienes	Propadiene	463-49-0
C4 Alkadienes	1,2-Butadiene	590-19-2
	1,3-Butadiene	106-99-0
C5 Alkadienes	1,2-Pentadiene	591-95-7
	1-cis-3-Pentadiene	1574-41-0
	1-trans-3-Pentadiene	2004-70-8
	1,4-Pentadiene	591-93-5
	2,3-Pentadiene	591-96-8
	3-Methyl-1,2-butadiene	598-25-4
	2-Methyl-1,3-butadiene	78-79-5
	Cyclopentadiene	542-92-7

1.2 Fuel Gas Analysis Methods

Table 1.7 describes the tests and procedures required for the analysis of your fuel gas. Triplicate grab samples are to be taken for each mix drum associated with each fuel gas system unless otherwise specified. In addition to providing the results of the tests indicated in this section, you should also indicate whether each fuel gas system you tested includes gas from a coking unit.

You will find copies of EPA methods at http://www.epa.gov/ttn/emc/tmethods.html. You can find instructions on how to obtain ASTM methods at http://www.astm.org/.

Table 1.7: Summary of Test Methods and Alternative Methods for Organic Compounds, Reduced Sulfur, and Other Parameters for Refinery Fuel Gas

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
C1 through C5 hydrocarbons plus benzene[2]	ASTM D1945-03. Use a minimum sample time of 2 hours per run. (One sample per run.)	U.S. EPA Method 18; U.S. EPA Method 320; ASTM D1946-90; GPA 2261-00; ASTM/UOP539-97	lb/hr and ppmvd
H_2S, COS, CS_2 [3]	U.S. EPA Method 15. Per method, a minimum of 16 individual samples during a period of 3 to 6 hours, per run.		lb/hr and ppmvd
TRS	U.S. EPA Method 15A or 16A; 2-hr sample time per run; (one 2-hr sample per run or three 40-minute samples per run)	U.S. EPA Method 16B combined with the analysis procedures U.S. EPA Method 15.	ppmvd
Inorganics/other[4]	ASTM D1945-03	ASTM D1946-90; GPA 2261-00; ASTM/UOP 539-97	
Higher Heating Value	Any of the following methods, as appropriate: ASTM D240-02 (Reapproved 2007), Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter; ASTM D1826-94 (Reapproved 2003), Standard Test Method for Calorific (Heating) Value of Gases in Natural Gas Range by Continuous Recording Calorimeter; ASTM D3588-98 (Reapproved 2003), Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels ASTM D4809-06, Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method) ASTM D4891-89 (Reapproved 2006), Standard Test Method for Heating Value of Gases in Natural Gas Range by Stoichiometric Combustion Gas Processors Association Standard 2172-09, Calculation of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer Calculated based on detailed gas compositional analysis using: ASTM D1945-03, Standard Method for Analysis of Natural Gas by Gas Chromatography; ASTM D1946-90 (Reapproved 2006), Standard Method for Analysis of Reformed Gas by Gas Chromatography; GPA 2261-00, Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography; or ASTM/UOP 539-97, Refinery Gas Analysis by Gas Chromatography Any of the methods specified in section 2.2.7 of Appendix D to part 75		MMBtu/scf

Table 1.7: Summary of Test Methods and Alternative Methods for Organic Compounds, Reduced Sulfur, and Other Parameters for Refinery Fuel Gas (cont.)

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
Gas flow rate	ASME MFC-3M, - 4M, -6M, -7M, -11M, -14M, or -18M; or AGA Report No. 11 (Measurement of Natural Gas by Coriolis Meter)	U.S. EPA Method 2, 2A, 2B, 2C, 2D, 2F, or 2G, as appropriate	acfm, scfm, and dscfm
Moisture	U.S. EPA Method 4	None	percent volume

[1] lb/hr = pounds per hour; ppmvd = parts per million by volume, dry basis; MMBtu/scf = million British thermal units per standard cubic foot; acfm = actual cubic feet per minute; scfm = standard cubic feet per minute; dscfm = dry standard cubic feet per minute.

[2] Target analytes are given in Table 1.6, but include benzene (CAS No. 71-43-02) as a specific analyte.

[3] If your fuel gas system has a certified continuous monitoring system (CMS) installed to measure H_2S concentrations, you may report hourly averages from 30 days of data from that CMS in lieu of conducting a H_2S test. In order to correlate these emissions with other emissions tests, a portion of the monitoring data submitted should contain the data collected during performance of the other requested tests. The CMS must meet the requirements of Performance Specification 7 or the accuracy and ongoing QA/QC requirements of 40 CFR part 60, subpart J or Ja.

[4] Target analytes are given in Table 1.8.

Table 1.8: Analytes for "Inorganics/Other" in Fuel or Flare Gas

Compound	CAS No.
Hydrogen	1333-74-0
Carbon monoxide	630-08-0
Carbon dioxide	124-38-9
Nitrogen	7727-37-9
Oxygen	7782-44-7

1.3 Sampling and Analysis Methods for Cooling Water Systems

Collect a sample from each cooling water system return line prior to exposure to air using "Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound Emissions from Water Sources."[a]

Table 1.9 describes the tests and procedures required for the analysis of your cooling water system sample. You will find copies of EPA methods at http://www.epa.gov/ttn/emc/tmethods.html. You can find instructions on how to obtain Standard Methods for the Examination of Water and Wastewater at http://www.standardmethods.org/.

Table 1.9: Summary of Test Methods for Analysis via Texas El Paso Stripping Column

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
Speciated Volatile Organic HAP[2]	Standard Methods 6200 for water U.S. EPA Method TO-15 for stripping air	U.S. EPA Method TO-14A for stripping air	ppmvd in air (as measured) and ppmw in cooling water
Speciated Semi-volatile Organic HAP[3]	Standard Methods 6410 for water U.S. EPA Method TO-13A for stripping air	None	ppmvd in air (as measured) and ppmw in cooling water
Formaldehyde	U.S. EPA Method TO-5 for stripping air.	U.S. EPA Method TO-11A for stripping air	ppmvd in air (as measured) and ppmw in cooling water (back-calculated)
THC	U.S. EPA Method TO-12 for stripping air.	None	ppmvd in air (as measured) and ppmw in cooling water (back-calculated)
CH_4	U.S. EPA Method 18.	U.S. EPA Method 320	ppmvd in air (as measured) and ppmw in cooling water (back-calculated)
HCl, Cl_2	U.S. EPA Method 26	U.S. EPA Method 26A	ppmvd in air (as measured) and ppmw in cooling water (back-calculated)

[1] ppmvd = parts per million by volume, dry basis; ppmw = parts per million by weight

[2] Target analytes are given in Table 1.3.

[3] Target analytes are given in Table 1.4.

[a] "Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound Emissions from Water Sources" Revision Number One, dated January 2003, Sampling Procedures Manual, Appendix P: Cooling Tower Monitoring, prepared by Texas Commission on Environmental Quality, January 31, 2003.

1.4 Sampling and Analysis Methods for Enhanced Biodegradation Units (EBU)

Table 1.10 lists the procedures required for the analysis of your EBU(s). You will find copies of EPA methods at http://www.epa.gov/ttn/emc/tmethods.html and copies of EPA SW-846 methods at http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm. You can find instructions on how to obtain Standard Methods for the Examination of Water and Wastewater at http://www.standardmethods.org/.

1.4.1 Sampling Methods

You should follow the sampling methods described in the EPA document "Handbook for Sampling and Sample Preservation of Water and Wastewater" (EPA-600/4-82-029). Additionally, you should conduct sample collection and preservation in accordance to 40 CFR Part 136, which can be accessed at: http://www.epa.gov/region9/qa/pdfs/40cfr136_03.pdf.

The sample chain-of-custody should also include the volumetric flow (m^3/s), pH, and temperature of each sample. You should include this information with the results of this study.

1.4.2 Sampling Location

Influent: One (1) grab sample of each influent stream to the EBU

EBU: One (1) grab sample within ten (10) feet of each influent location

Effluent: One (1) grab sample of each effluent stream of the EBU

1.4.3 Sampling Times

The sampling and testing events (*e.g.*, well-mixed assessment and F_{bio} determination) should occur at the same time and during normal operating conditions.

Table 1.10: Summary of Analytical Methods and Alternative Methods for Wastewater Treatment Systems

Pollutant	Recommended Method	Alternative Method	Target Reported Units of Measure[1]
Speciated Volatile Organic HAP[2]	SW-846 Method 8260B	Standard Methods 6200	µg/L
Speciated Semi-volatile Organic HAP[3]	SW-846 Method 8270C or D	Standard Methods 6410	µg/L
Aldehydes[4]	SW-846 Method 8315A	Standard Methods 6252	µg/L
Sulfide (as S)	EPA Method 376.1	Standard Methods 4500-S^{2-}	µg/L
BOD5 [5]	EPA Method 405.1	Standard Methods 5210	mg/L
COD [5]	EPA Method 410.1	Standard Methods 5220	mg/L
Well-mixed assessment	Technical Support Document for Evaluation of Thoroughly Mixed Biological Treatment Units, 1998.[6]	None	N/A
Site-specific biodegradation rates	Appendix C to 40 CFR Part 63 – Aerated reactor batch test with oxygen addition (BOX test). Do one test using benzene as the sole substrate and perform a second test using benzene, toluene, xylene, and naphthalene at equal concentrations.	Technical Support Document for the Evaluation of Aerobic Biological Treatment Units with Multiple Mixing Zones.[7]	(F_{bio})

[1] µg/L = micrograms per liter; mg/L = milligrams per liter; F_{bio} = site-specific fraction of organic compounds biodegraded

[2] Target analytes are given in Table 1.3.

[3] Target analytes are given in Table 1.4.

[4] Target analytes are given in Table 1.5.

[5] BOD5 = 5-day biological oxygen demand; COD = chemical oxygen demand.

[6] A copy of this document is located at http://www.epa.gov/ttncaaa1/t3/reports/guidfn.pdf.

[7] A copy of this document is located at http://www.epa.gov/ttn/caaa/t3/reports/mulmix5.pdf.

2.0 How to Report Data

The method for reporting the results of any testing and monitoring requests depend on the type of tests and the type of methods used to complete the test requirements. This section discusses the requirements for reporting the data.

2.1 Reporting stack test data

If you conducted testing using one of the methods listed in Table 2.1 you must report your data using the EPA Electronic Reporting Tool (ERT) Version 3. ERT is a Microsoft® Access database application. Two versions of the ERT application are available. If you are not a registered owner of Microsoft® Access, you can install the runtime version of the ERT Application. Both versions of the ERT are available at http://www.epa.gov/ttn/chief/ert/ert_tool.html. The ERT supports a Microsoft® Excel

spreadsheet application (which is included in the files downloaded with the ERT) to document the collection of the field sampling data.

** After completing the ERT, you will also need to submit an electronic copy of the emission test report (PDF format preferred) using one of the submittal methods described in your Section 114 letter.

