

ANALYZER INFORMATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

File Name: C:\DATA\Jobs\Valero\Tail Gas\UNIT 80 020911 B.cem
Computer: WSWCETP2 **Trailer:** 22

Analog Input Device: **Keithley KPCMCIA 16AI Card**

Channel 1

Analyte	O2
Method	EPA 3A, Using Bias
Analyzer Make, Model & Serial No.	Servomex 4900
Full-Scale Output, mv	1000
Span Concentration, %	21.0

Channel 2

Analyte	CO2
Method	EPA 3A, Using Bias
Analyzer Make, Model & Serial No.	Servomex 4900
Full-Scale Output, mv	1000
Span Concentration, %	16.8

Channel 4

Analyte	SO2
Method	EPA 6C, Using Bias
Analyzer Make, Model & Serial No.	Ametek 900
Full-Scale Output, mv	10000
Span Concentration, ppm	49.9

Channel 5

Analyte	CO
Method	EPA 10, Using Bias
Analyzer Make, Model & Serial No.	SERVOMEX 4900
Full-Scale Output, mv	10000
Span Concentration, ppm	251

ANALYZER INFORMATION

Number 1

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Channel 8

Analyte	THC
Method	EPA 25A, Not Using Bias
Analyzer Make, Model & Serial No.	JUM 3-300A
Full-Scale Output, mv	10000
Span Concentration, ppm	89.2

CALIBRATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 13:26

O2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	Cylinder ID
12.1	CC307713
21.0	CC158897

Calibration Results

Zero	-4 mv
Span, 21.0 %	8654 mv

Curve Coefficients

Slope	Intercept
412.3	-4.1

CO2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	Cylinder ID
9.0	CC307713
16.8	CC158897

Calibration Results

Zero	11 mv
Span, 16.8 %	8728 mv

Curve Coefficients

Slope	Intercept
518.9	11.3

CALIBRATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 13:26

SO₂

Method: EPA 6C

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
25.5	CC274191
49.9	CC314591

Calibration Results

Zero	-15 mv
Span, 49.9 ppm	7976 mv

Curve Coefficients

Slope	Intercept
160.1	-15.0

CO

Method: EPA 10

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
124	CC51951
251	CC79023

Calibration Results

Zero	4 mv
Span, 251 ppm	8442 mv

Curve Coefficients

Slope	Intercept
33.62	4.0

CALIBRATION

Number 1

Client: **Valero**
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Source: **Unit 80**

Project Number: **05614.015.001.0001**
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Date: **9 Feb 2011**

Starting Time: 13:26

THC

Method: EPA 25A

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
25.2	XC027851B
45.5	XC002134B
84.4	SG9183284

Calibration Results

Zero	15 mv
Span, 84.4 ppm	8499 mv

Curve Coefficients

Slope	Intercept
100.56	14.9

CALIBRATION ERROR

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 13:26

O2

Method: EPA 3A

Slope 412.3

Intercept -4.1

Standard, %	Response, mV	%	Error, %
Zero	-4	0.0	0
12.1	4942	12.0	-0.5
21.0	8654	21.0	0

CO2

Method: EPA 3A

Slope 518.9

Intercept 11.3

Standard, %	Response, mV	%	Error, %
Zero	11	0.0	0
9.00	4650	8.9	-0.6
16.8	8728	16.8	0

SO2

Method: EPA 6C

Slope 160.1

Intercept -15.0

Standard, ppm	Response, mV	ppm	Error, %
Zero	-15	0.0	0
25.5	4119	25.8	0.6
49.9	7976	49.9	0

CALIBRATION ERROR

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 13:26

CO

Method: EPA 10

Slope 33.62

Intercept 4.0

Standard, ppm	Response, mV	ppm	Error, %
Zero	4	0	0
124	4241	126	1.0
251	8442	251	0

THC

Method: EPA 25A

Slope 100.56

Intercept 14.9

Standard, ppm	Response, mV	ppm	Error, %
Zero	15	0.0	0
25.2	2563	25.3	0.4
45.5	4605	45.6	0.1
84.4	8499	84.4	0

BIAS

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 14:04

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias
Gas	%	%	Error
Zero	0.0	0.0	0.0%
Span	12.0	12.1	0.5%

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias
Gas	%	%	Error
Zero	0.0	0.0	0.0%
Span	8.9	8.8	-0.6%

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0.0	-0.2	-0.4%
Span	25.8	25.9	0.2%

BIAS

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 14:04

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0	1	0.4%
Span	126	126	0.0%

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 14:08					
14:09	0.1	5.8	0.2	96	55.3
14:10	0.1	5.8	0.1	92	54.1
14:11	0.1	5.8	0.1	85	54.8
14:12	0.1	5.8	0.1	87	53.4
14:13	0.1	5.8	0.1	87	51.0
14:14	0.1	5.7	0.1	82	51.0
14:15	0.1	5.8	0.1	81	52.5
14:16	0.1	5.9	0.1	83	53.4
14:17	0.1	5.8	0.1	84	54.9
14:18	0.1	5.8	0.2	87	54.1
14:19	0.1	5.8	0.1	88	48.3
14:20	0.1	5.7	0.2	81	45.9
14:21	0.1	5.7	0.1	72	45.7
14:22	0.1	5.7	0.1	70	45.1
14:23	0.1	5.7	0.1	67	48.5
14:24	0.1	5.7	0.1	67	49.5
14:25	0.1	5.7	0.2	69	50.1
14:26	0.1	5.7	0.1	66	56.2
14:27	0.1	5.8	0.1	69	60.6
14:28	0.1	5.8	0.1	79	61.0
14:29	0.1	5.8	0.0	83	57.8
14:30	0.1	5.7	0.1	81	51.5
14:31	0.1	5.7	0.1	75	50.8
14:32	0.1	5.7	0.1	70	58.4
14:33	0.1	5.7	0.1	74	59.5
14:34	0.1	5.6	0.1	85	49.9
14:35	0.1	5.5	0.1	79	45.3
14:36	0.1	5.6	0.0	69	50.8
14:37	0.1	5.6	0.0	67	53.7
14:38	0.1	5.6	0.0	74	58.4

RUN DATA

Number 1

Client: **Valero**
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Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
14:39	0.1	5.7	0.1	82	61.2
14:40	0.1	5.7	0.1	90	60.6
14:41	0.1	5.7	0.2	91	57.9
14:42	0.1	5.7	0.2	88	57.1
14:43	0.1	5.7	0.2	84	60.4
14:44	0.1	5.8	0.2	85	61.1
14:45	0.1	5.8	0.2	90	57.4
14:46	0.1	5.7	0.2	86	58.4
14:47	0.1	5.7	0.2	82	62.1
14:48	0.1	5.7	0.2	85	64.6
14:49	0.1	5.7	0.2	92	62.2
14:50	0.1	5.7	0.2	90	63.1
14:51	0.1	5.7	0.2	86	66.6
14:52	0.1	5.7	0.3	92	67.5
14:53	0.1	5.7	0.3	96	65.5
14:54	0.1	5.7	0.3	95	59.9
14:55	0.1	5.7	0.2	87	54.2
14:56	0.1	5.6	0.2	77	53.7
14:57	0.1	5.6	0.2	72	57.6
14:58	0.1	5.6	0.2	73	63.3
14:59	0.1	5.7	0.2	80	65.9
15:00	0.1	5.7	0.2	92	65.4
15:01	0.1	5.6	0.2	91	66.4
15:02	0.1	5.7	0.2	90	64.6
15:03	0.1	5.7	0.2	89	62.7
15:04	0.1	5.7	0.2	85	62.7
15:05	0.1	5.6	0.1	81	63.5
15:06	0.1	5.7	0.2	83	63.0
15:07	0.1	5.7	0.1	82	63.9
15:08	0.1	5.7	0.1	82	63.6
15:09	0.1	5.7	0.2	82	66.7

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
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Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
15:10	0.1	5.7	0.1	84	69.2
15:11	0.1	5.7	0.0	89	69.6
15:12	0.1	5.7	0.0	91	68.9
15:13	0.1	5.7	0.1	91	70.5
15:14	0.1	5.8	0.0	90	70.8
15:15	0.1	5.8	0.1	92	69.5
15:16	0.1	5.7	0.2	90	69.4
15:17	0.1	5.7	0.2	90	62.9
15:18	0.1	5.6	0.2	87	57.4
15:19	0.1	5.5	0.2	78	59.2
15:20	0.1	5.6	0.2	78	58.6
15:21	0.1	5.5	0.2	81	56.1
Run Avg	0.1	5.7	0.1	83	58.7

RUN SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Analyzer	O2	CO2	SO2	CO	THC
Method	EPA 3A	EPA 3A	EPA 6C	EPA 10	EPA 25A
Conc. Units	%	%	ppm	ppm	ppm

Time: 14:08 to 15:21

Run Averages

0.1	5.7	0.1	83	58.7
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Pre-run Bias at 14:04

Zero Bias	0.0	0.0	-0.2	1	N/A
Span Bias	12.1	8.8	25.9	126	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 15:24

Zero Bias	0.1	0.0	0.1	1	N/A
Span Bias	12.0	8.7	25.6	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.1	5.9	0.1	81	58.7*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 15:24

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.1	0.5%
Span	12.0	12.0	0.0%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.0	0.1	0.5%
Span	12.1	12.0	-0.5%

*Bias No. 1

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	8.9	8.7	-1.2%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	8.8	8.7	-0.6%

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 15:24

SO₂

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0.0	0.1	0.2%
Span	25.8	25.6	-0.4%

Calibration Drift

	Initial*	Final	Drift
Gas	ppm	ppm	
Zero	-0.2	0.1	0.6%
Span	25.9	25.6	-0.6%

*Bias No. 1

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0	1	0.4%
Span	126	125	-0.4%

Calibration Drift

	Initial*	Final	Drift
Gas	ppm	ppm	
Zero	1	1	0.0%
Span	126	125	-0.4%

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
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Date: **9 Feb 2011**

Starting Time: 15:24

THC

Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	
Gas	ppm	ppm	Drift
Zero	0.0	0.1	0.1%
Span	45.6	45.5	-0.1%

*Cal No. 1

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 15:40					
15:41	0.1	5.6	0.5	78	57.5
15:42	0.1	5.6	0.4	84	57.0
15:43	0.1	5.7	0.4	89	57.7
15:44	0.1	5.7	0.3	87	60.5
15:45	0.1	5.7	0.2	91	59.7
15:46	0.1	5.7	0.3	92	60.5
15:47	0.1	5.6	0.2	90	60.6
15:48	0.1	5.6	0.3	93	57.9
15:49	0.1	5.6	0.2	90	55.6
15:50	0.1	5.6	0.2	86	53.7
15:51	0.1	5.6	0.1	82	55.2
15:52	0.1	5.6	0.2	80	54.5
15:53	0.1	5.6	0.2	82	55.2
15:54	0.1	5.6	0.1	79	62.9
15:55	0.1	5.7	0.1	91	65.6
15:56	0.1	5.8	0.1	102	65.0
15:57	0.1	5.7	0.1	101	58.2
15:58	0.1	5.5	0.1	85	44.8
15:59	0.1	5.4	0.1	69	33.4
16:00	0.1	5.4	0.1	57	36.0
16:01	0.1	5.6	0.0	49	49.0
16:02	0.1	5.6	0.0	74	58.6
16:03	0.1	5.7	0.0	93	61.1
16:04	0.1	5.7	0.0	96	60.5
16:05	0.1	5.7	0.0	93	56.3
16:06	0.1	5.6	0.0	85	52.9
16:07	0.1	5.6	0.0	77	51.3
16:08	0.1	5.5	0.0	74	52.7
16:09	0.1	5.6	0.0	73	58.3
16:10	0.1	5.7	0.0	83	63.1

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
16:11	0.1	5.8	0.0	96	62.5
16:12	0.1	5.8	0.0	100	58.0
16:13	0.1	5.7	0.0	91	50.9
16:14	0.1	5.6	0.0	78	53.4
16:15	0.1	5.6	0.0	73	58.0
16:16	0.1	5.6	0.0	80	62.2
16:17	0.1	5.7	0.0	89	62.4
16:18	0.1	5.7	0.0	96	60.7
16:19	0.1	5.7	0.0	92	57.5
16:20	0.1	5.7	0.0	86	51.3
16:21	0.1	5.6	0.0	78	51.3
16:22	0.1	5.6	0.0	72	56.1
16:23	0.1	5.6	0.0	75	60.1
16:24	0.1	5.6	0.0	82	64.9
16:25	0.1	5.7	0.0	94	63.9
16:26	0.1	5.7	0.0	98	60.4
16:27	0.1	5.7	0.0	90	54.4
16:28	0.1	5.6	0.0	81	53.5
16:29	0.1	5.6	0.0	74	59.1
16:30	0.1	5.6	0.0	77	61.6
16:31	0.1	5.6	0.0	86	62.4
16:32	0.1	5.7	0.0	91	62.9
16:33	0.1	5.7	0.0	94	61.1
16:34	0.1	5.7	0.0	94	57.2
16:35	0.1	5.6	0.0	85	57.4
16:36	0.1	5.6	0.0	82	58.4
16:37	0.1	5.5	0.0	83	58.5
16:38	0.1	5.6	0.0	85	59.0
16:39	0.1	5.6	0.0	84	62.9
16:40	0.1	5.6	0.0	88	64.8
16:41	0.1	5.6	0.0	96	61.8

