

DEPARTMENT OF
ENVIRONMENTAL PROTECTION

OCT 06 1995

SITING COORDINATION

FINAL
BLEND EMISSIONS
TEST REPORT
FOR
JACKSONVILLE ELECTRIC
ST. JOHNS RIVER
POWER PARK
UNIT 1

August 11/19, 1995

95-058-FL

Report Date 9-11-95



TOTAL SOURCE ANALYSIS, INC.
ENVIRONMENTAL TESTING CONSULTANTS

September 11, 1995

I, James Tayfel, hereby certify that the emissions tests conducted at Jacksonville Electric Authority's St. Johns River Power Park, Unit 1 are in accordance with procedures established by the USEPA. This report accurately and faithfully presents the data obtained from the tests and the results determined from analysis of this data.


James Tayfel
Crew Chief

I, Carl Vineyard, P.E., hereby attest that all work on this project was completed under my supervision and this report accurately presents the emissions from the units.



Carl Vineyard, P.E.
Chief Test Engineer

I, Angel Aguiar, P.E., have reviewed the reports for completeness and accuracy.



Angel Aguiar, P.E.
Florida Professional Engineer

9/15/95

TABLE OF CONTENTS

INTRODUCTION.....A1
SUMMARY OF TEST RESULTS.....B1-B20
SAMPLING AND ANALYTICAL PROCEDURES.....C1-C17
APPENDIX
 Sample Calculations.....D1-D6
 TSA Field Data Sheets.....E1-E27
 TSA CEMS Log.....F1-F24
 TSA Calibration Data.....G1-G16
 Gas Certification Sheets.....H1-H9
 Calibration of Test Equipment.....I1-I5
 Laboratory Reports.....J1-J9

INTRODUCTION

INTRODUCTION

This report presents the results of the emissions tests performed for Jacksonville Electric St. Johns River Power Park, Unit 1.

The purpose of the tests was to determine the emissions of the unit. The results of the tests can be found in Section II of this report.

The emissions testing was performed by Total Source Analysis, Inc., whose Florida Branch Office is located at 810 N. Central Avenue, Umatilla, Florida 32784.

The tests were performed on August 11/19, 1995. The testing was performed in accordance with EPA reference methods as published in the July 1, 1994 Federal Register, - "Standards of Performance for New Stationary Sources" and subsequent revisions.

The testing equipment and sampling procedures are described in Section III of this report. The raw field data and equations used in determining final results are presented in the Appendix as well as the calibration data sheets for the applicable testing equipment.

SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS

The following table presents the final results of the emissions tests performed on Unit 1 at Jacksonville Electric's St. Johns River Power Park.

PARTICULATE

<u>Run No.</u>	<u>Location</u>	<u>Date</u>	<u>lbs/dscf</u>	<u>lbs/hr</u>	<u>lbs/MBtu</u>
1	Stack	8-14-95	5.06E-07	46.19	.006
2	Stack	8-14-95	1.07E-06	100.39	.014
3	Stack	8-14-95	1.03E-06	95.71	.013
Avg.			8.72E-07	80.76	.011
1	Stack	8-15-95	3.97E-07	36.25	.005
2	Stack	8-15-95	4.70E-07	44.01	.006
3	Stack	8-15-95	5.22E-07	48.60	.007
Avg.			4.63E-07	42.95	.006
1	Stack	8-16-95	2.29E-07	20.98	.003
2	Stack	8-16-95	4.08E-07	37.85	.005
3	Stack	8-16-95	3.04E-07	28.11	.004
Avg.			3.14E-07	28.98	.004
1	Stack	8-17-95	7.84E-07	71.31	.010
2	Stack	8-17-95	7.66E-07	71.73	.010
3	Stack	8-17-95	5.10E-07	46.82	.006
Avg.			6.87E-07	63.28	.009
1	Stack	8-19-95	2.75E-07	26.06	.004
2	Stack	8-19-95	2.65E-07	25.01	.003
3	Stack	8-19-95	2.05E-07	19.34	.003
Avg.			2.48E-07	23.47	.003

SO₃

Run No.	Location	Date	lbs/dscf	ppm	02%
1	Stack	8-11-95	1.541E-06	7.41	4.9
2	Stack	8-11-95	1.602E-06	7.70	4.9
3	Stack	8-11-95	1.559E-06	7.50	5.0
Avg.			1.567E-06	7.54	4.9
1	Stack	8-12-95	2.013E-06	9.68	5.0
2	Stack	8-12-95	1.879E-06	9.03	5.0
3	Stack	8-12-95	1.857E-06	8.93	4.9
Avg.			1.916E-06	9.21	5.0
1	Stack	8-13-95	1.154E-06	5.55	4.9
2	Stack	8-13-95	2.359E-06	11.34	4.8
3	Stack	8-13-95	5.243E-06	25.21	4.7
Avg.			2.9186E-06	14.03	4.8
1	Stack	8-18-95	1.712E-06	8.23	5.0
2	Stack	8-18-95	2.469E-06	11.87	5.1
3	Stack	8-18-95	2.913E-06	14.01	5.0
Avg.			2.364E-06	11.37	5.0

CO

<u>Run No.</u>	<u>Location</u>	<u>Test Date</u>	<u>ppm</u>	<u>%O2</u>
1	Stack	8-11-95	399.07	4.92
2	Stack	8-11-95	420.65	4.86
3	Stack	8-11-95	119.16	5.01
Avg.			312.96	4.93
1	Stack	8-12-95	460.81	5.04
2	Stack	8-12-95	481.31	4.98
3	Stack	8-12-95	550.61	4.93
Avg.			497.58	4.98
1	Stack	8-13-95	630.22	4.95
2	Stack	8-13-95	773.39	4.77
3	Stack	8-13-95	833.32	4.75
Avg.			745.64	4.82
1	Stack	8-18-95	444.22	5.00
2	Stack	8-18-95	471.25	5.05
3	Stack	8-18-95	488.23	5.04
Avg.			467.90	5.03

The complete results can be found on the computer printouts following.

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(01)	(02)	(03)
Date	8-14-95	8-14-95	8-14-95
Location	STACK BLEND	STACK BLEND	STACK BLEND
Start time	07:45	10:50	13:15
End time	10:05	13:00	15:25
Barometric Pressure	In. Hg 30.23	30.23	30.23
Static Pressure	In. H2O -0.55	-0.55	-0.55
Volume of Condensate	Mls 262	257	261
Volume Sampled	DCF 86.588	83.536	82.954
Meter Correction Factor	1.00	1.00	1.00
Square Root of Delta P	1.149	1.172	1.174
Orifice Pressure	In. H2O 1.40	1.42	1.40
Meter Temperature	Deg. F 116	118	118
Flue Temperature	Deg. F 166	164	166
Percent CO2	% 14.40	14.20	14.45
Percent O2	% 4.80	4.90	4.46
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0184	0.0377	0.0358
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.19	30.19	30.19
Corrected Sample Volume	DSCF 80.11	77.03	76.49
Moisture in Flue Gas	% 13.3	13.6	13.9
Molecular Weight	Lb/LbMole 28.83	28.78	28.76
Velocity of Flue Gas	Fps 72.89	74.30	74.57
Volume of Flue Gas	ACFM 2,061,809	2,101,643	2,109,254
Volume of Flue Gas	DSCFM 1,520,149	1,550,385	1,545,685
Dust Concentration	Lb/DSCF 5.06E-07	1.07E-06	1.03E-06
Dust Concentration	Lbs/Hour 46.19	100.39	95.71
Dust Concentration	Grs/ACF 2.63E-03	5.62E-03	5.34E-03
Dust Concentration	Grs/DSCF 3.54E-03	7.55E-03	7.22E-03
Isokinetic Rate	% 108.4	102.2	101.8
Particulate Emissions	Lb/MBtu 0.006	0.014	0.013

Averages:

Stack Temperature : 165.3
Vol Flue Gas ACFM : 2,090,902
Part Emis Lb/DSCF : 8.72E-07
Grs/ACF : 4.53E-03
Lbs/MBtu : 1.1E-02

Percent O2 : 4.7
DSCFM : 1,538,740
Lb/Hour : 80.76
Grs/DSCF : 6.11E-03

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(04)	(05)	(06)
Date	8-15-95	8-15-95	8-15-95
Location	STACK BLEND	STACK BLEND	STACK BLEND
Start time	08:00	10:35	13:15
End time	10:07	12:40	15:25
Barometric Pressure	In. Hg 30.16	30.16	30.16
Static Pressure	In. H2O -0.54	-0.54	-0.54
Volume of Condensate	Mls 261	284	276
Volume Sampled	DCF 83.217	85.552	84.692
Meter Correction Factor	1.00	1.00	1.00
Square Root of Delta P	1.158	1.192	1.186
Orifice Pressure	In. H2O 1.43	1.51	1.49
Meter Temperature	Deg. F 118	118	123
Flue Temperature	Deg. F 168	166	167
Percent CO2	% 14.40	14.00	14.30
Percent O2	% 5.10	5.20	4.80
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0138	0.0168	0.0183
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.12	30.12	30.12
Corrected Sample Volume	DSCF 76.56	78.72	77.26
Moisture in Flue Gas	% 13.8	14.5	14.4
Molecular Weight	Lb/LbMole 28.78	28.64	28.68
Velocity of Flue Gas	FpS 73.73	75.96	75.58
Volume of Flue Gas	ACFM 2,085,624	2,148,508	2,137,733
Volume of Flue Gas	DSCFM 1,520,200	1,558,742	1,550,968
Dust Concentration	Lb/DSCF 3.97E-07	4.70E-07	5.22E-07
Dust Concentration	Lbs/Hour 36.25	44.01	48.60
Dust Concentration	Grs/ACF 2.04E-03	2.41E-03	2.67E-03
Dust Concentration	Grs/DSCF 2.78E-03	3.29E-03	3.65E-03
Isokinetic Rate	% 103.6	103.9	102.5
Particulate Emissions	Lb/MBtu 0.005	0.006	0.007

Averages:

Stack Temperature	:	167.0	Percent O2	:	5.0
Vol Flue Gas	ACFM	: 2,123,955	DSCFM	:	1,543,303
Part Emis	Lb/DSCF	: 4.63E-07	Lb/Hour	:	42.95
	Grs/ACF	: 2.38E-03	Grs/DSCF	:	3.24E-03
	Lbs/MBtu	: 6E-03			

Total Source Analysis, Inc.
Particulate Test Analysis

JEA SJRPP POWERPARK
JACKSONVILLE FLA

95-058

Run Number	1	2	3
Data set	(10)	(11)	(12)
Date	8-16-95	8-16-95	8-16-95
Location	UNIT 1 BLEND	UNIT 1 BLEND	UNIT 1 BLEND
Start time	08:00	10:45	13:25
End time	10:25	12:50	15:37
Barometric Pressure	In. Hg 30.15	30.15	30.15
Static Pressure	In. H2O -0.88	-0.88	-0.88
Volume of Condensate	Mls 247	256	264
Volume Sampled	DCF 79.551	82.145	82.095
Meter Correction Factor	1.00	1.00	1.00
Square Root of Delta P	1.160	1.174	1.175
Orifice Pressure	In. H2O 1.25	1.40	1.41
Meter Temperature	Deg. F 118	118	119
Flue Temperature	Deg. F 167	167	167
Percent CO2	% 14.30	14.20	14.10
Percent O2	% 5.00	4.80	4.90
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0076	0.0140	0.0104
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.09	30.09	30.09
Corrected Sample Volume	DSCF 73.12	75.50	75.33
Moisture in Flue Gas	% 13.7	13.8	14.2
Molecular Weight	Lb/LbMole 28.78	28.75	28.69
Velocity of Flue Gas	FpS 73.84	74.79	74.92
Volume of Flue Gas	ACFM 2,088,592	2,115,444	2,119,114
Volume of Flue Gas	DSCFM 1,525,857	1,543,258	1,539,304
Dust Concentration	Lb/DSCF 2.29E-07	4.08E-07	3.04E-07
Dust Concentration	Lbs/Hour 20.98	37.85	28.11
Dust Concentration	Grs/ACF 1.17E-03	2.11E-03	1.56E-03
Dust Concentration	Grs/DSCF 1.60E-03	2.86E-03	2.13E-03
Isokinetic Rate	% 98.6	100.6	100.7
Particulate Emissions	Lb/MBtu 0.003	0.005	0.004

Averages:

Stack Temperature : 167.0
Vol Flue Gas ACFM : 2,107,717
Part Emis Lb/DSCF : 3.14E-07
Grs/ACF : 1.62E-03
Lbs/MBtu : 4E-03

Percent O2 : 4.9
DSCFM : 1,536,140
Lb/Hour : 28.98
Grs/DSCF : 2.2E-03

Total Source Analysis, Inc.
 Particulate Test Analysis

JEA SJRPP POWERPARK
 JACKSONVILLE FLA

Blend
 93-058
Unit #1

Run Number	1	2	3
Data set	(13)	(14)	(15)
Date	8-17-95	8-17-95	8-17-95
Location	UNIT 1	UNIT 1	UNIT 1
	BLEND	BLEND	BLEND
Start time	08:00	10:35	13:15
End time	10:10	12:45	15:25
Barometric Pressure	In. Hg 30.19	30.19	30.19
Static Pressure	In. H2O -0.83	-0.83	-0.83
Volume of Condensate	Mls 271	256	262
Volume Sampled	DCF 81.273	82.783	82.149
Water Correction Factor	1.00	1.00	1.00
Square Root of Delta P	1.161	1.184	1.166
Orifice Pressure	In. H2O 1.37	1.43	1.37
Water Temperature	Deg. F 118	120	119
Flue Temperature	Deg. F 167	166	169
Percent CO2	% 14.20	14.30	14.30
Percent O2	% 5.10	4.80	4.70
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0266	0.0264	0.0175
P Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.13	30.13	30.13
Corrected Sample Volume	DSCF 74.79	75.96	75.54
Moisture in Flue Gas	% 14.6	13.7	14.0
Molecular Weight	Lb/LbMole 28.66	28.77	28.73
Velocity of Flue Gas	FpS 74.03	75.26	74.37
Volume of Flue Gas	ACFM 2,094,037	2,128,696	2,103,624
Volume of Flue Gas	DSCFM 1,515,493	1,559,947	1,527,697
Dust Concentration	Lb/DSCF 7.84E-07	7.66E-07	5.10E-07
Dust Concentration	Lbs/Hour 71.31	71.73	46.82
Dust Concentration	Grs/ACF 4.01E-03	3.98E-03	2.62E-03
Dust Concentration	Grs/DSCF 5.48E-03	5.36E-03	3.57E-03
Stokinetic Rate	% 101.5	100.2	101.7
Particulate Emissions	Lb/MBtu 0.010	0.010	0.006

Averages:

Stack Temperature	:	167.5	Percent O2	:	4.9
Vol Flue Gas	ACFM	: 2,108,786	DSCFM	:	1,534,379
Part Emis	Lb/DSCF	: 6.87E-07	Lb/Hour	:	63.28
	Grs/ACF	: 3.54E-03	Grs/DSCF	:	4.81E-03
	Lbs/MBtu	: 8.67E-03			

Total Source Analysis, Inc.
Particulate Test Analysis

JEA SJRPP POWERPARK
JACKSONVILLE FLA

95-058

Run Number	1	2	3
Data set	(17)	(18)	(19)
Date	8-19-95	8-19-95	8-19-95
Location	UNIT 1	UNIT 1	UNIT 1
	BLEND	BLEND	BLEND
Start time	08:00	10:38	13:16
End time	10:15	12:56	15:32
Barometric Pressure	In. Hg 30.28	30.28	30.28
Static Pressure	In. H2O -0.71	-0.74	-0.74
Volume of Condensate	Mls 205	217	231
Volume Sampled	DCF 81.337	83.156	87.737
Meter Correction Factor	1.00	1.00	1.00
Square Root of Delta P	1.157	1.160	1.160
Orifice Pressure	In. H2O 1.38	1.44	1.46
Meter Temperature	Deg. F 111	120	121
Flue Temperature	Deg. F 154	154	154
Percent CO2	% 14.20	14.30	14.40
Percent O2	% 5.00	5.20	4.60
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0095	0.0092	0.0075
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.23	30.23	30.23
Corrected Sample Volume	DSCF 76.04	76.54	80.62
Moisture in Flue Gas	% 11.3	11.8	11.9
Molecular Weight	Lb/LbMole 29.07	29.02	29.00
Velocity of Flue Gas	FpS 72.35	72.60	72.62
Volume of Flue Gas	ACFM 2,046,505	2,053,438	2,054,070
Volume of Flue Gas	DSCFM 1,577,001	1,572,924	1,571,863
Dust Concentration	Lb/DSCF 2.75E-07	2.65E-07	2.05E-07
Dust Concentration	Lbs/Hour 26.06	25.01	19.34
Dust Concentration	Grs/ACF 1.49E-03	1.43E-03	1.10E-03
Dust Concentration	Grs/DSCF 1.92E-03	1.85E-03	1.43E-03
Isokinetic Rate	% 99.2	100.1	105.5
Particulate Emissions	Lb/MBtu 0.004	0.003	0.003

Averages:

Stack Temperature : 154.0
 Vol Flue Gas ACFM : 2,051,338
 Part Emis Lb/DSCF : 2.48E-07
 Grs/ACF : 1.35E-03
 Lbs/MBtu : 3.33E-03

Percent O2 : 4.9
 DSCFM : 1,573,929
 Lb/Hour : 23.47
 Grs/DSCF : 1.74E-03

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(19)	(20)	(21)
Date	8-11-95	8-11-95	8-11-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	08:15	10:14	12:13
End time	09:30	11:30	13:27
Barometric Pressure	In/Hg 30.22	30.22	30.22
Volume of Sample	Cu. Ft. 39.309	40.344	46.718
Meter Correction Factor	0.996	0.996	0.996
Meter Temperature	Deg. F 88	94	108
Percent O2	% 4.9	4.9	5.0
Volume of Solution	ML 160	211	224
Volume of Aliquot	ML 25	25	25
Normality of Barium	N 0.0099	0.0099	0.0099
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 10.50	8.40	8.70
Volume of Metered Gas	DSCF 38.086	38.665	43.671
Concentration of SO3	LBS/DSCF 1.541E-06	1.602E-06	1.559E-06
Parts Per Million SO3	PPM 7.41	7.70	7.50

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(22)	(23)	(24)
Date	8-12-95	8-12-95	8-12-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	08:06	10:00	11:50
End time	09:18	11:10	13:00
Barometric Pressure	In/Hg 30.23	30.23	30.29
Volume of Sample	Cu. Ft. 40.322	39.944	42.347
Meter Correction Factor	0.996	0.996	0.996
Meter Temperature	Deg. F 89	106	113
Percent O2	% 5.0	5.0	4.9
Volume of Solution	ML 250	175	171
Volume of Aliquot	ML 25	25	25
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 8.90	11.40	12.10
Volume of Metered Gas	DSCF 39.009	37.483	39.330
Concentration of SO3	LBS/DSCF 2.013E-06	1.879E-06	1.857E-06
Parts Per Million SO3	PPM 9.68	9.03	8.93

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(25)	(26)	(27)
Date	8-13-95	8-13-95	8-13-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	08:00	09:47	11:43
End time	09:10	11:00	12:55
Barometric Pressure	In/Hg 30.29	30.29	30.29
Volume of Sample	Cu. Ft. 41.740	41.816	40.900
Meter Correction Factor	0.996	0.996	0.996
Meter Temperature	Deg. F 110	113	112
Percent O2	% 4.9	4.8	4.7
Volume of Solution	ML 196	193	199
Volume of Aliquot	ML 25	25	25
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 6.50	13.45	28.40
Volume of Metered Gas	DSCF 38.970	38.837	38.053
Concentration of SO3	LBS/DSCF 1.154E-06	2.359E-06	5.243E-06
Parts Per Million SO3	PPM 5.55	11.34	25.21