Table 2.1: List of Test Methods Supported by ERT

EPA Test Methods (40 CFR parts 60 and 61; EMC website, http://www.epa.gov/ttn/emc/tmethods.html; and SW 846, http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm)
Methods 1 through 4 (testing locations, velocity, moisture, dilution gases)
Method 3A (O_2 and CO_2)
Method 5 (filterable PM)
Method 5B and 5F
Method 6C (SO_2)
Method 7E (NO_X)
Method 10 (CO)
Method 12
Method 13A and 13B
Method 17 (in-stack filterable PM)
Method 23 (PCDD and PCDF)
Method 25A (THC)
Method 26A (HCl and HF)
Method 29 (multiple metals including Hg)
Method 101 (Hg)
Method 101A (Hg)
Method 201A (formerly other test method (OTM) 27, conditional test method (CTM) 40)) (filterable $PM_{2.5}$)
Method 202 (formerly other test method (OTM) 28, conditional test method (CTM) 39)) (condensable PM)
CT Method 39
CT Method 39

At present, only the methods shown in Table 2.1 are supported by the ERT. If you conducted testing using a method not currently supported by the ERT, you must report the results of this test in the Refinery Testing Supplement. The Refinery Testing Supplement can be downloaded from the ICR website (https://refineryicr.rti.org). You must report the results of each test on the appropriately labeled form corresponding to the specific tests requested at your emissions source. If you conducted testing at more than one source at your refinery using methods not currently supported by the ERT, follow the Refinery Testing Supplement instructions on the ICR website (https://refineryicr.rti.org). After completing the Refinery Testing Supplement, you must also submit an electronic copy of the emission test report (PDF format preferred).

As noted in Section 1 of this document, if you have installed a CEMS or CMS on a unit that this ICR asks you to test, you may submit CEMS or CMS data to meet the testing requirement for that specific pollutant. If you have a CO Continuous Emissions Monitoring System (CEMS) that meets Performance Specification 4 (or other specified procedures), a SO_2 and/or NO_X CEMS that meets Performance Specification 2 (or other specified procedures), or a TRS CEMS that meets

Performance Specification 5, installed on the exhaust of your emissions unit, and you used CEMS data to meet CO, SO_2,NO_X, and/or TRS test requirements as noted in the footnotes of specific tables, you must report 30 days of daily averages of qualified CEMS data in a Microsoft® Excel CEMS Template. Similarly, if you have an H_2S continuous monitoring system (CMS) that meets Performance Specification 7, and you used CMS data to meet the H_2S testing requirements as noted in the footnotes of specific tables, you must report 30 days of hourly averages of qualified CMS data in a Microsoft® Excel CMS Template. The 30 operating days for which you provide data can be any 30 consecutive days with at least one hour of qualified CEMS or CMS data between April 1 and August 31, 2011, that includes the days during which you conducted the testing for the other pollutants requested for that process unit by this ICR. The Excel spreadsheet templates are specific to each pollutant and type of emissions source, and they can be downloaded from the ICR website (https://refineryicr.rti.org).

2.2 Required Fields for ERT Reporting

The list of fields within the ERT with notes explaining whether or not the field is required or optional can be found on the ICR website (https://refineryicr.rti.org).

2.3 Calculating and Reporting Values Measured Below Detection Levels

See Appendix A to this Component 4 for guidance on calculating and reporting measurements less than detection levels for emissions data collection (ICR) programs.

3.0 How to Submit Data

As explained in the previous section, where applicable, you must report your data using the ERT. If the ERT does not support a particular pollutant or method, you must report your data using the data reporting tools we provide. When you are ready to submit your data to EPA, use one of three transmittal ways listed below. In order to avoid duplicate data and keep all data for a particular facility together, we request that you submit all of the data requested from your facility in the same way.* To submit data not being entered into the ERT:

- Use the ICR website to upload your files. Detailed directions for uploading your files are provided on the ICR website (https://refineryicr.rti.org).
- E-mail an electronic copy of all requested files to refineryicr@epa.gov.
- Mail a CD or DVD containing an electronic copy of all requested files to the EPA address shown in your Section 114 letter. If no electronic copy is available, mail a hard copy of all requested files to the EPA address shown in your Section 114 letter.

* **Please Note**: If you are submitting Confidential Business Information (CBI), **DO NOT** use one of the methods listed above to submit your CBI. You must mail a separate CD, DVD, or hard copy package containing only the CBI portion of your data to the EPA address shown in your Section 114 letter.

4.0 Contact Information for Questions on Test Plan and Reporting

For questions on how to report data using the ERT, contact:
Ron Myers
U.S. EPA
(919) 541-5407
myers.ron@epa.gov

OR

Barrett Parker
U.S. EPA
(919) 541-5635
parker.barrett@epa.gov

For questions on the test methods, including the use of alternative methods, contact:
Peter Westlin
U.S. EPA
(919) 541-1058
westlin.peter@epa.gov

OR

Robin Segall
U.S. EPA
(919) 541-0893
segall.robin@epa.gov

OR

Jason DeWees
U.S. EPA
(919) 541-9724
dewees.jason@epa.gov

For questions on Component 4, including emissions sources selected for testing and reporting mechanisms other than the ERT, contact:
Brenda Shine
U.S. EPA
(919) 541-3608
shine.brenda@epa.gov

For questions on uploading files, please visit the ICR website (https://refineryicr.rti.org) and use the toll free technical support hotline.

Appendix A

Guidance For Calculating And Reporting Measurements Less Than In-Stack Method Detection Levels For Emissions Data Submitted in Response to Information Collection Request (ICR) Programs

Identify the status of measured values relative to detection levels on the spreadsheet or in the ERT using the following descriptions:

- **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 less than the laboratory's reported detection level(s); or
- **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).

For each reported emissions value, insert the appropriate flag (BDL, DLL, or ADL) in the ***Note*** line of the Microsoft® Excel emission test spreadsheet template or in the ***Comments*** line of the Electronic Reporting Tool (ERT).

When reporting and calculating individual test run data:

- For analytical data reported from the lab as "nondetect" or "below detection level":
  - Include a brief description of the procedures used to determine the analytical detection and in-stack detection levels:
    - In the ***Note*** line of Excel emission test spreadsheet template; or
    - In the ***Comments*** line of Lab Data tab in the Run Data Details in the **ERT**.
  - Describe these procedures completely in a separate attachment including the measurements made, the standards used, and the statistical procedures applied.
  - Calculate in-stack emissions rate for any analytical measurement below detection level using the relevant detection level as the "reported" value.
  - Report the calculated emissions concentration or rate result:
    - As a bracketed "less than" detection level value (*e.g.*, [<0.0105]) in the Excel emission test spreadsheet template and include the appropriate flag in the ***Note*** line; or
    - As a numerical value in the **ERT** with the appropriate general flag in the ***Flag*** column and as a bracketed "less than" detection level value (*e.g.*, [<0.0105]) followed by a space and any specific flag identifier in the ***Comments*** column. The following specific flag identifiers are commonly used by laboratories: B, E, J, Int, R, DPE.
  - Report as numerical values (*i.e.*, no brackets or < symbol) any analytical data measured above the detection level, including any data between the analytical detection level and a laboratory-specific reporting or quantification level (*i.e.*, flag as ADL).
  - Apply these reporting and calculation procedures to measurements made with **Method 23**:

  - Report data in the Excel emission test spreadsheet template for each of the D/F congeners measured with Method 23 below the detection level as [< detection level]
  - Do **not report emissions as zero** as described in the method

- For pollutant measurements composed of multiple components or fractions (*e.g.*, Hg and other metals sampling trains) when the result for the value for any component is measured below the analytical detection level;
  - Calculate in-stack emissions rate or concentrations as outlined above for each component or fraction;
  - Sum the measured and detection level values as outlined above using the in-stack emissions rate or concentrations for all of the components or fractions; and
  - Report the sum of all components or fractions:
    - As a bracketed "less than" detection level value (*e.g.*, [<0.0105]) in the Excel emission test spreadsheet template and include the appropriate flag in the ***Note*** line; or
    - As a numerical value in the **ERT** with the appropriate flag in the ***Comments*** line.
  - Report also the individual component or fraction values for each run if the Excel emission test spreadsheet template or ERT format allows; if not (*i.e.*, the format allows reporting only a single sum value):
    - For the Excel emission test spreadsheet template, next to the sum reported as above, report in the ***Notes*** line the appropriate flag along with the values for the measured or detection level value for each component or fraction as used in the calculations (*e.g.*, 0.036, [<0.069], 1.239, [<0.945] for a four fraction sample)
    - For the **ERT**, next to the sum reported as above, report in the ***Flag*** column the appropriate general flag and in the ***Comments*** column the measured or detection level value for each component or fraction as used in the calculations followed by a space and any specific flag identifier provided by the laboratory (*e.g.*, 0.036, [<0.069] J, 1.239, [<0.945] B for a four fraction sample).

- For measurements conducted using instrumental test methods (*e.g.*, Methods 3A, 6C, 7E, 10, 25A)
  - Record gaseous concentration values **as measured** including negative values and flag as ADL; do not report as BDL
  - Calculate and report in-stack emissions rates using these measured values
  - Include relevant information relative to calibration gas values or other technical qualifiers for measured values in ***Comments*** line in the **ERT**

- When reporting and calculating average emissions rate or concentration for a test when some results are reported as BDL
  - Sum all of the test run values including those indicated as BDL or DLL as reported values
  - Calculate the average emissions rate or concentration (*e.g.*, divide the sum by 3 for a three-run test)

- Report the average emissions rate or concentration average:
  - As a bracketed "less than" detection level value (*e.g.*, [<20.06]) in the Excel emission test spreadsheet template and include the appropriate flag in the ***Note*** line
  - As a numerical value in the **ERT** and include the appropriate flag in the ***Comments*** line.

APPENDIX J

EPA ERT TEST REPORT

Final Test Report
for

Petroleum Refinery Emissions ICR - Site Specific Test Plan for Hovensa LLC

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in this test report are true, accurate, and complete.

Permitted Facility Representative / / **Date**

Name: Bernd Haneke
Title:
Company:
Sign Date:

I have reviewed all testing details and results in this test report and hereby certify that the test report is authentic and accurate.

Testing Company Representative / /

Name:
Title:
Company:
Sign Date:

Facility Information:
Hovensa LLC
1 Estate Hope
Christiansted US 00820-5652
Contact: Bernd Haneke
Phone: 340-692-7427
Fax:
Email: bhaneke@hovensa.com

Testing Company:
ENTEC Services, Inc.
30 Monroe Drive
Pelham AL 35124
Contact: Charles Duncan
Phone: 205-358-1011
Fax: 205-358-1036
Email: cduncan@entecservices.com

Industry/SCC/NAIS 324110 **AFS #:** VI6A1530 **FRS #:** 110000307864

Air Permit Number: STX-TV-006-08 **Permitted Source ID/Name:**

Permitted Maximum Process	Max. Normal Operation Process	Target Process Test
165,000 barrell/day	110,000 - 130,000 barrell/day	110,000 - 120,000

SCC / 30600201 Industrial Processes - Petroleum Industry - Catalytic Cracking Units - Fluid Catalytic Cracking Unit

The following state and federal regulations that apply to the proposed testing:

Regulation Description	Compound	Limit	Unit
N/A. All guidelines for testing were included in the ICR guidance package, issued by EPA.		0	

Description of the source (including control equipment). Please see the attachments for source or

The FCCU, which is located in Area V of the refinery, converts heavy oils into wide boiling range material from which lower molecular weight products such as naphtha and middle distillates are fractionated by distillation. The feedstock is generally a heavy distillate or gas oil with a boiling range of about 500 to 1,000 °F. The FCCU consists of a catalyst section and a fractionating section which operate as an integrated processing unit. The catalyst section consists of a reactor, regenerator, standpipes, and risers. The catalyst is in the form of very small spherical particles that behave as a fluid when aerated. The reactor effluent is separated by distillation in the fractionator into recycle oil, middle distillate, naphtha, liquefied petroleum gas (LPG), and off-gas.