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
16:42	0.1	5.6	0.0	93	61.1
16:43	0.1	5.5	0.0	88	59.3
16:44	0.1	5.5	0.0	88	53.8
16:45	0.1	5.3	0.0	81	52.3
16:46	0.1	5.4	0.0	75	56.3
16:47	0.1	5.4	0.0	78	59.3
16:48	0.1	5.4	0.0	85	58.3
16:49	0.1	5.4	0.0	89	56.4
16:50	0.1	5.4	0.0	85	56.8
16:51	0.1	5.4	0.0	84	60.1
16:52	0.1	5.4	0.0	87	60.7
16:53	0.1	5.5	0.0	94	59.5
16:54	0.1	5.5	0.0	93	57.5
16:55	0.1	5.5	0.0	89	56.9
16:56	0.1	5.5	0.0	86	55.7
16:57	0.1	5.5	0.0	84	56.2
16:58	0.1	5.6	0.0	84	59.3
16:59	0.1	5.6	0.0	89	58.5
17:00	0.1	5.6	0.0	92	59.6
17:01	0.1	5.6	0.0	90	58.5
17:02	0.1	5.5	0.0	91	57.8
17:03	0.1	5.5	0.0	88	58.3
17:04	0.1	5.5	0.0	89	56.6
17:05	0.1	5.5	0.0	87	50.8
17:06	0.1	5.4	0.0	80	47.5
17:07	0.1	5.5	0.0	72	49.6
17:08	0.1	5.5	0.0	71	54.1
17:09	0.1	5.6	0.0	76	55.5
17:10	0.1	5.6	0.0	82	55.2
17:11	0.1	5.5	0.0	84	55.1
17:12	0.1	5.5	0.0	84	51.9

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
17:13	0.1	5.5	0.0	83	46.4
17:14	0.1	5.5	0.0	74	46.6
17:15	0.1	5.5	0.0	69	48.5
17:16	0.1	5.5	0.0	71	48.9
17:17	0.1	5.5	0.0	73	56.6
17:18	0.1	5.6	0.0	88	58.7
17:19	0.1	5.7	0.0	96	54.7
17:20	0.1	5.5	0.0	90	51.9
17:21	0.1	5.5	0.0	81	48.4
17:22	0.1	5.5	0.0	77	43.4
17:23	0.1	5.5	0.0	71	44.6
17:24	0.1	5.5	0.0	66	48.4
17:25	0.1	5.5	0.0	69	54.1
17:26	0.1	5.5	0.0	78	58.0
17:27	0.1	5.6	0.0	90	54.3
17:28	0.1	5.5	0.0	89	47.7
17:29	0.1	5.4	0.0	76	44.0
17:30	0.1	5.3	0.0	67	43.3
17:31	0.1	5.3	0.0	64	41.3
17:32	0.1	5.3	0.0	63	42.1
17:33	0.1	5.4	0.0	62	50.4
17:34	0.1	5.5	0.0	83	60.2
17:35	0.1	5.6	0.0	112	58.6
17:36	0.1	5.6	0.0	98	52.5
17:37	0.1	5.3	0.0	81	32.6
17:38	0.1	4.9	0.0	47	15.2
17:39	0.1	5.0	0.0	25	13.0
17:40	0.1	5.5	0.0	20	15.5
17:41	0.1	5.9	0.0	29	23.1
17:42	0.1	5.6	0.0	33	29.0
17:43	0.1	5.3	0.0	50	28.6

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
17:44	0.1	5.3	0.0	54	28.9
17:45	0.1	5.3	0.0	55	30.8
17:46	0.1	5.3	0.0	57	34.9
17:47	0.1	5.3	0.0	61	44.8
17:48	0.1	5.4	0.0	81	49.9
17:49	0.1	5.5	0.0	91	48.4
17:50	0.1	5.6	0.0	90	42.6
17:51	0.1	5.5	0.0	76	44.8
17:52	0.1	5.4	0.0	71	44.4
17:53	0.1	5.2	0.0	72	43.8
17:54	0.1	5.2	0.0	68	48.8
17:55	0.1	5.3	0.0	72	54.7
17:56	0.1	5.5	0.0	85	55.0
17:57	0.1	5.5	0.0	92	52.9
17:58	0.1	5.5	0.0	88	44.2
17:59	0.1	5.4	0.0	79	41.2
18:00	0.1	5.4	0.0	68	41.5
18:01	0.1	5.4	0.0	65	47.7
18:02	0.1	5.5	0.0	76	54.4
18:03	0.1	5.6	0.0	92	52.5
18:04	0.1	5.6	0.0	92	48.2
18:05	0.1	5.5	0.0	81	49.0
18:06	0.1	5.5	0.0	77	43.8
18:07	0.1	5.4	0.0	74	47.7
18:08	0.1	5.5	0.0	77	57.7
18:09	0.1	5.7	0.0	98	54.1
18:10	0.1	5.6	0.0	92	47.9
18:11	0.1	5.6	0.0	80	45.0
18:12	0.1	5.6	0.0	72	46.9
18:13	0.1	5.6	0.0	71	49.6
18:14	0.1	5.5	0.0	74	55.1

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
18:15	0.1	5.6	0.0	84	52.9
18:16	0.1	5.6	0.0	88	54.5
18:17	0.1	5.6	0.0	85	57.0
18:18	0.1	5.7	0.0	91	52.8
18:19	0.1	5.7	0.0	91	49.7
18:20	0.1	5.6	0.0	80	54.8
18:21	0.1	5.6	0.0	82	55.0
18:22	0.1	5.6	0.0	89	54.3
18:23	0.1	5.6	0.0	87	54.5
18:24	0.1	5.6	0.0	86	58.1
18:25	0.1	5.7	0.0	90	58.5
18:26	0.1	5.6	0.0	96	55.3
18:27	0.1	5.6	0.0	90	57.4
18:28	0.1	5.6	0.0	88	56.7
18:29	0.1	5.5	0.0	91	53.9
18:30	0.1	5.5	0.0	86	51.8
18:31	0.1	5.5	0.0	83	49.7
18:32	0.1	5.5	0.0	79	52.8
18:33	0.1	5.6	0.0	79	58.8
18:34	0.1	5.6	0.0	87	57.9
Run Avg	0.1	5.5	0.0	81	52.6

RUN SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Analyzer	O2	CO2	SO2	CO	THC
Method	EPA 3A	EPA 3A	EPA 6C	EPA 10	EPA 25A
Conc. Units	%	%	ppm	ppm	ppm

Time: 15:40 to 18:34

Run Averages

0.1	5.5	0.0	81	52.6
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Pre-run Bias at 15:24

Zero Bias	0.1	0.0	0.1	1	N/A
Span Bias	12.0	8.7	25.6	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 18:35

Zero Bias	0.1	0.1	-0.4	0	N/A
Span Bias	12.0	8.7	25.6	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.0	5.7	0.1	80	52.6*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 18:35

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.1	0.5%
Span	12.0	12.0	0.0%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.1	0.1	0.0%
Span	12.0	12.0	0.0%

*Bias No. 2

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.1	0.6%
Span	8.9	8.7	-1.2%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.0	0.1	0.6%
Span	8.7	8.7	0.0%

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 18:35

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0.0	-0.4	-0.8%
Span	25.8	25.6	-0.4%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0.1	-0.4	-1.0%
Span	25.6	25.6	0.0%

*Bias No. 2

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0	0	0.0%
Span	126	125	-0.4%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	1	0	-0.4%
Span	125	125	0.0%

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 18:35

THC

Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	
Gas	ppm	ppm	Drift
Zero	0.0	-0.2	-0.2%
Span	45.6	45.9	0.3%

*Cal No. 1

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 18:47					
18:48	0.1	5.5	0.0	86	58.6
18:49	0.1	5.6	0.0	96	57.6
18:50	0.1	5.6	0.0	103	53.6
18:51	0.1	5.5	0.0	90	54.5
18:52	0.1	5.5	0.0	85	51.6
18:53	0.1	5.5	0.0	83	55.7
18:54	0.1	5.5	0.0	82	55.7
18:55	0.1	5.5	0.0	88	54.3
18:56	0.1	5.5	0.0	84	56.3
18:57	0.1	5.5	0.0	85	54.1
18:58	0.1	5.4	0.0	86	52.4
18:59	0.1	5.4	0.0	82	54.7
19:00	0.1	5.4	0.0	81	57.6
19:01	0.1	5.4	0.0	86	58.5
19:02	0.1	5.4	0.0	90	59.4
19:03	0.1	5.5	0.0	91	58.0
19:04	0.1	5.5	0.0	91	57.6
19:05	0.1	5.5	0.0	87	56.5
19:06	0.1	5.5	0.0	86	58.8
19:07	0.1	5.4	0.0	85	56.2
19:08	0.0	5.4	0.0	87	53.9
19:09	0.0	5.4	0.0	80	57.2
19:10	0.1	5.4	0.0	81	61.3
19:11	0.1	5.5	0.0	92	60.1
19:12	0.1	5.6	0.0	98	52.8
19:13	0.1	5.5	0.0	85	53.9
19:14	0.1	5.4	0.0	78	55.0
19:15	0.1	5.4	0.0	83	52.5
19:16	0.0	5.4	0.0	81	52.0
19:17	0.1	5.4	0.0	80	58.0

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
19:18	0.1	5.5	0.0	87	59.7
19:19	0.1	5.6	0.0	97	58.6
19:20	0.0	5.5	0.0	96	52.3
19:21	0.1	5.5	0.0	88	49.6
19:22	0.0	5.4	0.0	77	54.8
19:23	0.0	5.5	0.0	81	52.7
19:24	0.0	5.4	0.0	83	56.3
19:25	0.1	5.5	0.0	85	54.5
19:26	0.1	5.5	0.0	90	55.1
19:27	0.0	5.4	0.0	86	54.1
19:28	0.1	5.4	0.0	90	54.2
19:29	0.1	5.4	0.0	86	54.3
19:30	0.1	5.4	0.0	88	54.3
19:31	0.1	5.4	0.0	85	54.6
19:32	0.1	5.4	0.0	87	54.5
19:33	0.1	5.4	0.0	87	51.5
19:34	0.1	5.4	0.0	85	47.4
19:35	0.0	5.3	0.0	77	51.0
19:36	0.1	5.3	0.0	75	52.5
19:37	0.0	5.3	0.0	82	51.2
19:38	0.1	5.3	0.0	80	53.7
19:39	0.1	5.3	0.0	81	55.9
19:40	0.1	5.4	0.0	88	56.8
19:41	0.1	5.4	0.0	92	56.7
19:42	0.0	5.4	0.0	92	53.4
19:43	0.1	5.3	0.0	87	47.3
19:44	0.1	5.3	0.0	78	39.5
19:45	0.1	5.2	0.0	68	33.7
19:46	0.1	5.2	0.0	58	33.1
19:47	0.1	5.3	0.0	52	38.3
19:48	0.1	5.3	0.0	58	48.6

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
19:49	0.1	5.4	0.0	83	50.3
19:50	0.1	5.4	0.0	88	50.1
19:51	0.1	5.4	0.0	86	47.5
19:52	0.1	5.3	0.0	82	46.3
19:53	0.1	5.3	0.0	77	46.5
19:54	0.1	5.3	0.0	77	47.2
19:55	0.0	5.3	0.0	77	48.0
19:56	0.1	5.4	0.0	79	47.6
19:57	0.1	5.3	0.0	79	50.6
19:58	0.1	5.4	0.0	82	48.8
19:59	0.1	5.3	0.0	84	45.8
20:00	0.1	5.3	0.0	77	50.9
20:01	0.1	5.4	0.0	76	52.0
20:02	0.1	5.4	0.0	87	52.0
20:03	0.1	5.3	0.0	84	53.0
20:04	0.1	5.4	0.0	85	48.0
20:05	0.1	5.4	0.0	82	41.3
20:06	0.1	5.3	0.0	71	36.9
20:07	0.1	5.3	0.0	63	33.2
20:08	0.1	5.3	0.0	57	30.3
20:09	0.1	5.3	0.0	52	33.9
20:10	0.1	5.4	0.0	52	41.7
20:11	0.1	5.4	0.0	66	47.1
20:12	0.1	5.5	0.0	80	46.9
20:13	0.1	5.4	0.0	84	48.0
20:14	0.1	5.4	0.0	81	49.5
20:15	0.1	5.4	0.0	83	47.8
20:16	0.1	5.4	0.0	84	44.2
20:17	0.1	5.4	0.0	78	41.4
20:18	0.1	5.4	0.0	72	43.5
20:19	0.1	5.5	0.0	70	50.1