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(28)	(29)	(30)
Date	8-18-95	8-18-95	8-18-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	08:00	09:50	11:35
End time	09:10	11:00	12:40
Barometric Pressure	In/Hg 30.19	30.19	30.19
Volume of Sample	Cu. Ft. 37.253	38.505	38.477
Meter Correction Factor	0.996	0.996	0.996
Meter Temperature	Deg. F 98	111	115
Percent O2	% 5.0	5.1	5.0
Volume of Solution	ML 193	197	165
Volume of Aliquot	ML 25	25	10
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 8.90	12.70	7.10
Volume of Metered Gas	DSCF 35.412	35.769	35.494
Concentration of SO3	LBS/DSCF 1.712E-06	2.469E-06	2.913E-06
Parts Per Million SO3	PPM 8.23	11.87	14.01

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

RUN NUMBER	POLLUTANT: CO MONITOR SPAN 1000		UNIT NO.:						CORRECTED PPM, DRY BASIS
	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS CALIBRATION DRIFT	GAS PPM	
1	392.31	0.00	0.00	0.00	59.90	62.00	0.21	62.00	399.07
2	422.81	0.00	0.00	0.00	302.70	304.40	0.17	302.00	420.65
3	119.69	0.00	0.00	0.00	304.40	302.30	-0.21	302.00	119.16

B13

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

C_{gas} = Effluent gas concentration, dry basis, ppm

C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm

C_{ma} = Actual concentration of the upscale calibration gas, ppm

8-11-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: 1

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	CALIBRATION GAS PERCENT	CORRECTED PERCENT, DRY BASIS
1	4.87%	0.10%	0.10%	0.00%	11.40%	11.30%	-0.40%	11.60%	4.92%
2	4.77%	0.10%	0.10%	0.00%	11.30%	11.20%	-0.40%	11.60%	4.86%
3	4.89%	0.10%	0.10%	0.00%	11.20%	11.20%	0.00%	11.60%	5.01%

B14

8-12-93

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 1000

UNIT NO.:)

RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	GAS CALIBRATION GAS PPM	CORRECTED PPM, DRY BASIS
1	464.24	0.00	0.00	0.00	304.20	304.30	0.01	302.00	460.81
2	484.47	0.00	0.10	0.01	304.30	303.70	-0.06	302.00	481.31
3	552.57	0.10	0.00	-0.01	303.70	302.50	-0.12	302.00	550.61

B15

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

C_{gas} = Effluent gas concentration, dry basis, ppm

C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm

C_{ma} = Actual concentration of the upscale calibration gas, ppm

8-12-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: 1

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	GAS CALIBRATION PERCENT	CORRECTED PERCENT, DRY BASIS
1	4.97%	0.10%	0.10%	0.00%	11.30%	11.30%	0.00%	11.60%	5.04%
2	4.91%	0.10%	0.10%	0.00%	11.30%	11.30%	0.00%	11.60%	4.98%
3	4.82%	0.10%	0.10%	0.00%	11.30%	11.10%	-0.80%	11.60%	4.93%

B16

8 75 - 9

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO		MONITOR SPAN 1000		UNIT NO.: /					CORRECTED	
RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	GAS CALIBRATION GAS PPM	PPM, DRY BASIS	
1	636.27	0.00	0.00	0.00	305.40	304.40	-0.10	302.00	630.22	
2	782.10	0.00	0.00	0.00	304.40	306.40	0.20	302.00	773.39	
3	842.98	0.00	0.00	0.00	306.40	304.60	-0.18	302.00	833.32	

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

C_{gas} = Effluent gas concentration, dry basis, ppm

C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm

C_{ma} = Actual concentration of the upscale calibration gas, ppm

8-13-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	CALIBRATION GAS PERCENT	CORRECTED PERCENT, DRY BASIS
1	4.96%	0.10%	0.10%	0.00%	11.50%	11.50%	0.00%	11.60%	4.95%
2	4.77%	0.10%	0.10%	0.00%	11.50%	11.40%	-0.40%	11.60%	4.77%
3	4.67%	0.10%	0.10%	0.00%	11.40%	11.10%	-1.20%	11.60%	4.75%

B18

8-18-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 1000

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	GAS CALIBRATION PPM	CORRECTED PPM, DRY BASIS
1	444.73	0.00	0.00	0.00	301.50	303.20	0.17	302.00	444.22
2	474.65	0.00	0.10	0.01	303.20	305.20	0.20	302.00	471.25
3	491.11	0.10	0.00	-0.01	305.20	302.40	-0.28	302.00	488.23

B19

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

C_{gas} = Effluent gas concentration, dry basis, ppm

C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm

C_{ma} = Actual concentration of the upscale calibration gas, ppm

8-18-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: 1

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	GAS CALIBRATION PERCENT	CORRECTED PERCENT, DRY BASIS
1	4.99%	0.10%	0.10%	0.00%	11.50%	11.40%	-0.40%	11.60%	5.00%
2	5.01%	0.10%	0.30%	0.80%	11.40%	11.10%	-1.20%	11.60%	5.05%
3	4.92%	0.30%	0.20%	-0.40%	11.10%	10.90%	-0.80%	11.60%	5.04%

B20

SAMPLING AND ANALYTICAL PROCEDURES

TESTING EQUIPMENT - EPA METHOD 5B SAMPLING TRAIN

An Anderson Corporation Stack Sampler (Model 201415) was used at the sampling locations(s). The particulate sampling train consisted basically of a glass or stainless steel probe; a variable-heat-controlled filter oven with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 1/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; a control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated orifice; and an umbilical with various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe and oven temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressure, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20-hp sealed-head diaphragm vacuum pump, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, the percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Programmable Calculator

A Hewlett Packard, Model 32SII, programmable calculator was used to determine the isokinetic sampling rate at each sampling point.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Gelman Spectro Grade, glass-fiber-mat filters with 99.9 percent retention of 0.3-micron particles were individually numbered, placed in similarly numbered glass petri dishes, oven dried at 320 degrees Fahrenheit for two to three hours, cooled in a desiccator and individually weighed on a Mettler analytical balance (Model H54AR) to the nearest 0.1-milligram, and weighed a minimum of every six hours until two consecutive weights within ± 0.5 milligrams were obtained. Several 250 milliliter crucibles were desiccated for a minimum of 24 hours and weighed in the same manner as the filters and petri dishes. Also, several 200-gram quantities of Type 6-16 mesh indicating silica gel were weighed on an Ohaus beam balance and placed into separate airtight polypropylene storage bottles.

The number of sampling points and positions of the points in the flue at the sampling location(s), and the sampling time at each point were determined prior to the particulate testing. The sampling procedures were performed in accordance with the Environment Protection Agency's Reference Method 5B, "Determination of Particulate Emissions from Stationary Sources" in the July 1, 1994 Federal Register, "Standards of Performance for New Stationary Sources" and subsequent revisions.

Before each test run, a particulate sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of the sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling positions in the flue. A standard impinger assembly was prepared by adding 200 milliliters of distilled water, to each of the first two glass impingers. The third glass impinger was left dry and the fourth was filled with approximately 400 grams of type 6-16 mesh indicating silica gel. The entire impinger assembly was then placed in an ice bath. A disc filter was removed from its petri dish and placed inside a filter holder. The filter holder was then placed inside a filter oven and assembled to the sampling probe outlet and the impinger unit inlet. Next, an umbilical and sampling hoses were connected to the sampling probe, filter oven, impinger unit, vacuum pump and the control unit, accordingly. The probe and oven were then heated to and held at temperatures between 300 and 340 degrees Fahrenheit. The inclined draft gauges were checked and zeroed.

As soon as the probe and oven temperatures had stabilized the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the particulate sampling train had been assembled, as previously described, the particulate sampling was performed.

The sampling nozzle, probe and filter holder were washed with nanograde acetone. The acetone washing and acetone blank were collected in labeled polypropylene sample bottles and retained for later evaporation, desiccation and weighing.

Flue gas concentrations (percentage of CO_2 , percentage of O_2 , and percentage of CO) were determined by taking several orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

Prior to the particulate sampling, a preliminary temperature and velocity traverse, orsat analysis and calculations were performed to determine a correct nozzle and orifice size, and the factors that would be used in calculating the isokinetic sampling rate for each sampling point. Knowing the actual pressure differential across the pitot tube used, the isokinetic sampling rate was calculated at each sampling point using a Hewlett Packard, Model 32SII, Programmable Calculator.

Three test runs were performed at the sampling location(s). The sampling data for each test run was recorded on a field test form during each of the sampling periods.

After the completion of a test run, the following procedures were performed: A final leak-check was performed at highest vacuum during the test for one minute and the leakage rate recorded. The flue gas moisture collected in the first three impingers was measured and recorded. The moisture laden silica gel in the fourth impinger was transferred to an appropriately marked, airtight polypropylene bottle and retained for later weighing. The weight gain of the silica gel moisture collection was added to the measured moisture condensed for that test run. The sample nozzle, probe and filter holder were capped and taken to a clean area for sample recovery. At the recovery area, the disc filter was carefully removed from the filter holder and transferred to its petri dish for later weighing.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

After the field testing was completed, the following procedures were performed: Each silica gel moisture collection was weighed in its storage bottle on an Ohaus beam balance with sensitivity of 0.1-gram. Each disc filter and petri dish was oven dried at 320 degrees Fahrenheit for six hours and cooled in a desiccator for two hours before weighing. Each acetone washing and acetone blank was transferred from its sample bottle to a preweighed crucible for evaporation. When the acetone in a crucible had completely evaporated, it was oven dried at 320 degrees Fahrenheit for six hours and transferred to a desiccator for further drying at room temperature. Each acetone blank collected was used to determine the amount of residual weight each crucible retained due to acetone impurities. Each disc filter and petri dish, acetone washing and acetone blank was weighed on a Mettler analytical balance (Model H54AR) with a sensitivity of 0.1-milligram.

All test instruments were recalibrated to determine the deviation percentage.

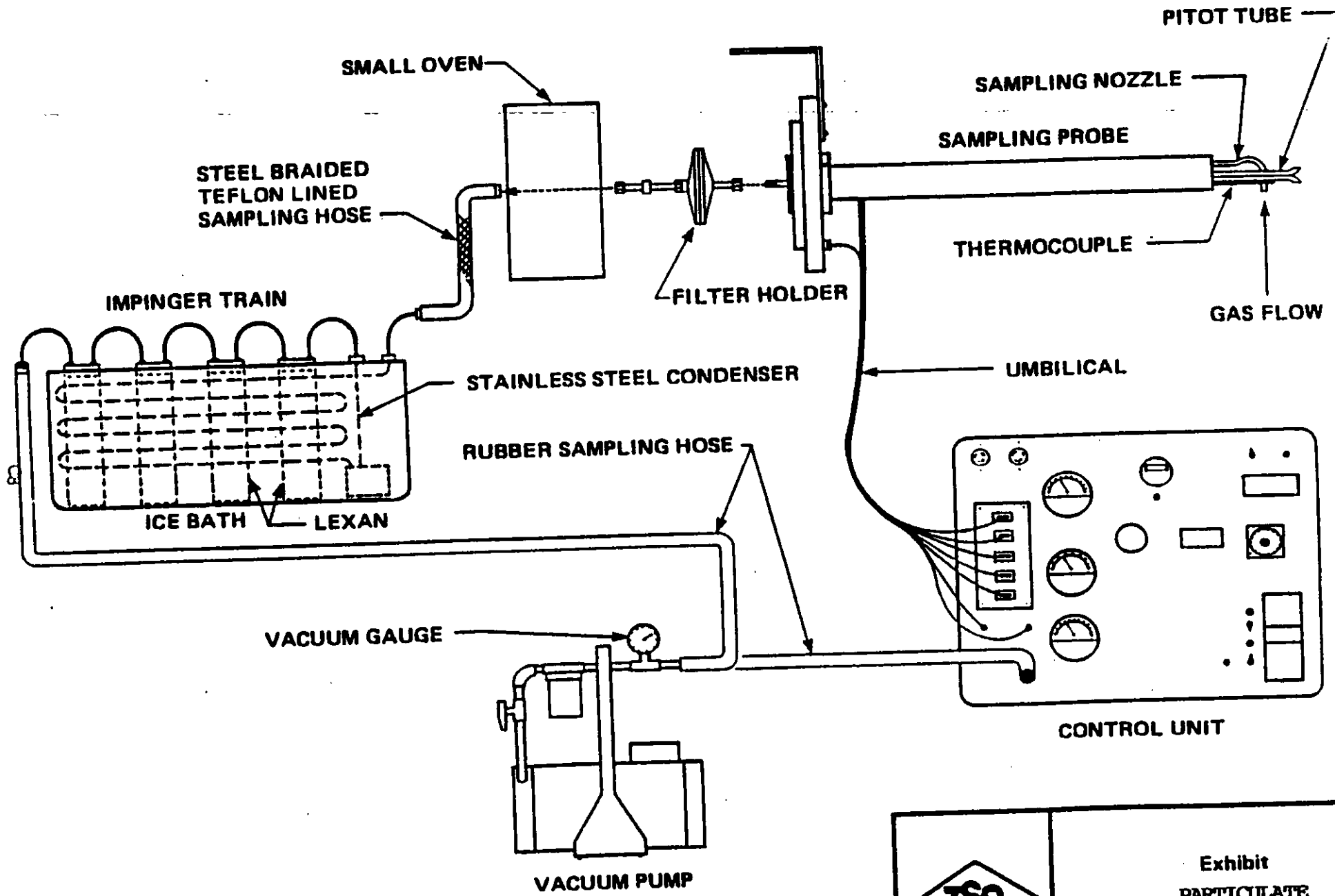
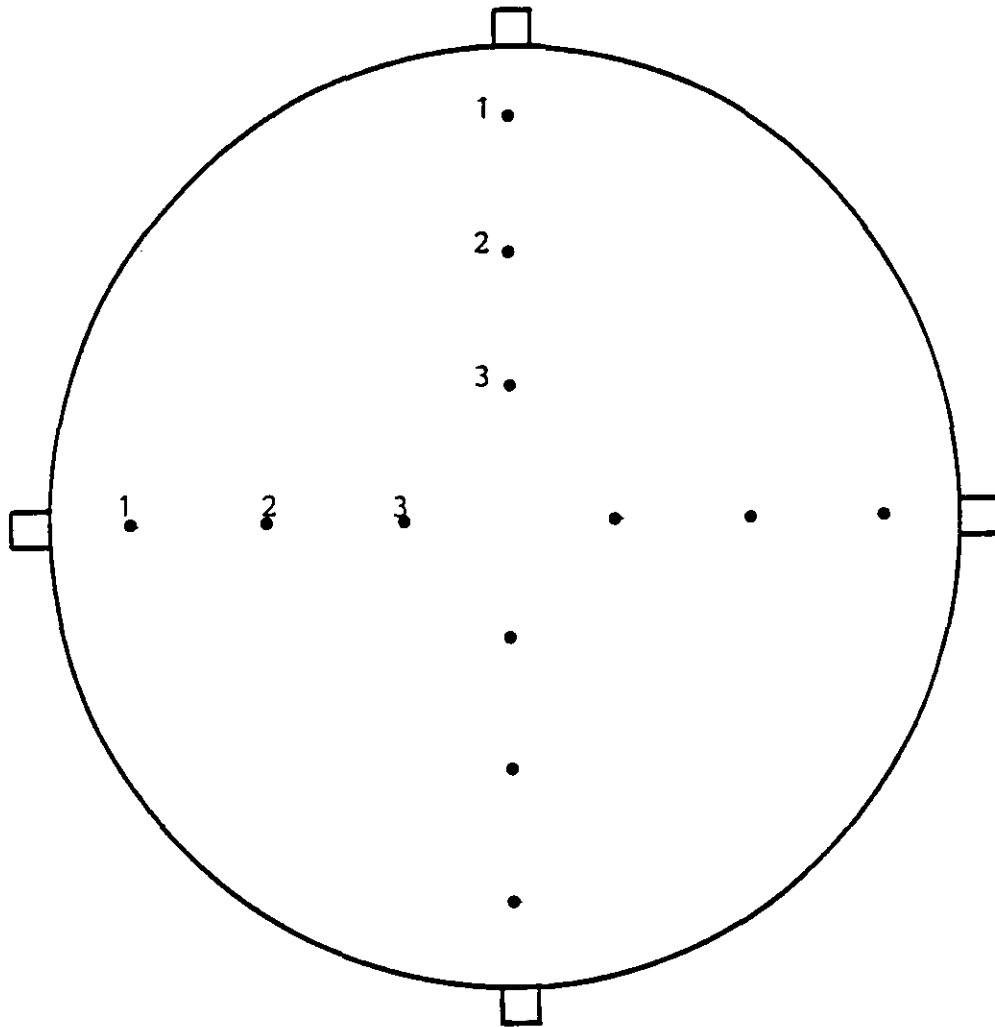


Exhibit
 PARTICULATE
 SAMPLING TRAIN


JEA-SJRPP UNIT 1&2
 PARTICULATE SAMPLE POINTS



<u>POINTS</u>	<u>DISTANCE FROM INSIDE WALL</u>
1	12 7/8"
2	3' 6 7/8"
3	7' 3 "

DIAMETER STACK 24' 6"
 CROSS SECTION AREA 471.43 FT²

NOT TO SCALE

 Total Source Analysis, Inc. Environmental Testing Consultants	Exhibit STACK TEST POINT LOCATIONS
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TESTING EQUIPMENT - EPA REFERENCE METHOD 8

Sulfuric Acid Mist and Sulfur Dioxide

A Nutech Corporation Stack Sampler (Model 2010) was used at the sampling location(s). The sampling train consisted basically of an effective length stainless steel probe, a standard glass impinger assembly with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 3/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated variable-diameter orifice; and an umbilical and various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressures, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20 hp sealed-head diaphragm vacuum pump, a Dwyer flowmeter; a plastic bag housed in a protective aluminum case, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 8 (SO₃)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Before each test run a sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of a sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling point positions in the flue. A standard impinger assembly was prepared by adding 100 milliliters of 80% Isopropanol to the first glass impinger. A glass filter holder was placed between the first and second impingers to catch sulfuric acid mist carryover, and 100 milliliters of 3% hydrogen peroxide was added to the second and third impingers. The fourth impinger was left dry and the fifth was filled with 250 grams of type 6-16 mesh indicating silica gel.

The entire impinger assembly was then placed into an ice bath. Next, an umbilical and sampling hoses were connected to the sampling probe and impinger unit, a vacuum pump and a control unit, accordingly. The probe was then heated to and held at approximately 248 degrees Fahrenheit. All magnehelic gauges were checked and zeroed. As soon as the probe temperatures had stabilized, the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the sampling train had been assembled, the probe heated, and the entire system leak-checked, as previously described, the SO₃ sampling was performed.

Flue gas concentrations (percentage of CO₂, percentage of O₂, and percentage of CO) were determined by taking several Orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 8

Container number one: A 100 ml aliquot of this solution was pipetted into a 250-ml Erlenmeyer flask, then 2 to 4 drops of thorin indicator were added, and the sample was titrated to a pink endpoint using 0.0100 normality barium perchlorate. The titration was repeated with a second aliquot of sample and titration values averaged. Replicate titrations must agree within 1 percent or ±0.2 ml., whichever is greater.

Container number two: The solution in the container holding the contents of the second and third impingers were discarded.

Blanks were prepared by adding 2 to 4 drops of thorin indicator to 100 ml of 80 percent isopropanol. The blanks were titrated in the same manner as the samples.

All test instruments were recalibrated to determine the deviation percentage.

EPA METHOD 10

DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES

1. Principle

1.1 Principle - An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a nondispersive infrared analyzer (NDIR).

2. Range and Sensitivity

2.1 Range - 0 to 1,000 ppm.

2.2 Sensitivity - minimum detectable concentration is 0.1 ppm for a 0 to 1,000 ppm span.

3. Precision and Accuracy

3.1 Precision - The precision of most NDIR analyzers is approximately ± 2 percent of span.

3.2 Accuracy - The accuracy of most NDIR analyzers is approximately ± 5 percent of span after calibration.

4. Apparatus

4.1 Probe - Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

4.2 Air-cooled Condenser or Equivalent - To remove any excess moisture.

4.3 Valve - Needle valve, or Equivalent, to adjust flow rate.

4.4 Pump - Leak-free diaphragm type, or equivalent, to transport gas.

- 4.5 Rate Meter - Rotometer, or equivalent, to measure a flow range from 0 to 1.0 liter per minute (0.035 cfm).
- 4.6 Flexible Bag - Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 feet). The bag was leak tested in the laboratory before using by evacuating the bag with a pump followed by a dry gas meter. When evacuation was complete, there was no flow through the meter.