A low sulfur content feedstock (= 0.6 weight percent) and a high efficiency venturi wet gas scrubber (WGS) is used to reduce sulfur dioxide (SO2) emissions from the FCCU complex. Oxides of nitrogen (NOx) emissions from the FCCU complex are controlled using temperature controls and by minimizing the oxidation conditions. Particulate matter (PM) emissions are controlled by the high efficiency scrubber. Carbon monoxide (CO) emissions are reduced using a high temperature regenerator. Volatile organic compounds (VOCs) are reduced using combustion controls (e.g., temperature and excess air).

Sampling Location Information:

Location	Round Duct Diam.	Rect. Duct Length	Rect. Duct Width	Equiv. Diam	Distance from upstream dist.	Distance from downstream dist.	Number of Traverse Ports	Min.Travers Points
FCCU	132	0	0	0	188	751.75	4	20

process flow diagram:

Test Parameter Information:

Location	Target Parameter	Test Method	Number of	Test Run Duration	Sample Points	Comments
FCCU	Naphthalene**	M0010	3	180	0	
FCCU	2-Methylnaphthalene	M0010	3	180	0	
FCCU	Acenaphthylene**	M0010	3	180	0	
FCCU	Acenaphthene**	M0010	3	180	0	
FCCU	Fluorene**	M0010	3	180	0	
FCCU	Phenanthrene**	M0010	3	180	0	
FCCU	Anthracene**	M0010	3	180	0	
FCCU	Fluoranthene**	M0010	3	180	0	
FCCU	Pyrene**	M0010	3	180	0	
FCCU	Benzo(a)Anthracene*	M0010	3	180	0	
FCCU	Chrysene*	M0010	3	180	0	
FCCU	Benzo(b)Fluoranthene*	M0010	3	180	0	
FCCU	Benzo(k)Fluoranthene*	M0010	3	180	0	
FCCU	Benzo(e)Pyrene	M0010	3	180	0	
FCCU	Benzo(a)Pyrene*	M0010	3	180	0	
FCCU	Perylene	M0010	3	180	0	
FCCU	Indeno(1,2,3-cd)Pyrene*	M0010	3	180	0	
FCCU	Dibenzo(a,h)Anthracene*	M0010	3	180	0	
FCCU	Benzo(ghi)Perylene**	M0010	3	180	0	
FCCU	Carbon Monoxide	Method 10	3	60	0	
FCCU	Formaldehyde	Method 0011	3	60	0	
FCCU	2,3,7,8-TCDD	Method 23	3	180	0	
FCCU	1,2,3,7,8-PeCDD	Method 23	3	180	0	
FCCU	1,2,3,4,7,8-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,6,7,8-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,7,8,9-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,4,6,7,8-HpCDD	Method 23	3	180	0	
FCCU	OCDD	Method 23	3	180	0	
FCCU	2,3,7,8-TCDF	Method 23	3	180	0	
FCCU	1,2,3,7,8-PeCDF	Method 23	3	180	0	
FCCU	2,3,4,7,8-PeCDF	Method 23	3	180	0	
FCCU	1,2,3,4,7,8-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,6,7,8-HxCDF	Method 23	3	180	0	
FCCU	2,3,4,6,7,8-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,7,8,9-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,4,6,7,8-HpCDF	Method 23	3	180	0	
FCCU	1,2,3,4,7,8,9-HpCDF	Method 23	3	180	0	
FCCU	OCDF	Method 23	3	180	0	
FCCU	Other TCDD	Method 23	3	180	0	
FCCU	Other PeCDD	Method 23	3	180	0	
FCCU	Other HxCDD	Method 23	3	180	0	
FCCU	Other HpCDD	Method 23	3	180	0	
FCCU	Other TCDF	Method 23	3	180	0	
FCCU	Other PeCDF	Method 23	3	180	0	
FCCU	Other HxCDF	Method 23	3	180	0	
FCCU	Other HpCDF	Method 23	3	180	0	
FCCU	Total Dioxins	Method 23	3	180	0	

FCCU	Total Furans	Method 23	3	180	0
FCCU	3,3',4,4'-TCB (PCB77)	Method 23	3	180	0
FCCU	3,4,4',5-TCB (PCB81)	Method 23	3	180	0
FCCU	2,3,3',4,4'-PeCB (PCB105)	Method 23	3	180	0
FCCU	2,3,4,4',5-PeCB (PCB114)	Method 23	3	180	0
FCCU	2,3',4,4',5-PeCB (PCB118)	Method 23	3	180	0
FCCU	2',3,4,4',5-PeCB (PCB123)	Method 23	3	180	0
FCCU	3,3',4,4',5-PeCB (PCB126)	Method 23	3	180	0
FCCU	2,3,3',4,4',5/2,3,3',4,4',5'-HxCB (PCBs156/157)	Method 23	3	180	0
FCCU	2,3',4,4',5,5'-HxCB (PCB167)	Method 23	3	180	0
FCCU	3,3',4,4',5,5'-HxCB (PCB169)	Method 23	3	180	0
FCCU	2,3,3',4,4',5,5'-HpCB (PCB189)	Method 23	3	180	0
FCCU	Other Mono-CBs	Method 23	3	180	0
FCCU	Other Di-CBs	Method 23	3	180	0
FCCU	Other Tri-CBs	Method 23	3	180	0
FCCU	Other Tetra-CBs	Method 23	3	180	0
FCCU	Other Penta-CBs	Method 23	3	180	0
FCCU	Other Hexa-CBs	Method 23	3	180	0
FCCU	Other Hepta-CBs	Method 23	3	180	0
FCCU	Other Octa-CBs	Method 23	3	180	0
FCCU	Other Nona-CBs	Method 23	3	180	0
FCCU	DeCB	Method 23	3	180	0
FCCU	Total PCBs	Method 23	3	180	0
FCCU	Total TEQ	Method 23	3	180	0
FCCU	Total organic compounds (TOC) as Propane	Method 25A	3	60	0
FCCU	Total Chloride	Method 26A	3	120	0
FCCU	Chlorine	Method 26A	3	120	0
FCCU	Hydrogen Fluoride	Method 26A	3	120	0
FCCU	Hydrogen Chloride	Method 26A	3	120	0
FCCU	Arsenic	Method 29	3	150	0
FCCU	Selenium	Method 29	3	150	0
FCCU	Cobalt	Method 29	3	150	0
FCCU	Manganese	Method 29	3	150	0
FCCU	Nickel	Method 29	3	150	0
FCCU	Lead	Method 29	3	150	0
FCCU	Chromium	Method 29	3	150	0
FCCU	Beryllium	Method 29	3	150	0
FCCU	Antimony	Method 29	3	150	0
FCCU	Cadmium	Method 29	3	150	0
FCCU	Filterable Particulate	Method 5/202	3	150	0
FCCU	Inorganic (Aqueous) Condensible Part.	Method 5/202	3	150	0
FCCU	Organic Condensible Particulate	Method 5/202	3	150	0
FCCU	Total Particulate	Method 5/202	3	150	0
FCCU	Custom	SW846 0061	3	150	0
FCCU	Custom	CTM-027	3	150	0
FCCU	Custom	MOTM029	3	60	0

The following describes any modifications and/or deviations to the applicable test methods. If alternative methods were requested, see the attachments for documentation of request AND approval, including dates.

Sampling / Stack Data Results

Location FCCU - CTM-027

Run Number	OTM027 R1	OTM027 R2	OTM027 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:52:00 AM	12:45:00 PM	7:53:00 AM	
Run Finish Time	10:14:30	3:07:30	10:15:30	
Net Run Time, minutes	150	150	150	
Dry Gas Meter Volume Sampled, dscf	98.224	99.083	97.624	98.310
Moisture Content of Stack Gas, %	22.69	22.35	23.05	22.697
Moisture Saturation at Stack Gas Temperature, %	22.37	22.04	22.20	22.203
Carbon Dioxide, %	14.11	14.12	13.98	14.070
Oxygen, %	1.76	1.72	1.86	1.780
Average Stack Gas Temperature, °F	144.95	144.35	144.65	144.650
Dry Volumetric Flow Rate, dry scfm	257,463.6	258,080.8	255,728.0	257,090.800
Actual Wet Volumetric Flue Gas Flow Rate, acfm	382,032.7	380,949.3	378,440.4	380,474.133
Percent Isokinetic of Sampling Rate, %	93.2	93.8	93.3	93.433
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - M0010

Run Number	0010SM R2	0010SM R3	0010SM R1	Average
Test Date	6/16/2011	6/17/2011	6/16/2011	
Run Start Time	2:18:00 PM	2:18:00	10:13:00	
Run Finish Time	5:18:00 PM	5:09:00	1:13:00 PM	
Net Run Time, minutes	180	180	189	
Dry Gas Meter Volume Sampled, dscf	150.600	153.878	168.933	157.804
Moisture Content of Stack Gas, %	22.19	23.69	20.39	22.090
Moisture Saturation at Stack Gas Temperature, %	22.08	22.37	22.16	22.203
Carbon Dioxide, %	14.09	14.14	13.94	14.057
Oxygen, %	1.55	1.6	1.71	1.620
Average Stack Gas Temperature, °F	144.35	144.95	144.50	144.600
Dry Volumetric Flow Rate, dry scfm	255,540.3	256,003.4	258,735.2	256,759.633
Actual Wet Volumetric Flue Gas Flow Rate, acfm	378,155.3	379,865.9	374,848.2	377,623.133
Percent Isokinetic of Sampling Rate, %	91.3	93.1	96.3	93.567
F-Factor, dscfm/MMBtu @ %O2	9190	0	0	3,063.333
Fw	10320	0	0	3,440.000
Fc	1420	0	0	473.333

Location FCCU - Method 0011

				Average
Run Number	0011A R2	0011A R1	0011A R3	
Test Date	6/17/2011	6/17/2011	6/17/2011	
Run Start Time	10:37:00	8:25:00 AM	12:23:00	
Run Finish Time	11:34:00	9:22:00 AM	1:20:00 PM	
Net Run Time, minutes	60	60	60	
Dry Gas Meter Volume Sampled, dscf	55.724	54.937	55.685	55.449
Moisture Content of Stack Gas, %	22.03	21.62	22.85	22.167
Moisture Saturation at Stack Gas Temperature, %	21.80	21.63	22.11	21.847
Carbon Dioxide, %	13.94	13.83	14.09	13.953
Oxygen, %	1.7	1.87	1.53	1.700
Average Stack Gas Temperature, °F	143.90	143.60	144.45	143.983
Dry Volumetric Flow Rate, dry scfm	264,319.2	262,855.0	262,260.6	263,144.933
Actual Wet Volumetric Flue Gas Flow Rate, acfm	388,932.1	385,567.9	387,791.7	387,430.567
Percent Isokinetic of Sampling Rate, %	98.0	97.1	98.7	97.933
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 23

Run Number	M23 R2	M23 R1	M23 R3	Average
Test Date	6/16/2011	6/16/2011	6/17/2011	
Run Start Time	2:18:00 PM	10:13:00 AM	8:43:00 AM	
Run Finish Time	5:09:00 PM	1:04:00	11:34:00	
Net Run Time, minutes	180	180	180	
Dry Gas Meter Volume Sampled, dscf	125.231	123.879	131.644	126.918
Moisture Content of Stack Gas, %	21.98	22.14	21.94	22.020
Moisture Saturation at Stack Gas Temperature, %	20.28	20.41	20.52	20.403
Carbon Dioxide, %	14.09	13.94	14.14	14.057
Oxygen, %	1.55	1.71	1.6	1.620
Average Stack Gas Temperature, °F	141.00	141.25	141.55	141.267
Dry Volumetric Flow Rate, dry scfm	258,492.8	257,133.5	275,455.3	263,693.867
Actual Wet Volumetric Flue Gas Flow Rate, acfm	371,940.2	370,742.7	396,971.8	379,884.900
Percent Isokinetic of Sampling Rate, %	98.7	98.1	97.3	98.033
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 25A