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
20:20	0.1	5.5	0.0	85	50.4
20:21	0.1	5.5	0.0	91	42.2
20:22	0.1	5.4	0.0	73	30.6
20:23	0.1	5.3	0.0	60	22.8
20:24	0.1	5.3	0.0	48	21.6
20:25	0.1	5.3	0.0	39	22.1
20:26	0.1	5.3	0.0	37	27.9
20:27	0.1	5.4	0.0	48	37.8
20:28	0.1	5.5	0.0	74	41.1
20:29	0.1	5.4	0.0	80	40.4
20:30	0.1	5.4	0.0	79	38.5
20:31	0.1	5.4	0.0	73	36.5
20:32	0.1	5.3	0.0	66	37.1
20:33	0.1	5.2	0.0	63	40.0
20:34	0.1	5.3	0.0	66	41.7
20:35	0.1	5.3	0.0	72	43.1
20:36	0.1	5.4	0.0	74	52.0
20:37	0.1	5.5	0.0	98	51.8
20:38	0.1	5.3	0.0	94	47.2
20:39	0.1	5.2	0.0	80	44.4
20:40	0.1	5.2	0.0	74	40.0
20:41	0.1	5.2	0.0	70	39.7
20:42	0.1	5.2	0.0	64	49.6
20:43	0.1	5.4	0.0	81	50.2
20:44	0.1	5.3	0.0	87	48.2
20:45	0.1	5.3	0.0	83	48.6
20:46	0.1	5.3	0.0	81	46.7
20:47	0.1	5.2	0.0	82	41.4
20:48	0.1	5.2	0.0	75	43.0
20:49	0.1	5.2	0.0	70	45.8
20:50	0.1	5.2	0.0	73	52.2

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
20:51	0.1	5.3	0.0	88	51.1
20:52	0.1	5.3	0.0	92	50.3
20:53	0.1	5.3	0.0	87	46.7
20:54	0.1	5.2	0.0	81	46.4
20:55	0.1	5.1	0.0	76	48.9
20:56	0.1	5.2	0.0	78	48.7
20:57	0.1	5.2	0.0	79	53.2
20:58	0.1	5.3	0.0	83	52.8
20:59	0.1	5.3	0.0	91	48.4
21:00	0.1	5.2	0.0	86	48.4
21:01	0.1	5.2	0.0	80	52.4
21:02	0.1	5.3	0.0	85	51.8
21:03	0.1	5.3	0.0	93	50.1
21:04	0.1	5.2	0.0	87	49.9
21:05	0.1	5.2	0.0	85	48.3
21:06	0.1	5.3	0.0	84	50.3
21:07	0.1	5.3	0.0	85	44.7
21:08	0.1	5.2	0.0	83	43.5
21:09	0.1	5.3	0.0	74	52.2
21:10	0.1	5.5	0.0	97	55.2
21:11	0.1	5.5	0.0	106	50.8
21:12	0.1	5.4	0.0	91	46.4
21:13	0.1	5.3	0.0	80	45.0
21:14	0.1	5.3	0.0	76	46.9
21:15	0.0	5.4	0.0	76	46.6
21:16	0.0	5.4	0.0	77	53.7
21:17	0.1	5.5	0.0	86	55.5
21:18	0.1	5.5	0.0	96	52.9
21:19	0.1	5.4	0.0	91	46.2
21:20	0.1	5.4	0.0	81	40.0
21:21	0.1	5.4	0.0	69	46.7
Run Avg	0.1	5.4	0.0	80	48.6

RUN SUMMARY

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Analyzer	O2	CO2	SO2	CO	THC
Method	EPA 3A	EPA 3A	EPA 6C	EPA 10	EPA 25A
Conc. Units	%	%	ppm	ppm	ppm

Time: 18:47 to 21:21

Run Averages

0.1	5.4	0.0	80	48.6
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Pre-run Bias at 18:35

Zero Bias	0.1	0.1	-0.4	0	N/A
Span Bias	12.0	8.7	25.6	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 21:23

Zero Bias	0.1	0.0	-0.4	0	N/A
Span Bias	12.0	8.7	24.6	124	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.0	5.6	0.4	79	48.6*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 21:23

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.1	0.5%
Span	12.0	12.0	0.0%

Calibration Drift

	Initial*	Final	
Gas	%	%	Drift
Zero	0.1	0.1	0.0%
Span	12.0	12.0	0.0%

*Bias No. 3

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	8.9	8.7	-1.2%

Calibration Drift

	Initial*	Final	
Gas	%	%	Drift
Zero	0.1	0.0	-0.6%
Span	8.7	8.7	0.0%

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 21:23

SO₂

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0.0	-0.4	-0.8%
Span	25.8	24.6	-2.4%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	-0.4	-0.4	0.0%
Span	25.6	24.6	-2.0%

*Bias No. 3

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0	0	0.0%
Span	126	124	-0.8%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0	0	0.0%
Span	125	124	-0.4%

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 80**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **9 Feb 2011**

Starting Time: 21:23

THC

Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	Drift
Gas	ppm	ppm	
Zero	0.0	-0.3	-0.3%
Span	45.6	45.9	0.3%

*Cal No. 1

ANALYZER INFORMATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

File Name: C:\DATA\Jobs\Valero\Tail Gas\UNIT 81 020811 B.cem
Computer: WSWCETP2 **Trailer:** 22

Analog Input Device: **Keithley KPCMCIA 16AI Card**

Channel 1

Analyte	O2
Method	EPA 3A, Using Bias
Analyzer Make, Model & Serial No.	Servomex 4900
Full-Scale Output, mv	1000
Span Concentration, %	21.0

Channel 2

Analyte	CO2
Method	EPA 3A, Using Bias
Analyzer Make, Model & Serial No.	Servomex 4900
Full-Scale Output, mv	1000
Span Concentration, %	16.8

Channel 4

Analyte	SO2
Method	EPA 6C, Using Bias
Analyzer Make, Model & Serial No.	Ametek 900
Full-Scale Output, mv	10000
Span Concentration, ppm	49.9

Channel 5

Analyte	CO
Method	EPA 10, Using Bias
Analyzer Make, Model & Serial No.	SERVOMEX 4900
Full-Scale Output, mv	10000
Span Concentration, ppm	251

ANALYZER INFORMATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Channel 8

Analyte

THC

Method

EPA 25A, Not Using Bias

Analyzer Make, Model & Serial No.

JUM 3-300A

Full-Scale Output, mv

10000

Span Concentration, ppm

89.2

CALIBRATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:09

O2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	Cylinder ID
12.1	CC307713
21.0	CC158897

Calibration Results

Zero	4 mv
Span, 21.0 %	8561 mv

Curve Coefficients

Slope	Intercept
407.5	4.1

CO2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	Cylinder ID
9.0	CC307713
16.8	CC158897

Calibration Results

Zero	8 mv
Span, 16.8 %	8401 mv

Curve Coefficients

Slope	Intercept
499.6	7.7

CALIBRATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:09

SO₂

Method: EPA 6C

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
25.5	CC274191
49.9	CC314591

Calibration Results

Zero	3 mv
Span, 49.9 ppm	8276 mv

Curve Coefficients

Slope	Intercept
165.8	3.1

CO

Method: EPA 10

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
124	CC51951
251	CC79023

Calibration Results

Zero	3 mv
Span, 251 ppm	8391 mv

Curve Coefficients

Slope	Intercept
33.42	3.3

CALIBRATION

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:09

THC

Method: EPA 25A

Calibration Type: Linear Zero and High Span

Calibration Standards

ppm	Cylinder ID
24.8	SG9148206
45.1	CC53960
89.2	CC122469

Calibration Results

Zero	2 mv
Span, 89.2 ppm	8905 mv

Curve Coefficients

Slope	Intercept
99.84	2.0

CALIBRATION ERROR

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:09

O2

Method: EPA 3A

Slope 407.5

Intercept 4.1

Standard, %	Response, mV	%	Error, %
Zero	4	0.0	0
12.1	4935	12.1	0.0
21.0	8561	21.0	0

CO2

Method: EPA 3A

Slope 499.6

Intercept 7.7

Standard, %	Response, mV	%	Error, %
Zero	8	0.0	0
9.00	4529	9.0	0.0
16.8	8401	16.8	0

SO2

Method: EPA 6C

Slope 165.8

Intercept 3.1

Standard, ppm	Response, mV	ppm	Error, %
Zero	3	0.0	0
25.5	4241	25.6	0.2
49.9	8276	49.9	0

CALIBRATION ERROR

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:09

CO

Method: EPA 10

Slope 33.42

Intercept 3.3

Standard, ppm	Response, mV	ppm	Error, %
Zero	3	0	0
124	4245	127	1.4
251	8391	251	0

THC

Method: EPA 25A

Slope 99.84

Intercept 2.0

Standard, ppm	Response, mV	ppm	Error, %
Zero	2	0.0	0
24.8	2519	25.2	1.6
45.1	4529	45.3	0.4
89.2	8905	89.2	0

BIAS

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:18

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias
Gas	%	%	Error
Zero	0.0	0.0	0.0%
Span	12.1	12.1	0.0%

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias
Gas	%	%	Error
Zero	0.0	0.0	0.0%
Span	9.0	8.9	-0.6%

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0.0	0.3	0.6%
Span	25.6	25.0	-1.2%

BIAS

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 11:18

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0	0	0.0%
Span	127	127	0.0%

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 11:47					
11:48	0.0	6.3	1.9	135	60.8
11:49	0.0	6.3	2.0	135	61.1
11:50	0.0	6.3	2.1	130	61.8
11:51	0.0	6.4	2.1	132	60.3
11:52	0.0	6.3	2.1	135	58.2
11:53	0.0	6.3	2.2	128	58.1
11:54	0.0	6.3	2.2	124	59.9
11:55	0.0	6.4	2.3	128	61.1
11:56	0.0	6.4	2.3	132	60.4
11:57	0.0	6.3	2.4	131	61.0
11:58	0.0	6.4	2.4	129	60.5
11:59	0.0	6.4	2.4	132	59.1
12:00	0.0	6.3	2.4	129	59.9
12:01	0.0	6.3	2.4	125	63.4
12:02	0.0	6.4	2.5	131	61.3
12:03	0.0	6.4	2.4	135	59.1
12:04	0.0	6.3	2.4	123	60.5
12:05	0.0	6.3	2.5	121	63.1
12:06	0.0	6.4	2.5	126	63.4
12:07	0.0	6.4	2.5	131	62.1
12:08	0.0	6.3	2.5	128	62.2
12:09	0.0	6.3	2.5	126	64.9
12:10	0.0	6.4	2.5	128	65.8
12:11	0.0	6.5	2.5	139	62.8
12:12	0.0	6.4	2.6	134	59.3
12:13	0.0	6.3	2.7	123	59.7
12:14	0.0	6.4	2.6	122	62.7
12:15	0.0	6.4	2.7	127	62.3
12:16	0.0	6.4	2.7	135	60.1
12:17	0.0	6.4	2.7	132	56.2

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
12:18	0.0	6.3	2.7	125	57.8
12:19	0.0	6.4	2.7	121	61.3
12:20	0.0	6.4	2.7	129	59.9
12:21	0.0	6.4	2.7	133	58.5
12:22	0.0	6.3	2.6	126	60.6
12:23	0.0	6.4	2.6	125	62.7
12:24	0.0	6.5	2.7	132	63.1
12:25	0.0	6.4	2.7	134	64.5
12:26	0.0	6.5	2.7	133	64.5
12:27	0.0	6.5	2.7	134	62.2
12:28	0.0	6.4	2.7	132	62.5
12:29	0.0	6.4	2.8	128	65.3
12:30	0.0	6.5	2.7	130	65.0
12:31	0.0	6.5	2.7	135	64.5
12:32	0.0	6.4	2.8	134	65.0
12:33	0.1	6.4	2.8	132	65.1
12:34	0.0	6.4	2.8	133	64.5
12:35	0.0	6.4	2.9	133	64.7
12:36	0.0	6.5	2.8	133	65.3
12:37	0.0	6.5	2.8	133	65.3
12:38	0.0	6.5	2.9	135	65.2
12:39	0.0	6.5	2.8	136	65.7
12:40	0.0	6.5	2.8	136	64.9
12:41	0.0	6.5	2.8	135	63.5
12:42	0.1	6.5	2.8	132	63.9
12:43	0.0	6.4	2.8	131	63.9
12:44	0.1	6.4	2.7	130	65.3
12:45	0.1	6.4	2.7	129	66.9
12:46	0.1	6.5	2.8	132	66.9
12:47	0.1	6.5	2.8	135	66.6
12:48	0.0	6.4	2.8	133	64.5