5. Analysis

- 5.1 Carbon Monoxide Analyzer - A Horiba Model 321 or Fuji Model 730 nondispersive infrared analyzer is used. The instrument was demonstrated by the manufacturer to meet or exceed manufacturer's specifications and those described in this method.

6. Calibration Gases

- 6.1 Calibration Gases - Known concentration of CO in nitrogen for instrument span, prepurified grade of nitrogen for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases are certified by the manufacturer to be within ± 2 percent of the specified concentration.
- 6.2 Silica Gel - Indicating type, 6 to 16 mesh, dried at 175 degrees C (347 degrees F) for two hours.
- 6.3 Ascarite

7. Procedure

7.1 Continuous Sampling - Set up the equipment as shown in Figure 10-1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. CO₂ content of the gas may be determined. During the sampling system bias check, the system is operated at the normal sampling rate, no adjustments to the measurement system, other than those necessary to achieve proper calibration gas flow rates at the analyzer, are made. Alternately, introduce the zero and upscale gases until a stable response is achieved. The tester determined the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases. Note the longer of the two times as the response time. The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas.

APPENDIX

Sample Calculations

NOMENCLATURE

act	= actual cubic feet	P_f	= static pressure in flue in inches water, average
acfm	= actual cubic feet per minute	$\sqrt{\Delta P}$	= square root of velocity head in inches water, average
A	= effective area of flue in square feet	%S	= percent sulfur by weight, dry basis
acm	= actual cubic meters	scf	= standard cubic feet
acmm	= actual cubic meters per minute	scm	= standard cubic meters
A_n	= inside area of sampling nozzle in square feet	T_{std}	= absolute temperature of air in degrees Rankine at standard conditions (528 degrees)
B_{ws}	= water vapor in gas stream, proportion by volume	T_S	= absolute temperature of flue gas in degrees Rankin, average
%C	= percent carbon by weight, dry basis	T_m	= absolute temperature at meter in degrees Rankine, average
%CO	= percent carbon monoxide by volume, dry basis	V_S	= velocity of flue gas in feet (meters) per second
%CO ₂	= percent carbon dioxide by volume, dry basis	V_l	= volume of condensate through the impingers in milliliters
C_p	= pitot tube coefficient	V_{lc}	= volume of liquid collected in condenser in milliliters plus weight of liquid absorbed in silica gel in grams indicated as milliliters
D_l	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr constant	V_m	= volume of metered gas measured at meter conditions in cubic feet (meters)
D_l'	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr calculated	V_{ms}	= volume of metered gas corrected to dry standard conditions in cubic feet (meters)
dscf	= dry standard cubic feet	V_o	= volume of flue gas at actual conditions in cubic feet (meters) per minute
dscfh	= dry standard cubic feet per hour	Q_{sd}	= volume of flue gas corrected to dry standard conditions in cubic feet (meters) per hour
dscm	= dry standard cubic meters	V_t	= total volume of flue gas sampled at actual conditions in cubic feet (meters)
dscmh	= dry standard cubic meters per hour	V_w	= volume of water vapor in metered gas corrected to standard conditions in cubic feet (meters)
fps	= feet per second	V_{wc}	= volume of water condensed in impingers corrected to standard conditions
F_r	= ratio factor of dry flue gas volume to heat value of combusted fuel in dry standard cubic feet (meters) per million Btu (calories)	V_{wsg}	= volume of water collected in silica gel corrected to standard conditions
gms	= grams	W_d	= total weight of dust collected per unit volume in grains (grams) per actual cubic feet (meters)
gm-mole	= gram-mole	W_d'	= total weight of dust collected per unit volume in pounds (grams) per dry standard cubic feet (meters)
grs	= grains	W_g	= total weight of dust collected in grams
ΔH	= orifice pressure drop in inches water, average	W_h	= total weight of dust collected per unit volume in pounds (grams) per hour, dry basis
%H	= percent hydrogen by weight, dry basis	W_p	= total weight of dust collected in pounds
H_c	= heat of combustion in Btu per pound, dry basis	W_s	= total weight of dust collected per unit volume in grains (grams) per dry standard cubic feet (meters)
hr	= hour	W_{sg}	= impinger silica gel weight gain in grams
%I	= percent isokinetic	Y	= metered gas volume correction factor
in. Hg	= inches mercury	Θ	= total elapsed sampling time in minutes
lbs	= pounds		
lb-mole	= pound-mole		
%M	= percent moisture by volume		
mmBtu	= million Btu		
mmcal	= million calories		
mm Hg	= millimeters mercury		
mps	= meters per second		
M_s	= molecular weight in pounds (gram) per pound (gram) mole (wet basis)		
%N	= percent nitrogen by weight, dry basis		
%N ₂	= percent nitrogen by difference, dry basis		
%O	= percent oxygen by difference, dry basis		
%O ₂	= percent oxygen by volume, dry basis		
P_b	= barometric pressure in inches mercury		
P_{std}	= standard absolute pressure (29.92 in Hg)		
P_s	= absolute pressure in flue in inches (millimeters) mercury		



- (1) ABSOLUTE FLUE PRESSURE (in. Hg)

$$P_s = (\pm P_f \div 13.6) + P_b$$

- (2) WATER VAPOR VOLUME IN METERED GAS CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{wc} = .04707 \times V_l \quad V_{wsg} = .04715 \times W_{sg}$$

$$V_w = V_{wc} + V_{wsg}$$

- (3) METERED GAS VOLUME CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{ms} = 17.64 \times Y \times V_m \frac{P_b + (\Delta H/13.6)}{T_m}$$

- (4) PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_w}{(V_{ms} + V_w)} \quad \%M = B_{ws} \times 100$$

- (5) AVERAGE RESULTS OF FLUE GAS ANALYSIS

$$\%N_2 \text{ dry} = 100 - (\%CO_2 + \%O_2 + \%CO)$$

- (6) APPROXIMATE MOLECULAR WEIGHT OF FLUE GAS (WET BASIS) (lb/lb-mole)

$$M_s = (18 \times B_{ws}) + ((.440 (\%CO_2) + .320 (\%O_2) + .280 (\%N_2 + \%CO)) \times (1 - B_{ws}))$$

- (7) GAS VELOCITY IN FLUE (fps)

$$V_s = 85.49 \times C_p \times (\sqrt{\Delta P}) \text{ avg. } \sqrt{\frac{T_s}{P_s \times M_s}}$$

- (8) FLUE GAS VOLUME AT ACTUAL CONDITIONS (acfm)

$$V_0 = V_s \times A \times 60$$

- (9) FLUE GAS VOLUME CORRECTED TO DRY STANDARD CONDITIONS (dscfh)

$$Q_{sd} = \frac{T_{std}}{29.92} \times \frac{P_s}{T_s} \times V_0 \times (1 - B_{ws}) \times 60$$

- (10) TOTAL FLUE GAS VOLUME SAMPLED AT ACTUAL CONDITIONS (acf)

$$V_t = \left[V_m \times Y \times \frac{T_s}{T_m} \times \left(\frac{P_b + (\Delta H/13.6)}{P_s} \right) \right] + \left(0.00287 \times V_{lc} \times \frac{T_s}{P_s} \right)$$



(11) DUST CONCENTRATION FOR INDIRECT HEATING UNIT ACTUAL CONDITIONS AND STANDARD CONDITIONS

$$W_g = \text{gms}$$

$$W_p = 0.002205 \times W_g \text{ (lb)}$$

$$W_d = \frac{W_p}{V_{ms}} \text{ (lb/dscf)}$$

$$W_h = W_d \times Q_{sd} \text{ (lb/hr dry)}$$

$$W_a = \frac{7000 \times W_p}{V_t} \text{ (gr/act)}$$

$$W_s = 7000 \times W_d \text{ (gr/dscf)}$$

$$D_l = \frac{9780 \times 20.9 \times W_d}{(20.9 - \%O_2)} \text{ (lb/mmBtu with constant 9780Fr)}$$

$$F_r = \frac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{H_c} \text{ (dscf/mmBtu)}$$

$$D_l' = \frac{20.9 \times W_d \times F_r}{(20.9 - \%O_2)} \text{ (lb/mmBtu with calculated } F_r)$$

(12) PERCENT OF ISOKINETIC SAMPLING

$$\%I = \frac{1.667 \times T_s \times \left\{ 0.00267 \times V_{lc} + \left[\frac{V_m \times Y}{T_m} \times (P_b + \Delta H/13.6) \right] \right\}}{\Theta \times V_s \times P_s \times A_n}$$



SO₂ SO₃ NOMENCLATURE

%C	=	Percent carbon by weight, dry basis
C _{SO₂}	=	Concentration of sulfur dioxide, dry basis corrected to standard conditions (lb/dscf)
C _{SO₃}	=	Concentration of sulfur trioxide, dry basis corrected to standard conditions (lb/dscf)
ESO ₂	=	Emissions of SO ₂ (lb/mmBtu)
ESO ₃	=	Emissions of SO ₃ (lb/mmBtu)
F	=	F factor, ratio factor of dry flue gas volume to heat of combusted fuel in dry standard cubic feet per million Btu.
%H	=	Percent hydrogen by weight, dry basis
Hc	=	Heat of combustion, dry basis, Btu/lb.
In Hg	=	inches mercury
mls	=	Milliliters of the standard sulfuric acid used to standardize the barium perchlorate solution
MI _t	=	Milliliters required to titrate the standard sulfuric acid solution
%N	=	Percent nitrogen by weight, dry basis
Ns	=	Normality of sulfuric acid as labeled on bottle
Nt	=	normality of barium perchlorate titrant, milliequivalents/ml
%O	=	Percent oxygen by weight, dry basis
%O ₂	=	Percent oxygen by volume, dry basis
Pb	=	Barometric pressure in inches, mercury
Pstd	=	Standard absolute pressure (29.92 in. Hg)
PPM	=	Parts per million
%S	=	Percent sulfure by weight, dry basis
Tm	=	Absolute temperature at meter in degrees Rankine, average
Va	=	Volume of sample aliquot titrated, ml.
Vm	=	Volume dry gas as measured by the dry gas meter, (dcf)
Vmstd	=	Volume dry gas measured by the dry gas meter corrected to standard conditions (dscf)
Vsoln	=	Total volume of solution in which the sulfur dioxide sample is contained, 100 ml.
Vt	=	Volume of barium perchlorate titrant used for the sample, ml (average of replicate titrations)
Vtb	=	Volume of barium perchlorate titrant used for the blank, ml.
Y	=	Dry gas meter calibration factor



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EPA - SO₃ FORMULAS

- (1) $N_t = \frac{(mis) \times (Ns)}{Mi_t}$
- (2) $V_{mstd} = 17.64 \frac{(Y) (V_m) (P_b)}{T_m}$
- (3) $C_{SO_3} = 1.081 \times 10^{-4} \frac{(V_t - V_{tb}) N \left(\frac{V_{SO_3}}{V_a} \right)}{V_{mstd}}$
- (4) $PPM_{SO_3} = C_{SO_3} \times 4.822 \times 10^6$
- (5) $ES_{O_3} = C_{SO_3} (F) \frac{20.9}{20.9 - \%O_2}$
- (6) $Fr = \frac{10^6 \times [(3.84 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.48 \times \%O)]}{H_c} \text{ (dscf/mmBtu)}$

SAMPLE CALCULATION

- (1) $\underline{\quad} N_t = \frac{(\underline{\quad} mis) \times (\underline{\quad} N)}{\underline{\quad} mis}$
- (2) $\underline{\quad} dscf = 17.64 \frac{(\underline{\quad}) (\underline{\quad} cf) (\underline{\quad} NHg)}{\underline{\quad} ^\circ R}$
- (3) $\underline{\quad} lb/dscf = 1.081 \times 10^{-4} \frac{(\underline{\quad} mi - \underline{\quad} mi) \underline{\quad} N \left(\frac{\underline{\quad} mi}{\underline{\quad} mi} \right)}{\underline{\quad} dscf}$
- (4) $\underline{\quad} ppm = \underline{\quad} lb/dscf \times 4.822 \times 10^6$
- (5) $\underline{\quad} lb/mBtu = \underline{\quad} lb/dscf \times \underline{\quad} dscf/mBtu \frac{20.9}{(20.9 - \underline{\quad} \%)}$
- (6) $\underline{\quad} dscf/mBtu = \frac{10^6 \times [(3.84 \times \underline{\quad}) + (1.53 \times \underline{\quad}) + (0.57 \times \underline{\quad}) + (0.14 \times \underline{\quad})]}{\underline{\quad} Btu/lb}$



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CO CALCULATION

$$\text{lb/dscf} = 0.726 \times 10^{-7} \times \text{PPM}$$

$$\text{lb/MBtu} = \text{lb/dscf} \times \text{F Factor} \times \frac{20.9}{(20.9 - \%O_2)}$$

$$\text{lb/hour} = \text{lb/dscf} \times \text{dscfm} \times 60 \text{ min./hr.}$$



TSA Field Data Sheets

Client J.E.A. S.J.R.P.P.				Date 8/11/95		Page 1 of 2	
Project No. 95-058-FL.		Operator HARLEY C. O'NEILL		Orsat Analysis			
Sampling Location Unit # 1 Stack			Run No. 1	CO ₂	+O ₂	O ₂	CO
Filter No. —	Acetone No. —	Condensate 80.0 <small>20.065.</small>		14.34	—	4.92	—
Barometric Pressure 30.22		Static Pressure 41 41	Probe Number N-10-6-1F		14.34	—	4.92
Nozzle Diameter .187	Nozzle Number FL3	Pilot Coefficient .875	Pilot Number N-10-6-1-1F		—	—	—
Meter Corr. Factor .996		Meter-Orifice 2.999		—	—	—	—

Sample Pt. Time 5min 60min TEST.		Assumed % Moisture 13.2		Leak Test		Before .004 @ 15" HG	After .002 @ 6" HG
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0815										162.411
1	1.30	1.140	1.77	170	327	61	322	86	87	4	166.247
2	1.25	1.118	1.12	171	326	60	328	86	86	4	169.898
3	0.95	0.975	0.853	172	332	60	324	86	86	4	172.693
1	1.45	1.204	1.32	171	331	63	329	89	88	4	175.899
2	1.33	1.153	1.21	170	335	58	324	91	88	4	179.010
3	1.25	1.118	1.14	168	331	62	327	91	87	4	182.006
1	1.43	1.196	1.31	169	330	63	328	92	87	4	185.369
2	1.35	1.162	1.24	168	334	62	327	92	87	4	188.836
3	0.97	0.985	0.89	167	331	65	324	93	88	4	191.874
1	1.49	1.221	1.35	169	321	60	327	90	86	4	195.150
2	1.32	1.149	1.20	169	324	62	324	90	86	6	198.602
3	1.12	1.058	1.02	170	321	64	329	91	87	6	201.720
Stop	0930										
AVG		(1.123)	(1.20)	(169.50)				(91.458)	88	433	(39.309) Cu./Ft.
				ISOkinetic Rate → 103.2%							
				11.0% moisture							

Pilot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



503 Field Data Sheet

Client J.E.A. S.J.R.P.P.						Date 8/11/95		Page 1 of 2			
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit # 1 Stack				Run No. 2		CO ₂	+ O ₂	O ₂	CO		
Filter No.		Acetone No.		Condensate 81.5 ml. 59 19.50		14.35		4.86			
Barometric Pressure 30.22			Static Pressure -.55		Probe Number N-10-6-1F						
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pilot Number N-10-6-1-F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13%			Leak Test .008 @ 15" HG .004 @ 3" HG					
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1014										208.124
1	1.46	1.208	1.33	171	324	60	320	90	85	3	211.796
2	1.39	1.179	1.26	170	322	61	328	90	86	3	215.131
3	1.09	1.044	0.99	168	324	60	332	92	86	3	218.144
1	1.51	1.229	1.39	168	321	59	334	91	90	3	221.490
2	1.34	1.158	1.24	168	322	59	328	94	89	3	224.699
3	1.08	1.039	1.00	169	323	60	328	97	91	3	227.750
1	1.52	1.237	1.41	169	321	63	327	95	93	3	231.149
2	1.43	1.196	1.83	170	322	63	327	101	93	3	234.512
3	1.23	1.109	1.56	171	324	62	329	105	95	3	238.003
1	1.46	1.208	1.43	170	329	61	329	96	96	3	241.396
2	1.31	1.145	1.63	168	331	61	327	106	97	3	245.004
3	1.05	1.025	1.31	169	330	60	324	110	95	3	248.468
Stop	1130										
AV →		(1.148)	(1.364)	(169.25)				(94.292)		3	(40.344) Cu./Ft.
		ISO = 103.0									
		moisture = 10.90									

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client J.E.A. S.J.R.P.P.			Date 8/11/95		Page 1 of 2
Project No. 95-058-FL.		Operator NARLEY C. O'NEILL		Orsat Analysis	
Sampling Location Unit # Stack			Run No. 3		CO ₂ +O ₂ O ₂ CO
Filter No.	Acetone No.	Condensate TR 22.8 sec / 69.0 ml		14.11	5.01
Barometric Pressure 30.22		Static Pressure -.55		Probe Number N-10-G-1F	
Nozzle Diameter 1.87		Nozzle Number		Pitot Coefficient .875	
Meter Corr. Factor .996		Meter-Orifice 2.999		Pitot Number N-10-G-1-1F	

Sample Pt. Time Spin 60 min TEST.	Assumed % Moisture 1190	Leak Test	Before .006 @ 15" Hg	After CO₂ @ 4" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1213										259.006
1	1.51	1.229	1.89	172	322	60	329	102	102	3	262.620
2	1.43	1.196	1.81	170	328	61	329	107	105	3	266.501
3	1.29	1.136	1.65	170	327	61	333	112	106	3	270.284
1	1.52	1.233	1.92	168	327	64	330	105	105	4	274.285
2	1.38	1.175	1.77	169	329	63	332	113	105	4	278.255
3	1.31	1.145	1.68	168	328	62	331	114	106	4	282.075
1	1.53	1.237	1.94	169	329	61	324	105	107	4	286.025
2	1.42	1.192	1.80	171	327	60	327	117	106	4	289.946
3	1.27	1.127	1.63	170	323	60	321	116	106	4	293.838
1	1.52	1.233	1.94	169	328	59	320	110	105	4	297.875
2	1.43	1.196	1.84	169	325	62	323	116	105	4	301.852
3	1.24	1.114	1.60	170	324	62	322	117	107	4	305.724
Stop	1327										
AVG		(1.184)	(1.789)	(169.58)				(108.292)		13.75	(46.718) Cu./Ft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



2-13

SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.						Date 12 Aug. 95		Page 1 of 2			
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit #1 Stack				Run No. 1		CO ₂	+ O ₂	O ₂	CO		
Filter No.		Acetone No.		Condensate 60.0ml 31.0g		14.23		5.04			
Barometric Pressure 30.23			Static Pressure -54		Probe Number N-10-G-1F						
Nozzle Diameter .187		Nozzle Number FL3		Pilot Coefficient .875		Pilot Number N-10-G-11F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 5min 60min Test.			Assumed % Moisture 1190			Leak Test Before .004 @ 15" H₂O		Leak Test After .002 @ 5" H₂O			
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0806										316.521
1	1.49	1.221	1.54	170	321	60	324	85	85	4	320.369
2	1.39	1.179	1.31	171	318	60	322	88	86	4	323.959
3	1.25	1.118	1.18	169	319	63	322	88	86	4	227.098
1	1.47	1.212	1.39	170	322	61	327	86	86	3	330.401
2	1.38	1.175	1.31	171	324	61	327	90	87	3	333.746
3	1.08	1.039	1.04	169	325	60	326	94	89	3	336.872
1	1.53	1.237	1.47	170	324	61	325	90	87	5	340.148
2	1.41	1.187	1.35	171	328	64	329	92	90	5.75	343.531
3	1.29	1.136	1.24	170	329	63	325	92	89	5	346.795
1	1.50	1.225	1.44	168	325	61	324	92	86	5	350.159
2	1.43	1.196	1.37	167	322	61	328	96	85	5	353.529
3	1.18	1.086	1.13	169	324	62	324	99	86	5	356.843
Stop	0918										
AVG		(1.168)	(1.314)					(88.917)		14.25	(40.322)
				169.75	TL.						Cu./Ft.
		ISO = 101.2									
		9.9% moisture.									
											SO ₃ = 8.72 ppm wet.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client J.E.A. S.J.R.P.P.				Date 12 Aug. 95		Page 1 of 2	
Project No. 95-058-FL.		Operator HARLEY C. O'NEILL		Orsat Analysis			
Sampling Location Unit #1 Stack		Run No. 2					
Filter No. -	Acetone No. -	Condensate 51 ml		38.65%	14.22	4.98	
Barometric Pressure 30.23		Static Pressure -.54		Probe Number N-10-G-1F			
Nozzle Diameter .187		Nozzle Number FL3		Pilot Coefficient .875		Pilot Number N-10-G-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999					

Sample Pt. Time 5min 60min Test.	Assumed % Moisture 1190	Leak Test	Before .001 @ 15" Hg	After .001 @ 11" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1000										357.038
1	1.51	1.229	1.45	170	324	60	321	95	95	6	360.197
2	1.40	1.183	1.36	171	322	61	327	106	96	7	363.338
3	1.20	1.095	1.20	170	329	62	324	107	100	8	366.595
1	1.49	1.221	1.49	169	322	62	327	107	102	10	370.005
2	1.39	1.179	1.41	168	323	63	325	110	103	10	373.396
3	1.11	1.054	1.13	170	324	60	332	112	103	10	376.775
1	1.52	1.233	1.55	171	327	61	330	113	105	10	380.258
2	1.44	1.200	1.48	170	324	61	330	113	106	11	383.882
3	1.09	1.044	1.13	169	321	60	331	115	108	11	386.994
1	1.50	1.225	1.51	170	322	61	331	105	105	11	390.359
2	1.42	1.192	1.46	171	323	62	322	115	106	11	393.699
3	1.21	1.100	1.24	171	323	62	331	115	106	10	396.982
Stop	1110										

AVG	(1.163)	(1.37)	(170.00)								(109.417)	19.58	(39.944)
											106		Cu./FT.
	ISO = 953												
	moisture = 10.1%												
	PPM = 8.17 wet.												