Run Number	1	2	3	Average
Test Date	6/16/2011	6/16/2011	6/16/2011	
Run Start Time	10:22:00	12:28:00 PM	1:52:00 PM	
Run Finish Time	11:23:00	1:37:00	3:03:00 PM	
Carbon Dioxide, %	13.97	14.06	14.11	14.047
Oxygen, %	1.71	1.55	1.61	1.623
Dry Volumetric Flow Rate, dry scfm	258735	255540	379866	298,047.000
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Moisture, %	22.19	23.69	20.39	22.090
Fuel Type		Override	Override	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 25A 3

		Average
Run Number	4	
Test Date	6/16/2011	
Run Start Time	3:23:00 PM	
Run Finish Time	4:23:00 PM	
Carbon Dioxide, %	14.11	14.110
Oxygen, %	1.61	1.610
Dry Volumetric Flow Rate, dry scfm	256063	256,063.000
F-Factor, dscfm/MMBtu @ %O2	0	0.000
Moisture, %	20.39	20.390
Fuel Type	Override	
Fw	0	0.000
Fc	0	0.000

Location FCCU - Method 26A

				Average
Run Number	M26A R2	M26A R1	M26A R3	
Test Date	6/15/2011	6/15/2011	6/15/2011	
Run Start Time	1:20:00 PM	10:00:00 AM	3:42:00 PM	
Run Finish Time	3:14:00 PM	11:54:00 AM	5:36:00 PM	
Net Run Time, minutes	120	120	120	
Dry Gas Meter Volume Sampled, dscf	99.703	99.749	99.544	99.665
Moisture Content of Stack Gas, %	23.13	23.24	23.09	23.153
Moisture Saturation at Stack Gas Temperature, %	22.09	21.98	21.93	22.000
Carbon Dioxide, %	13.77	13.77	13.75	13.763
Oxygen, %	1.96	1.96	2	1.973
Average Stack Gas Temperature, °F	144.40	144.20	144.10	144.233
Dry Volumetric Flow Rate, dry scfm	243,900.9	244,017.2	243,982.1	243,966.733
Actual Wet Volumetric Flue Gas Flow Rate, acfm	360,764.3	360,308.1	359,966.0	360,346.133
Percent Isokinetic of Sampling Rate, %	95.0	95.0	94.8	94.933
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 29

Run Number	M29 R2	M29 R3	M29 R1	Average
Test Date	6/18/2011	6/19/2011	6/18/2011	
Run Start Time	12:44:00	7:46:00 AM	7:52:00 AM	
Run Finish Time	3:06:30 PM	10:08:30 AM	10:14:30	
Net Run Time, minutes	150	150	150	
Dry Gas Meter Volume Sampled, dscf	133.493	133.497	134.480	133.823
Moisture Content of Stack Gas, %	22.25	22.23	22.25	22.243
Moisture Saturation at Stack Gas Temperature, %	22.01	22.15	22.12	22.093
Carbon Dioxide, %	14.12	13.97	14.11	14.067
Oxygen, %	1.72	1.86	1.75	1.777
Average Stack Gas Temperature, °F	144.30	144.55	144.50	144.450
Dry Volumetric Flow Rate, dry scfm	262,800.5	263,261.4	265,429.4	263,830.433
Actual Wet Volumetric Flue Gas Flow Rate, acfm	387,734.6	389,274.2	392,296.2	389,768.333
Percent Isokinetic of Sampling Rate, %	94.4	94.2	94.2	94.267
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 5/202

				Average
Run Number	M5202 R2	M5202 R3	M5-202 R1	
Test Date	6/18/2011	6/19/2011	6/18/2011	
Run Start Time	1/12/1900 10:33:36	7:46:00 AM	7:50:00 AM	
Run Finish Time	1/12/1900 12:56:06	10:08:30 AM	10:12:30	
Net Run Time, minutes	150	150	150	
Dry Gas Meter Volume Sampled, dscf	108.491	112.109	112.142	110.914
Moisture Content of Stack Gas, %	22.32	22.35	21.88	22.183
Moisture Saturation at Stack Gas Temperature, %	20.21	20.58	20.16	20.317
Carbon Dioxide, %	14.12	13.97	14.11	14.067
Oxygen, %	1.72	1.86	1.76	1.780
Average Stack Gas Temperature, °F	140.95	141.65	140.85	141.150
Dry Volumetric Flow Rate, dry scfm	257,920.0	264,884.5	257,288.9	260,031.133
Actual Wet Volumetric Flue Gas Flow Rate, acfm	369,887.4	382,089.7	368,690.0	373,555.700
Percent Isokinetic of Sampling Rate, %	96.5	97.1	100.0	97.867
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - MOTM029

Run Number	OTM029 R1	OTM029 R2	OTM029 R3	Average
Test Date	6/15/2011	6/15/2011	6/15/2011	
Run Start Time	10:00:00	1:20:00	3:42:00 PM	
Run Finish Time	10:57:00	2:17:00	4:39:00 PM	
Net Run Time, minutes	60	60	60	
Dry Gas Meter Volume Sampled, dscf	43.377	45.033	44.208	44.206
Moisture Content of Stack Gas, %	25.55	29.04	26.82	27.137
Moisture Saturation at Stack Gas Temperature, %	20.08	19.83	20.24	20.050
Carbon Dioxide, %	13.8	13.8	13.83	13.810
Oxygen, %	1.94	1.95	1.84	1.910
Average Stack Gas Temperature, °F	140.65	140.15	140.95	140.583
Dry Volumetric Flow Rate, dry scfm	253,466.3	251,874.4	253,745.5	253,028.733
Actual Wet Volumetric Flue Gas Flow Rate, acfm	363,216.1	359,509.8	364,527.6	362,417.833
Percent Isokinetic of Sampling Rate, %	104.6	109.3	106.5	106.800
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - SW846 0061

Run Number	M0061 R1	M0061 R2	M0061 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:50:00 AM	12:44:00 PM	7:46:00 AM	
Run Finish Time	9:50:00 AM	2:51:30	10:08:30	
Net Run Time, minutes	120	127.5	150	
Dry Gas Meter Volume Sampled, dscf	104.101	117.787	138.385	120.091
Moisture Content of Stack Gas, %	21.76	21.86	21.81	21.810
Moisture Saturation at Stack Gas Temperature, %	21.84	21.91	21.92	21.890
Carbon Dioxide, %	14.11	14.12	13.97	14.067
Oxygen, %	1.77	1.72	1.86	1.783
Average Stack Gas Temperature, °F	144.00	144.12	144.15	144.090
Dry Volumetric Flow Rate, dry scfm	264,782.4	266,250.6	266,962.5	265,998.500
Actual Wet Volumetric Flue Gas Flow Rate, acfm	389,217.2	391,954.1	392,638.3	391,269.867
Percent Isokinetic of Sampling Rate, %	92.8	98.3	97.9	96.333
F-Factor, dscfm/MMBtu @ %O2	8710	0	0	2,903.333
Fw	10390	0	0	3,463.333
Fc	1250	0	0	416.667

Emissions Summary

Location: **Turbine Stack - OTM - 27/28**

Compound: Filterable PM2.5

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	2.78	3.05	0.63	2.15E+00
Elb/hr	8.88E-01	9.90E-01	1.94E-01	6.91E-01
gr/dscf	1.10E-03	1.23E-03	2.37E-04	8.56E-04
lb/mmBtuO2	2.48E-03	2.82E-03	5.43E-04	1.95E-03

Compound: Inorganic (Aqueous) Condensible

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	0.44	1.23	1.73	1.13E+00
Elb/hr	1.41E-01	3.99E-01	5.33E-01	3.58E-01
gr/dscf	1.74E-04	4.98E-04	6.52E-04	4.41E-04
lb/mmBtuO2	3.92E-04	1.14E-03	1.49E-03	1.01E-03

Compound: Organic Condensible Particulate

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	3.34	1.71	0.94	2.00E+00
Elb/hr	1.07E+00	5.55E-01	2.90E-01	6.38E-01
gr/dscf	1.32E-03	6.92E-04	3.54E-04	7.89E-04
lb/mmBtuO2	2.98E-03	1.58E-03	8.10E-04	1.79E-03

Compound: Total PM2.5

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	6.56	5.99	3.3	5.28E+00
Elb/hr	2.10E+00	1.94E+00	1.02E+00	1.69E+00
gr/dscf	2.59E-03	2.42E-03	1.24E-03	2.08E-03
lb/mmBtuO2	5.84E-03	5.53E-03	2.84E-03	4.74E-03

Process Run Data

Run	Name	Value	UOM	Target Value	Comments
1	Fresh Feed Processed	125	1000	125	

APCD Run Data

Run	Name	Value	UOM	Target Value	Comments
1	THERMAL OXIDIZER	0		0	

Process Lab Run Data

Sampling / Stack Data Results Detail

Location FCCU - CTM-027

Run Number	OTM027 R1	OTM027 R2	OTM027 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:52:00 AM	12:45:00	7:53:00 AM	
Run Finish Time	10:14:30 AM	3:07:30 PM	10:15:30	
Net Traversing Points	20	20	20	
Net Run Time, minutes	150	150	150	
Nozzle Diameter, inches	0.218	0.218	0.218	0.218
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.985	0.985	0.985	0.985
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	1.77	1.77	1.75	1.763
Dry Gas Meter Volume Sampled, cubic feet	104.680	105.091	103.820	104.530
Average Dry Gas Meter Temperature, °F	94.45	91.80	93.25	93.167
Dry Gas Meter Volume Sampled, dscf	98.224	99.083	97.624	98.310
Total Moisture Liquid collected, g	612.2	605.9	621.1	613.067
Volume of Water Vapor, standard cubic feet	28.82	28.52	29.24	28.860
Moisture Content of Stack Gas, %	22.69	22.35	23.05	22.697
Moisture Saturation at Stack Gas Temperature, %	22.37	22.04	22.20	22.203
Dry Mole Fraction	0.7763	0.7796	0.778	0.778
Carbon Dioxide, %	14.11	14.12	13.98	14.070
Oxygen, %	1.76	1.72	1.86	1.780
Carbon Monoxide & Nitrogen, %	84.13	84.16	84.16	84.150
Fuel Factor	1.36	1.36	1.36	
Dry Molecular Weight, lb/lb-Mole	30.33	30.33	30.31	30.323
Wet Molecular weight, lb/lb-Mole	27.63	27.67	27.73	27.677
Flue Gas Static Pressure, inches of H2O	-0.48	-0.59	-0.48	-0.517
Absolute Flue Gas Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Stack Gas Temperature, °F	144.95	144.35	144.65	144.650
Average Velocity Head, inches of H2O	1.183152704 01654	1.17929354 996931	1.165739460 28676	1.176
Average Stack Gas Velocity, feet/second	67.00	66.81	66.37	66.727
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	257,463.6	258,080.8	255,728.0	257,090.800
Actual Wet Volumetric Flue Gas Flow Rate, acfm	382,032.7	380,949.3	378,440.4	380,474.133
Percent Isokinetic of Sampling Rate, %	93.2	93.8	93.3	93.433
Percent Excess Air, %	8.6	8.4	9.1	8.700
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - M0010