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
12:49	0.0	6.5	2.8	131	63.4
12:50	0.1	6.4	2.9	128	67.6
12:51	0.1	6.5	2.9	132	67.3
12:52	0.1	6.5	2.9	138	65.7
12:53	0.1	6.4	2.9	133	64.4
12:54	0.1	6.4	2.9	129	66.8
12:55	0.1	6.5	2.9	134	66.5
12:56	0.1	6.6	2.9	144	61.7
12:57	0.0	6.4	2.9	122	59.3
12:58	0.0	6.4	2.9	118	63.8
12:59	0.0	6.5	2.9	126	65.8
13:00	0.1	6.5	2.9	137	64.8
13:01	0.1	6.5	2.9	135	64.8
13:02	0.0	6.5	2.9	130	65.5
13:03	0.0	6.5	2.8	131	65.7
13:04	0.1	6.5	2.8	134	65.8
13:05	0.1	6.5	2.8	134	68.2
13:06	0.1	6.5	2.9	135	67.2
13:07	0.1	6.5	2.9	142	64.7
13:08	0.0	6.4	2.9	133	65.7
13:09	0.0	6.5	2.9	129	65.3
13:10	0.1	6.5	2.9	136	64.3
13:11	0.1	6.5	2.9	135	64.6
13:12	0.1	6.5	3.0	131	65.8
13:13	0.1	6.5	2.9	136	63.3
13:14	0.0	6.5	3.0	140	58.6
13:15	0.0	6.4	2.9	128	59.2
13:16	0.0	6.4	2.9	123	64.5
13:17	0.1	6.6	2.9	135	63.1
13:18	0.0	6.5	2.9	141	61.8
13:19	0.0	6.4	2.9	130	62.6

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
13:20	0.0	6.5	2.9	129	63.7
13:21	0.1	6.5	2.9	136	62.9
13:22	0.1	6.5	2.8	136	62.4
13:23	0.1	6.5	2.8	130	63.1
13:24	0.0	6.5	2.8	132	62.9
13:25	0.0	6.5	2.8	136	60.5
13:26	0.0	6.5	2.8	131	63.2
13:27	0.0	6.6	2.9	130	64.5
13:28	0.0	6.6	2.9	139	61.1
13:29	0.0	6.5	2.9	132	60.2
13:30	0.1	6.4	2.9	124	64.1
13:31	0.0	6.5	2.9	127	65.0
13:32	0.0	6.5	2.9	136	63.5
13:33	0.0	6.5	3.0	135	63.0
13:34	0.1	6.5	2.9	130	63.5
13:35	0.0	6.5	2.9	132	64.0
13:36	0.0	6.5	2.9	133	64.4
13:37	0.0	6.5	2.9	133	65.3
13:38	0.0	6.6	2.9	136	65.8
13:39	0.0	6.5	2.8	136	64.7
13:40	0.0	6.5	2.9	133	64.9
13:41	0.0	6.5	2.9	131	66.0
13:42	0.0	6.5	2.8	132	65.3
13:43	0.0	6.5	2.8	133	65.8
13:44	0.1	6.5	2.8	133	65.1
13:45	0.0	6.5	2.8	134	64.5
13:46	0.0	6.5	2.8	133	65.7
13:47	0.0	6.5	2.8	133	65.1
13:48	0.0	6.4	2.9	133	65.1
13:49	0.0	6.5	2.9	132	65.4
13:50	0.0	6.4	2.9	134	65.9

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
13:51	0.0	6.4	2.9	133	66.7
13:52	0.0	6.4	2.9	133	65.5
13:53	0.0	6.4	2.9	134	63.6
13:54	0.0	6.4	2.9	130	65.1
13:55	0.0	6.4	2.9	127	67.2
13:56	0.0	6.4	2.9	132	67.6
13:57	0.0	6.5	2.9	138	65.5
13:58	0.0	6.4	2.9	133	65.1
13:59	0.0	6.4	2.8	126	67.1
14:00	0.0	6.5	2.8	131	65.9
14:01	0.0	6.5	2.8	135	65.6
14:02	0.0	6.4	2.7	130	67.4
14:03	0.1	6.5	2.8	132	66.8
14:04	0.0	6.4	2.8	135	64.7
14:05	0.0	6.4	2.8	132	61.7
14:06	0.0	6.4	2.7	130	59.5
14:07	0.0	6.3	2.8	124	63.7
14:08	0.0	6.4	2.8	126	63.7
14:09	0.0	6.4	2.8	137	60.9
14:10	0.1	6.4	2.8	131	60.5
14:11	0.1	6.4	2.8	125	61.6
14:12	0.0	6.4	2.8	128	62.5
14:13	0.0	6.4	2.9	133	63.0
14:14	0.0	6.4	2.9	133	62.7
14:15	0.0	6.4	2.8	131	61.6
14:16	0.0	6.4	2.9	131	61.4
14:17	0.0	6.4	2.9	130	62.3
14:18	0.0	6.5	2.8	133	61.7
14:19	0.0	6.5	2.9	134	60.9
14:20	0.0	6.4	2.9	130	61.3
14:21	0.0	6.4	2.9	129	61.2

RUN DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
14:22	0.0	6.4	2.8	131	60.9
14:23	0.0	6.4	2.8	130	60.9
14:24	0.0	6.4	2.8	131	61.5
14:25	0.0	6.4	2.8	133	60.3
14:26	0.0	6.4	2.8	135	57.7
14:27	0.0	6.3	2.8	129	59.4
14:28	0.0	6.4	2.8	125	60.7
14:29	0.0	6.5	2.8	136	57.7
14:30	0.0	6.4	2.7	131	56.6
14:31	0.0	6.3	2.7	122	59.8
14:32	0.0	6.4	2.8	126	59.4
14:33	0.0	6.4	2.9	135	58.6
14:34	0.0	6.3	2.8	129	59.0
14:35	0.0	6.3	2.8	125	60.3
14:36	0.0	6.4	2.9	131	59.3
14:37	0.0	6.4	2.9	133	58.0
14:38	0.0	6.3	2.9	127	59.3
14:39	0.0	6.4	2.8	129	59.5
14:40	0.0	6.4	2.9	131	59.2
14:41	0.0	6.4	2.9	130	58.6
14:42	0.0	6.3	2.9	129	58.4
14:43	0.0	6.3	2.9	127	58.8
14:44	0.0	6.4	2.9	130	58.1
14:45	0.0	6.4	2.9	132	56.5
14:46	0.0	6.4	2.9	130	56.7
14:47	0.0	6.4	2.9	129	55.9
14:48	0.0	6.4	2.8	130	54.6
14:49	0.0	6.4	2.8	130	53.1
Run Avg	0.0	6.4	2.8	131	62.7

RUN SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Analyzer	O2	CO2	SO2	CO	THC
Method	EPA 3A	EPA 3A	EPA 6C	EPA 10	EPA 25A
Conc. Units	%	%	ppm	ppm	ppm

Time: 11:47 to 14:49

Run Averages

0.0	6.4	2.8	131	62.7
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Pre-run Bias at 11:18

Zero Bias	0.0	0.0	0.3	0	N/A
Span Bias	12.1	8.9	25.0	127	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 14:51

Zero Bias	0.0	0.0	0.0	0	N/A
Span Bias	12.1	9.1	24.1	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.0	6.4	2.8	128	62.7*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 14:51

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	12.1	12.1	0.0%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	12.1	12.1	0.0%

*Bias No. 1

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

	Cal	Bias	Bias Error
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	9.0	9.1	0.6%

Calibration Drift

	Initial*	Final	Drift
Gas	%	%	
Zero	0.0	0.0	0.0%
Span	8.9	9.1	1.2%

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 14:51

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0.0	0.0	0.0%
Span	25.6	24.1	-3.0%

Calibration Drift

	Initial*	Final	Drift
Gas	ppm	ppm	
Zero	0.3	0.0	-0.6%
Span	25.0	24.1	-1.8%

*Bias No. 1

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

	Cal	Bias	Bias
Gas	ppm	ppm	Error
Zero	0	0	0.0%
Span	127	125	-0.8%

Calibration Drift

	Initial*	Final	Drift
Gas	ppm	ppm	
Zero	0	0	0.0%
Span	127	125	-0.8%

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 14:51

THC

Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	
Gas	ppm	ppm	Drift
Zero	0.0	0.0	0.0%
Span	45.3	45.9	0.7%

*Cal No. 1

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 15:25					
15:26	0.0	6.3	0.0	130	64.6
15:27	0.0	6.3	0.0	129	64.3
15:28	0.0	6.3	0.0	128	65.4
15:29	0.0	6.3	0.0	129	66.4
15:30	0.0	6.3	0.0	131	64.7
15:31	0.0	6.3	0.0	129	63.4
15:32	0.0	6.3	0.0	125	65.4
15:33	0.0	6.3	0.0	126	65.9
15:34	0.0	6.4	0.0	132	65.9
15:35	0.0	6.3	0.0	132	65.3
15:36	0.0	6.3	0.0	126	66.1
15:37	0.0	6.3	0.0	125	66.3
15:38	0.0	6.3	0.0	130	65.9
15:39	0.0	6.3	0.0	129	66.8
15:40	0.0	6.3	0.0	127	68.5
15:41	0.0	6.3	0.0	131	69.4
15:42	0.0	6.3	0.0	134	68.8
15:43	0.0	6.3	0.0	134	67.6
15:44	0.0	6.3	0.0	133	67.1
15:45	0.0	6.3	0.0	130	66.5
15:46	0.0	6.3	0.0	133	64.1
15:47	0.0	6.3	0.0	131	58.6
15:48	0.0	6.2	0.0	123	58.7
15:49	0.0	6.3	0.0	117	64.7
15:50	0.0	6.4	0.0	125	63.2
15:51	0.0	6.3	0.0	133	62.2
15:52	0.0	6.3	0.1	122	65.3
15:53	0.0	6.3	0.1	123	66.0
15:54	0.0	6.3	0.1	129	65.6
15:55	0.0	6.3	0.1	130	66.3

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
15:56	0.0	6.3	0.1	132	66.9
15:57	0.0	6.4	0.1	135	66.3
15:58	0.0	6.3	0.1	134	65.1
15:59	0.0	6.3	0.0	128	65.1
16:00	0.0	6.3	0.0	126	66.0
16:01	0.0	6.3	0.0	128	65.4
16:02	0.0	6.2	0.0	128	64.5
16:03	0.0	6.2	0.0	125	64.0
16:04	0.0	6.3	0.0	123	66.2
16:05	0.0	6.4	0.0	126	66.0
16:06	0.0	6.3	0.0	129	65.4
16:07	0.0	6.3	0.0	128	66.0
16:08	0.0	6.3	0.1	127	66.0
16:09	0.0	6.3	0.0	128	66.4
16:10	0.0	6.4	0.1	129	67.2
16:11	0.0	6.4	0.1	131	67.8
16:12	0.0	6.4	0.1	135	67.1
16:13	0.0	6.4	0.1	131	66.5
16:14	0.0	6.4	0.1	129	67.0
16:15	0.0	6.4	0.1	131	65.4
16:16	0.0	6.4	0.1	130	65.7
16:17	0.0	6.4	0.1	128	66.4
16:18	0.0	6.4	0.1	131	64.4
16:19	0.0	6.4	0.0	130	63.5
16:20	0.0	6.4	0.0	128	64.2
16:21	0.0	6.4	0.0	129	65.4
16:22	0.0	6.4	0.0	134	64.4
16:23	0.0	6.4	0.0	136	63.4
16:24	0.0	6.4	0.0	132	60.4
16:25	0.0	6.3	0.0	127	57.9
16:26	0.0	6.3	0.0	121	63.2

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
16:27	0.0	6.4	0.0	125	63.3
16:28	0.0	6.4	0.0	135	60.5
16:29	0.0	6.3	0.0	126	60.7
16:30	0.0	6.4	0.0	120	64.6
16:31	0.0	6.4	0.0	128	63.9
16:32	0.0	6.4	0.0	132	64.0
16:33	0.0	6.3	0.0	124	64.9
16:34	0.0	6.4	0.0	127	66.0
16:35	0.0	6.4	0.0	132	64.7
16:36	0.0	6.4	0.1	133	62.5
16:37	0.0	6.4	0.0	127	64.1
16:38	0.0	6.4	0.1	127	63.6
16:39	0.0	6.4	0.0	130	62.4
16:40	0.0	6.3	0.0	129	62.7
16:41	0.0	6.3	0.1	129	62.9
16:42	0.0	6.3	0.0	130	61.8
16:43	0.0	6.4	0.0	131	61.1
16:44	0.0	6.4	0.0	130	61.3
16:45	0.0	6.4	0.0	128	60.7
16:46	0.0	6.3	0.0	126	62.5
16:47	0.0	6.3	0.0	126	65.0
16:48	0.0	6.4	0.0	133	63.2
16:49	0.0	6.3	0.0	132	62.1
16:50	0.0	6.3	0.0	124	64.5
16:51	0.0	6.4	0.0	123	67.6
16:52	0.0	6.4	0.0	132	65.5
16:53	0.0	6.3	0.0	130	65.0
16:54	0.0	6.3	0.0	119	67.7
16:55	0.0	6.4	0.0	126	65.3
16:56	0.0	6.4	0.0	129	64.3
16:57	0.0	6.4	0.0	121	69.2