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Set 15

SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.		Date 12 AUG. 95	Page 1	Of 2
Project No. 95-058-FL.		Operator THOMAS C. O'NEILL		
Sampling Location Unit # Stack		Run No. 3		
Filter No. -	Acetone No. -	Condensate 535	CO ₂ 14.18	Orsat Analysis + O ₂ O ₂ CO 4.93
Barometric Pressure 30.29		Static Pressure -.54	Probe Number N-10-G-11F	
Nozzle Diameter .167	Nozzle Number FL3	Pitot Coefficient .875	Pitot Number N-10-G-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999		

Sample Pt. Time Spin 60 min TEST.	Assumed % Moisture 10%	Leak Test Before .000 @ 15" Hg After .000 @ 4" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1150										406.578
1	1.51	1.229	1.55	169	319	59	328	110	110	4	410.223
2	1.39	1.179	1.46	170	322	60	329	111	111	4	413.837
3	1.21	1.110	1.27	171	323	60	327	112	111	4	417.194
1	1.48	1.217	1.56	168	321	60	327	111	111	4	420.639
2	1.40	1.183	1.49	169	322	61	328	115	113	4	424.552
3	1.03	1.015	1.10	170	323	64	334	117	115	4	427.839
1	1.50	1.225	1.58	170	321	62	330	112	111	4	431.403
2	1.37	1.170	1.45	171	322	63	322	115	112	4	434.605
3	1.01	1.005	1.07	172	328	63	322	116	112	4	438.483
1	1.53	1.237	1.62	170	322	63	327	113	112	4	442.085
2	1.34	1.158	1.42	171	325	61	328	115	113	4	445.691
3	1.18	1.086	1.26	169	324	62	328	115	113	4	448.925
Stop	1300										

AV → (1.151) (1.403) (170.00) (112.750) 4 (42.347) Cu./Ft.

ISC = 104.6%

moisture = 11.0%

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK



SO₃ Field Data Sheet

2516.5-T.

Client J.E.A. S.J.R.P.P.				Date 8-13-95		Page 1 of 2	
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis	
Sampling Location Unit # 1 Stack				Run No. 1		CO ₂ + O ₂ O ₂ CO	
Filter No. -		Acetone No.		Condensate 72ml		21.2g @ 14.29 L 4.95	
Barometric Pressure 30.29			Static Pressure -.55		Probe Number N-10-G-1F		
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-6-11F	
Meter Corr. Factor .996			Meter-Orifice 2.999				

Sample Pt. Time Smin 60min TEST.		Assumed % Moisture 10%		Leak Test		Before .006 @ 15" HG		After .006 @ 4" HG	
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0800										450.961
1	1.41	1.187	1.46	169	315	62	329	106	106	4	454.568
2	1.33	1.153	1.39	168	322	58	328	110	105	4	457.997
3	1.15	1.072	1.21	167	322	59	328	112	106	4	461.400
1	1.49	1.221	1.56	168	323	60	330	105	105	4	464.787
2	1.39	1.179	1.47	167	324	61	331	114	109	4	468.523
3	1.18	1.086	1.25	169	324	62	332	117	108	4	471.910
1	1.39	1.179	1.43	170	323	62	332	106	105	4	475.429
2	1.31	1.145	1.38	171	319	64	329	116	110	4	478.895
3	1.18	1.086	1.25	170	322	62	325	116	111	4	482.255
1	1.42	1.192	1.49	169	329	62	325	111	110	4	485.692
2	1.31	1.145	1.41	170	327	62	326	117	111	4	489.294
3	1.11	1.054	1.18	170	324	61	327	116	111	4	492.701
Stop	0910										

AV → (1.141) (1.37) (1.68.67) (110.125) 4 (41.740) Cu./Ft.

T.S.O = 103.5%
moisture = 10.1.
ppm = 4.99

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



SO₃ Field Data Sheet

Set 17

Client J.E.A. S.J.R.P.P.						Date 8-13-95		Page 1 Of 2			
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit # Stack			Run No. 2								
Filter No.		Acetone No.		Condensate 62.0 ml		24.39		14.42		4.77	
Barometric Pressure 30.29			Static Pressure -.55		Probe Number N-10-G-1-F						
Nozzle Diameter .187		Nozzle Number FL 3		Pitot Coefficient .875		Pitot Number N-10-G-11F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 5 min 60 min Test.			Assumed % Moisture 10%			Leak Test Before .000 @ 15"		Leak Test After .004 @ 3" Hg			
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0947										500.410
1	1.51	1.229	1.59	168	321	60	324	110	110	3	504.075
2	1.40	1.183	1.48	169	322	61	324	113	110	3	507.643
3	1.15	1.072	1.21	169	323	61	323	114	110	3	510.999
1	1.51	1.229	1.59	170	324	62	324	111	111	3	514.660
2	1.37	1.170	1.45	171	322	62	327	116	110	3	518.201
3	1.11	1.054	1.18	168	328	61	324	117	110	3	521.463
1	1.43	1.196	1.51	169	329	64	325	113	111	3	525.091
2	1.31	1.145	1.39	169	328	63	327	115	111	3	528.589
3	1.14	1.068	1.21	170	328	63	329	115	112	3	531.883
1	1.41	1.187	1.49	171	327	64	322	113	112	3	535.441
2	1.34	1.159	1.41	172	324	62	329	116	115	3	538.939
3	1.12	1.058	1.19	171	322	63	321	116	113	3	542.226
Stop	1100										
AVG				(1.146)	(1.39)	(169.75)			(112.667)	3	(41.816)
Cu./Ft.											
TSP = 102.3%											
moisture = 9.4%											
10.27 ppm											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E8

SO₃ Field Data Sheet

pt. 18-

Client J.E.A. S.J.R.P.P.			Date 8-13-95		Page 1 of 2
Project No. 95-058-FL.		Operator HARLEY C. O'NEILL			Orsat Analysis
Sampling Location Unit # Stack			Run No. 3		
Filter No. -	Acetone No. -	Condensate 67.00 ml		23.75 g.	CO ₂ + O ₂ O ₂ CO
Barometric Pressure 30.29		Static Pressure -.55		Probe Number N-10-G-1F	
Nozzle Diameter .187	Nozzle Number FL.3	Pitot Coefficient		Pitot Number N-10-G-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999			

Sample Pt. Time 5 min 60 min TEST.	Assumed % Moisture 10.9%	Leak Test	Before .008 @ 15" Hg	After .006 @ 3" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1143										351.832
1	1.49	1.22	1.57	271	321	61	327	112	112	3	355.152
2	1.39	1.17	1.47	170	322	60	327	114	113	3	358.339
3	1.28	1.13	1.36	169	323	61	324	115	113	3	361.699
1	1.45	1.20	1.53	169	322	58	323	112	112	3	365.252
2	1.35	1.16	1.43	169	323	59	323	114	113	3	368.804
3	1.05	1.02	1.13	170	324	60	329	114	113	3	372.135
1	1.48	1.21	1.56	170	325	60	327	112	112	3	375.664
2	1.29	1.13	1.37	171	324	61	326	115	113	3	379.151
3	1.10	1.04	1.17	168	325	61	329	114	112	3	382.400
1	1.50	1.22	1.58	170	324	60	327	113	112	3	386.001
2	1.35	1.16	1.43	169	322	60	324	112	112	3	389.517
3	1.17	1.08	1.24	169	323	61	320	113	112	3	392.732
Stop	1255										

AV → (1.149) (1.40) (169.58) (112.875) | 3 | (40.900) Cu/ft.

ISO = 100.3%
moistures 10.1%

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E9

Client JEA/S.J.R.P.P.		Date 8-14-95	Page 1 of 2	
Project No. 95-058 FL		Operator HARLEY C. O'NEILL		Orsat Analysis CO ₂ + O ₂ O ₂ CO
Sampling Location STACK UNIT 1		Run No. 2		
Filter No. 95-029 FL	Acetone No. -	Condensate 239 ML ^{17.7}		14.2 19.1 4.90
Barometric Pressure 30.23		Static Pressure -.55	Probe Number N-10-G-1F	
Nozzle Diameter .187	Nozzle Number FL 3	Pitot Coefficient .875	Pitot Number N-10-G-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999		

Sample Pt. Time 10 min	Assumed % Moisture 120 min TEST 10.5	Leak Test 001 @ 15" HG	Before 006 @ 2" HG	After 006 @ 2" HG
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
START	1050										688.002
1	1.51	1.229	1.60	163	324	61	327	114	114	2	694.813
2	1.42	1.192	1.51	164	327	62	324	115	114	2	701.993
3	1.26	1.118	1.33	165	329	60	322	123	119	2	708.678
1	1.52	1.233	1.52	167	324	61	327	116	114	2	715.914
2	1.43	1.196	1.46	164	322	59	324	123	115	2	722.934
3	1.18	1.086	1.20	168	321	64	327	126	116	2	729.664
1	1.49	1.221	1.51	163	328	63	326	117	116	2	736.995
2	1.39	1.179	1.43	164	327	62	326	124	117	2	743.025
3	1.22	1.105	1.25	163	324	61	326	124	117	2	750.777
1	1.52	1.233	1.56	164	323	62	327	112	112	2	757.975
2	1.51	1.229	1.547	164	324	61	325	124	117	2	765.395
3	1.16	1.079	1.12	163	324	61	322	126	116	2	771.538
STOP	1300										

AVG. (1.172) (1.42) (1.64.0) (117.96) | 2" | (83.536) cuft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Particulate Field Data Sheet

Client JEA / S.J.R.P.A.		Date 8-14-95	Page 1	Of 2
Project No. 95-058 FL		Operator HARLEY C. O'NEILL		Orsat Analysis CO ₂ + O ₂ O ₂ CO
Sampling Location Stack Unit 1		Run No. 3		
Filter No. 95-030 FL	Acetone No. -	Condensate 245 ML ^{16.4}		14.45 4.46
Barometric Pressure 30.23		Static Pressure -.55	Probe Number N-10-G-1F	
Nozzle Diameter .187	Nozzle Number FL3	Pitot Coefficient .875	Pitot Number N-10-G-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999		

Sample Pt. Time 10min	Assumed % Moisture 13%	Leak Test	Before .000 @ 15" Hg	After .00 @ 2" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1.315										771.646
1	1.49	1.22	1.50	164	329	58	327	115	115	2	777.810
2	1.39	1.179	1.40	164	327	59	329	117	115	2	789.712
3	1.28	1.131	1.28	167	324	61	331	119	115	2	791.454
1	1.50	1.225	1.52	163	327	62	331	116	115	2	798.655
2	1.35	1.162	1.37	164	324	62	330	119	116	2	805.566
3	1.30	1.140	1.34	167	322	59	322	126	118	2	812.337
1	1.80	1.225	1.52	165	327	60	320	117	116	2	819.660
2	1.40	1.188	1.42	165	325	61	323	117	116	2	826.980
3	1.21	1.100	1.23	166	324	62	324	119	117	2	833.996
1	1.52	1.233	1.52	169	327	60	322	126	116	2	841.255
2	1.37	1.170	1.37	166	324	60	322	127	116	2	848.040
3	1.24	1.114	1.28	167	322	61	324	126	115	2	854.600
Stop	1.325										

AVG.		1.174 (1.174)	1.40 (1.40)	1.655 (1.655)				1.224 (1.224)	118	118	(82.954) cuft.
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Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Particulate Field Data Sheet

Client JEA / S.J.R.P.P.		Date 8-15-95	Page 1	Of 2
Project No. 95-058 FL		Operator HARLEY C. O'NEILL		Orsat Analysis
Sampling Location Unit 1 Stack		Run No. 1	CO ₂	+ O ₂
Filter No. 95-031 FL	Acetone No. -	Condensate 244 mL	17.4	14.4
Barometric Pressure 30.16	Static Pressure -.54	Probe Number N-10-6-1F	5.10	
Nozzle Diameter .187	Nozzle Number FL3	Pitot Coefficient .875	Pitot Number N-10-6-11F	
Meter Corr. Factor .996	Meter-Orifice 2.999			

Sample Pt. Time 10 min	Assumed % Moisture 11%	Leak Test	Before .008 @ 15" HG	After .004 @ 2" HG
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Over	Meter In	Meter Out		
Start	0800										854.756
1	1.47	1.212	1.57	169	324	61	327	114	114	2	861.995
2	1.29	1.136	1.35	168	325	62	326	117	112	2	868.760
3	1.13	1.063	1.20	168	325	61	327	122	113	2	875.086
1	1.48	1.217	1.55	168	322	59	326	115	113	2	882.289
2	1.37	1.170	1.47	169	324	59	326	126	115	2	889.402
3	1.23	1.109	1.32	167	323	58	326	126	116	2	896.152
1	1.49	1.221	1.56	168	325	59	322	115	115	2	903.338
2	1.37	1.170	1.47	169	324	60	323	126	116	2	910.478
3	1.26	1.122	1.35	170	321	59	324	126	119	2	917.196
1	1.49	1.221	1.58	169	326	62	327	120	116	2	924.401
2	1.34	1.158	1.44	168	322	61	325	126	118	2	931.423
3	1.20	1.095	1.29	169	322	61	325	127	116	2	937.973
Stop	1007										
AVG		(1.158)	(1.68.33)					(118.458)	2		(83.217) cu ft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / SJRPP						Date 8-15-95		Page 1 of 2			
Project No. 95-058 FL			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location UNIT 1 STACK				Run No. 3		CO ₂	+ O ₂ %	O₂	CO		
Filter No. 95-033 FL		Acetone No. -		Condensate 256 ML		19.7	14.3	4.8			
Barometric Pressure 30.16			Static Pressure -.54		Probe Number N-10-G-1F						
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-G-11F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 10 min		Assumed % Moisture 1190		Leak Test		Before .000	After 15" HG .0042" H₂O				
Sample Point	ΔP	$\sqrt{\Delta P}$	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1315										024.983
1	1.52	1.233	1.61	165	321	61	324	112	113	2	032.308
2	1.43	1.196	1.51	164	327	60	323	116	113	2	039.425
3	1.31	1.145	1.39	163	324	60	323	124	116	2	046.241
1	1.50	1.225	1.59	167	319	59	324	115	115	2	053.524
2	1.39	1.179	1.47	169	320	63	324	122	116	2	060.533
3	1.25	1.118	1.32	169	322	63	320	127	119	2	067.180
1	1.51	1.229	1.60	165	321	62	324	115	115	2	074.481
2	1.42	1.172	1.50	167	324	63	324	119	115	2	081.571
3	1.31	1.145	1.39	164	323	60	325	126	119	2	088.385
1	1.52	1.233	1.61	170	331	61	327	114	113	2	095.720
2	1.43	1.196	1.51	169	330	59	321	117	115	2	102.820
3	1.31	1.145	1.41	169	331	62	324	125	120	2	109.675
stop	1525										
AUG		(6.186)(1.49)		(1166.70)		(122,500)		112		(1584.692)	
cuft.											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK
 E15



Client JEA / S.J.R.P.P.				Date 8-16-95				Page 1 Of 2			
Project No. 95-058FL			Operator WIMLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit 1 Stack					Run No. 1		CO ₂	+O ₂	O ₂	CO	
Filter No. 95-034FL		Acetone No. -		Condensate 235 ml		11.6	14.3	5.0			
Barometric Pressure 30.15			Static Pressure - .88		Probe Number N-10-G-11F						
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-G-1F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 60 min 120 min test		Assumed % Moisture 13%			Leak Test		Before .000 @ 15" HG		After .000 @ 2" HG		
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0800										110.994
1	1.50	1.225	1.54	169	324	62	322	112	112	2	117.295
2	1.41	1.187	1.41	169	322	58	324	116	112	2	124.055
3	1.29	1.136	1.31	167	322	59	324	122	115	2	130.230
1	1.47	1.212	1.49	167	324	59	323	115	115	2	137.135
2	1.35	1.162	1.37	168	325	60	322	124	115	2	143.774
3	1.18	1.086	1.21	167	324	60	321	127	116	2	150.280
1	1.52	1.233	1.54	165	327	59	322	116	116	2	157.310
2	1.35	1.162	1.37	166	324	59	322	127	116	2	164.028
3	1.09	1.044	1.10	167	325	60	321	126	116	2	170.642
1	1.55	1.245	1.56	167	324	61	322	116	116	2	177.862
2	1.38	1.175	1.416	167	323	61	324	125	117	2	183.995
3	1.11	1.054	1.144	164	323	61	324	126	116	2	190.545
Stop	1025										
AVG		(1.160)(1.25)(1.66.92)						(118.083)		2	(79.551) cuft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / S.J.R.P.A.			Date 8-16-95		Page 1 Of 2
Project No. 95-058 FL		Operator HARLEY C. O'NEILL			Orsat Analysis CO ₂ +O ₂ O ₂ CO
Sampling Location Unit 1 Stack			Run No. 2		
Filter No. 95-035 FL	Acetone No. -	Condensate 235 ML		21.4	14.2 4.8
Barometric Pressure 30.15		Static Pressure -.88	Probe Number N-10-G-1F		
Nozzle Diameter .187	Nozzle Number FL3	Pitot Coefficient .875	Pitot Number N-10-G-11F		
Meter Corr. Factor .996		Meter-Orifice 2.999			

Sample Pt. Time 10 min	Assumed % Moisture 13%	Leak Test .000 @ 15" H₂O	Before	After
120 min test			.000 @ 15" H₂O	.000 @ 2" H₂O

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1045										191.396
1	1.51	1.229	1.52	167	322	60	320	116	116	2	198.601
2	1.43	1.196	1.47	164	320	61	321	124	116	2	205.625
3	1.31	1.145	1.35	164	324	63	323	124	116	2	212.331
1	1.50	1.225	1.52	163	324	63	324	116	116	2	219.459
2	1.41	1.187	1.43	163	319	60	327	117	116	2	226.371
3	1.32	1.129	1.36	168	322	61	330	126	119	2	233.120
1	1.49	1.221	1.49	169	324	62	329	115	114	2	240.160
2	1.30	1.140	1.31	170	327	60	327	119	115	2	246.754
3	1.26	1.122	1.29	171	326	60	327	125	116	2	253.320
1	1.49	1.221	1.49	169	327	59	325	115	114	2	260.370
2	1.32	1.149	1.34	169	326	58	324	122	116	2	267.060
3	1.22	1.105	1.26	169	329	58	328	126	120	2	273.541
Stop	1250										
AVG		(1.174)	(1.40)	(167.17)				(118.242)	12		(282.145) cu-ft.