				Average
Run Number	0010SM R2	0010SM R3	0010SM R1	
Test Date	6/16/2011	6/17/2011	6/16/2011	
Run Start Time	2:18:00 PM	2:18:00 PM	10:13:00	
Run Finish Time	5:18:00 PM	5:09:00 PM	1:13:00 PM	
Net Traversing Points	21	20	21	
Net Run Time, minutes	180	180	189	
Nozzle Diameter, inches	0.25	0.25	0.25	0.250
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.985	0.985	0.985	0.985
Barometric Pressure, inches of Mercury	29.74	29.8	29.74	29.760
Average Orifice Meter Differential, inches H2O	2.93	2.98	2.59	2.833
Dry Gas Meter Volume Sampled, cubic feet	160.305	163.093	179.460	167.619
Average Dry Gas Meter Temperature, °F	94.25	93.05	92.68	93.327
Dry Gas Meter Volume Sampled, dscf	150.600	153.878	168.933	157.804
Total Moisture Liquid collected, g	912.3	1014.6	919.2	948.700
Volume of Water Vapor, standard cubic feet	42.94	47.76	43.27	44.657
Moisture Content of Stack Gas, %	22.19	23.69	20.39	22.090
Moisture Saturation at Stack Gas Temperature, %	22.08	22.37	22.16	22.203
Dry Mole Fraction	0.7792	0.7763	0.7961	0.784
Carbon Dioxide, %	14.09	14.14	13.94	14.057
Oxygen, %	1.55	1.6	1.71	1.620
Carbon Monoxide & Nitrogen, %	84.36	84.26	84.35	84.323
Fuel Factor	1.37	1.36	1.38	
Dry Molecular Weight, lb/lb-Mole	30.32	30.33	30.30	30.317
Wet Molecular weight, lb/lb-Mole	27.62	27.81	27.79	27.740
Flue Gas Static Pressure, inches of H2O	-0.49	-0.49	-0.49	-0.490
Absolute Flue Gas Pressure, inches of Mercury	29.70	29.76	29.70	29.720
Average Stack Gas Temperature, °F	144.35	144.95	144.50	144.600
Average Velocity Head, inches of H2O	1.157848404	1.17737241	1.144119806	1.160
	83702	019424	04954	
Average Stack Gas Velocity, feet/second	66.32	66.62	65.74	66.227
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	255,540.3	256,003.4	258,735.2	256,759.633
Actual Wet Volumetric Flue Gas Flow Rate, acfm	378,155.3	379,865.9	374,848.2	377,623.133
Percent Isokinetic of Sampling Rate, %	91.3	93.1	96.3	93.567
Percent Excess Air, %	7.5	7.8	8.3	7.867
F-Factor, dscfm/MMBtu @ %O2	9190	0	0	3,063.333
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	10320	0	0	3,440.000
Fc	1420	0	0	473.333

Location FCCU - Method 0011

				Average
Run Number	0011A R2	0011A R1	0011A R3	
Test Date	6/17/2011	6/17/2011	6/17/2011	
Run Start Time	10:37:00 AM	8:25:00 AM	12:23:00 PM	
Run Finish Time	11:34:00 AM	9:22:00 AM	1:20:00 PM	
Net Traversing Points	20	20	20	
Net Run Time, minutes	60	60	60	
Nozzle Diameter, inches	0.25	0.25	0.25	0.250
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.986	0.986	0.986	0.986
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	3.11	3.08	3.10	3.097
Dry Gas Meter Volume Sampled, cubic feet	58.742	58.012	58.516	58.423
Average Dry Gas Meter Temperature, °F	90.80	91.70	89.05	90.517
Dry Gas Meter Volume Sampled, dscf	55.724	54.937	55.685	55.449
Total Moisture Liquid collected, g	334.4	321.9	350.4	335.567
Volume of Water Vapor, standard cubic feet	15.74	15.15	16.49	15.793
Moisture Content of Stack Gas, %	22.03	21.62	22.85	22.167
Moisture Saturation at Stack Gas Temperature, %	21.80	21.63	22.11	21.847
Dry Mole Fraction	0.782	0.7838	0.7789	0.782
Carbon Dioxide, %	13.94	13.83	14.09	13.953
Oxygen, %	1.7	1.87	1.53	1.700
Carbon Monoxide & Nitrogen, %	84.36	84.3	84.38	84.347
Fuel Factor	1.38	1.38	1.37	
Dry Molecular Weight, lb/lb-Mole	30.30	30.29	30.32	30.303
Wet Molecular weight, lb/lb-Mole	27.66	27.63	27.73	27.673
Flue Gas Static Pressure, inches of H2O	-0.78	-0.74	-0.75	-0.757
Absolute Flue Gas Pressure, inches of Mercury	29.74	29.75	29.74	29.743
Average Stack Gas Temperature, °F	143.90	143.60	144.45	143.983
Average Velocity Head, inches of H2O	1.229081851 47141	1.20762819 364812	1.223876348 44154	1.220
Average Stack Gas Velocity, feet/second	68.21	67.62	68.01	67.947
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	264,319.2	262,855.0	262,260.6	263,144.933
Actual Wet Volumetric Flue Gas Flow Rate, acfm	388,932.1	385,567.9	387,791.7	387,430.567
Percent Isokinetic of Sampling Rate, %	98.0	97.1	98.7	97.933
Percent Excess Air, %	8.3	9.2	7.4	8.300
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 23

				Average
Run Number	M23 R2	M23 R1	M23 R3	
Test Date	6/16/2011	6/16/2011	6/17/2011	
Run Start Time	2:18:00 PM	10:13:00	8:43:00 AM	
Run Finish Time	5:09:00 PM	1:04:00 PM	11:34:00	
Net Traversing Points	20	20	20	
Net Run Time, minutes	180	180	180	
Nozzle Diameter, inches	0.218	0.218	0.218	0.218
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	1.01	1.01	1.01	1.010
Barometric Pressure, inches of Mercury	29.74	29.74	29.8	29.760
Average Orifice Meter Differential, inches H2O	1.75	1.82	1.98	1.850
Dry Gas Meter Volume Sampled, cubic feet	129.650	128.170	135.668	131.163
Average Dry Gas Meter Temperature, °F	91.15	90.90	90.05	90.700
Dry Gas Meter Volume Sampled, dscf	125.231	123.879	131.644	126.918
Total Moisture Liquid collected, g	749.7	748.4	786.3	761.467
Volume of Water Vapor, standard cubic feet	35.29	35.23	37.01	35.843
Moisture Content of Stack Gas, %	21.98	22.14	21.94	22.020
Moisture Saturation at Stack Gas Temperature, %	20.28	20.41	20.52	20.403
Dry Mole Fraction	0.7972	0.7959	0.7948	0.796
Carbon Dioxide, %	14.09	13.94	14.14	14.057
Oxygen, %	1.55	1.71	1.6	1.620
Carbon Monoxide & Nitrogen, %	84.36	84.35	84.26	84.323
Fuel Factor	1.37	1.38	1.36	
Dry Molecular Weight, lb/lb-Mole	30.32	30.30	30.33	30.317
Wet Molecular weight, lb/lb-Mole	28.13	28.10	28.06	28.097
Flue Gas Static Pressure, inches of H2O	-0.65	-0.69	-0.49	-0.610
Absolute Flue Gas Pressure, inches of Mercury	29.69	29.69	29.76	29.713
Average Stack Gas Temperature, °F	141.00	141.25	141.55	141.267
Average Velocity Head, inches of H2O	1.146727626 11336	1.13750875 371866	1.304786345 05657	1.196
Average Stack Gas Velocity, feet/second	65.23	65.02	69.62	66.623
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	258,492.8	257,133.5	275,455.3	263,693.867
Actual Wet Volumetric Flue Gas Flow Rate, acfm	371,940.2	370,742.7	396,971.8	379,884.900
Percent Isokinetic of Sampling Rate, %	98.7	98.1	97.3	98.033
Percent Excess Air, %	7.5	8.3	7.8	7.867
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 25A

				Average
Run Number	1	2	3	
Test Date	6/16/2011	6/16/2011	6/16/2011	
Run Start Time	10:22:00 AM	12:28:00	1:52:00 PM	
Run Finish Time	11:23:00 AM	1:37:00 PM	3:03:00 PM	
Carbon Dioxide, %	13.97	14.06	14.11	14.047
Oxygen, %	1.71	1.55	1.61	1.623
Fuel Factor	1.37	1.38	1.37	
Dry Volumetric Flow Rate, dry scfm	258735	255540	379866	298,047.000
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Moisture, %	22.19	23.69	20.39	22.090
Analyzer Make				
Analyzer Model				
Analyzer Serial Number				
Operating Range	100	100	100	100.000
Operating Units	ppm	ppm	ppm	
No. Readings/Avg.	1	1	1	1.000
Calibration Set	1	1	1	1.000
Calibration Pre Zero Cylinder ID	Zero Grade Air	Zero Grade Air	Zero Grade Air	
Calibration Pre Zero Cylinder Instrument Response	-0.3	-1.4	-1	-0.900
Calibration Pre Zero Cylinder Bias	0.5	-0.6	-0.2	-0.100
Calibration Pre Zero Cylinder Drift	0	0	0	0.000
Calibration Pre High Cylinder ID	CC100936	CC100936	CC100936	
Calibration Pre High Cylinder Instrument Response	30.9	32.9	29.5	31.100
Calibration Pre High Cylinder Bias	0	2	-1.4	0.200
Calibration Pre High Cylinder Drift	0	0	0	0.000
Calibration Post Zero Cylinder ID	Zero Grade Air	Zero Grade Air	Zero Grade Air	
Calibration Post Zero Cylinder Instrument Response	-1.4	-1	-2.4	-1.600
Calibration Post Zero Cylinder Bias	-0.6	-0.2	-1.6	-0.800
Calibration Post Zero Cylinder Drift	1.1	0.4	7.6	3.033
Calibration Post High Cylinder ID	CC100936	CC100936	CC100936	
Calibration Post High Cylinder Instrument Response	32.9	29.5	27.2	29.867
Calibration Post High Cylinder Bias	2	-1.4	-3.7	-1.033
Calibration Post High Cylinder Drift	2	3.4	2.3	2.567
Cavg	22.7	22.1	19	21.267
Cavg Units	ppmvd	ppmvd	ppmvd	
Cgas	21.6372	21.6388	20.7276	21.335
Cgas Units	ppmvd	ppmvd	ppmvd	
Fuel Type		Override	Override	
Fw	0	0	0	0.000
Fc	0	0	0	0.000
Cgasw	0	0	0	0.000
Cgasw Units				

Location FCCU - Method 25A 3

		Average
Run Number	4	
Test Date	6/16/2011	
Run Start Time	3:23:00 PM	
Run Finish Time	4:23:00 PM	
Carbon Dioxide, %	14.11	14.110
Oxygen, %	1.61	1.610
Fuel Factor	1.37	
Dry Volumetric Flow Rate, dry scfm	256063	256,063.000
F-Factor, dscfm/MMBtu @ %O2	0	0.000
Moisture, %	20.39	20.390
Analyzer Make		
Analyzer Model		
Analyzer Serial Number		
Operating Range	100	100.000
Operating Units	ppm	
No. Readings/Avg.	1	1.000
Calibration Set	1	1.000
Calibration Pre Zero Cylinder ID	Zero Grade Air	
Calibration Pre Zero Cylinder Instrument Response	-2.4	-2.400
Calibration Pre Zero Cylinder Bias	-1.6	-1.600
Calibration Pre Zero Cylinder Drift	0	0.000
Calibration Pre High Cylinder ID	CC100936	
Calibration Pre High Cylinder Instrument Response	27.2	27.200
Calibration Pre High Cylinder Bias	-3.7	-3.700
Calibration Pre High Cylinder Drift	0	0.000
Calibration Post Zero Cylinder ID	Zero Grade Air	
Calibration Post Zero Cylinder Instrument Response	-0.2	-0.200
Calibration Post Zero Cylinder Bias	0.6	0.600
Calibration Post Zero Cylinder Drift	2.2	2.200
Calibration Post High Cylinder ID	CC100936	
Calibration Post High Cylinder Instrument Response	31.1	31.100
Calibration Post High Cylinder Bias	0.2	0.200
Calibration Post High Cylinder Drift	3.9	3.900
Cavg	20.2	20.200
Cavg Units	ppmvd	
Cgas	21.2458	21.246
Cgas Units	ppmvd	
Fuel Type	Override	
Fw	0	0.000
Fc	0	0.000
Cgasw	0	0.000
Cgasw Units		