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
16:58	0.0	6.5	0.0	127	68.6
16:59	0.0	6.4	0.0	137	66.7
17:00	0.0	6.3	0.0	126	67.9
17:01	0.0	6.3	0.0	123	68.4
17:02	0.0	6.4	0.0	129	68.0
17:03	0.0	6.3	0.0	129	67.8
17:04	0.0	6.3	0.0	127	69.5
17:05	0.0	6.4	0.0	131	68.8
17:06	0.0	6.4	0.0	132	68.8
17:07	0.0	6.4	0.0	130	68.4
17:08	0.0	6.4	0.0	131	67.4
17:09	0.0	6.4	0.0	132	65.0
17:10	0.0	6.4	0.0	127	68.3
17:11	0.0	6.4	0.0	128	68.7
17:12	0.0	6.4	0.0	137	66.4
17:13	0.0	6.3	0.0	130	66.2
17:14	0.0	6.3	0.0	125	68.8
17:15	0.0	6.4	0.0	128	71.0
17:16	0.0	6.4	0.0	136	68.6
17:17	0.0	6.4	0.0	135	66.1
17:18	0.0	6.3	0.0	123	66.1
17:19	0.0	6.3	0.0	121	67.1
17:20	0.0	6.3	0.0	124	69.5
17:21	0.0	6.4	0.0	129	69.3
17:22	0.0	6.4	0.0	135	64.8
17:23	0.0	6.3	0.0	124	59.6
17:24	0.0	6.3	0.0	117	54.2
17:25	0.0	6.3	0.0	111	61.7
17:26	0.0	6.5	0.0	122	66.5
17:27	0.0	6.4	0.0	135	63.3
17:28	0.0	6.3	0.0	118	62.2

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
17:29	0.0	6.3	0.0	115	65.1
17:30	0.0	6.4	0.0	121	64.5
17:31	0.0	6.4	0.0	127	63.1
17:32	0.0	6.3	0.0	122	66.3
17:33	0.0	6.4	0.0	123	67.3
17:34	0.0	6.4	0.0	132	65.4
17:35	0.0	6.4	0.0	128	65.4
17:36	0.0	6.4	0.0	123	68.0
17:37	0.0	6.4	0.0	129	66.4
17:38	0.0	6.3	0.0	131	65.9
17:39	0.0	6.3	0.0	126	65.4
17:40	0.0	6.3	0.0	126	67.2
17:41	0.0	6.4	0.0	129	67.0
17:42	0.0	6.4	0.0	132	66.1
17:43	0.0	6.3	0.0	129	65.2
17:44	0.0	6.3	0.0	126	64.0
17:45	0.0	6.3	0.0	125	63.7
17:46	0.0	6.3	0.0	125	65.7
17:47	0.0	6.4	0.0	129	65.1
17:48	0.0	6.4	0.0	130	63.8
17:49	0.0	6.3	0.0	125	64.7
17:50	0.0	6.4	0.0	126	64.2
17:51	0.0	6.3	0.0	129	63.4
17:52	0.0	6.3	0.0	127	64.0
17:53	0.0	6.4	0.0	127	65.1
17:54	0.0	6.4	0.0	129	66.5
17:55	0.0	6.4	0.0	132	65.7
17:56	0.0	6.4	0.0	136	63.9
17:57	0.0	6.4	0.0	129	63.3
17:58	0.0	6.3	0.0	125	64.9
17:59	0.0	6.4	0.0	128	65.4

RUN DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
18:00	0.0	6.4	0.0	133	65.1
18:01	0.0	6.4	0.0	132	65.5
18:02	0.0	6.4	0.0	130	64.2
18:03	0.0	6.3	0.0	130	60.1
18:04	0.0	6.2	0.0	124	58.9
18:05	0.0	6.3	0.0	117	65.6
18:06	0.0	6.4	0.0	125	66.1
18:07	0.0	6.3	0.0	135	62.1
18:08	0.0	6.2	0.0	126	59.9
18:09	0.0	6.2	0.0	118	63.7
18:10	0.0	6.4	0.0	121	66.9
18:11	0.0	6.4	0.0	132	65.5
18:12	0.0	6.4	0.0	135	62.7
18:13	0.0	6.3	0.0	124	62.0
18:14	0.0	6.3	0.0	122	63.0
18:15	0.0	6.4	0.0	125	63.3
18:16	0.0	6.4	0.0	128	64.8
Run Avg	0.0	6.3	0.0	128	65.0

RUN SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Analyzer	O2	CO2	SO2	CO	THC
Method	EPA 3A	EPA 3A	EPA 6C	EPA 10	EPA 25A
Conc. Units	%	%	ppm	ppm	ppm

Time: 15:25 to 18:16

Run Averages

0.0	6.3	0.0	128	65.0
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Pre-run Bias at 14:51

Zero Bias	0.0	0.0	0.0	0	N/A
Span Bias	12.1	9.1	24.1	125	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 18:17

Zero Bias	0.0	0.0	0.0	0	N/A
Span Bias	12.0	9.1	25.2	126	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.0	6.2	0.0	126	65.0*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 18:17

O2

Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Gas	Cal	Bias	Bias Error
	%	%	
Zero	0.0	0.0	0.0%
Span	12.1	12.0	-0.5%

Calibration Drift

Gas	Initial*	Final	Drift
	%	%	
Zero	0.0	0.0	0.0%
Span	12.1	12.0	-0.5%

*Bias No. 2

CO2

Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Gas	Cal	Bias	Bias Error
	%	%	
Zero	0.0	0.0	0.0%
Span	9.0	9.1	0.6%

Calibration Drift

Gas	Initial*	Final	Drift
	%	%	
Zero	0.0	0.0	0.0%
Span	9.1	9.1	0.0%

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 18:17

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0.0	0.0	0.0%
Span	25.6	25.2	-0.8%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0.0	0.0	0.0%
Span	24.1	25.2	2.2%

*Bias No. 2

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0	0	0.0%
Span	127	126	-0.4%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0	0	0.0%
Span	125	126	0.4%

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 18:17

THC
Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	
Gas	ppm	ppm	Drift
Zero	0.0	0.1	0.1%
Span	45.3	44.1	-1.3%

*Cal No. 1

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
Starting time 18:36					
18:37	0.0	6.4	0.0	120	67.3
18:38	0.0	6.4	0.0	131	65.4
18:39	0.0	6.3	0.0	129	64.7
18:40	0.0	6.3	0.0	122	68.5
18:41	0.0	6.4	0.0	127	68.4
18:42	0.0	6.3	0.0	132	67.6
18:43	0.0	6.3	0.0	127	69.0
18:44	0.0	6.3	0.0	127	68.4
18:45	0.0	6.3	0.0	130	65.7
18:46	0.0	6.3	0.0	126	67.3
18:47	0.0	6.4	0.0	126	68.7
18:48	0.0	6.4	0.0	132	68.2
18:49	0.0	6.3	0.0	130	66.8
18:50	0.0	6.3	0.0	126	67.1
18:51	0.0	6.3	0.0	126	68.6
18:52	0.0	6.3	0.0	131	68.3
18:53	0.0	6.3	0.0	131	69.0
18:54	0.0	6.3	0.0	132	67.7
18:55	0.0	6.3	0.0	132	67.8
18:56	0.0	6.3	0.0	129	68.4
18:57	0.0	6.3	0.0	132	66.8
18:58	0.0	6.3	0.0	133	64.2
18:59	0.0	6.2	0.1	127	60.0
19:00	0.0	6.2	0.0	120	61.6
19:01	0.0	6.2	0.1	117	65.4
19:02	0.0	6.2	0.1	125	64.4
19:03	0.0	6.2	0.1	129	62.1
19:04	0.0	6.1	0.1	122	62.2
19:05	0.0	6.2	0.1	120	65.2
19:06	0.0	6.2	0.1	126	65.2

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
19:07	0.0	6.2	0.2	132	63.3
19:08	0.0	6.1	0.1	126	61.7
19:09	0.0	6.2	0.1	121	61.5
19:10	0.0	6.2	0.1	122	60.5
19:11	0.0	6.2	0.1	122	62.5
19:12	0.0	6.2	0.1	122	64.6
19:13	0.0	6.2	0.0	128	64.5
19:14	0.0	6.2	0.0	126	64.0
19:15	0.0	6.2	0.0	123	65.6
19:16	0.0	6.2	0.0	124	66.3
19:17	0.0	6.2	0.0	127	64.1
19:18	0.0	6.2	0.0	123	62.4
19:19	0.0	6.2	0.0	117	64.7
19:20	0.0	6.2	0.0	118	67.2
19:21	0.0	6.2	0.0	124	68.3
19:22	0.0	6.3	0.0	129	66.2
19:23	0.0	6.2	0.0	126	63.9
19:24	0.0	6.2	0.0	120	64.5
19:25	0.0	6.2	0.0	120	65.0
19:26	0.0	6.2	0.0	124	64.6
19:27	0.0	6.2	0.0	124	64.7
19:28	0.0	6.3	0.0	123	65.3
19:29	0.0	6.3	0.0	124	66.0
19:30	0.0	6.3	0.1	127	67.0
19:31	0.0	6.3	0.0	129	66.4
19:32	0.0	6.4	0.1	131	65.5
19:33	0.0	6.3	0.1	126	65.8
19:34	0.0	6.3	0.2	125	67.2
19:35	0.0	6.3	0.1	128	67.6
19:36	0.0	6.3	0.1	132	66.9
19:37	0.0	6.3	0.2	129	63.9

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
19:38	0.0	6.2	0.2	123	58.0
19:39	0.0	6.2	0.2	116	55.5
19:40	0.0	6.3	0.2	110	62.6
19:41	0.0	6.4	0.3	113	60.6
19:42	0.0	6.3	0.3	122	55.7
19:43	0.0	6.5	0.2	114	64.4
19:44	0.0	6.7	0.3	137	63.4
19:45	0.0	6.5	0.3	126	58.2
19:46	0.0	6.4	0.3	110	59.4
19:47	0.0	6.6	0.2	117	69.4
19:48	0.0	6.6	0.2	144	64.5
19:49	0.0	6.4	0.1	117	61.5
19:50	0.0	6.5	0.1	113	67.7
19:51	0.0	6.6	0.1	122	69.6
19:52	0.0	6.5	0.0	132	67.2
19:53	0.0	6.4	0.0	126	70.9
19:54	0.0	6.5	0.0	127	71.0
19:55	0.0	6.5	0.0	133	63.7
19:56	0.0	6.3	0.0	118	56.5
19:57	0.0	6.4	0.0	109	64.8
19:58	0.0	6.5	0.0	118	69.7
19:59	0.0	6.4	0.0	131	62.9
20:00	0.0	6.2	0.0	118	60.2
20:01	0.0	6.4	0.0	113	69.7
20:02	0.0	6.5	0.0	136	67.9
20:03	0.0	6.4	0.0	131	64.7
20:04	0.0	6.4	0.0	120	66.1
20:05	0.0	6.5	0.0	119	70.4
20:06	0.0	6.6	0.1	131	69.4
20:07	0.0	6.5	0.0	136	66.9
20:08	0.0	6.5	0.1	128	66.8

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
20:09	0.0	6.5	0.1	127	66.9
20:10	0.0	6.4	0.1	129	64.5
20:11	0.0	6.4	0.1	127	65.2
20:12	0.0	6.4	0.1	123	69.7
20:13	0.0	6.4	0.1	128	69.5
20:14	0.0	6.3	0.1	134	65.8
20:15	0.0	6.2	0.1	125	64.9
20:16	0.0	6.3	0.1	122	66.1
20:17	0.0	6.3	0.2	125	64.6
20:18	0.0	6.3	0.2	129	65.5
20:19	0.0	6.3	0.2	128	65.0
20:20	0.0	6.3	0.2	129	63.8
20:21	0.0	6.3	0.2	127	62.8
20:22	0.0	6.3	0.2	123	60.4
20:23	0.0	6.3	0.3	121	58.5
20:24	0.0	6.3	0.2	118	63.7
20:25	0.0	6.3	0.3	120	68.3
20:26	0.0	6.4	0.2	132	67.6
20:27	0.0	6.3	0.2	135	65.1
20:28	0.0	6.2	0.2	124	65.2
20:29	0.0	6.3	0.2	122	67.0
20:30	0.0	6.4	0.2	125	69.1
20:31	0.0	6.4	0.2	130	69.5
20:32	0.0	6.4	0.2	132	67.8
20:33	0.0	6.4	0.1	131	69.4
20:34	0.0	6.4	0.1	130	70.2
20:35	0.0	6.4	0.1	136	64.7
20:36	0.0	6.3	0.1	128	64.3
20:37	0.0	6.3	0.1	122	67.1
20:38	0.0	6.4	0.1	126	68.1
20:39	0.0	6.4	0.1	133	67.5