Pitot Tube Leak Check: Before OK After OK
Integrated Bag Leak Check: Before OK After OK



Particulate Field Data Sheet

Client J.E.A. / S.J.R.P.P.						Date 8-16-95						Page 1 of 2				
Project No. 95-058 FL				Operator HARLEY C. O'NEILL				Orsat Analysis								
Sampling Location Unit 1 Stack						Run No. 3		CO₂		+ O₂		O₂		CO		
Filter No. 95-036 FL			Acetone No. -			Condensate 244 mL			20.4		14.1		4.9			
Barometric Pressure 30.15				Static Pressure -.88		Probe Number N-10-G-1F										
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-G-11F										
Meter Corr. Factor .996				Meter-Orifice 2.999												
Sample Pt. Time 10 min 120 min test			Assumed % Moisture 13%			Leak Test			Before .000 @ 15"			After .000 @ 16"				
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.					
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out							
Start	1325											273.700				
1	1.51	1.229	1.51	169	321	59	325	115	115	2		280.820				
2	1.42	1.192	1.45	168	320	60	322	123	117	2		287.790				
3	1.29	1.136	1.32	168	322	61	322	123	118	2		294.421				
1	1.50	1.225	1.53	167	321	60	327	116	116	2		301.567				
2	1.40	1.183	1.43	169	322	61	328	121	116	2		308.470				
3	1.29	1.136	1.32	170	328	62	328	126	119	2		315.120				
1	1.50	1.225	1.54	164	327	60	325	116	116	2		322.290				
2	1.39	1.179	1.43	168	325	59	321	126	118	2		329.213				
3	1.26	1.122	1.31	164	323	60	320	127	119	2		335.821				
1	1.51	1.229	1.52	167	322	61	322	116	116	2		342.981				
2	1.40	1.183	1.44	165	327	62	327	123	118	2		349.601				
3	1.12	1.058	1.15	165	322	60	329	126	118	2		355.795				
Stop	1537	1.175	1.41	167.00				(119.333)	119	2	1	(32.095)				
												cu-ft.				
AVG.																

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E18

Client JEA / SJRPP			Date 8-17-95		Page 1 of 2
Project No. 95-058 FL		Operator HARLEY C. O'NEILL			Orsat Analysis
Sampling Location Unit 1 Stack			Run No. 1		
Filter No. 95-037 FT	Acetone No. -	Condensate 250 ML		CO ₂ 14.2	+ O ₂ 5.1
Barometric Pressure 30.19		Static Pressure -.83	Probe Number N-10-G-1F		
Nozzle Diameter .187	Nozzle Number FL 3	Pitot Coefficient .875	Pitot Number N-10-G-11F		
Meter Corr. Factor .996		Meter-Orifice 2.999			

Sample Pt. Time 10 min 120 min TEST	Assumed % Moisture 13 %	Leak Test	Before .000 @ 15" H ₂ O	After .00 @ 2" H ₂ O
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0800										355.942
1	1.51	1.229	1.51	168	321	61	325	114	114	2	363.151
2	1.40	1.183	1.40	168	322	61	324	115	114	2	369.902
3	1.24	1.114	1.26	167	323	62	323	120	116	2	376.451
4	1.53	1.237	1.53	168	322	60	323	115	115	2	383.476
2	1.38	1.175	1.40	168	324	60	322	124	115	2	390.301
3	1.05	1.025	1.07	169	327	60	321	125	115	2	396.435
1	1.52	1.233	1.52	169	327	61	321	115	115	2	403.407
2	1.40	1.183	1.44	165	323	60	322	124	119	2	410.289
3	1.11	1.054	1.15	164	324	59	324	125	119	2	416.987
1	1.53	1.237	1.54	167	325	59	324	115	115	2	424.000
2	1.40	1.183	1.44	168	324	60	327	126	119	2	430.821
3	1.19	1.091	1.22	168	325	61	328	127	119	2	437.215
Stop	1010										
Avg		(1.161)	(1.37)	(167.42)				(118.333)	(118.333)	(2)	(81.273) cu-ft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Particulate Field Data Sheet

Client JEA / S.J.R.P.P.						Date 8-17-95						Page 1 Of 2			
Project No. 95-058 FL				Operator HARLEY C. O'NEILL				Orsat Analysis							
Sampling Location Unit 1 Stack						Run No. 2		CO ₂		+ O ₂		O ₂		CO	
Filter No. 95-038 FL		Acetone No. -		Condensate 233 mL		23.4		14.3		4.8					
Barometric Pressure 30.19				Static Pressure - .83		Probe Number N-10-G-1F									
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-G-11F									
Meter Corr. Factor .996				Meter-Orifice 2.999											
Sample Pt. Time 10 min			Assumed % Moisture 13%			Leak Test			Before .000 15" HG			After .000 2" HG			
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.				
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out						
Start	1035											437.336			
1	1.50	1.225	1.50	168	321	61	324	115	115	2		444.417			
2	1.39	1.179	1.41	168	322	61	327	121	116	2		451.246			
3	1.21	1.100	1.24	169	322	60	324	126	120	2		457.667			
1	1.55	1.245	1.59	164	321	62	324	116	116	2		464.901			
2	1.41	1.187	1.44	165	322	61	325	123	117	2		471.840			
3	1.21	1.100	1.25	165	323	61	327	126	120	2		478.320			
1	1.51	1.229	1.52	166	324	64	329	116	115	2		485.420			
2	1.45	1.204	1.46	166	324	63	328	126	116	2		492.392			
3	1.50	1.225	1.54	166	325	64	328	125	116	2		499.550			
1	1.48	1.217	1.52	165	322	65	327	126	116	2		506.673			
2	1.40	1.183	1.44	164	322	65	326	127	116	2		513.590			
3	1.24	1.114	1.28	163	320	66	320	126	116	2		520.119			
Stop	1245														
AVG		(1.184)	(1.43)	(1.6575)				(120.083)	(112)			(82.783) cu-ft.			

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / SJR.P.P.				Date 8-17-95				Page 1 of 2		
Project No. 95-058 FL			Operator HARLEY C. O'NEILL			Orsat Analysis				
Sampling Location Unit 1 Stack					Run No. 3		CO ₂	+ O ₂	O ₂	CO
Filter No. 95-039 FL		Acetone No.		Condensate 240 ml		21-6	14.3	14.3 14.7		
Barometric Pressure 30.19			Static Pressure 783		Probe Number N-10-G-1F					
Nozzle Diameter .187		Nozzle Number FL 3		Pitot Coefficient .875		Pitot Number N-10-G-11F				
Meter Corr. Factor .996			Meter-Orifice 2.999							

Sample Pt. Time 10 min		Assumed % Moisture 13%		Leak Test Before .000 @ 15" HG		Leak Test After .000 @ 2" HG	
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1315										520.226
1	1.51	1.229	1.51	168	324	61	327	115	115	2	527.331
2	1.42	1.192	1.42	167	327	60	324	119	115	2	534.201
3	1.29	1.136	1.29	167	325	58	324	126	118	2	540.760
1	1.50	1.225	1.50	169	324	59	325	116	115	2	547.841
2	1.39	1.179	1.39	171	324	60	324	119	116	2	556.663
3	1.19	1.091	1.22	170	322	61	323	126	120	2	563.056
1	1.51	1.229	1.50	171	320	62	324	116	112	2	570.127
2	1.39	1.179	1.38	172	321	61	324	123	119	2	576.920
3	1.21	1.100	1.24	169	322	63	325	126	119	2	582.870
1	1.55	1.245	1.59	169	327	64	324	115	115	2	589.566
2	1.39	1.179	1.41	169	327	62	325	121	116	2	596.463
3	1.01	1.005	1.04	169	324	64	327	127	121	2	602.375
Stop	1525										
Avg		(1.166 X 1.37 X 1.04)						(118.750)	112		(582.149) cu-ft.

tot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Set 19

SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.				Date 8-18-95				Page 1 of 2			
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit # 1 Stack			Run No. 1			CO ₂ SO₂ ^{3A} O ₂ CO					
Filter No. N/A		Acetone No. -		Condensate 58.5ml		24.25		14.23		5.00	
Barometric Pressure 30.19		Static Pressure -.76		Probe Number N-10-G-1F							
Nozzle Diameter .187		Nozzle Number FL 3		Pitot Coefficient .875		Pitot Number N-10-G-11F					
Meter Corr. Factor .996		Meter-Orifice 2.999									
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13%			Leak Test		Before .000 @ 15" HG		After .000 @ "HG	
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0500										602.909
1	1.53	1.237	1.42	167	324	59	327	95	95	7	606.209
2	1.39	1.179	1.30	164	323	60	329	95	94	7	609.524
3	1.01	1.005	0.95	163	324	60	325	95	94	7	612.529
1	1.51	1.229	1.42	163	323	61	324	96	95	7	615.670
2	1.30	1.140	1.23	164	320	60	324	100	96	7	618.779
3	1.03	1.015	0.98	165	321	58	326	102	96	7	621.635
1	1.52	1.233	1.44	165	322	59	327	100	96	7	625.848
2	1.23	1.109	1.18	163	321	58	326	104	96	7	628.009
3	1.01	1.005	0.96	166	324	59	327	106	96	7	630.963
1	1.52	1.233	1.44	165	322	59	327	100	96	7	634.135
2	1.31	1.145	1.25	165	320	61	327	102	96	7	637.296
3	1.04	1.020	0.99	168	325	60	324	104	96	7	640.162
Stop	0910										
AVG		(1.129)	(1.21)	(165.17)				(97.708)		17	(637.253) Cu/FT.
ISO = 94.9%											
moisture = 9.9%											
SO ₂ ppm = 7.39											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E22

Client J.E.A. S.J.R.P.P.			Date 8-18-95		Page 1 of 2	
Project No. 95-058-FL.		Operator HARLEY C. O'NEILL			Orsat Analysis	
Sampling Location Unit # 1 Stack			Run No. 2		CO ₂	+ O ₂
Filter No. N/A		Acetone No.		Condensate 66.0 ml		O ₂
Barometric Pressure 30.19		Static Pressure .76		Probe Number N-10-G-1F		CO
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		
Meter Corr. Factor .996		Meter-Orifice 2.999				

Sample Pt. Time 5 min 60 min TEST.		Assumed % Moisture 13%		Leak Test Before .002 @ 15" H After .002 @ 1" H	
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0950										650.164
1	1.51	1.229	1.42	164	327	58	325	95	95	6	653.493
2	1.38	1.175	1.36	163	327	56	324	111	107	7	656.777
3	1.29	1.136	1.28	163	326	56	324	115	106	7	660.038
1	1.51	1.229	1.48	166	326	57	329	110	108	7	663.302
2	1.29	1.136	1.28	166	326	57	327	112	109	7	666.500
3	1.15	1.072	1.11	167	323	59	330	118	110	7	669.694
1	1.52	1.233	1.49	166	324	60	331	110	106	7	673.005
2	1.36	1.166	1.30	166	325	63	330	115	111	7	676.161
3	1.14	1.068	1.15	165	327	64	329	121	112	7	679.263
1	1.50	1.225	1.49	166	325	62	329	112	112	7	682.495
2	1.31	1.145	1.30	166	327	60	327	121	112	7	685.550
3	1.15	1.072	1.16	167	324	61	326	122	113	7	688.669
Stop	1100										

AVG (1.157) (1.32) (165.42) (110.88) 16.9 (38.505) Cu./Ft.

ISO = 94.1% moisture = 10.6%

SO₂ ppm = 10.61

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Set 21

SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.				Date 8-10-95				Page 1 Of 2			
Project No. 95-058-FL.			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit # 1 Stack			Run No. 3			CO ₂		+O ₂ 3A		O ₂	CO
Filter No. N/A		Acetone No. -		Condensate 49.0 ml		26.55 g		14.25		5.04	
Barometric Pressure 30.19			Static Pressure -.76		Probe Number N-10-G-1F						
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .875		Pitot Number N-10-G-11F					
Meter Corr. Factor .996			Meter-Orifice 2.999								
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13%			Leak Test		Before .008 @ "HG		After .004 @ "HG	
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1135										696.583
1	1.50	1.225	1.39	169	321	59	327	95	95	7	699.773
2	1.37	1.170	1.37	169	319	61	326	116	114	7	703.200
3	1.15	1.072	1.15	169	322	62	323	116	113	7	706.102
1	1.51	1.229	1.60	164	324	60	326	117	114	7	709.305
2	1.31	1.145	1.32	163	322	61	327	115	114	7	712.511
3	1.21	1.100	1.22	163	325	62	324	115	116	7	715.714
1	1.54	1.241	1.55	165	324	62	326	116	115	7	719.002
2	1.33	1.153	1.36	165	327	60	329	121	116	7	722.029
3	1.25	1.118	1.28	167	324	61	327	123	118	7	725.292
1	1.50	1.225	1.51	167	327	62	325	115	115	7	728.760
2	1.31	1.145	1.33	168	326	60	329	127	115	7	732.041
3	1.10	1.049	1.12	165	321	59	327	121	115	7	735.060
Stop	1240										
AVG		(1.156)	(1.35)	(166.17)				(114.63)		17	(38.477) Cu./Ft.
ISO = 92.3											
moisture = 9.1%											
SO ₃ mg = 12.73											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / SJRPP.			Date 8-19-95		Page 2
Project No. 95-058 FL		Operator J. KEITH			Orsat Analysis CO ₂ +O ₂ O ₂ CO
Sampling Location Unit 1 Stack			Run No. 1		
Filter No. 95-040 FL	Acetone No.	Condensate 150 mls		15.0	
Barometric Pressure 30.28		Static Pressure -0.71	Probe Number N-10-G-1F		
Nozzle Diameter .187	Nozzle Number FL3	Pilot Coefficient .875	Pilot Number N-10-G-11F		
Meter Corr. Factor .996		Meter-Orifice 2.999			

Sample Pt. Time 10 min 120 min test	Assumed % Moisture 13%	Leak Test .007 @ 12" Hg .006 @ 11" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	08:00										746.584
C	1	1.5	1.225	1.54	153	320	62	340	108	1.0	753.82
	2	1.3	1.140	1.34	158	332	63	342	106	1.0	760.49
	3	1.2	1.095	1.24	155	330	62	337	107	1.0	766.89
B	1	1.5	1.225	1.54	154	326	63	342	105	1.0	774.01
	2	1.4	1.183	1.44	156	340	64	335	107	1.0	780.94
	3	1.1	1.049	1.13	153	339	65	334	110	1.0	787.13
A	1	1.5	1.225	1.54	154	327	65	330	111	1.5	794.30
	2	1.4	1.183	1.44	154	338	66	336	112	1.5	801.23
	3	1.2	1.095	1.24	152	330	66	329	113	1.0	807.62
D	1	1.4	1.183	1.44	153	327	64	333	116	1.5	814.57
	2	1.4	1.183	1.44	154	325	65	340	116	1.5	821.47
	3	1.2	1.095	1.24	153	332	65	335	117	1.0	827.910
Stop	10:15										
AVG		(1.157)	(1.38)	(1.54)					(111)	(1)	(81.337)
											CUF.

Total Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / S.J.R.P.P.		Date 8-19-95	Page 1 Of 2	
Project No. 95-058FL		Operator J. KEHL		Orsat Analysis CO ₂ + O ₂ O ₂ CO
Sampling Location UNIT 1 STACK		Run No. 2		
Filter No. 95-041FL	Acetone No.	Condensate 200 m.l.s 17.3		4.3 5.2
Barometric Pressure 30.28		Static Pressure -0.74	Probe Number N-10-G-1F	
Nozzle Diameter .187	Nozzle Number FL 3	Pitot Coefficient .875	Pitot Number N-10-G-18F	
Meter Corr. Factor .996		Meter-Orifice 2.999		

Sample Pt. Time 10 min.	Assumed % Moisture 18%	Leak Test .005 @ 12" H₂O	Before .005 @ 12" H₂O	After .005 @ 12" H₂O
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	10:39										828.129
D	1.5	1.225	1.53	153	329	63	339	115	2.0		835.29
	2	1.183	1.43	154	335	63	330	116	2.0		842.17
	3	1.049	1.12	153	340	64	334	116	1.5		848.31
A	1	1.183	1.52	155	334	63	330	120	2.0		855.40
	2	1.183	1.52	154	340	64	327	121	2.0		862.53
	3	1.095	1.30	154	335	65	333	122	1.5		869.11
B	1	1.5	1.225	1.63	154	341	65	329	122	2.0	876.51
	2	1.183	1.52	154	338	65	332	121	2.0		883.60
	3	1.095	1.30	152	334	66	337	122	1.5		890.22
C	1	1.183	1.52	154	329	66	334	123			897.32
	2	1.5	1.225	1.63	154	331	65	338	124	2.0	904.66
	3	1.095	1.30	153	336	66	330	123	2.5		911.278
Stop	12:56									2.0	
Avg		(1.160 X 1.44 X 1.54)						(120)			(83.156) cuft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client JEA / S.J.R.P.P.			Date 8-19-95	Page 1 of 2
Project No. 95-058 FL		Operator J. KEHL		Orsat Analysis
Sampling Location Unit 1 Stack		Run No. 3		
Filter No. 95-042 FL	Acetone No.	Condensate 215 mLs		CO ₂ + O ₂ + O ₂ CO
Barometric Pressure 30.28		Static Pressure -.74	Probe Number N-10-6-1F	
Nozzle Diameter .187	Nozzle Number FL3	Pitot Coefficient .875	Pitot Number N-10-6-11F	
Meter Corr. Factor .996		Meter-Orifice 2.999		

Sample Pt. Time 10 min. 120 min test	Assumed % Moisture 1.7%	Leak Test	Before .008 @ 13" H₂O	After .007 @ 11" H₂O
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	13:16										911.814
C 1	1.5	1.225	1.63	154	321	61	330	11	6	2.5	919.16
2	1.4	1.183	1.52	154	328	61	336	11	7	2.5	926.31
3	1.1	1.049	1.19	153	332	62	332	11	9	2.0	932.64
B 1	1.5	1.225	1.63	154	329	63	335	12	0	2.5	939.98
2	1.4	1.183	1.52	155	333	62	340	12	0	2.5	947.09
3	1.2	1.095	1.30	154	338	63	337	12	1	2.0	953.71
A 1	1.4	1.183	1.52	154	340	62	334	12	1	2.5	960.83
2	1.4	1.183	1.52	155	338	62	330	12	2	2.5	967.91
3	1.2	1.095	1.30	152	336	63	329	12	1	2.5	978.54
D 1	1.5	1.225	1.63	154	331	63	331	12	2	2.5	985.87
2	1.4	1.183	1.52	154	329	64	334	12	3	2.5	992.95
3	1.2	1.095	1.30	153	325	65	329	12	3	2.0	999.551
Stop	17:32										
Avg		(1.160)	(1.46)	(154)				(12)	(0)	(1)	(987.737) cuft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E27

TSA CEMS Log

Client : JEA SJRPP
 File : 0000
 Unit : 1
 Project : 95-058
 Document : Run #1
 Test Date : 8/11/95 Time : 08:15 thru 09:15:06