Location FCCU - Method 26A

				Average
Run Number	M26A R2	M26A R1	M26A R3	
Test Date	6/15/2011	6/15/2011	6/15/2011	
Run Start Time	1:20:00 PM	10:00:00	3:42:00 PM	
Run Finish Time	3:14:00 PM	11:54:00	5:36:00 PM	
Net Traversing Points	20	20	20	
Net Run Time, minutes	120	120	120	
Nozzle Diameter, inches	0.25	0.25	0.25	0.250
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.985	0.985	0.985	0.985
Barometric Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Orifice Meter Differential, inches H2O	2.87	2.87	2.86	2.867
Dry Gas Meter Volume Sampled, cubic feet	105.862	105.452	105.791	105.702
Average Dry Gas Meter Temperature, °F	93.15	90.75	93.65	92.517
Dry Gas Meter Volume Sampled, dscf	99.703	99.749	99.544	99.665
Total Moisture Liquid collected, g	637.4	641.6	635.1	638.033
Volume of Water Vapor, standard cubic feet	30.00	30.20	29.89	30.030
Moisture Content of Stack Gas, %	23.13	23.24	23.09	23.153
Moisture Saturation at Stack Gas Temperature, %	22.09	21.98	21.93	22.000
Dry Mole Fraction	0.7791	0.7802	0.7807	0.780
Carbon Dioxide, %	13.77	13.77	13.75	13.763
Oxygen, %	1.96	1.96	2	1.973
Carbon Monoxide & Nitrogen, %	84.27	84.27	84.25	84.263
Fuel Factor	1.38	1.38	1.37	
Dry Molecular Weight, lb/lb-Mole	30.28	30.28	30.28	30.280
Wet Molecular weight, lb/lb-Mole	27.75	27.81	27.80	27.787
Flue Gas Static Pressure, inches of H2O	-0.58	-0.49	-0.53	-0.533
Absolute Flue Gas Pressure, inches of Mercury	29.72	29.72	29.72	29.720
Average Stack Gas Temperature, °F	144.40	144.20	144.10	144.233
Average Velocity Head, inches of H2O	1.059273538	1.05932224	1.057023247	1.059
	12807	185638	28501	
Average Stack Gas Velocity, feet/second	63.27	63.19	63.13	63.197
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	243,900.9	244,017.2	243,982.1	243,966.733
Actual Wet Volumetric Flue Gas Flow Rate, acfm	360,764.3	360,308.1	359,966.0	360,346.133
Percent Isokinetic of Sampling Rate, %	95.0	95.0	94.8	94.933
Percent Excess Air, %	9.7	9.7	9.9	9.767
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 29

				Average
Run Number	M29 R2	M29 R3	M29 R1	
Test Date	6/18/2011	6/19/2011	6/18/2011	
Run Start Time	12:44:00 PM	7:46:00 AM	7:52:00 AM	
Run Finish Time	3:06:30 PM	10:08:30	10:14:30	
Net Traversing Points	20	20	20	
Net Run Time, minutes	150	150	150	
Nozzle Diameter, inches	0.25	0.25	0.25	0.250
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.996	0.996	0.996	0.996
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	3.04	3.07	3.11	3.073
Dry Gas Meter Volume Sampled, cubic feet	138.829	138.873	140.060	139.254
Average Dry Gas Meter Temperature, °F	88.80	89.00	89.70	89.167
Dry Gas Meter Volume Sampled, dscf	133.493	133.497	134.480	133.823
Total Moisture Liquid collected, g	811.6	810.9	817.6	813.367
Volume of Water Vapor, standard cubic feet	38.20	38.17	38.48	38.283
Moisture Content of Stack Gas, %	22.25	22.23	22.25	22.243
Moisture Saturation at Stack Gas Temperature, %	22.01	22.15	22.12	22.093
Dry Mole Fraction	0.7799	0.7785	0.7788	0.779
Carbon Dioxide, %	14.12	13.97	14.11	14.067
Oxygen, %	1.72	1.86	1.75	1.777
Carbon Monoxide & Nitrogen, %	84.16	84.17	84.14	84.157
Fuel Factor	1.36	1.36	1.36	
Dry Molecular Weight, lb/lb-Mole	30.33	30.31	30.33	30.323
Wet Molecular weight, lb/lb-Mole	27.66	27.60	27.63	27.630
Flue Gas Static Pressure, inches of H2O	-0.49	-0.49	-0.49	-0.490
Absolute Flue Gas Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Stack Gas Temperature, °F	144.30	144.55	144.50	144.450
Average Velocity Head, inches of H2O	1.221460656	1.22794494	1.248685413	1.233
	47273	567587	90607	
Average Stack Gas Velocity, feet/second	68.00	68.27	68.80	68.357
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	262,800.5	263,261.4	265,429.4	263,830.433
Actual Wet Volumetric Flue Gas Flow Rate, acfm	387,734.6	389,274.2	392,296.2	389,768.333
Percent Isokinetic of Sampling Rate, %	94.4	94.2	94.2	94.267
Percent Excess Air, %	8.4	9.1	8.6	8.700
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - Method 5/202

				Average
Run Number	M5202 R2	M5202 R3	M5-202 R1	
Test Date	6/18/2011	6/19/2011	6/18/2011	
Run Start Time	1/12/1900 10:33:36 AM	7:46:00 AM	7:50:00 AM	
Run Finish Time	1/12/1900 12:56:06 PM	10:08:30	10:12:30	
Net Traversing Points	20	20	20	
Net Run Time, minutes	150	150	150	
Nozzle Diameter, inches	0.225	0.225	0.225	0.225
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	1.01	1.01	1.01	1.010
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	1.95	2.07	2.02	2.013
Dry Gas Meter Volume Sampled, cubic feet	112.222	115.741	115.915	114.626
Average Dry Gas Meter Temperature, °F	92.05	91.15	91.75	91.650
Dry Gas Meter Volume Sampled, dscf	108.491	112.109	112.142	110.914
Total Moisture Liquid collected, g	662.1	685.5	667.3	671.633
Volume of Water Vapor, standard cubic feet	31.17	32.27	31.41	31.617
Moisture Content of Stack Gas, %	22.32	22.35	21.88	22.183
Moisture Saturation at Stack Gas Temperature, %	20.21	20.58	20.16	20.317
Dry Mole Fraction	0.7979	0.7942	0.7984	0.797
Carbon Dioxide, %	14.12	13.97	14.11	14.067
Oxygen, %	1.72	1.86	1.76	1.780
Carbon Monoxide & Nitrogen, %	84.16	84.17	84.13	84.153
Fuel Factor	1.36	1.36	1.36	
Dry Molecular Weight, lb/lb-Mole	30.33	30.31	30.33	30.323
Wet Molecular weight, lb/lb-Mole	28.22	28.10	28.15	28.157
Flue Gas Static Pressure, inches of H2O	-0.49	-0.49	-0.49	-0.490
Absolute Flue Gas Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Stack Gas Temperature, °F	140.95	141.65	140.85	141.150
Average Velocity Head, inches of H2O	1.140485387 18173	1.21021151 507779	1.130400705 63391	1.160
Average Stack Gas Velocity, feet/second	64.87	67.01	64.66	65.513
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	257,920.0	264,884.5	257,288.9	260,031.133
Actual Wet Volumetric Flue Gas Flow Rate, acfm	369,887.4	382,089.7	368,690.0	373,555.700
Percent Isokinetic of Sampling Rate, %	96.5	97.1	100.0	97.867
Percent Excess Air, %	8.4	9.1	8.6	8.700
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - MOTM029

Run Number	OTM029 R1	OTM029 R2	OTM029 R3	Average
Test Date	6/15/2011	6/15/2011	6/15/2011	
Run Start Time	10:00:00 AM	1:20:00 PM	3:42:00 PM	
Run Finish Time	10:57:00 AM	2:17:00 PM	4:39:00 PM	
Net Traversing Points	20	20	20	
Net Run Time, minutes	60	60	60	
Nozzle Diameter, inches	0.218	0.218	0.218	0.218
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	1.01	1.01	1.01	1.010
Barometric Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Orifice Meter Differential, inches H2O	1.77	1.77	1.78	1.773
Dry Gas Meter Volume Sampled, cubic feet	44.558	46.077	45.414	45.350
Average Dry Gas Meter Temperature, °F	87.25	85.10	87.30	86.550
Dry Gas Meter Volume Sampled, dscf	43.377	45.033	44.208	44.206
Total Moisture Liquid collected, g	316.4	391.6	344.2	350.733
Volume of Water Vapor, standard cubic feet	14.89	18.43	16.20	16.507
Moisture Content of Stack Gas, %	25.55	29.04	26.82	27.137
Moisture Saturation at Stack Gas Temperature, %	20.08	19.83	20.24	20.050
Dry Mole Fraction	0.7992	0.8017	0.7976	0.800
Carbon Dioxide, %	13.8	13.8	13.83	13.810
Oxygen, %	1.94	1.95	1.84	1.910
Carbon Monoxide & Nitrogen, %	84.26	84.25	84.33	84.280
Fuel Factor	1.37	1.37	1.38	
Dry Molecular Weight, lb/lb-Mole	30.29	30.29	30.29	30.290
Wet Molecular weight, lb/lb-Mole	28.81	29.51	28.99	29.103
Flue Gas Static Pressure, inches of H2O	-0.49	-0.49	-0.49	-0.490
Absolute Flue Gas Pressure, inches of Mercury	29.72	29.72	29.72	29.720
Average Stack Gas Temperature, °F	140.65	140.15	140.95	140.583
Average Velocity Head, inches of H2O	1.121666946 97961	1.12639272 347136	1.136138200 38199	1.128
Average Stack Gas Velocity, feet/second	63.70	63.05	63.93	63.560
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	253,466.3	251,874.4	253,745.5	253,028.733
Actual Wet Volumetric Flue Gas Flow Rate, acfm	363,216.1	359,509.8	364,527.6	362,417.833
Percent Isokinetic of Sampling Rate, %	104.6	109.3	106.5	106.800
Percent Excess Air, %	9.6	9.6	9.0	9.400
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - SW846 0061