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
20:40	0.0	6.4	0.1	133	65.8
20:41	0.0	6.3	0.1	127	64.7
20:42	0.0	6.3	0.1	123	65.5
20:43	0.0	6.3	0.1	124	65.3
20:44	0.0	6.3	0.1	127	65.8
20:45	0.0	6.4	0.1	130	66.3
20:46	0.0	6.4	0.1	131	66.1
20:47	0.0	6.4	0.1	129	66.5
20:48	0.0	6.4	0.2	130	66.0
20:49	0.0	6.4	0.2	131	64.5
20:50	0.0	6.4	0.2	130	63.1
20:51	0.0	6.4	0.2	127	64.9
20:52	0.0	6.4	0.2	130	64.2
20:53	0.0	6.4	0.2	130	64.8
20:54	0.0	6.4	0.2	129	63.8
20:55	0.0	6.4	0.2	130	59.9
20:56	0.0	6.4	0.2	126	59.7
20:57	0.0	6.4	0.3	123	63.5
20:58	0.0	6.5	0.2	127	65.6
20:59	0.0	6.5	0.3	134	66.2
21:00	0.0	6.5	0.3	133	66.7
21:01	0.0	6.5	0.3	132	67.6
21:02	0.0	6.5	0.3	132	67.8
21:03	0.0	6.5	0.3	133	65.8
21:04	0.0	6.4	0.3	130	64.5
21:05	0.0	6.4	0.3	126	62.1
21:06	0.0	6.5	0.3	128	62.3
21:07	0.0	6.5	0.3	131	64.2
21:08	0.0	6.4	0.3	131	65.8
21:09	0.0	6.5	0.3	131	65.9
21:10	0.0	6.5	0.3	132	64.1

RUN DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

	Time	O2 %	CO2 %	SO2 ppm	CO ppm	THC ppm
	21:11	0.0	6.4	0.3	130	64.4
	21:12	0.0	6.5	0.2	128	66.0
	21:13	0.0	6.5	0.2	131	69.0
	21:14	0.0	6.5	0.2	135	68.9
	21:15	0.0	6.5	0.2	137	66.7
	21:16	0.0	6.4	0.2	127	66.7
	21:17	0.0	6.5	0.2	125	68.8
	21:18	0.0	6.6	0.3	132	68.1
	21:19	0.0	6.5	0.3	134	67.3
	21:20	0.0	6.5	0.4	132	65.5
	21:21	0.0	6.5	0.6	131	58.8
	21:22	0.0	6.4	0.7	122	54.9
	Run Avg	0.0	6.4	0.1	127	65.3

RUN SUMMARY

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**
Calibration: **1**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Analyzer Method Conc. Units	O2 EPA 3A %	CO2 EPA 3A %	SO2 EPA 6C ppm	CO EPA 10 ppm	THC EPA 25A ppm
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Time: 18:36 to 21:22

Run Averages

0.0	6.4	0.1	127	65.3
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Pre-run Bias at 18:17

Zero Bias	0.0	0.0	0.0	0	N/A
Span Bias	12.0	9.1	25.2	126	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Post-run Bias at 21:24

Zero Bias	0.0	0.1	0.0	0	N/A
Span Bias	12.0	9.0	25.0	126	N/A
Span Gas	12.1	9.0	25.5	124	N/A

Run averages corrected for the average of the pre-run and post-run bias

0.0	6.4	0.1	124	65.3*
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*No Correction

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 21:24

SO2

Method: EPA 6C
Span Conc. 49.9 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0.0	0.0	0.0%
Span	25.6	25.0	-1.2%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0.0	0.0	0.0%
Span	25.2	25.0	-0.4%

*Bias No. 3

CO

Method: EPA 10
Span Conc. 251 ppm

Bias Results

Gas	Cal ppm	Bias ppm	Bias Error
Zero	0	0	0.0%
Span	127	126	-0.4%

Calibration Drift

Gas	Initial* ppm	Final ppm	Drift
Zero	0	0	0.0%
Span	126	126	0.0%

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Unit 81**

Project Number: **05614.015.001.0001**
Operator: **SB**
Date: **8 Feb 2011**

Starting Time: 21:24

THC

Method: EPA 25A
Span Conc. 89.2 ppm

Calibration Drift

	Initial*	Final	
Gas	ppm	ppm	Drift
Zero	0.0	0.1	0.1%
Span	45.3	44.6	-0.8%

*Cal No. 1

INSTRUMENT DATA

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

File: >:\Documents and Settings\laxops\My Documents\Jobs\Valero\Valero 020911.tv
Computer: WSWC1444FIELD2 Trailer: 22

Analog Input Device Keithley KPCMCI A 16AI Card

Sampling Rate $50/1024$ sec

Data Interval 0.5 sec

Gas Chromatograph GC-8A 1644

Gases	Pressure psig	Flow mL/min	Temperatures	Sample Loop
H ₂	30	50	Column 100°C	Column 1
Air	30	60	Detector 120°C	Column 2
Carrier	50	30		Detector Range 10

Injection Cycle

Length 300 sec

Valve Timing	Time, sec
Inject	0
Load/Backflush	120

njection is triggered by internal clock

Integration Parameters

Signal threshold 0.67 mv
Peak detection window ± 10 sec
Minimum peak area 2 mv-sec Minimum peak height 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72°F
Barometric Pressure 30.21 in. Hg

PERMEATION RATE CALCULATIONS

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

To calculate the permeation rate in volume units:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460^\circ + T_a) / T_s] \times (P_s / P_a)$$

Where:

PR_{nl} = Permeation Rate, nL/min
 PR_{ng} = Permeation Rate, ng/min
 V_{mol} = Molar Volume of any gas @32°C & 29.92 mm Hg = 22.4 L/mole
 W_{mol} = Molecular Weight of compound
 T_a = Ambient Temperature, °F
 T_s = Standard Temperature = 492°R
 P_s = Standard Pressure = 29.92 in Hg
 P_a = Ambient Pressure, in Hg

To calculate concentration:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
 PR_{nl} = Permeation Rate, nL/min
 F_d = Diluent Flow Rate, mL/min

$T_a = 72^\circ\text{F}$ $P_a = 30.21$

H₂S: Device T-35381 $PR_{ng} = 634$ ng/min $W_{mol} = 34.08$
 $PR_{nl} = 634 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
= **446** nL/min

COS: Device F-35177 $PR_{ng} = 476$ ng/min $W_{mol} = 60.07$
 $PR_{nl} = 476 \times (22.4 / 60.07) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
= **190** nL/min

CS₂: Device 33-35287 $PR_{ng} = 620$ ng/min $W_{mol} = 76.14$
 $PR_{nl} = 620 \times (22.4 / 76.14) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
= **195** nL/min

	H₂S	COS	CS₂
Permeation Device ID	T-35381	F-35177	33-35287
Permeation Rate, ng/min	634	476	620
Permeation Rate, nL/min	446	190	195

CALIBRATION DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Ambient Temp 72°F Baro. Press. 30.21 in. Hg

Compound	H ₂ S	COS	CS ₂
Perm. Device ID	T-35381	F-35177	33-35287
Perm. Rate, nL/min	446	190	195
Ret. Time, sec	38.0	53.0	208.0

1 Flow 119 mL/min	3.75 ppm	1.60 ppm	1.64 ppm
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Time: 09:11	Peak Areas, mv-sec
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1279	361	704
1311	366	716
1279	355	719

<u>Average Area</u>	1289	360	713
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2 Flow 57.1 mL/min	7.82 ppm	3.33 ppm	3.42 ppm
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Time: 08:22	Peak Areas, mv-sec
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4649	1309	2787
4641	1386	2667
4618	1338	2783

<u>Average Area</u>	4636	1344	2746
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3 Flow 30.2 mL/min	14.8 ppm	6.29 ppm	6.47 ppm
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Time: 06:49	Peak Areas, mv-sec
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11585	4074	7766
11791	4207	8396
11657	4191	8128

<u>Average Area</u>	11678	4157	8097
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CALIBRATION SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

H₂S	1	2	3		
Time	09:11	08:22	06:49		
Conc.	3.75	7.82	14.8		
Response	1289	4636	11678		
Calc. Conc.	3.68	8.14	14.5		
% Error	-1.9	+4.2	-2.2		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.6104	2.1993	0.9986	2	0.07
COS	1	2	3		
Time	09:11	08:22	06:49		
Conc.	1.60	3.33	6.29		
Response	360	1344	4157		
Calc. Conc.	1.60	3.34	6.29		
% Error	-0.1	+0.3	-0.1		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7833	2.1951	>0.9999	2	0.09
CS₂	1	2	3		
Time	09:11	08:22	06:49		
Conc.	1.64	3.42	6.47		
Response	713	2746	8097		
Calc. Conc.	1.63	3.48	6.41		
% Error	-0.8	+1.8	-0.9		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7737	2.4776	0.9997	2	0.06

RECOVERY DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Calibration Number 1 Before Run 1
Start Time 11:25 End Time 11:43

Recovery was run using H₂S

Recovery Gas to Probe, Time: 11:25

Peak Areas, mv-sec			Average	ppm
3185	3230	3183	3199	6.47

Recovery Gas to GC, Time: 11:39

Peak Areas, mv-sec			Average	ppm
3311	3240	3253	3268	6.55

Recovery 98.7%

REDUCED SULFUR FIELD DATA

Run 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
11:44	171	1.05	2281	4.49	<2	<0.06	5.54
11:49	114	0.82	2041	4.22	19	0.21	5.45
11:54	163	1.02	2254	4.46	8	0.13	5.74
11:59	141	0.93	2011	4.18	9	0.14	5.40
12:04	119	0.84	2976	5.21	11	0.15	6.36
12:09	114	0.82	1913	4.07	46	0.35	5.58
12:14	109	0.79	2342	4.56	6	0.11	5.57
12:19	111	0.80	1903	4.06	<2	<0.06	4.86
12:24	73	0.62	2543	4.77	8	0.13	5.65
12:29	120	0.84	1905	4.06	<2	<0.06	4.90
12:34	161	1.01	4430	6.51	7	0.12	7.76
12:39	199	1.15	7024	8.44	73	0.45	10.5
12:44	114	0.81	1039	2.89	13	0.17	4.04
12:49	144	0.94	2217	4.42	<2	<0.06	5.36
12:54	172	1.06	4379	6.47	22	0.23	7.99
12:59	149	0.96	2202	4.40	24	0.24	5.85
Threw out injections from 1300 to 1350 due to freezing in the sample lines.							
13:50	129	0.88	2096	4.28	<2	<0.06	5.16
13:55	132	0.89	2698	4.93	<2	<0.06	5.82
14:00	124	0.86	1973	4.14	13	0.17	5.34
14:05	132	0.90	2537	4.77	<2	<0.06	5.66
14:10	141	0.93	2743	4.98	33	0.29	6.49
14:15	131	0.89	2273	4.48	17	0.20	5.77
14:20	133	0.90	1887	4.04	<2	<0.06	4.94
14:25	142	0.93	1998	4.17	13	0.17	5.43
14:30	177	1.07	2060	4.24	35	0.30	5.91
14:35	138	0.92	1556	3.62	20	0.22	4.97
14:40	136	0.91	2616	4.85	<2	<0.06	5.76
14:45	151	0.97	2596	4.83	7	0.12	6.03
14:50	136	0.91	2384	4.60	<2	<0.06	5.51
14:55	135	0.91	2054	4.23	18	0.21	5.55
15:00	141	0.93	3048	5.28	<2	<0.06	6.21
15:05	139	0.92	2090	4.27	<2	<0.06	5.20
15:10	142	0.94	2287	4.50	12	0.16	5.76

REDUCED SULFUR FIELD DATA

Run 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
Averages:		0.91		4.65		0.13	5.82

RUN SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Start Time 11:44 End Time 15:15

Average Measured TRS Conc.	5.82 ppm
Recovery No. 2	99.4 %
TRS Corrected for Recovery	5.86 ppm

RECOVERY DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Calibration Number 1 After Run 1 Before Run 2
Start Time 15:15 End Time 15:33