Time	1030 02 %	1029 CO2 %	1028 CO PPm
08:15:59	4.74	14.29	357.22
08:16:59	4.79	14.25	320.82
08:17:59	5.07	14.03	199.32
08:18:59	4.98	14.08	218.01
08:19:59	4.70	14.36	278.66
08:20:59	4.48	14.45	796.51
08:21:59	5.09	13.95	409.58
08:22:59	5.14	14.00	169.02
08:23:59	4.42	14.50	765.53
08:24:59	5.15	13.87	594.63
08:25:59	5.24	13.92	124.26
08:26:59	4.44	14.50	819.94
08:27:59	5.03	13.98	531.32
08:28:59	5.34	13.81	128.52
08:29:58	4.50	14.49	573.56
08:30:58	4.72	14.32	433.54
08:31:58	4.77	14.27	473.64
08:32:58	5.32	13.85	259.03
08:33:58	4.60	14.42	585.77
08:34:58	4.78	14.29	368.36
08:35:58	4.99	14.11	184.48
08:36:58	5.15	14.00	92.87
08:37:58	4.54	14.46	808.72
08:38:58	5.05	14.06	263.62
08:39:58	4.79	14.29	204.39
08:40:58	4.75	14.31	501.98
08:41:58	5.22	13.93	238.51
08:42:58	4.98	14.14	170.44
08:43:58	4.79	14.27	303.33
08:44:58	4.93	14.15	487.47
08:45:58	4.88	14.19	345.25
08:46:58	4.93	14.16	376.26
08:47:58	4.99	14.11	301.36
08:48:58	4.83	14.22	412.80
08:49:58	4.85	14.22	447.77
08:50:58	4.99	14.10	430.45
08:51:58	5.09	14.05	143.37
08:52:58	4.64	14.36	983.06
08:53:58	4.95	14.12	547.62
08:54:58	4.95	14.16	268.19
08:55:58	4.79	14.27	344.17
08:56:58	5.07	14.05	197.31
08:57:58	4.79	14.28	290.25
08:58:58	4.72	14.31	532.61
08:59:58	5.16	13.96	287.29
09:00:58	4.68	14.34	479.20

Client : JEA SJRPP
 Site : 0000
 Jnit : 1
 Project : 95-058
 Comment : Run #1
 Test Date : 8/11/95

Time : 08:15 thru 09:15:06

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:01:58	4.83	14.24	451.56
09:02:58	4.79	14.25	521.89
09:03:58	4.91	14.14	401.67
09:04:58	4.87	14.18	515.00
09:05:58	4.87	14.20	286.29
09:06:58	4.74	14.30	509.98
09:07:58	4.86	14.17	377.35
09:08:58	4.75	14.28	433.56
09:09:58	4.94	14.13	342.23
09:10:58	4.91	14.17	282.34
09:11:58	4.73	14.32	439.45
09:12:58	4.80	14.25	516.76
09:13:58	5.03	14.07	280.22
09:14:58	4.86	14.19	255.60
09:15:06	4.84	14.22	267.26
Averages for 61 Points	4.87	14.18	392.31

Σ 25 → 4.918 14.347 399.068

Client : JEA SJRPP
 Site : 0000
 Unit : R 1
 Project : 95-058
 Comment : Run 2
 Start Date : 8/11/95 Time : 10:14 thru 11:14:30

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:14:06	4.79	14.23	342.28
10:15:06	4.71	14.32	613.62
10:16:06	4.66	14.35	468.33
10:17:06	5.04	14.04	278.64
10:18:06	4.62	14.39	328.27
10:19:06	4.85	14.19	486.44
10:20:06	4.80	14.25	275.28
10:21:06	4.59	14.41	352.98
10:22:06	4.68	14.32	742.54
10:23:06	5.01	14.07	291.81
10:24:06	4.82	14.23	225.49
10:25:06	4.62	14.40	285.30
10:26:06	4.62	14.37	490.88
10:27:06	5.26	13.84	182.51
10:28:06	4.49	14.47	622.65
10:29:06	4.85	14.18	497.00
10:30:06	4.71	14.31	349.58
10:31:06	4.78	14.24	500.75
10:32:06	5.27	13.84	186.66
10:33:06	4.37	14.54	733.10
10:34:06	4.78	14.23	592.87
10:35:06	4.66	14.34	342.71
10:36:06	4.96	14.09	306.35
10:37:06	4.85	14.21	233.55
10:38:06	4.75	14.26	288.01
10:39:06	4.80	14.22	393.73
10:40:05	4.82	14.22	446.29
10:41:05	4.71	14.29	729.37
10:42:05	4.99	14.07	280.33
10:43:05	4.74	14.29	278.82
10:44:05	4.78	14.24	431.45
10:45:05	4.66	14.33	601.63
10:46:05	4.70	14.30	651.12
10:47:05	4.79	14.25	521.31
10:48:05	4.84	14.20	343.25
10:49:05	4.61	14.37	917.39
10:50:05	4.66	14.35	669.05
10:51:05	4.83	14.21	567.75
10:52:05	4.82	14.22	521.20
10:53:05	4.77	14.22	502.06
10:54:05	4.78	14.24	685.67
10:55:05	4.67	14.33	973.72
10:56:05	4.54	14.45	779.71
10:57:05	4.62	14.41	368.87
10:58:05	4.54	14.45	484.83
10:59:05	4.60	14.41	418.64

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run#2
 Test Date : 8/11/95 Time : 10:14 thru 11:14:30

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:00:05	4.81	14.21	315.79
11:01:05	4.79	14.23	245.11
11:02:05	4.78	14.26	181.99
11:03:05	4.84	14.22	161.25
11:04:05	4.53	14.44	347.23
11:05:05	4.74	14.28	630.16
11:06:05	4.73	14.28	298.74
11:07:05	4.82	14.19	221.42
11:08:05	4.95	14.10	171.50
11:09:05	4.88	14.15	304.34
11:10:05	4.96	14.08	135.97
11:11:05	4.98	14.06	347.82
11:12:05	4.87	14.16	291.23
11:13:05	4.94	14.12	100.21
11:14:05	4.62	14.36	454.97

Averages
 for 61
 Points 4.77 14.25 422.81

egas 4.86 14.35 420.65

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run #3
Test Date :8/11/95

Time :12:13 thru 13:13:49

Page 1

	1030	1029	1028
	O2	CO2	CO
Time	%	%	PPm
12:13:09	4.77	14.19	139.36
12:14:09	4.73	14.23	188.61
12:15:09	4.80	14.17	201.37
12:16:09	4.86	14.10	245.91
12:17:09	4.74	14.22	179.88
12:18:09	5.02	13.92	261.53
12:19:08	4.72	14.18	388.79
12:20:08	4.74	14.19	181.49
12:21:08	4.78	14.17	128.57
12:22:08	5.06	13.93	62.03
12:23:08	4.72	14.23	122.55
12:24:08	4.79	14.16	155.42
12:25:08	4.97	14.00	88.90
12:26:08	5.00	13.96	44.93
12:27:08	4.81	14.15	40.99
12:28:08	4.80	14.15	65.05
12:29:08	5.07	13.87	85.80
12:30:08	4.62	14.31	153.49
12:31:08	4.74	14.17	299.35
12:32:08	4.99	13.96	169.65
12:33:08	4.85	14.12	107.57
12:34:08	4.72	14.22	118.58
12:35:08	4.94	14.02	143.46
12:36:08	4.95	13.98	160.59
12:37:08	4.80	14.16	107.12
12:38:08	4.75	14.15	200.36
12:39:08	4.98	13.97	145.38
12:40:08	4.87	14.08	103.67
12:41:08	5.07	13.90	94.91
12:42:08	5.09	13.89	26.00
12:43:08	5.01	13.96	145.27
12:44:08	5.05	13.92	124.36
12:45:08	4.89	14.06	184.25
12:46:08	4.97	14.00	169.53
12:47:08	5.10	13.90	170.53
12:48:08	4.81	14.14	208.01
12:49:08	5.09	13.90	181.67
12:50:08	5.05	13.95	72.91
12:51:08	5.01	13.98	91.75
12:52:08	4.98	14.02	65.05
12:53:08	5.05	13.92	154.53
12:54:08	4.81	14.17	97.85
12:55:08	5.00	14.00	102.27
12:56:08	4.82	14.15	108.04
12:57:08	4.83	14.16	82.86
12:58:08	5.00	14.01	73.77

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run #3
 Test Date : 8/11/95

Time : 12:13 thru 13:13:49

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
12:59:08	4.95	14.09	54.81
13:00:08	4.81	14.21	110.70
13:01:08	4.90	14.11	99.21
13:02:08	4.88	14.15	30.94
13:03:08	4.89	14.14	39.87
13:04:08	4.85	14.16	48.88
13:05:08	4.84	14.17	30.94
13:06:07	5.17	13.88	11.87
13:07:07	4.85	14.18	17.88
13:08:07	4.67	14.30	90.72
13:09:07	5.15	13.88	71.02
13:10:07	4.79	14.23	36.95
13:11:07	4.66	14.30	122.56
13:12:07	5.08	13.91	65.12
13:13:07	4.97	14.10	31.84
13:13:49	4.64	14.34	113.62
Averages for 62 Points	4.89	14.08	119.69
\bar{c} gas	5.01	14.11	119.43

```

Instrument : JEA SJRPP
File       : 0000
Unit      : Run 1
Project   : 95-058
Document  : Unit 1
Test Date : 8/12/95      Time : 08:00 thru 09:00:19

```

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:00:31	4.90	14.24	487.66
08:01:31	4.97	14.16	424.52
08:02:31	5.03	14.13	395.20
08:03:31	4.87	14.24	617.70
08:04:31	5.02	14.12	727.42
08:05:31	5.30	13.91	367.98
08:06:31	5.04	14.14	366.46
08:07:31	5.21	14.00	331.26
08:08:31	5.60	13.63	135.65
08:09:31	5.30	13.97	78.79
08:10:31	4.58	14.47	1000.37
08:11:31	5.24	13.92	611.53
08:12:31	5.30	13.96	167.22
08:13:31	4.60	14.48	631.05
08:14:31	5.23	13.99	635.90
08:15:31	4.86	14.30	388.41
08:16:31	4.89	14.29	498.84
08:17:31	4.77	14.33	689.70
08:18:31	5.08	14.11	506.23
08:19:31	4.85	14.29	366.49
08:20:31	5.03	14.14	490.95
08:21:31	4.96	14.21	499.87
08:22:31	4.98	14.21	280.20
08:23:30	4.88	14.28	372.66
08:24:30	4.79	14.36	299.26
08:25:30	4.90	14.26	578.76
08:26:30	4.99	14.20	384.62
08:27:30	4.92	14.26	341.27
08:28:30	5.04	14.14	357.63
08:29:30	5.03	14.17	345.20
08:30:30	4.76	14.35	731.33
08:31:30	4.90	14.22	657.84
08:32:30	5.36	13.88	241.37
08:33:30	4.75	14.36	377.70
08:34:30	4.75	14.34	776.62
08:35:30	5.16	14.04	396.54
08:36:30	4.92	14.24	350.35
08:37:30	4.92	14.24	355.03
08:38:30	4.91	14.25	421.49
08:39:30	4.92	14.22	353.36
08:40:30	4.99	14.16	641.97
08:41:30	5.05	14.10	417.19
08:42:30	4.92	14.23	475.44
08:43:30	4.97	14.17	589.62
08:44:30	5.12	14.07	411.31
08:45:30	4.49	14.50	1000.37

Client : JEA SJRPP
 Site : 0000
 Jnit : 1
 Project : 95-058
 Comment : Run 1
 Test Date : 8/12/95

Time : 08:00 thru 09:00:19

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:46:30	5.19	14.01	773.80
08:47:30	4.98	14.18	406.56
08:48:30	4.92	14.23	284.50
08:49:30	4.94	14.20	453.21
08:50:30	4.99	14.17	500.79
08:51:30	5.00	14.18	329.45
08:52:30	5.04	14.12	379.39
08:53:30	4.79	14.34	498.00
08:54:30	4.89	14.20	1000.52
08:55:30	5.09	14.12	351.24
08:56:30	4.84	14.28	490.00
08:57:30	5.12	14.06	261.67
08:58:30	4.96	14.22	220.20
08:59:30	4.85	14.28	347.28
09:00:19	5.01	14.14	446.29

Averages
 for 61
 Points 4.97 14.18 464.24

Gas = 5.04 14.23 460.81

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Document : Rev 2
Start Date :8/12/95

Time :10:00 thru 11:00:16

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:00:25	5.11	14.06	448.48
10:01:25	5.00	14.18	535.13
10:02:25	4.92	14.22	489.32
10:03:25	5.02	14.17	353.69
10:04:25	4.84	14.29	444.50
10:05:25	4.88	14.24	722.74
10:06:25	4.99	14.18	588.44
10:07:25	5.08	14.09	445.14
10:08:25	5.05	14.14	304.67
10:09:25	4.76	14.36	568.67
10:10:25	4.72	14.34	920.36
10:11:25	5.01	14.16	531.74
10:12:25	4.99	14.19	280.24
10:13:25	4.74	14.36	596.51
10:14:25	5.01	14.15	557.93
10:15:25	5.10	14.06	393.41
10:16:25	4.72	14.39	361.78
10:17:25	4.96	14.17	753.73
10:18:25	4.83	14.30	415.32
10:19:25	5.01	14.14	419.65
10:20:25	4.86	14.28	480.25
10:21:25	4.88	14.25	487.29
10:22:25	4.96	14.20	476.43
10:23:25	4.88	14.26	437.63
10:24:25	4.87	14.27	399.39
10:25:25	4.80	14.33	400.54
10:26:25	5.01	14.11	383.61
10:27:25	5.01	14.16	286.46
10:28:25	4.61	14.46	567.02
10:29:25	4.99	14.13	777.61
10:30:24	5.02	14.16	381.80
10:31:24	4.74	14.37	503.47
10:32:24	5.00	14.16	601.96
10:33:24	4.84	14.30	365.80
10:34:24	4.97	14.17	396.44
10:35:24	5.02	14.16	178.84
10:36:24	4.93	14.18	593.58
10:37:24	4.66	14.38	795.90
10:38:24	5.12	14.02	590.73
10:39:24	4.99	14.16	373.73
10:40:24	4.78	14.34	379.44
10:41:24	4.88	14.24	525.23
10:42:24	4.90	14.25	472.80
10:43:24	4.68	14.41	564.26
10:44:24	5.11	14.03	607.53
10:45:24	5.06	14.12	392.85

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : *Run 2*
 Test Date : 8/12/95

Time : 10:00 thru 11:00:16

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:46:24	4.73	14.38	438.40
10:47:24	4.81	14.30	608.64
10:48:24	5.02	14.12	345.48
10:49:24	4.81	14.30	505.38
10:50:24	4.99	14.17	503.89
10:51:24	4.93	14.22	334.34
10:52:24	4.84	14.27	470.51
10:53:24	4.95	14.20	382.02
10:54:24	4.91	14.22	441.49
10:55:24	4.92	14.23	504.88
10:56:24	4.91	14.23	407.45
10:57:24	4.89	14.21	781.21
10:58:24	4.87	14.26	422.65
10:59:24	4.82	14.27	459.32
11:00:16	4.81	14.33	395.34

Averages
 for 61
 Points 4.91 14.22 484.47

Gas = 4.98 14.22 481.31

Client : JEA SJRPP
Site : 0000
Unit : 1
Project : 95-058
Comment : Run 3
Test Date : 8/12/95

Time : 11:50 thru 12:50:11

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
1:50:05	4.83	14.31	636.96
1:51:05	5.05	14.13	312.46
1:52:05	4.90	14.27	188.68
1:53:05	4.74	14.36	497.58
1:54:05	4.82	14.31	572.30
1:55:05	4.74	14.40	442.32
1:56:05	4.81	14.31	767.35
1:57:05	4.74	14.36	665.58
1:58:05	4.84	14.27	552.79
1:59:05	4.75	14.38	366.59
2:00:05	4.92	14.25	534.74
2:01:05	4.74	14.37	558.60
2:02:05	4.87	14.25	651.78
2:03:05	4.85	14.29	416.38
2:04:05	4.82	14.34	442.52
2:05:05	4.92	14.23	469.56
2:06:05	5.07	14.09	273.65
2:07:05	4.74	14.40	320.62
2:08:05	4.82	14.28	635.80
2:09:05	5.24	13.96	248.54
2:10:05	4.62	14.50	305.45
2:11:05	4.57	14.50	1000.52
2:12:05	4.67	14.41	868.72
2:13:05	4.88	14.27	426.64
2:14:05	4.77	14.36	485.21
2:15:05	4.63	14.47	546.05
2:16:05	4.77	14.36	560.61
2:17:05	4.86	14.30	385.19
2:18:04	4.64	14.44	574.47
2:19:04	4.99	14.15	634.13
2:20:04	4.82	14.31	321.53
2:21:04	4.78	14.34	420.59
2:22:04	4.97	14.17	576.70
2:23:04	4.85	14.27	443.43
2:24:04	4.73	14.36	548.20
2:25:04	4.77	14.33	663.69
2:26:04	5.05	14.11	290.49
2:27:04	4.98	14.18	252.54
2:28:04	4.70	14.40	487.27
2:29:04	4.76	14.34	496.01
2:30:04	4.86	14.24	850.01
2:31:04	4.82	14.26	600.46
2:32:04	4.73	14.33	709.47
2:33:04	4.79	14.30	542.37
2:34:04	4.73	14.34	494.89
2:35:04	4.99	14.12	477.24

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : RUN 3
 Test Date : 8/12/95

Time : 11:50 thru 12:50:11

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
12:36:04	4.72	14.38	356.33
12:37:04	4.67	14.36	855.23
12:38:04	4.94	14.13	1000.37
12:39:04	4.81	14.29	508.22
12:40:04	4.69	14.36	894.74
12:41:04	4.86	14.20	915.81
12:42:04	4.76	14.30	789.37
12:43:04	4.99	14.14	422.99
12:44:04	4.82	14.29	370.60
12:45:04	4.72	14.33	845.52
12:46:04	4.88	14.22	475.06
12:47:04	4.90	14.19	507.23
12:48:04	4.71	14.35	521.21
12:49:04	4.60	14.42	929.50
12:50:04	4.97	14.12	718.00
12:50:11	5.01	14.09	632.67

Averages
 for 62
 Points 4.82 14.28 552.57

$\bar{c}_{gas} = 4.93 \quad 14.18 \quad 550.61$

Client : JEA SJRPP
 File : 0000
 Unit :
 Project : 95-058
 Comment : Run!
 Test Date : 8/13/95

Time : 08:00 thru 09:00:14

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:00:07	5.21	14.11	432.46
08:01:07	5.07	14.22	610.68
08:02:07	5.17	14.15	311.68
08:03:07	5.15	14.14	543.78
08:04:07	4.85	14.35	1000.67
08:05:07	5.33	14.02	372.76
08:06:07	4.85	14.39	466.26
08:07:07	4.75	14.44	937.57
08:08:07	5.12	14.16	845.30
08:09:07	5.14	14.19	433.81
08:10:07	4.71	14.49	664.59
08:11:07	4.78	14.43	789.89
08:12:07	5.03	14.27	533.90
08:13:07	4.96	14.30	442.29
08:14:07	4.87	14.36	753.65
08:15:07	5.07	14.21	706.41
08:16:07	5.08	14.25	433.04
08:17:07	4.99	14.29	543.57
08:18:07	5.16	14.17	440.50
08:19:07	4.95	14.34	584.17
08:20:07	4.85	14.40	732.21
08:21:06	5.19	14.14	590.81
08:22:06	5.16	14.21	249.38
08:23:06	4.93	14.34	727.46
08:24:06	5.15	14.17	456.12
08:25:06	4.64	14.53	1000.44
08:26:06	5.00	14.28	999.29
08:27:06	4.88	14.38	820.56
08:28:06	5.14	14.19	702.92
08:29:06	4.93	14.38	521.98
08:30:06	4.90	14.35	999.83
08:31:06	5.08	14.26	576.86
08:32:06	4.81	14.47	709.68
08:33:06	4.95	14.32	924.48
08:34:06	4.91	14.38	384.59
08:35:06	5.03	14.29	439.28
08:36:06	4.97	14.34	447.19
08:37:06	5.15	14.20	314.85
08:38:06	4.95	14.35	439.81
08:39:06	4.97	14.31	777.87
08:40:06	5.20	14.13	357.43
08:41:06	4.88	14.38	591.31
08:42:06	5.07	14.25	526.77
08:43:06	4.86	14.40	915.49
08:44:06	4.86	14.41	654.02
08:45:06	5.06	14.27	406.54

Client :JEA SJRPP
 Site :0000
 Unit :
 Project :95-058
 Comment : Run 1
 Test Date :8/13/95

Time :08:00 thru 09:00:14

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:46:06	4.70	14.54	932.17
08:47:06	4.96	14.37	556.06
08:48:06	4.97	14.32	502.86
08:49:06	4.69	14.55	944.48
08:50:06	4.68	14.53	999.98
08:51:06	5.23	14.10	825.43
08:52:06	4.84	14.43	554.58
08:53:06	5.04	14.24	789.83
08:54:06	4.87	14.42	542.86
08:55:06	4.84	14.41	989.41
08:56:06	4.96	14.32	747.63
08:57:06	4.95	14.37	605.09
08:58:06	4.86	14.38	897.07
08:59:06	4.94	14.38	367.68
09:00:06	4.84	14.42	539.69
09:00:14	4.87	14.40	539.89