Run Number	M0061 R1	M0061 R2	M0061 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:50:00 AM	12:44:00	7:46:00 AM	
Run Finish Time	9:50:00 AM	2:51:30 PM	10:08:30	
Net Traversing Points	17	18	20	
Net Run Time, minutes	120	127.5	150	
Nozzle Diameter, inches	0.248	0.248	0.248	0.248
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.986	0.986	0.986	0.986
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	3.03	3.06	3.13	3.073
Dry Gas Meter Volume Sampled, cubic feet	110.399	123.711	145.754	126.621
Average Dry Gas Meter Temperature, °F	94.00	88.71	90.35	91.020
Dry Gas Meter Volume Sampled, dscf	104.101	117.787	138.385	120.091
Total Moisture Liquid collected, g	615	700	820	711.667
Volume of Water Vapor, standard cubic feet	28.95	32.95	38.60	33.500
Moisture Content of Stack Gas, %	21.76	21.86	21.81	21.810
Moisture Saturation at Stack Gas Temperature, %	21.84	21.91	21.92	21.890
Dry Mole Fraction	0.7824	0.7814	0.7819	0.782
Carbon Dioxide, %	14.11	14.12	13.97	14.067
Oxygen, %	1.77	1.72	1.86	1.783
Carbon Monoxide & Nitrogen, %	84.12	84.16	84.17	84.150
Fuel Factor	1.36	1.36	1.36	
Dry Molecular Weight, lb/lb-Mole	30.33	30.33	30.31	30.323
Wet Molecular weight, lb/lb-Mole	27.65	27.63	27.63	27.637
Flue Gas Static Pressure, inches of H2O	-0.48	-0.59	-0.47	-0.513
Absolute Flue Gas Pressure, inches of Mercury	29.76	29.76	29.77	29.763
Average Stack Gas Temperature, °F	144.00	144.12	144.15	144.090
Average Velocity Head, inches of H2O	1.230910240 3453	1.24726557 220911	1.251828043 93735	1.243
Average Stack Gas Velocity, feet/second	68.26	68.74	68.86	68.620
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	264,782.4	266,250.6	266,962.5	265,998.500
Actual Wet Volumetric Flue Gas Flow Rate, acfm	389,217.2	391,954.1	392,638.3	391,269.867
Percent Isokinetic of Sampling Rate, %	92.8	98.3	97.9	96.333
Percent Excess Air, %	8.7	8.4	9.1	8.733
F-Factor, dscfm/MMBtu @ %O2	8710	0	0	2,903.333
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	10390	0	0	3,463.333
Fc	1250	0	0	416.667

Final Test Report
for

Petroleum Refinery Emissions ICR - Site Specific Test Plan for Hovensa LLC

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in this test report are true, accurate, and complete.

/
Permitted Facility Representative / **Date**

Name: Bernd Haneke
Title: Senior Environmental Specialist
Company: Hovensa, LLC
Sign Date:

I have reviewed all testing details and results in this test report and hereby certify that the test report is authentic and accurate.

/
Testing Company Representative /

Name: Troy Burrows
Title: Quality Manager
Company: Entec Services, Inc.
Sign Date:

Petroleum Refinery Emissions ICR - Site Specific Test Plan for Hovensa LLC

Facility Information:

Hovensa LLC
1 Estate Hope

Christiansted US 00820-5652

Contact: Bernd Haneke
Phone: 340-692-7427
Fax:
Email: bhaneke@hovensa.com

Testing Company:

ENTEC Services, Inc.
30 Monroe Drive

Pelham AL 35124

Contact: Charles Duncan
Phone: 205-358-1011
Fax: 205-358-1036
Email: cduncan@entecservices.com

Industry/SCC/NAIS 324110 **AFS #:** VI6A1530 **FRS #:** 110000307864

Air Permit Number: STX-TV-006-08

Permitted Source ID/Name:

Permitted Maximum Process	Max. Normal Operation Process	Target Process Test
165,000 barrell/day	110,000 - 130,000 barrell/day	110,000 - 120,000

SCC / 30600201 Industrial Processes - Petroleum Industry - Catalytic Cracking Units - Fluid Catalytic Cracking Unit

The following state and federal regulations that apply to the proposed testing:

Regulation Description	Compound	Limit	Unit
N/A. All guidelines for testing were included in the ICR guidance package, issued by EPA.		0	

Description of the source (including control equipment). Please see the attachments for source or

The FCCU, which is located in Area V of the refinery, converts heavy oils into wide boiling range material from which lower molecular weight products such as naphtha and middle distillates are fractionated by distillation. The feedstock is generally a heavy distillate or gas oil with a boiling range of about 500 to 1,000 °F. The FCCU consists of a catalyst section and a fractionating section which operate as an integrated processing unit. The catalyst section consists of a reactor, regenerator, standpipes, and risers. The catalyst is in the form of very small spherical particles that behave as a fluid when aerated. The reactor effluent is separated by distillation in the fractionator into recycle oil, middle distillate, naphtha, liquefied petroleum gas (LPG), and off-gas.

A low sulfur content feedstock (= 0.6 weight percent) and a high efficiency venturi wet gas scrubber (WGS) is used to reduce sulfur dioxide (SO2) emissions from the FCCU complex. Oxides of nitrogen (NOx) emissions from the FCCU complex are controlled using temperature controls and by minimizing the oxidation conditions. Particulate matter (PM) emissions are controlled by the high efficiency scrubber. Carbon monoxide (CO) emissions are reduced using a high temperature regenerator. Volatile organic compounds (VOCs) are reduced using combustion controls (e.g., temperature and excess air).

Sampling Location Information:

Location	Round Duct Diam.	Rect. Duct Length	/Width	Equiv. Diam	Distance from upstream dist.	Distance from downstream dist.	Number of Traverse Ports	Min.Travers Points
FCCU	132	0	0	0	188	751.75	4	20

process flow diagram:

Test Parameter Information:

Location	Target Parameter	Test Method	Number of	Test Run Duration	Sample Points	Comments
FCCU	Naphthalene**	M0010	3	180	0	
FCCU	2-Methylnaphthalene	M0010	3	180	0	
FCCU	Acenaphthylene**	M0010	3	180	0	
FCCU	Acenaphthene**	M0010	3	180	0	
FCCU	Fluorene**	M0010	3	180	0	
FCCU	Phenanthrene**	M0010	3	180	0	
FCCU	Anthracene**	M0010	3	180	0	
FCCU	Fluoranthene**	M0010	3	180	0	
FCCU	Pyrene**	M0010	3	180	0	
FCCU	Benzo(a)Anthracene*	M0010	3	180	0	
FCCU	Chrysene*	M0010	3	180	0	
FCCU	Benzo(b)Fluoranthene*	M0010	3	180	0	
FCCU	Benzo(k)Fluoranthene*	M0010	3	180	0	
FCCU	Benzo(e)Pyrene	M0010	3	180	0	
FCCU	Benzo(a)Pyrene*	M0010	3	180	0	
FCCU	Perylene	M0010	3	180	0	
FCCU	Indeno(1,2,3-cd)Pyrene*	M0010	3	180	0	
FCCU	Dibenzo(a,h)Anthracene*	M0010	3	180	0	
FCCU	Benzo(ghi)Perylene**	M0010	3	180	0	
FCCU	Carbon Monoxide	Method 10	3	60	0	
FCCU	Formaldehyde	Method 0011	3	60	0	
FCCU	2,3,7,8-TCDD	Method 23	3	180	0	
FCCU	1,2,3,7,8-PeCDD	Method 23	3	180	0	
FCCU	1,2,3,4,7,8-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,6,7,8-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,7,8,9-HxCDD	Method 23	3	180	0	
FCCU	1,2,3,4,6,7,8-HpCDD	Method 23	3	180	0	
FCCU	OCDD	Method 23	3	180	0	
FCCU	2,3,7,8-TCDF	Method 23	3	180	0	
FCCU	1,2,3,7,8-PeCDF	Method 23	3	180	0	
FCCU	2,3,4,7,8-PeCDF	Method 23	3	180	0	
FCCU	1,2,3,4,7,8-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,6,7,8-HxCDF	Method 23	3	180	0	
FCCU	2,3,4,6,7,8-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,7,8,9-HxCDF	Method 23	3	180	0	
FCCU	1,2,3,4,6,7,8-HpCDF	Method 23	3	180	0	
FCCU	1,2,3,4,7,8,9-HpCDF	Method 23	3	180	0	
FCCU	OCDF	Method 23	3	180	0	
FCCU	Other TCDD	Method 23	3	180	0	
FCCU	Other PeCDD	Method 23	3	180	0	
FCCU	Other HxCDD	Method 23	3	180	0	
FCCU	Other HpCDD	Method 23	3	180	0	
FCCU	Other TCDF	Method 23	3	180	0	
FCCU	Other PeCDF	Method 23	3	180	0	
FCCU	Other HxCDF	Method 23	3	180	0	
FCCU	Other HpCDF	Method 23	3	180	0	
FCCU	Total Dioxins	Method 23	3	180	0	

FCCU	Total Furans	Method 23	3	180	0
FCCU	3,3',4,4'-TCB (PCB77)	Method 23	3	180	0
FCCU	3,4,4',5-TCB (PCB81)	Method 23	3	180	0
FCCU	2,3,3',4,4'-PeCB (PCB105)	Method 23	3	180	0
FCCU	2,3,4,4',5-PeCB (PCB114)	Method 23	3	180	0
FCCU	2,3',4,4',5-PeCB (PCB118)	Method 23	3	180	0
FCCU	2',3,4,4',5-PeCB (PCB123)	Method 23	3	180	0
FCCU	3,3',4,4',5-PeCB (PCB126)	Method 23	3	180	0
FCCU	2,3,3',4,4',5/2,3,3',4,4',5'-HxCB (PCBs156/157)	Method 23	3	180	0
FCCU	2,3',4,4',5,5'-HxCB (PCB167)	Method 23	3	180	0
FCCU	3,3',4,4',5,5'-HxCB (PCB169)	Method 23	3	180	0
FCCU	2,3,3',4,4',5,5'-HpCB (PCB189)	Method 23	3	180	0
FCCU	Other Mono-CBs	Method 23	3	180	0
FCCU	Other Di-CBs	Method 23	3	180	0
FCCU	Other Tri-CBs	Method 23	3	180	0
FCCU	Other Tetra-CBs	Method 23	3	180	0
FCCU	Other Penta-CBs	Method 23	3	180	0
FCCU	Other Hexa-CBs	Method 23	3	180	0
FCCU	Other Hepta-CBs	Method 23	3	180	0
FCCU	Other Octa-CBs	Method 23	3	180	0
FCCU	Other Nona-CBs	Method 23	3	180	0
FCCU	DeCB	Method 23	3	180	0
FCCU	Total PCBs	Method 23	3	180	0
FCCU	Total TEQ	Method 23	3	180	0
FCCU	Total organic compounds (TOC) as Propane	Method 25A	3	60	0
FCCU	Total Chloride	Method 26A	3	120	0
FCCU	Chlorine	Method 26A	3	120	0
FCCU	Hydrogen Fluoride	Method 26A	3	120	0
FCCU	Hydrogen Chloride	Method 26A	3	120	0
FCCU	Arsenic	Method 29	3	150	0
FCCU	Selenium	Method 29	3	150	0
FCCU	Cobalt	Method 29	3	150	0
FCCU	Manganese	Method 29	3	150	0
FCCU	Nickel	Method 29	3	150	0
FCCU	Lead	Method 29	3	150	0
FCCU	Chromium	Method 29	3	150	0
FCCU	Beryllium	Method 29	3	150	0
FCCU	Antimony	Method 29	3	150	0
FCCU	Cadmium	Method 29	3	150	0
FCCU	Filterable Particulate	Method 5/202	3	150	0
FCCU	Inorganic (Aqueous) Condensible Part.	Method 5/202	3	150	0
FCCU	Organic Condensible Particulate	Method 5/202	3	150	0
FCCU	Total Particulate	Method 5/202	3	150	0
FCCU	Custom	SW846 0061	3	150	0
FCCU	Custom	CTM-027	3	150	0
FCCU	Custom	MOTM029	3	60	0

The following describes any modifications and/or deviations to the applicable test methods. If alternative methods were requested, see the attachments for documentation of request AND approval, including dates.