Recovery was run using H₂S

Recovery Gas to Probe, Time: 15:15

Peak Areas, mv-sec			Average	ppm
3231	3295	3236	3254	6.54

Recovery Gas to GC, Time: 15:28

Peak Areas, mv-sec			Average	ppm
3277	3270	3312	3286	6.58

Recovery 99.4

REDUCED SULFUR FIELD DATA

Run 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS ppm
	area	ppm	area	ppm	area	ppm	
15:33	161	1.01	2298	4.51	10	0.15	5.81
15:38	153	0.98	1784	3.91	36	0.30	5.50
15:43	164	1.02	2228	4.43	38	0.31	6.08
15:48	175	1.06	2667	4.90	8	0.13	6.22
15:53	142	0.94	1964	4.13	<2	<0.06	5.06
15:58	149	0.96	2399	4.62	<2	<0.06	5.58
16:03	145	0.95	3667	5.86	<2	<0.06	6.81
16:08	144	0.94	1821	3.96	13	0.17	5.24
16:13	143	0.94	2828	5.06	8	0.13	6.26
16:18	156	0.99	2957	5.19	4	0.08	6.35
16:23	204	1.17	1674	3.77	17	0.20	5.34
16:28	158	1.00	2312	4.52	14	0.17	5.87
16:33	159	1.00	2027	4.20	17	0.20	5.59
16:38	158	1.00	2151	4.34	21	0.22	5.79
16:43	161	1.01	2457	4.68	9	0.13	5.96
16:48	151	0.97	2515	4.74	11	0.16	6.03
16:53	161	1.01	2855	5.09	76	0.46	7.03
16:58	157	0.99	2238	4.44	17	0.20	5.83
17:03	154	0.98	2272	4.48	16	0.19	5.84
17:08	144	0.94	1787	3.92	18	0.21	5.27
17:13	157	0.99	2279	4.49	12	0.16	5.80
17:18	167	1.04	2180	4.38	35	0.30	6.01
17:23	168	1.04	1724	3.84	18	0.20	5.28
17:28	146	0.95	2853	5.09	16	0.19	6.43
17:33	137	0.91	1651	3.74	17	0.20	5.05
17:38	144	0.94	2610	4.84	23	0.24	6.26
17:43	205	1.18	9629	10.1	86	0.49	12.2
17:48	147	0.96	1818	3.95	32	0.28	5.47
17:57	133	0.90	2867	5.10	6	0.11	6.22
18:02	135	0.90	1852	3.99	12	0.16	5.23
18:07	162	1.01	1933	4.09	20	0.22	5.54
18:12	154	0.98	1841	3.98	<2	<0.06	4.96
18:17	144	0.94	2332	4.55	14	0.18	5.85
18:22	147	0.95	2667	4.90	13	0.17	6.20

REDUCED SULFUR FIELD DATA

Run 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
18:27	147	0.96	2679	4.91	32	0.28	6.43
18:32	132	0.89	1986	4.15	22	0.23	5.51
Averages:		0.98		4.63		0.19	6.00

RUN SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Start Time 15:33 End Time 18:37

Average Measured TRS Conc.	6.00 ppm
Recovery No. 3	96.7 %
TRS Corrected for Recovery	6.20 ppm

RECOVERY DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Calibration Number 1 After Run 2 Before Run 3

Start Time 18:36 End Time 18:52

Recovery was run using H₂S

Recovery Gas to Probe, Time: 18:36

Peak Areas, mv-sec			Average	ppm
3082	3279	3297	3219	6.49

Recovery Gas to GC, Time: 18:46

Peak Areas, mv-sec			Average	ppm
3380	3418	3400	3399	6.72

Recovery 96.7

REDUCED SULFUR FIELD DATA

Run 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
18:57	141	0.93	2249	4.45	27	0.26	5.90
19:02	134	0.90	2479	4.70	15	0.18	5.98
19:07	130	0.88	2229	4.43	9	0.14	5.60
19:12	142	0.94	3416	5.63	8	0.13	6.82
19:17	130	0.89	1931	4.09	13	0.17	5.31
19:22	129	0.88	1671	3.77	5	0.10	4.86
19:27	132	0.89	2191	4.39	<2	<0.06	5.28
19:32	136	0.91	2374	4.59	4	0.09	5.68
19:37	138	0.92	2405	4.63	<2	<0.06	5.54
19:42	126	0.87	2891	5.13	29	0.27	6.53
19:47	147	0.96	1581	3.66	21	0.22	5.06
19:52	143	0.94	2216	4.42	33	0.29	5.94
19:57	136	0.91	1907	4.06	11	0.15	5.28
20:02	144	0.94	2909	5.15	6	0.11	6.30
20:07	129	0.88	1537	3.60	<2	<0.06	4.48
20:12	157	0.99	2626	4.86	<2	<0.06	5.85
20:17	132	0.89	2005	4.18	18	0.20	5.47
20:22	147	0.95	2432	4.65	<2	<0.06	5.61
20:27	138	0.92	2257	4.46	16	0.19	5.76
20:32	131	0.89	1579	3.65	27	0.26	5.06
20:37	133	0.90	2480	4.70	<2	<0.06	5.60
20:42	117	0.83	1376	3.38	10	0.15	4.51
20:47	137	0.91	2187	4.38	37	0.31	5.91
20:52	139	0.92	2851	5.09	47	0.35	6.71
20:57	135	0.90	1898	4.05	12	0.16	5.28
21:02	148	0.96	2253	4.46	<2	<0.06	5.42
21:07	133	0.90	2174	4.37	3	0.07	5.41
21:12	146	0.95	3646	5.84	3	0.07	6.93
21:17	144	0.94	2278	4.49	<2	<0.06	5.43
21:22	144	0.94	2039	4.22	25	0.25	5.65
21:27	145	0.95	2567	4.80	30	0.27	6.28
21:32	147	0.95	2660	4.89	13	0.17	6.19
21:37	145	0.95	3944	6.10	11	0.15	7.36
21:42	140	0.93	2165	4.36	14	0.18	5.64

REDUCED SULFUR FIELD DATA

Run 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
21:47	140	0.93	2434	4.66	22	0.23	6.04
21:52	153	0.98	2757	4.99	22	0.23	6.43
Averages:		0.92		4.54		0.15	5.75

RUN SUMMARY

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Start Time 18:57 End Time 21:57

Average Measured TRS Conc.	5.75 ppm
Recovery No. 4	95.6 %
TRS Corrected for Recovery	6.02 ppm

RECOVERY DATA

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Calibration Number 1 After Run 3 Before Run 4
Start Time 21:57 End Time 22:17

Recovery was run using H₂S

Recovery Gas to Probe, Time: 21:57

Peak Areas, mv-sec			Average	ppm
3306	3316	3218	3280	6.57

Recovery Gas to GC, Time: 22:05

Peak Areas, mv-sec			Average	ppm
3507	3528	3552	3529	6.87

Recovery 95.6

CALIBRATION DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **10 Feb 2011**

Ambient Temp 72°F Baro. Press. 30.21 in. Hg

Compound	H ₂ S	COS	CS ₂
Perm. Device ID	T-35381	F-35177	33-35287
Perm. Rate, nL/min	446	190	195
Ret. Time, sec	38.0	53.0	208.0

2 Flow 112 mL/min	3.98 ppm	1.70 ppm	1.74 ppm
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Time: 09:28

Peak Areas, mv-sec

1487	395	792
1487	399	743
1496	402	753
Average Area	399	763

3 Flow 76.8 mL/min	5.81 ppm	2.48 ppm	2.54 ppm
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Time: 10:01

Peak Areas, mv-sec

2844	742	1462
2830	775	1442
2847	783	1500
Average Area	766	1468

5 Flow 27.9 mL/min	16.0 ppm	6.81 ppm	7.00 ppm
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Time: 08:03

Peak Areas, mv-sec

12483	4339	8088
12621	4491	8628
12866	4557	8823
Average Area	4463	8513

CALIBRATION SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 80**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **10 Feb 2011**

H₂S	1	2	3		
Time	09:28	10:01	08:03		
Conc.	3.98	5.81	16.0		
Response	1490	2840	12657		
Calc. Conc.	3.91	5.97	15.9		
% Error	-1.9	+2.7	-0.7		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.5262	2.2695	0.9995	2	0.05
COS	1	2	3		
Time	09:28	10:01	08:03		
Conc.	1.70	2.48	6.81		
Response	399	766	4463		
Calc. Conc.	1.70	2.47	6.81		
% Error	+0.1	-0.1	+0.0		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7383	2.2008	>0.9999	2	0.08
CS₂	1	2	3		
Time	09:28	10:01	08:03		
Conc.	1.74	2.54	7.00		
Response	763	1468	8513		
Calc. Conc.	1.74	2.54	7.00		
% Error	+0.0	-0.0	+0.0		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7356	2.4631	>0.9999	2	0.06

INSTRUMENT DATA

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **7 Feb 2011**

File: Z:\Documents and Settings\laxops\My Documents\Jobs\Valero\Valero 020711.trv
Computer: WSWC1444FIELD2 Trailer: 22

Analog Input Device Keithley KPCMCIA 16AI Card

Sampling Rate $50/1024$ sec

Data Interval 0.5 sec

Gas Chromatograph GC-8A 1644

Gases	Pressure psig	Flow mL/min	Temperatures	Sample Loop
H ₂	30	50	Column 100°C	Column 1
Air	30	60	Detector 120°C	Column 2
Carrier	50	30		Detector Range 10

Injection Cycle

Length 300 sec

Valve Timing	Time, sec
Inject	0
Load/Backflush	120

njection is triggered by internal clock

Integration Parameters

Signal threshold 0.67 mv
Peak detection window ± 10 sec
Minimum peak area 2 mv-sec Minimum peak height 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72°F
Barometric Pressure 30.21 in. Hg

PERMEATION RATE CALCULATIONS

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **7 Feb 2011**

To calculate the permeation rate in volume units:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460^\circ + T_a) / T_s] \times (P_s / P_a)$$

Where:

PR_{nl} = Permeation Rate, nL/min
 PR_{ng} = Permeation Rate, ng/min
 V_{mol} = Molar Volume of any gas @32°C & 29.92 mm Hg = 22.4 L/mole
 W_{mol} = Molecular Weight of compound
 T_a = Ambient Temperature, °F
 T_s = Standard Temperature = 492°R
 P_s = Standard Pressure = 29.92 in Hg
 P_a = Ambient Pressure, in Hg

To calculate concentration:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
 PR_{nl} = Permeation Rate, nL/min
 F_d = Diluent Flow Rate, mL/min

$$T_a = 72^\circ\text{F} \quad P_a = 30.21$$

H₂S: Device T-35381 $PR_{ng} = 634 \text{ ng/min}$ $W_{mol} = 34.08$
 $PR_{nl} = 634 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
 $= 446 \text{ nL/min}$

COS: Device F-35177 $PR_{ng} = 476 \text{ ng/min}$ $W_{mol} = 60.07$
 $PR_{nl} = 476 \times (22.4 / 60.07) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
 $= 190 \text{ nL/min}$

CS₂: Device 33-35287 $PR_{ng} = 620 \text{ ng/min}$ $W_{mol} = 76.14$
 $PR_{nl} = 620 \times (22.4 / 76.14) \times [(460 + 72) / 492] \times (29.92 / 30.21)$
 $= 195 \text{ nL/min}$

	H₂S	COS	CS₂
Permeation Device ID	T-35381	F-35177	33-35287
Permeation Rate, ng/min	634	476	620
Permeation Rate, nL/min	446	190	195

CALIBRATION DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Ambient Temp 72°F Baro. Press. 30.21 in. Hg

Compound	H ₂ S	COS	CS ₂
Perm. Device ID	T-35381	F-35177	33-35287
Perm. Rate, nL/min	446	190	195
Ret. Time, sec	38.0	53.0	208.0

1 Flow 121 mL/min	3.69 ppm	1.57 ppm	1.61 ppm
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Time: 09:20	Peak Areas, mv-sec
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1044	285	575
1063	287	569
1135	291	577

<u>Average Area</u>	1081	288	574
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3 Flow 52.2 mL/min	8.55 ppm	3.64 ppm	3.74 ppm
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Time: 08:58	Peak Areas, mv-sec
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4446	1318	2608
4527	1281	2628
4543	1328	2522

<u>Average Area</u>	4505	1309	2586
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4 Flow 29.5 mL/min	15.1 ppm	6.44 ppm	6.62 ppm
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Time: 07:49	Peak Areas, mv-sec
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10423	3698	7549
10475	3566	7517
10379	3541	7769

<u>Average Area</u>	10426	3602	7612
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CALIBRATION SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

H₂S	1	2	3		
Time	09:20	08:58	07:49		
Conc.	3.69	8.55	15.1		
Response	1081	4505	10426		
Calc. Conc.	3.64	8.82	14.8		
% Error	-1.3	+3.2	-1.9		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.6128	2.1286	0.9992	2	0.07
COS	1	2	3		
Time	09:20	08:58	07:49		
Conc.	1.57	3.64	6.44		
Response	288	1309	3602		
Calc. Conc.	1.57	3.65	6.43		
% Error	-0.1	+0.3	-0.2		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7912	2.1089	>0.9999	2	0.10
CS₂	1	2	3		
Time	09:20	08:58	07:49		
Conc.	1.61	3.74	6.62		
Response	574	2586	7612		
Calc. Conc.	1.62	3.70	6.67		
% Error	+0.5	-1.2	+0.7		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.8288	2.3743	0.9999	2	0.07