Averages
 for 62
 Points 4.96 14.31 636.27

gas = 4.95 14.29 630.22

Client : JEA SJRPP
Site : 0000
Unit : 1
Project : 95-058
Comment : Run 2
Test Date : 8/13/95

Time : 09:47 thru 10:47

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:47:41	4.88	14.44	295.55
09:48:40	4.73	14.52	815.61
09:49:40	5.02	14.26	870.46
09:50:40	4.45	14.71	904.76
09:51:40	4.76	14.46	1000.37
09:52:40	4.88	14.42	574.82
09:53:40	4.76	14.51	498.91
09:54:40	4.79	14.48	653.45
09:55:40	4.70	14.56	861.16
09:56:40	4.80	14.44	1000.52
09:57:40	4.93	14.39	470.78
09:58:40	4.52	14.67	980.56
09:59:40	4.85	14.40	1000.60
10:00:40	4.84	14.43	518.02
10:01:40	4.85	14.45	546.35
10:02:40	4.70	14.51	762.42
10:03:40	4.92	14.38	643.06
10:04:40	4.82	14.44	729.43
10:05:40	4.90	14.38	548.67
10:06:40	4.75	14.48	675.51
10:07:40	4.86	14.37	1000.52
10:08:40	4.93	14.34	720.29
10:09:40	4.89	14.38	512.88
10:10:40	4.78	14.44	800.61
10:11:40	5.02	14.25	631.00
10:12:40	4.78	14.45	698.63
10:13:40	4.75	14.47	893.83
10:14:40	4.76	14.46	792.14
10:15:40	4.89	14.35	724.65
10:16:40	4.79	14.44	551.00
10:17:40	4.82	14.41	648.85
10:18:40	4.63	14.55	888.59
10:19:40	4.67	14.52	896.72
10:20:40	4.74	14.45	899.82
10:21:40	4.81	14.42	884.83
10:22:40	4.59	14.57	1000.45
10:23:40	4.87	14.37	697.02
10:24:40	4.92	14.35	518.82
10:25:40	4.64	14.53	853.56
10:26:40	4.73	14.45	843.49
10:27:40	4.63	14.55	1000.29
10:28:40	4.82	14.40	859.72
10:29:40	4.77	14.44	721.55
10:30:40	4.70	14.51	676.83
10:31:40	4.70	14.48	988.33
10:32:40	4.83	14.38	781.74

Client : JEA SJRPP
 Site : 0000
 Unit :
 Project : 95-058
 Comment : *Run 2*
 Test Date : 8/13/95

Time : 09:47 thru 10:47

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:33:40	4.79	14.44	756.98
10:34:40	4.74	14.47	940.64
10:35:39	4.84	14.39	698.49
10:36:39	4.50	14.62	999.75
10:37:39	4.78	14.45	1000.45
10:38:39	4.70	14.50	1000.29
10:39:39	4.74	14.46	791.98
10:40:39	4.64	14.52	1000.22
10:41:39	4.81	14.41	780.10
10:42:39	4.81	14.42	652.53
10:43:39	4.79	14.43	674.96
10:44:39	4.80	14.43	791.69
10:45:39	4.68	14.49	1000.29
10:46:39	4.64	14.52	1000.52
Averages			
for 60			
Points	4.77	14.45	782.10
<i>Egas</i>	<i>4.77</i>	<i>14.42</i>	<i>773.39</i>
		<i>TR</i>	

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run 3
Start Date :8/13/95

Time :11:43 thru 12:43:23

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:43:12	4.63	14.51	999.98
11:44:12	4.74	14.45	951.46
11:45:12	4.76	14.46	780.10
11:46:12	4.71	14.45	999.83
11:47:12	4.74	14.45	938.59
11:48:12	4.60	14.57	912.88
11:49:12	4.54	14.57	1000.45
11:50:12	4.65	14.52	970.54
11:51:12	4.74	14.45	748.11
11:52:12	4.43	14.65	1000.75
11:53:12	4.79	14.40	1000.37
11:54:12	4.86	14.40	489.79
11:55:12	4.42	14.67	1000.29
11:56:12	4.69	14.47	1000.29
11:57:12	4.63	14.55	758.86
11:58:12	4.48	14.62	999.98
11:59:12	4.71	14.46	1000.37
12:00:12	4.73	14.44	1000.45
12:01:12	4.74	14.43	1000.45
12:02:12	4.73	14.46	761.85
12:03:12	4.79	14.39	702.92
12:04:12	4.76	14.44	462.37
12:05:12	4.59	14.58	807.84
12:06:12	4.67	14.50	678.82
12:07:12	4.57	14.56	1000.75
12:08:12	4.67	14.48	918.92
12:09:12	5.00	14.22	519.12
12:10:12	4.36	14.68	1000.14
12:11:12	4.54	14.57	1000.37
12:12:12	4.76	14.42	1000.14
12:13:12	4.69	14.46	1000.45
12:14:12	4.54	14.59	846.53
12:15:12	4.63	14.51	1000.52
12:16:12	4.66	14.49	936.94
12:17:12	4.80	14.39	843.77
12:18:12	4.71	14.47	436.66
12:19:12	4.59	14.54	913.79
12:20:12	4.78	14.40	857.53
12:21:12	4.73	14.45	689.89
12:22:11	4.78	14.41	494.20
12:23:11	4.99	14.24	449.03
12:24:11	4.75	14.47	361.84
12:25:11	4.26	14.74	1000.68
12:26:11	4.69	14.47	1000.29
12:27:11	4.67	14.50	1000.52
12:28:11	4.71	14.49	896.91

Client : JEA SJRPP
 Site : 0000
 Jnit : 1
 Project : 95-058
 Comment : Run 3
 Test Date : 8/13/95

Time : 11:43 thru 12:43:23

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
12:29:11	4.88	14.35	559.15
12:30:11	4.62	14.57	657.93
12:31:11	4.65	14.50	999.98
12:32:11	4.67	14.49	863.56
12:33:11	4.58	14.57	804.85
12:34:11	4.59	14.53	1000.60
12:35:11	4.77	14.42	847.88
12:36:11	4.78	14.40	1000.45
12:37:11	4.66	14.52	796.09
12:38:11	4.61	14.52	999.83
12:39:11	4.70	14.48	830.21
12:40:11	4.75	14.43	680.66
12:41:11	4.69	14.46	713.58
12:42:11	4.73	14.44	871.76
12:43:11	4.62	14.54	755.91
12:43:23	4.61	14.54	746.04
Averages for 62 Points	4.67	14.48	842.98

Gas 4.75 14.38 833.32

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : *Run*
Start Date :8/18/95

Time :08:00 thru 09:00:12

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:00:22	4.94	14.29	292.35
08:01:22	5.03	14.19	456.44
08:02:22	5.09	14.17	279.26
08:03:22	5.10	14.16	155.43
08:04:22	5.15	14.12	112.42
08:05:22	5.02	14.24	119.57
08:06:22	4.87	14.32	329.38
08:07:22	4.69	14.49	460.12
08:08:22	4.89	14.31	473.28
08:09:22	5.11	14.15	262.58
08:10:22	5.14	14.12	121.81
08:11:22	5.11	14.15	213.24
08:12:22	4.80	14.41	238.37
08:13:22	4.85	14.37	574.95
08:14:22	4.94	14.30	211.29
08:15:21	4.96	14.28	225.42
08:16:21	4.90	14.31	287.39
08:17:21	5.01	14.21	251.91
08:18:21	4.93	14.29	350.18
08:19:21	5.02	14.22	464.20
08:20:21	4.93	14.31	256.36
08:21:21	4.92	14.27	455.42
08:22:21	4.90	14.31	444.26
08:23:21	4.98	14.24	227.23
08:24:21	4.90	14.32	373.34
08:25:21	4.96	14.26	315.53
08:26:21	5.02	14.23	211.21
08:27:21	4.97	14.27	195.36
08:28:21	4.77	14.39	437.01
08:29:21	5.06	14.15	667.01
08:30:21	4.96	14.27	283.51
08:31:21	5.08	14.16	191.60
08:32:21	4.98	14.27	288.28
08:33:21	5.03	14.20	247.35
08:34:21	4.90	14.32	176.07
08:35:21	5.38	13.88	317.68
08:36:21	4.67	14.46	394.18
08:37:21	4.84	14.26	1000.52
08:38:21	5.67	13.65	308.40
08:39:21	4.64	14.50	554.96
08:40:21	5.68	13.60	262.66
08:41:21	5.06	14.19	161.52
08:42:21	4.50	14.50	1000.52
08:43:21	5.37	13.86	999.83
08:44:21	4.71	14.40	711.45
08:45:21	4.78	14.30	1000.60

Client :JEA SJRPP
 Site :0000
 Unit :
 Project :95-058
 Comment : Rm

Test Date :8/18/95 Time :08:00 thru 09:00:12

Time	1030 02 %	1029 CO2 %	1028 CO PPm
08:46:21	5.65	13.68	390.87
08:47:21	4.53	14.52	952.16
08:48:21	5.57	13.62	987.72
08:49:21	5.45	13.81	154.54
08:50:21	4.79	14.29	1000.67
08:51:21	4.89	14.23	803.75
08:52:21	4.93	14.21	575.89
08:53:21	4.84	14.27	694.77
08:54:21	4.97	14.19	527.77
08:55:21	4.98	14.16	481.48
08:56:21	4.93	14.20	625.98
08:57:21	5.01	14.16	417.53
08:58:21	4.79	14.31	955.60
08:59:21	4.98	14.17	676.67
09:00:12	5.01	14.17	521.84
Averages for 61 Points	4.99	14.20	444.73

gas → 5.00 14.23 444.22

Unit :JEA SJRPP
id :0000
Unit :
Project :95-058
Document : Run 2.
Test Date :8/18/95

Time :09:50 thru 10:50

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
9:50:48	5.15	14.10	209.36
9:51:48	4.91	14.28	462.66
9:52:48	5.00	14.20	376.91
9:53:48	5.11	14.12	251.91
9:54:48	4.86	14.33	462.01
9:55:48	4.86	14.30	647.08
9:56:48	5.30	13.96	223.07
9:57:48	4.88	14.28	862.25
9:58:48	4.92	14.25	490.10
9:59:48	5.39	13.85	338.46
10:00:48	4.85	14.35	440.56
10:01:48	5.15	14.08	422.26
10:02:48	5.13	14.14	192.31
10:03:48	4.79	14.39	408.39
10:04:48	5.41	13.82	315.26
10:05:48	4.95	14.29	288.91
10:06:48	4.71	14.41	1000.52
10:07:48	5.32	13.92	376.72
10:08:48	5.10	14.11	340.17
10:09:48	4.96	14.25	335.55
10:10:47	5.23	14.02	255.95
10:11:47	4.89	14.32	356.04
10:12:47	4.96	14.22	464.50
10:13:47	4.89	14.29	481.09
10:14:47	5.02	14.18	402.41
10:15:47	5.01	14.20	330.28
10:16:47	5.13	14.10	271.23
10:17:47	4.98	14.21	570.96
10:18:47	5.24	14.01	323.00
10:19:47	5.09	14.14	325.53
10:20:47	4.85	14.26	982.12
10:21:47	5.05	14.13	664.71
10:22:47	5.02	14.19	500.22
10:23:47	4.97	14.19	662.72
10:24:47	5.07	14.16	364.85
10:25:47	4.96	14.22	545.67
10:26:47	5.06	14.15	553.98
10:27:47	5.05	14.17	387.56
10:28:47	4.82	14.34	622.32
10:29:47	4.98	14.22	600.35
10:30:47	5.20	14.00	414.87
10:31:47	5.06	14.19	245.76
10:32:47	4.81	14.32	779.75
10:33:47	4.92	14.23	799.88
10:34:47	5.03	14.18	375.86
10:35:47	5.10	14.13	327.37

Client :JEA SJRPP
 Site :0000
 Unit : 1
 Project :95-058
 Comment : Run 2
 Test Date :8/18/95 Time :09:50 thru 10:50

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:36:47	5.03	14.16	356.73
10:37:47	5.11	14.12	219.41
10:38:47	4.63	14.45	1000.14
10:39:47	4.87	14.27	828.14
10:40:47	5.07	14.12	593.81
10:41:47	5.14	14.07	455.54
10:42:47	5.02	14.18	419.01
10:43:47	5.08	14.12	556.01
10:44:47	5.06	14.14	418.98
10:45:47	4.97	14.22	499.30
10:46:47	4.84	14.32	644.17
10:47:47	5.04	14.13	515.39
10:48:47	5.10	14.11	365.33
10:49:47	4.92	14.24	554.14

Averages
 for 60
 Points 5.01 14.18 474.65

Egas = 5.05 14.28 471.25

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Run 3
Test Date :8/18/95

Time :11:35 thru 12:35

Page 1

Time	1030	1029	1028
	O2 %	CO2 %	CO PPm
11:35:05	4.90	14.29	512.98
11:36:05	4.95	14.23	582.71
11:37:05	5.12	14.06	314.21
11:38:05	4.99	14.24	211.94
11:39:05	4.98	14.18	587.65
11:40:05	5.17	14.03	346.10
11:41:05	5.11	14.11	239.13
11:42:05	4.80	14.37	321.80
11:43:05	4.66	14.47	932.59
11:44:05	4.67	14.46	1000.52
11:45:05	5.23	13.97	503.44
11:46:05	4.73	14.42	527.78
11:47:05	4.89	14.27	635.63
11:48:05	5.10	14.11	322.34
11:49:05	4.84	14.33	514.67
11:50:05	4.79	14.37	724.67
11:51:05	4.98	14.19	485.65
11:52:05	4.89	14.28	471.85
11:53:05	4.97	14.21	610.63
11:54:05	5.14	14.11	256.47
11:55:05	4.89	14.28	569.93
11:56:05	4.90	14.30	421.52
11:57:05	4.87	14.30	583.31
11:58:05	4.92	14.28	383.69
11:59:05	5.08	14.08	361.41
12:00:05	4.99	14.21	331.82
12:01:05	4.84	14.32	712.32
12:02:05	5.08	14.11	520.35
12:03:05	5.04	14.18	229.76
12:04:05	4.81	14.35	615.54
12:05:05	5.01	14.17	411.49
12:06:04	4.90	14.28	564.68
12:07:04	4.77	14.34	995.61
12:08:04	4.99	14.13	952.35
12:09:04	5.11	14.10	285.63
12:10:04	4.84	14.33	416.09
12:11:04	5.13	14.09	194.76
12:12:04	4.93	14.25	256.47
12:13:04	4.90	14.27	374.59
12:14:04	4.98	14.19	303.50
12:15:04	4.87	14.26	420.05
12:16:04	4.97	14.21	246.81
12:17:04	4.71	14.42	504.17
12:18:04	5.01	14.16	276.53
12:19:04	4.93	14.20	358.17
12:20:04	4.88	14.26	378.07

Client :JEA SJRPP
 Site :0000
 Jnit : 1
 Project :95-058
 Comment : Run 3
 Test Date :8/18/95 Time :11:35 thru 12:35

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
12:21:04	4.85	14.28	563.39
12:22:04	5.17	14.01	321.49
12:23:04	4.56	14.51	829.61
12:24:04	4.87	14.23	1000.60
12:25:04	4.96	14.21	332.46
12:26:04	4.86	14.27	390.26
12:27:04	4.84	14.27	810.83
12:28:04	5.04	14.13	298.50
12:29:04	4.66	14.41	557.85
12:30:04	4.82	14.27	806.84
12:31:04	5.04	14.10	435.39
12:32:04	4.87	14.27	340.28
12:33:04	4.99	14.10	680.84
12:34:04	4.96	14.17	327.08

Averages
 for 60
 Points 4.92 14.23 491.11

5.04 14.25 488.23

Test Calibration Data

ANALYZER CALIBRATION DATA

Client J.E.A. S.J.R.P.P. Project # 95-058-F1 Test Date 8-11-95

Source Identification Unit #1 Stack Operator T. Roth

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>100</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS		14.74	14.80	.06	.06
MID-RANGE GAS		29.73	29.0	.73	.73
HIGH-RANGE GAS <i>up scale</i>		62.0	61.80	.20	.20

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>1000</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS		-			
MID-RANGE GAS		302.0	305.9	3.90	.39
HIGH-RANGE GAS		603.5	603.7	.20	.02

Calibration Data For Sampling Runs: <u>PE</u> Gas Type: <u>O2</u> Span: <u>25</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	.10	.10	.40
LOW-RANGE GAS		-			
MID-RANGE GAS <i>up scale</i>		11.60	11.60	0.0	0.0
HIGH-RANGE GAS		20.90	20.90	0.0	0.0

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO2</u> Span: <u>20</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS		-			
MID-RANGE GAS <i>up scale</i>		10.9	11.0	.1	.50
HIGH-RANGE GAS	G1	17.20	17.20	0.0	0.0

ANALYZER CALIBRATION DATA

Client: J.E.A. S.J.R.P.P. Project # 95-058-F1 Test Date 8-12-95
 Source Identification Unit #1 Stack Operator T. Roth

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>Co</u> Span: <u>100</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	ALM02364	14.74	14.25	.49	.49
MID-RANGE GAS	ALM028243	29.73	29.24	.49	.49
HIGH-RANGE GAS <i>upscale</i>	SA 6640	62.0	61.0	1.0	1.0

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>Co</u> Span: <u>1000</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	-	-			
MID-RANGE GAS <i>2 upscale</i>	ALM02568	302.0	305.7	3.70	.37
HIGH-RANGE GAS	ALM012900	603.5	602.2	1.30	.13

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>O2</u> Span: <u>25</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066 0.0	0.0	.10	.10	-.40
LOW-RANGE GAS	-	-			
MID-RANGE GAS <i>upscale</i>	SG913268	11.60	11.60		0.0
HIGH-RANGE GAS	Amb. Air.	20.90	20.70	-.20	-.80

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO2</u> Span: <u>20</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	-	-			
MID-RANGE GAS <i>upscale</i>	SG9133059	10.90	11.0	.10	.50
HIGH-RANGE GAS G2	ALM049101	17.20	17.20	0.0	0.0

ANALYZER CALIBRATION DATA

Client J.E.A. S.J.R.P.P. Project # 95-058-F1 Test Date 8-13-95
 Source Identification Unit #1 Stack Operator T. Roth

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>100</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	ALM023664	14.74	14.0	.740	.74
MID-RANGE GAS	ALM028243	29.73	29.00	.73	.73
HIGH-RANGE GAS	SA6640	62.0	61.0	1.0	1.0

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>1000</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	-	-			
MID-RANGE GAS	ALM02868	302.0	305.4	3.40	.34
HIGH-RANGE GAS	ALM02900	603.5	600.6	2.90	.29

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>O2</u> Span: <u>25</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	0.0	0.0	0.0
LOW-RANGE GAS	-	-			
MID-RANGE GAS	SG9133268	11.60	11.70	-.10	.40
HIGH-RANGE GAS	Amb. Air	20.90	20.80	-.10	.40

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO2</u> Span: <u>20</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1066	0.0	.10	.10	.50
LOW-RANGE GAS	-	-			
MID-RANGE GAS	SG9133059	10.90	11.10	.20	1.0
HIGH-RANGE GAS	G3 ALM049101	17.20	17.20	0.0	0.0

ANALYZER CALIBRATION DATA

Client J.E.A. S.J.R.P.P. Project # 95-058-F1 Test Date 8-18-95
 Source Identification Unit # 1 Stock Operator T. Roth

Calibration Data For Sampling Runs: <u>1-3</u> Gas Type: <u>CO</u> Span: <u>100</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1061	0.0	0.0	0.0	0.0
LOW-RANGE GAS	ALM023664	14.74	13.95	.79	.79
MID-RANGE GAS	ALM022443	29.73	29.00	.73	.73
HIGH-RANGE GAS	SA6640	62.0	60.0 ^{TR}	1.0	1.0

Calibration Data For Sampling Runs: <u>1-3</u> Gas Type: <u>CO</u> Span: <u>1000</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1061	0.0	0.0	0.0	0.0
LOW-RANGE GAS	—	—			
MID-RANGE GAS <u>upscal</u>	ALM028068	302.0	303.3	1.3	.130
HIGH-RANGE GAS	ALM02900	603.5	601.6	1.90	.190