Sampling / Stack Data Results

Location FCCU - CTM-027

Run Number	OTM027 R1	OTM027 R2	OTM027 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:52:00 AM	12:45:00 PM	7:53:00 AM	
Run Finish Time	10:14:30	3:07:30	10:15:30	
Net Run Time, minutes	150	150	150	
Dry Gas Meter Volume Sampled, dscf	98.224	99.083	97.624	98.310
Moisture Content of Stack Gas, %	22.69	22.35	23.05	22.697
Moisture Saturation at Stack Gas Temperature, %	22.37	22.04	22.20	22.203
Carbon Dioxide, %	14.11	14.12	13.98	14.070
Oxygen, %	1.76	1.72	1.86	1.780
Average Stack Gas Temperature, °F	144.95	144.35	144.65	144.650
Dry Volumetric Flow Rate, dry scfm	257,463.6	258,080.8	255,728.0	257,090.800
Actual Wet Volumetric Flue Gas Flow Rate, acfm	382,032.7	380,949.3	378,440.4	380,474.133
Percent Isokinetic of Sampling Rate, %	93.2	93.8	93.3	93.433
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - M0010

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - Method 0011

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - Method 23

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - Method 25A

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Carbon Dioxide, %	
Oxygen, %	
Dry Volumetric Flow Rate, dry scfm	
F-Factor, dscfm/MMBtu @ %O2	
Moisture, %	
Fuel Type	
Fw	
Fc	

Location FCCU - Method 25A 3

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Carbon Dioxide, %	
Oxygen, %	
Dry Volumetric Flow Rate, dry scfm	
F-Factor, dscfm/MMBtu @ %O2	
Moisture, %	
Fuel Type	
Fw	
Fc	

Location FCCU - Method 26A

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - Method 29

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - Method 5/202

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - MOTM029

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Location FCCU - SW846 0061

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Run Time, minutes	
Dry Gas Meter Volume Sampled, dscf	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Carbon Dioxide, %	
Oxygen, %	
Average Stack Gas Temperature, °F	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
F-Factor, dscfm/MMBtu @ %O2	
Fw	
Fc	

Emissions Summary

Location: **Turbine Stack - OTM - 27/28**

Compound: Filterable PM2.5

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	2.78	3.05	0.63	2.15E+00
Elb/hr	8.88E-01	9.90E-01	1.94E-01	6.91E-01
gr/dscf	1.10E-03	1.23E-03	2.37E-04	8.56E-04
lb/mmBtuO2	2.48E-03	2.82E-03	5.43E-04	1.95E-03

Compound: Inorganic (Aqueous) Condensible

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	0.44	1.23	1.73	1.13E+00
Elb/hr	1.41E-01	3.99E-01	5.33E-01	3.58E-01
gr/dscf	1.74E-04	4.98E-04	6.52E-04	4.41E-04
lb/mmBtuO2	3.92E-04	1.14E-03	1.49E-03	1.01E-03

Compound: Organic Condensible Particulate

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	3.34	1.71	0.94	2.00E+00
Elb/hr	1.07E+00	5.55E-01	2.90E-01	6.38E-01
gr/dscf	1.32E-03	6.92E-04	3.54E-04	7.89E-04
lb/mmBtuO2	2.98E-03	1.58E-03	8.10E-04	1.79E-03

Compound: Total PM2.5

RunNumber	1-OTM	2-OTM	3-OTM	Average
Mass_mg	6.56	5.99	3.3	5.28E+00
Elb/hr	2.10E+00	1.94E+00	1.02E+00	1.69E+00
gr/dscf	2.59E-03	2.42E-03	1.24E-03	2.08E-03
lb/mmBtuO2	5.84E-03	5.53E-03	2.84E-03	4.74E-03

Process Run Data

Run	Name	Value	UOM	Target Value	Comments
1	Fresh Feed Processed	125	1000	125	

APCD Run Data

Run	Name	Value	UOM	Target Value	Comments
1	THERMAL OXIDIZER	0		0	

Process Lab Run Data

Sampling / Stack Data Results Detail

Location FCCU - CTM-027

Run Number	OTM027 R1	OTM027 R2	OTM027 R3	Average
Test Date	6/18/2011	6/18/2011	6/19/2011	
Run Start Time	7:52:00 AM	12:45:00	7:53:00 AM	
Run Finish Time	10:14:30 AM	3:07:30 PM	10:15:30	
Net Traversing Points	20	20	20	
Net Run Time, minutes	150	150	150	
Nozzle Diameter, inches	0.218	0.218	0.218	0.218
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.985	0.985	0.985	0.985
Barometric Pressure, inches of Mercury	29.8	29.8	29.8	29.800
Average Orifice Meter Differential, inches H2O	1.77	1.77	1.75	1.763
Dry Gas Meter Volume Sampled, cubic feet	104.680	105.091	103.820	104.530
Average Dry Gas Meter Temperature, °F	94.45	91.80	93.25	93.167
Dry Gas Meter Volume Sampled, dscf	98.224	99.083	97.624	98.310
Total Moisture Liquid collected, g	612.2	605.9	621.1	613.067
Volume of Water Vapor, standard cubic feet	28.82	28.52	29.24	28.860
Moisture Content of Stack Gas, %	22.69	22.35	23.05	22.697
Moisture Saturation at Stack Gas Temperature, %	22.37	22.04	22.20	22.203
Dry Mole Fraction	0.7763	0.7796	0.778	0.778
Carbon Dioxide, %	14.11	14.12	13.98	14.070
Oxygen, %	1.76	1.72	1.86	1.780
Carbon Monoxide & Nitrogen, %	84.13	84.16	84.16	84.150
Fuel Factor	1.36	1.36	1.36	
Dry Molecular Weight, lb/lb-Mole	30.33	30.33	30.31	30.323
Wet Molecular weight, lb/lb-Mole	27.63	27.67	27.73	27.677
Flue Gas Static Pressure, inches of H2O	-0.48	-0.59	-0.48	-0.517
Absolute Flue Gas Pressure, inches of Mercury	29.76	29.76	29.76	29.760
Average Stack Gas Temperature, °F	144.95	144.35	144.65	144.650
Average Velocity Head, inches of H2O	1.183152704 01654	1.17929354 996931	1.165739460 28676	1.176
Average Stack Gas Velocity, feet/second	67.00	66.81	66.37	66.727
Stack Cross-Sectional Area, square feet	95.033	95.033	95.033	95.033
Dry Volumetric Flow Rate, dry scfm	257,463.6	258,080.8	255,728.0	257,090.800
Actual Wet Volumetric Flue Gas Flow Rate, acfm	382,032.7	380,949.3	378,440.4	380,474.133
Percent Isokinetic of Sampling Rate, %	93.2	93.8	93.3	93.433
Percent Excess Air, %	8.6	8.4	9.1	8.700
F-Factor, dscfm/MMBtu @ %O2	0	0	0	0.000
Round Duct Diameter, inches	132	132	132	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	0	0	0	0.000
Fc	0	0	0	0.000

Location FCCU - M0010

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - Method 0011

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - Method 23

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - Method 25A

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Carbon Dioxide, %	
Oxygen, %	
Fuel Factor	
Dry Volumetric Flow Rate, dry scfm	
F-Factor, dscfm/MMBtu @ %O2	
Moisture, %	
Analyzer Make	
Analyzer Model	
Analyzer Serial Number	
Operating Range	
Operating Units	
No. Readings/Avg.	
Calibration Set	
Calibration Pre Zero Cylinder ID	
Calibration Pre Zero Cylinder Instrument Response	
Calibration Pre Zero Cylinder Bias	
Calibration Pre Zero Cylinder Drift	
Calibration Pre High Cylinder ID	
Calibration Pre High Cylinder Instrument Response	
Calibration Pre High Cylinder Bias	
Calibration Pre High Cylinder Drift	
Calibration Post Zero Cylinder ID	
Calibration Post Zero Cylinder Instrument Response	
Calibration Post Zero Cylinder Bias	
Calibration Post Zero Cylinder Drift	
Calibration Post High Cylinder ID	
Calibration Post High Cylinder Instrument Response	
Calibration Post High Cylinder Bias	
Calibration Post High Cylinder Drift	
Cavg	
Cavg Units	
Cgas	
Cgas Units	
Fuel Type	
Fw	
Fc	
Cgasw	
Cgasw Units	

Location FCCU - Method 25A 3

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Carbon Dioxide, %	
Oxygen, %	
Fuel Factor	
Dry Volumetric Flow Rate, dry scfm	
F-Factor, dscfm/MMBtu @ %O2	
Moisture, %	
Analyzer Make	
Analyzer Model	
Analyzer Serial Number	
Operating Range	
Operating Units	
No. Readings/Avg.	
Calibration Set	
Calibration Pre Zero Cylinder ID	
Calibration Pre Zero Cylinder Instrument Response	
Calibration Pre Zero Cylinder Bias	
Calibration Pre Zero Cylinder Drift	
Calibration Pre High Cylinder ID	
Calibration Pre High Cylinder Instrument Response	
Calibration Pre High Cylinder Bias	
Calibration Pre High Cylinder Drift	
Calibration Post Zero Cylinder ID	
Calibration Post Zero Cylinder Instrument Response	
Calibration Post Zero Cylinder Bias	
Calibration Post Zero Cylinder Drift	
Calibration Post High Cylinder ID	
Calibration Post High Cylinder Instrument Response	
Calibration Post High Cylinder Bias	
Calibration Post High Cylinder Drift	
Cavg	
Cavg Units	
Cgas	
Cgas Units	
Fuel Type	
Fw	
Fc	
Cgasw	
Cgasw Units	

Location FCCU - Method 26A

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - Method 29

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - Method 5/202

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - MOTM029

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	

Location FCCU - SW846 0061

	Average
Run Number	
Test Date	
Run Start Time	
Run Finish Time	
Net Traversing Points	
Net Run Time, minutes	
Nozzle Diameter, inches	
Pitot Tube Coefficient	
Dry Gas Meter Calibration Factor	
Barometric Pressure, inches of Mercury	
Average Orifice Meter Differential, inches H2O	
Dry Gas Meter Volume Sampled, cubic feet	
Average Dry Gas Meter Temperature, °F	
Dry Gas Meter Volume Sampled, dscf	
Total Moisture Liquid collected, g	
Volume of Water Vapor, standard cubic feet	
Moisture Content of Stack Gas, %	
Moisture Saturation at Stack Gas Temperature, %	
Dry Mole Fraction	
Carbon Dioxide, %	
Oxygen, %	
Carbon Monoxide & Nitrogen, %	
Fuel Factor	
Dry Molecular Weight, lb/lb-Mole	
Wet Molecular weight, lb/lb-Mole	
Flue Gas Static Pressure, inches of H2O	
Absolute Flue Gas Pressure, inches of Mercury	
Average Stack Gas Temperature, °F	
Average Velocity Head, inches of H2O	
Average Stack Gas Velocity, feet/second	
Stack Cross-Sectional Area, square feet	
Dry Volumetric Flow Rate, dry scfm	
Actual Wet Volumetric Flue Gas Flow Rate, acfm	
Percent Isokinetic of Sampling Rate, %	
Percent Excess Air, %	
F-Factor, dscfm/MMBtu @ %O2	
Round Duct Diameter, inches	
Rectangular Duct Width, inches	
Rectangular Duct Length, inches	
Fw	
Fc	