RECOVERY DATA

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Calibration Number 1 Before Run 1
Start Time 10:14 End Time 10:40

Recovery was run using H₂S

Recovery Gas to Probe, Time: 10:14

Peak Areas, mv-sec

2777 2761 2701

Average ppm
2746 6.49

Recovery Gas to GC, Time: 10:35

Peak Areas, mv-sec

2767 2802 2777

Average ppm
2782 6.54

Recovery 99.2%

REDUCED SULFUR FIELD DATA

Run 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS ppm
	area	ppm	area	ppm	area	ppm	
11:30	273	1.55	1491	3.93	3	0.09	5.66
11:35	260	1.51	1573	4.05	<2	<0.07	5.55
11:40	282	1.58	1553	4.02	4	0.11	5.83
11:45	320	1.71	1700	4.23	53	0.44	6.82
11:50	289	1.61	1462	3.89	9	0.16	5.82
11:55	269	1.54	1255	3.57	18	0.24	5.60
12:00	269	1.54	1263	3.58	2	0.07	5.27
12:05	297	1.63	1326	3.68	3	0.09	5.49
12:10	297	1.63	1434	3.85	30	0.32	6.13
12:15	261	1.51	1296	3.63	5	0.12	5.38
12:20	276	1.56	1454	3.88	10	0.17	5.79
12:25	306	1.66	1624	4.12	7	0.14	6.07
12:30	287	1.60	1439	3.85	<2	<0.07	5.46
12:35	268	1.53	1328	3.68	6	0.13	5.49
12:40	277	1.57	1470	3.90	5	0.13	5.72
12:45	322	1.72	1420	3.82	<2	<0.07	5.54
12:50	305	1.66	1358	3.73	21	0.27	5.92
12:55	284	1.59	1322	3.67	<2	<0.07	5.27
13:00	303	1.65	1831	4.41	9	0.17	6.40
13:05	308	1.67	1567	4.04	<2	<0.07	5.71
13:10	303	1.65	1644	4.15	19	0.25	6.31
13:15	287	1.60	1363	3.74	6	0.13	5.59
13:20	324	1.73	1479	3.91	26	0.30	6.24
13:25	320	1.71	1688	4.21	2	0.08	6.08
13:30	318	1.70	1352	3.72	30	0.32	6.07
13:35	302	1.65	1432	3.84	88	0.58	6.65
13:40	341	1.78	1715	4.25	18	0.24	6.51
13:45	349	1.81	1597	4.08	7	0.14	6.18
13:50	317	1.70	1600	4.09	<2	<0.07	5.79
13:55	299	1.64	1345	3.71	15	0.22	5.80
14:00	324	1.73	1520	3.97	<2	<0.07	5.70
14:05	341	1.78	1666	4.18	2	0.08	6.13
14:10	328	1.74	1745	4.29	<2	<0.07	6.03
14:15	291	1.61	1538	4.00	<2	<0.07	5.61

REDUCED SULFUR FIELD DATA

Run 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
14:20	303	1.66	1531	3.99	21	0.27	6.18
14:25	360	1.84	1645	4.15	<2	<0.07	5.99
Averages:		1.65		3.94		0.15	5.88

RUN SUMMARY

Number 1

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Start Time 11:30 End Time 14:30

Average Measured TRS Conc.	5.88 ppm
Recovery No. 2	98.4 %
TRS Corrected for Recovery	5.98 ppm

RECOVERY DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Calibration Number 1 After Run 1 Before Run 2
Start Time 14:50 End Time 15:13

Recovery was run using H₂S

Recovery Gas to Probe, Time: 14:50

Peak Areas, mv-sec			Average	ppm
2756	2775	2806	2779	6.54

Recovery Gas to GC, Time: 15:05

Peak Areas, mv-sec			Average	ppm
2724	2796	3041	2854	6.65

Recovery 98.4%

REDUCED SULFUR FIELD DATA

Run 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS ppm
	area	ppm	area	ppm	area	ppm	
15:14	385	1.92	1725	4.26	10	0.17	6.53
15:19	361	1.84	1592	4.08	22	0.27	6.46
15:24	352	1.82	1532	3.99	<2	<0.07	5.81
15:29	354	1.82	1556	4.02	3	0.10	6.04
15:34	333	1.76	1804	4.37	27	0.30	6.73
15:39	370	1.87	1513	3.96	<2	<0.07	5.83
15:44	358	1.83	1581	4.06	19	0.25	6.40
15:49	357	1.83	1461	3.89	13	0.20	6.13
15:54	268	1.53	1448	3.87	11	0.19	5.77
15:59	358	1.84	1579	4.06	23	0.28	6.46
16:04	363	1.85	1518	3.97	4	0.11	6.04
16:09	355	1.83	1551	4.02	6	0.14	6.11
16:14	344	1.79	1647	4.15	3	0.08	6.11
16:19	353	1.82	1490	3.93	38	0.37	6.48
16:24	371	1.88	1500	3.94	30	0.32	6.46
16:29	349	1.81	1335	3.69	16	0.23	5.96
16:34	351	1.81	1763	4.32	12	0.19	6.52
16:39	333	1.76	1452	3.87	17	0.24	6.11
16:44	331	1.75	1463	3.89	18	0.24	6.13
16:49	379	1.90	1573	4.05	<2	<0.07	5.95
16:54	369	1.87	1642	4.15	6	0.14	6.30
16:59	364	1.85	1930	4.54	26	0.30	6.99
17:04	352	1.82	1658	4.17	3	0.09	6.17
17:09	350	1.81	1457	3.88	<2	<0.07	5.69
17:14	350	1.81	1506	3.95	8	0.16	6.08
17:19	350	1.81	1432	3.84	10	0.18	6.01
17:24	349	1.81	1194	3.47	7	0.15	5.58
17:29	341	1.78	1409	3.81	11	0.19	5.97
17:34	371	1.88	1905	4.51	19	0.26	6.89
17:39	361	1.84	1482	3.92	12	0.20	6.16
17:44	354	1.82	1545	4.01	7	0.14	6.12
17:49	355	1.83	1550	4.02	9	0.17	6.18
17:54	360	1.84	1781	4.34	21	0.27	6.72
17:59	353	1.82	1704	4.23	21	0.26	6.58

REDUCED SULFUR FIELD DATA

Run 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
18:04	374	1.89	1305	3.65	46	0.41	6.35
18:09	366	1.86	1414	3.81	10	0.18	6.03
Averages:		1.82		4.02		0.19	6.22

RUN SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Start Time 15:14 End Time 18:14

Average Measured TRS Conc.	6.22 ppm
Recovery No. 3	98.1 %
TRS Corrected for Recovery	6.34 ppm

RECOVERY DATA

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Calibration Number 1 After Run 2 Before Run 3
Start Time 18:14 End Time 18:26

Recovery was run using H₂S

Recovery Gas to Probe, Time: 18:14

Peak Areas, mv-sec			Average	ppm
2956	2989	3017	2987	6.84

Recovery Gas to GC, Time: 18:22

Peak Areas, mv-sec			Average	ppm
3080	3076	3086	3080	6.97

Recovery 98.1%

REDUCED SULFUR FIELD DATA

Run 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15** Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS
	area	ppm	area	ppm	area	ppm	
18:26	357	1.83	1679	4.20	28	0.31	6.65
18:31	313	1.69	1738	4.28	23	0.28	6.53
18:36	328	1.74	1288	3.62	39	0.37	6.11
18:41	322	1.72	1776	4.33	13	0.20	6.46
18:46	323	1.72	1539	4.00	3	0.09	5.89
18:51	314	1.69	1544	4.01	45	0.40	6.51
18:56	311	1.68	1649	4.16	24	0.28	6.41
19:01	294	1.63	1343	3.71	12	0.20	5.72
19:06	293	1.62	1630	4.13	4	0.11	5.97
19:11	275	1.56	1312	3.66	<2	<0.07	5.22
19:16	310	1.68	1599	4.09	<2	<0.07	5.77
19:21	319	1.71	1676	4.19	17	0.24	6.38
19:26	292	1.62	1611	4.10	9	0.17	6.06
19:31	288	1.60	1833	4.41	27	0.31	6.63
19:36	290	1.61	1957	4.57	<2	<0.07	6.18
19:41	278	1.57	1613	4.11	19	0.25	6.17
19:46	277	1.57	1374	3.75	10	0.18	5.68
19:51	291	1.62	1816	4.39	<2	<0.07	6.00
19:56	290	1.61	1496	3.94	29	0.32	6.18
20:01	279	1.57	1367	3.74	<2	<0.07	5.32
20:06	278	1.57	2090	4.75	26	0.30	6.91
20:11	283	1.59	1464	3.89	<2	<0.07	5.48
20:16	275	1.56	1414	3.82	<2	<0.07	5.37
20:21	279	1.57	1545	4.01	33	0.34	6.26
20:26	269	1.54	1939	4.55	17	0.24	6.57
20:31	287	1.60	1763	4.32	21	0.26	6.44
20:36	274	1.56	1650	4.16	3	0.09	5.90
20:41	265	1.52	1603	4.09	23	0.28	6.17
20:46	262	1.51	1777	4.33	12	0.20	6.25
20:51	302	1.65	1614	4.11	<2	<0.07	5.76
20:56	270	1.54	1474	3.90	29	0.31	6.07
21:01	265	1.52	1742	4.29	11	0.19	6.19
21:06	256	1.49	1493	3.93	42	0.39	6.21
21:11	250	1.47	1597	4.08	10	0.17	5.90

REDUCED SULFUR FIELD DATA

Run 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Time	H ₂ S		COS		CS ₂		TRS ppm
	area	ppm	area	ppm	area	ppm	
21:16	300	1.65	1695	4.22	3	0.09	6.04
21:21	269	1.54	1710	4.24	13	0.20	6.19
Averages:		1.61		4.11		0.19	6.10

RUN SUMMARY

Number 3

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Calibration Number 1

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Start Time 18:26 End Time 21:26

Average Measured TRS Conc.	6.10 ppm
Recovery No. 4	98.0 %
TRS Corrected for Recovery	6.22 ppm

RECOVERY DATA

Number 4

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **8 Feb 2011**

Calibration Number 1 After Run 3 Before Run 4
Start Time 21:26 End Time 21:45

Recovery was run using H₂S

Recovery Gas to Probe, Time: 21:26

Peak Areas, mv-sec			Average	ppm
2920	2944	3050	2971	6.82

Recovery Gas to GC, Time: 21:40

Peak Areas, mv-sec			Average	ppm
3083	3048	3080	3070	6.96

Recovery 98.0%

CALIBRATION DATA

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

Ambient Temp 72°F Baro. Press. 30.21 in. Hg

Compound	H ₂ S	COS	CS ₂
Perm. Device ID	T-35381	F-35177	33-35287
Perm. Rate, nL/min	446	190	195
Ret. Time, sec	38.0	53.0	208.0

1 Flow 119 mL/min	3.75 ppm	1.60 ppm	1.64 ppm
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Time: 09:11

Peak Areas, mv-sec

1279	361	704
1311	366	716
1279	355	719

Average Area

1289	360	713
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2 Flow 57.1 mL/min	7.82 ppm	3.33 ppm	3.42 ppm
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Time: 08:22

Peak Areas, mv-sec

4649	1309	2787
4641	1386	2667
4618	1338	2783

Average Area

4636	1344	2746
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3 Flow 30.2 mL/min	14.8 ppm	6.29 ppm	6.47 ppm
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Time: 06:49

Peak Areas, mv-sec

11585	4074	7766
11791	4207	8396
11657	4191	8128

Average Area

11678	4157	8097
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CALIBRATION SUMMARY

Number 2

Client: **Valero**
Location: **Paulsboro, NJ**
Source: **Tail Gas Unit 81**
Method: **15**

Project Number: **05614.015.001**
Operator: **SB**
Date: **9 Feb 2011**

H₂S	1	2	3		
Time	09:11	08:22	06:49		
Conc.	3.75	7.82	14.8		
Response	1289	4636	11678		
Calc. Conc.	3.68	8.14	14.5		
% Error	-1.9	+4.2	-2.2		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.6104	2.1993	0.9986	2	0.07
COS	1	2	3		
Time	09:11	08:22	06:49		
Conc.	1.60	3.33	6.29		
Response	360	1344	4157		
Calc. Conc.	1.60	3.34	6.29		
% Error	-0.1	+0.3	-0.1		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7833	2.1951	>0.9999	2	0.09
CS₂	1	2	3		
Time	09:11	08:22	06:49		
Conc.	1.64	3.42	6.47		
Response	713	2746	8097		
Calc. Conc.	1.63	3.48	6.41		
% Error	-0.8	+1.8	-0.9		
Calibration Curve:	Slope	Intercept	Corr Coeff	Min Area	Det Lim
	1.7737	2.4776	0.9997	2	0.06