Calibration Data For Sampling Runs: <u>1-3</u> Gas Type: <u>O₂</u> Span: <u>25</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1061	0.0	0.0	0.0	0.0
LOW-RANGE GAS	—	—			
MID-RANGE GAS <u>upscal</u>	SG9/3320	11.60	11.60	0.0	0.0
HIGH-RANGE GAS	4th Air.	20.90	20.60	.30	1.20

Calibration Data For Sampling Runs: <u>1-3</u> Gas Type: <u>CO₂</u> Span: <u>20</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	UN1061	0.0	0.0	0.0	0.0
LOW-RANGE GAS	—	—			
MID-RANGE GAS <u>upscal</u>	SG9/33059	10.90	11.0	.10	.50
HIGH-RANGE GAS <u>G4</u>	ALM049106	17.20	17.2	0.0	0.0

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-11-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		61.80	59.90	-0.19	62.00	0.02	0.21
	CMA:	62.00		CO:	0.00	CM:	60.95

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.10	0.50	0.00
UPSCALE GAS		11.00	10.80	-1.00	10.80	-1.00	0.00
	CMA:	10.90		CO:	0.10	CM:	10.80

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.10	0.10	0.00	0.10	0.00	0.00
UPSCALE GAS		11.60	11.40	-0.80	11.30	-1.20	-0.40
	CMA:	11.60		CO:	0.10	CM:	11.35

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:			CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEASJRPP PROJECT # 95-058-FL TEST DATE 08-11-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.90	302.70	-0.32	304.40	-0.15	0.17
	CMA:	302.00		CO:	0.00	CM:	303.55

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.10	0.50	0.00
UPSCALE GAS		11.00	10.80	-1.00	10.90	-0.50	0.50
	CMA:	10.90		CO:	0.10	CM:	10.85

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.10	0.10	0.00	0.10	0.00	0.00
UPSCALE GAS		11.60	11.30	-1.20	11.20	-1.60	-0.40
	CMA:	11.60		CO:	0.10	CM:	11.25

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:			CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-11-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO						
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.90	304.40	-0.15	302.30	-0.36	-0.21
	CMA:	302.70		CO:	0.00	CM:	303.35

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2						
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.10	0.50	0.00
UPSCALE GAS		11.00	10.90	-0.50	10.90	-0.50	0.00
	CMA:	10.90		CO:	0.10	CM:	10.90

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2						
SPAN:	25						
ZERO GAS		0.10	0.10	0.00	0.10	0.00	0.00
UPSCALE GAS		11.60	11.20	-1.60	11.20	-1.60	0.00
	CMA:	11.60		CO:	0.10	CM:	11.20

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass						
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:			CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-12-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.70	304.20	-0.15	304.30	-0.14	0.01
CMA:		302.00		CO:	0.00	CM:	304.25

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.20	1.00	0.50
UPSCALE GAS		11.00	10.90	-0.50	10.90	-0.50	0.00
CMA:		10.90		CO:	0.15	CM:	10.90

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.60	11.30	-1.20	11.30	-1.20	0.00
CMA:		11.60		CO:	0.10	CM:	11.30

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
CMA:				CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-12-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.10	0.01	0.01
UPSCALE GAS		305.70	304.30	-0.14	303.70	-0.20	-0.06
CMA:		302.00		CO:	0.05	CM:	304.00

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.20	1.00	0.20	1.00	0.00
UPSCALE GAS		11.00	10.90	-0.50	11.00	0.00	0.50
CMA:		10.90		CO:	0.20	CM:	10.95

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.60	11.30	-1.20	11.30	-1.20	0.00
CMA:		11.60		CO:	0.10	CM:	11.30

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
CMA:		0.00		CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-12-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.10	0.01	0.00	0.00	-0.01
UPSCALE GAS		305.70	303.70	-0.20	302.50	-0.32	-0.12
CMA:		302.00		CO:	0.05	CM:	303.10

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.00	0.00	0.20	1.00	1.00
UPSCALE GAS		11.00	11.00	0.00	11.00	0.00	0.00
CMA:		10.90		CO:	0.10	CM:	11.00

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.60	11.30	-1.20	11.10	-2.00	-0.80
CMA:		11.60		CO:	0.10	CM:	11.20

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
CMA:		0.00		CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-13-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO						
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.40	305.40	0.00	304.40	-0.10	-0.10
	CMA:	302.00		CO:	0.00	CM:	304.90

RUN NO:	1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2						
SPAN:	20						
ZERO GAS		0.10	0.10	0.00	0.20	0.50	0.50
UPSCALE GAS		11.10	10.90	-1.00	11.00	-0.50	0.50
	CMA:	10.90		CO:	0.15	CM:	10.95

RUN NO:	1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	02						
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.70	11.50	-0.80	11.50	-0.80	0.00
	CMA:	11.60		CO:	0.10	CM:	11.50

RUN NO:	1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass						
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:			CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.

ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-13-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.40	304.40	-0.10	306.40	0.10	0.20
CMA:		302.00		CO:	0.00	CM:	305.40

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.10	0.20	0.50	0.00	-0.50	-1.00
UPSCALE GAS		11.10	11.00	-0.50	10.90	-1.00	-0.50
CMA:		10.90		CO:	0.10	CM:	10.95

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.70	11.50	-0.80	11.40	-1.20	-0.40
CMA:		11.60		CO:	0.10	CM:	11.45

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
CMA:		0.00		CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-13-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO						
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		305.40	306.40	0.10	304.60	-0.08	-0.18
		CMA: 302.00		CO: 0.00		CM: 305.50	

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2						
SPAN:	20						
ZERO GAS		0.10	0.00	-0.50	0.20	0.50	1.00
UPSCALE GAS		11.10	10.90	-1.00	11.10	0.00	1.00
		CMA: 10.90		CO: 0.10		CM: 11.00	

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2						
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.70	11.40	-1.20	11.10	-2.40	-1.20
		CMA: 11.60		CO: 0.10		CM: 11.25	

RUN NO:	3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass						
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
		CMA: 0.00		CO: 0.00		CM: 0.00	

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-18-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.00	0.00	0.00
UPSCALE GAS		303.30	301.50	-0.18	303.20	-0.01	0.17
	CMA:	302.00		CO:	0.00	CM:	302.35

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.10	0.50	0.00
UPSCALE GAS		11.00	10.90	-0.50	10.90	-0.50	0.00
	CMA:	10.90		CO:	0.10	CM:	10.90

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.10	0.40	0.00
UPSCALE GAS		11.60	11.50	-0.40	11.40	-0.80	-0.40
	CMA:	11.60		CO:	0.10	CM:	11.45

RUN NO:	1	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:			CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-18-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS		0.00	0.00	0.00	0.10	0.01	0.01
UPSCALE GAS		303.30	303.20	-0.01	305.20	0.19	0.20
	CMA:	302.00		CO:	0.05	CM:	304.20

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS		0.00	0.10	0.50	0.10	0.50	0.00
UPSCALE GAS		11.00	10.90	-0.50	10.80	-1.00	-0.50
	CMA:	10.90		CO:	0.10	CM:	10.85

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	02	RESPONSE					
SPAN:	25						
ZERO GAS		0.00	0.10	0.40	0.30	1.20	0.80
UPSCALE GAS		11.60	11.40	-0.80	11.10	-2.00	-1.20
	CMA:	11.60		CO:	0.20	CM:	11.25

RUN NO:	2	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS		0.00	0.00	ERR	0.00	ERR	ERR
UPSCALE GAS		0.00	0.00	ERR	0.00	ERR	ERR
	CMA:	0.00		CO:	0.00	CM:	0.00

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT # 95-058-FL TEST DATE 08-18-95

SOURCE IDENTIFICATION UNIT 1 STACK OPERATOR T. ROTH

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO	RESPONSE					
SPAN:	1000						
ZERO GAS	0.00		0.10	0.01	0.00	0.00	-0.01
UPSCALE GAS	303.30		305.20	0.19	302.40	-0.09	-0.28
CMA:	302.00		CO:	0.05	CM:	303.80	

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	CO2	RESPONSE					
SPAN:	20						
ZERO GAS	0.00		0.00	0.00	0.10	0.50	0.50
UPSCALE GAS	11.00		10.80	-1.00	11.00	0.00	1.00
CMA:	10.90		CO:	0.05	CM:	10.90	

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	O2	RESPONSE					
SPAN:	25						
ZERO GAS	0.00		0.30	1.20	0.20	0.80	-0.40
UPSCALE GAS	11.60		11.10	-2.00	10.90	-2.80	-0.80
CMA:	11.60		CO:	0.25	CM:	11.00	

RUN NO:	3	ANALYZER	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
			SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:	Gass	RESPONSE					
SPAN:	0						
ZERO GAS	0.00		0.00	ERR	0.00	ERR	ERR
UPSCALE GAS	0.00		0.00	ERR	0.00	ERR	ERR
CMA:	0.00		CO:	0.00	CM:	0.00	

TOTAL SOURCE ANALYSIS, INC.
 ENVIROMENTAL TESTING CONSULTANTS

Gas Certification Sheets



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH, 44090

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1344
Scott Project # 558885

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM023664
Cylinder Pressure 1900 psig

Certification Date 12-8-93
Previous Certification Dates None

Expiration Date 12-7-96

ANALYZED CYLINDER

Components
Carbon Monoxide

Certified Concentration
14.74 ppm

Analytical Uncertainty*
±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type CRM 1678
Expiration Date 5-12-94

Cylinder Number
AAL6302

Concentration
45.76 PPM CO IN N₂

INSTRUMENTATION

Instrument/Model/Serial #
CO: Beckman/867/0100157

Last Date Calibrated
11-10-93

Analytical Principle
Non-Dispersive Infrared

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

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Monoxide	Date: 11-29-93 Response Units: mv Z1=0.00 R1=46.80 T1=15.20 R2=46.80 Z2=0.00 T2=15.20 Z3=0.00 T3=15.20 R3=46.80 Avg. Conc. of Cust. Cyl. 14.74 ppm	Date: 12-8-93 Response Units: mv Z1=0.00 R1=46.80 T1=15.20 R2=46.80 Z2=0.00 T2=15.20 Z3=0.00 T3=15.20 R3=46.80 Avg. Conc. of Cust. Cyl. 14.74 ppm	Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴ r=0.99999 CRM 1678 Constants: A=0.3465483 B=0.9339077 C=0.00095399 D=-0.000003327 E=0
			Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴
			Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴

Special Notes

Tim Sanderson
Analyst Tim Sanderson



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX: (810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory

Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 2004
Scott Project # : 575700

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM028243
Cylinder Pressure + : 1900 psig

Certificate Date : 1/13/95
Previous Certificate Date : None

Expiration Date : 1/13/98

ANALYZED CYLINDER

Components

Carbon Monoxide

Certified Concentration

29.73 ppm

Analytical Uncertainty*

±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1679	8/11/96	ALM037782	97.10 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #

CO:Horiba/OPE-135/565607092

Last Date Calibrated

1/13/95

Analytical Principle

Non-Dispersive Infrared

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

Components

Carbon Monoxide

First Triad Analysis

Date: 1/8/95	Response Units: mv		
Z1=0.00	R1=80.00	T1=25.00	
R2=80.00	Z2=0.00	T2=25.00	
Z3=0.00	T3=25.00	R3=80.00	
Avg. Conc. of Cust. Cyl. 29.67 ppm			

Second Triad Analysis

Date: 1/13/95	Response Units: mv		
Z1=0.00	R1=80.00	T1=25.10	
R2=80.00	Z2=0.00	T2=25.10	
Z3=0.00	T3=25.10	R3=80.00	
Avg. Conc. of Cust. Cyl. 29.79 ppm			

Calibration Curve

Concentrations A=B=Cx ² +Dx ³ +Ex ⁴	
r=1.00000	NTRM 1679
Constants:	A=0.058415000
B=1.202500000	C=-0.001100400
D=0.000015397	E=0.000000000

Special Notes

Mail

H2

Analyst



610-691-2474
FAX # 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER S/T CANTON

P.O NUMBER 49763

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 49.7 PPM GMIS VS.	1678C	CAL-6763	45.2 PPM

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

COMPONENT	CARBON MONOXIDE	49.7 PPM	ANALYZER MAKE-MODEL-S/N	SIEMENS ULTRAMAT 5E	55-500
ANALYTICAL PRINCIPLE	NON-DISPERSIVE INFRARED		LAST CALIBRATION DATE	03/31/95	
FIRST ANALYSIS DATE	04/17/95		SECOND ANALYSIS DATE	04/25/95	
Z 0.00	R 50.8	C 63.4	CONC.	62.0	Z 0.00
R 50.6	Z 0.00	C 63.4	CONC.	62.0	R 50.6
Z 0.00	C 63.4	R 50.8	CONC.	62.0	Z 0.00
U/M	PPM	MEAN TEST ASSAY	62.0	U/M	PPM
					MEAN TEST ASSAY
					62.1

THIS CYLINDER NO.	SA6640	CERTIFIED CONCENTRATION	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R93/224	CARBON MONOXIDE	62.0 ppm
OF TRACEABILITY PROTOCOL NO.	REV. 9/93	NITROGEN	BALANCE
PROCEDURE	G1		
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE		
CYLINDER PRESSURE	1650 PSIG		
CERTIFICATION DATE	04/25/95		
EXPIRATION DATE	04/25/98		

ANALYZED BY

Daniel J. Day
DANIEL J. DAY, H3

CERTIFIED BY

Robert Hillard
ROBERT HILLARD



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1477
Scott Project # : 568881

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM049209
Cylinder Pressure + : 1900 psig

Certificate Date : 7/25/94
Previous Certificate Date : None

Expiration Date : 7/25/97

ANALYZED CYLINDER

Components
Carbon Dioxide

Certified Concentration
10.9 %

Analytical Uncertainty*
±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type
SRM 2745

Expiration Date
11/3/96

Cylinder Number
SX20311

Concentration
15.75 % Carbon Dioxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO2:Horiba/PIR-2000/02609015

Last Date Calibrated
7/14/94

Analytical Principle
Non-Dispersive Infrared

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

Components
Carbon Dioxide

First Triad Analysis		
Date: 7/25/94	Response Units: mV	
Z1=0.00	R1=120.90	T1=96.90
R2=120.90	Z2=0.00	T2=96.90
Z3=0.00	T3=96.90	R3=120.90
Avg. Conc. of Cust. Cyl. 10.9 %		

Second Triad Analysis

Calibration Curve

Concentration $A+Bx+Cx^2+Dx^3+Ex^4$	
r=1.00000	SRM 2745
Constants:	A=-1.41800000
B=0.140570000	C=-0.000842880
D=0.000006416	E=0.000000000

Special Notes

Analyst Rhonda Lundy

AGA Gas, Inc.

Specialty & Medical Gases Division

CERTIFICATE OF ANALYSIS EPA PROTOCOL PERFORMED ACCORDING TO SECTION 2.2, PROCEDURE G1

Production Number: 12940090
Cylinder Number: CC7791
Cylinder Pressure: 2000 psi

NOTICE, THIS CYLINDER IS NOT TO BE USED WHEN PRESSURE IS UNDER 150 psig

Certified Component	Certified Concentration	Date of Certification	Analytical Method
Carbon Dioxide	13.93%	1/23/95	Non-Dispersive Infrared

Expiration Date: 1/23/98
Balance Gas: Nitrogen

REFERENCE STANDARD DATA:

SRM Number	Cylinder Number	Concentration
GMIS	CC4109	13.93% Carbon Dioxide

CERTIFIED AT:

AGA Gas Inc.
Specialty & Medical Gas Division
6421 Morclove Road
Maumee, Ohio 43537


Michael Sickmiller
Quality Control Supervisor



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory

Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1477
Scott Project # : 568881

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM049101
Cylinder Pressure + : 1900 psig

Certificate Date : 7/25/94
Previous Certificate Date : None

Expiration Date : 7/25/97

ANALYZED CYLINDER

Components

Carbon Dioxide

Certified Concentration

17.2 %

Analytical Uncertainty*

±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
SRM 2745	11/3/96	SX20311	15.75 % % Carbon Dioxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO2:Horiba/PIR-2000/02609015

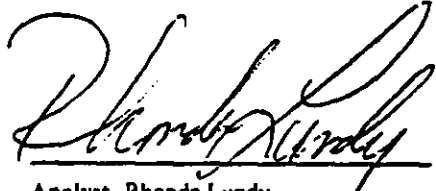
Last Date Calibrated
7/14/94

Analytical Principle
Non-Dispersive Infrared

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

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Dioxide	Date: 7/25/94 Response Units: mv Z1=0.00 R1=120.90 T1=127.10 R2=120.90 Z2=0.00 T2=127.10 Z3=0.00 T3=127.10 R3=120.90 Avg. Conc. of Cust. Cyl. 17.2 %		$C = Concentration = A + Bx + Cx^2 + Dx^3 + Ex^4$ r=1.00000 SRM 2745 Constants: A=-1.415500000 B=0.140570000 C=-0.000842880 D=0.000008418 E=0.000000000

Special Notes



Analyst Rhonda Lundy

Air Products and Chemicals, Inc.
 SPECIALTY GAS DEPARTMENT
 12722 S. WENTWORTH AVENUE
 CHICAGO, IL 60628

Certificate of Analysis - EPA Protocol Gas Standard

Page 1 of 1

PERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

Customer:
 APCI
 5420 WARNER RD,
 VALLEY VIEW
 CLEVELAND OH 44125

Notes:

Order No: 231-019520
 Batch No: 861-23317
 Cylinder No: SG9133258B
 Cylinder Pressure*: 2000 psig
 Certification Date: 01/23/95
 Expiration Date: 01/23/98

PO: Rel:

*** Certified Concentration *** ***** Reference Standards ***** ***** Analytical Instrumentation *****

Component	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
OXYGEN	11.6 ±.10 %	SG9113455BAL	GMIS	15.0500 %	Shimadzu GC-8A	32029	01/18/95	GC-TCD

Balance Gas: Nitrogen

* Standard should not be used below 150 psig

H7

Analyst: Shaher Aboor
 Shaher Aboor

Approved By: Robert McNear
 Robert McNear



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory

Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1433
Scott Project # : 565319

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM028068

Certificate Date : 4/28/94

Expiration Date : 4/28/97

Cylinder Pressure + : 1900 psig

Previous Certificate Date : None

ANALYZED CYLINDER

Components

Carbon Monoxide

Certified Concentration

302.0 ppm

Analytical Uncertainty*

±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type

CRM 1681

Expiration Date

7/19/95

Cylinder Number

ALM-024827

Concentration

966.1 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial

CO: Beckman/864/102528

Last Date Calibrated

4/15/94

Analytical Principle

Non-Dispersive Infrared

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

Components

Carbon Monoxide

First Triad Analysis

Date: 3/15/94	Response Units: mv		
Z1=0.00	R1=100.00	T1=35.40	
R2=100.00	Z2=0.00	T2=35.40	
Z3=0.00	T3=35.40	R3=100.00	
Avg. Conc. of Cust. Cyl. 302.0 ppm			

Second Triad Analysis

Date: 4/28/94	Response Units: mv		
Z1=0.00	R1=100.00	T1=35.40	
R2=100.00	Z2=0.00	T2=35.40	
Z3=0.00	T3=35.40	R3=100.00	
Avg. Conc. of Cust. Cyl. 302.0 ppm			

Calibration Curve

Concentration = A + Bx + Cx ² + Dx ³ - Ex ⁴	
r=1.00000	CRM 1681
Constants:	A=0.162780000
B=7.918200000	C=0.017444000
D=0.000000000	E=0.000000000

Special Notes

H8

Analyst Don Eichler, Jr



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer TOTAL SOURCE ANALYSIS 510 DICKSON STREET WELLINGTON, OH 44090-1171	Assay Laboratory Scott Specialty Gases, Inc 1290 Combermere Troy, MI 48083	Purchase Order : +1433 Scott Project # : 565319
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ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM012900	Certificate Date : 4/28/94	Expiration Date : 4/28/97
Cylinder Pressure + : 1900 psig	Previous Certificate Date : None	

ANALYZED CYLINDER

Components Carbon Monoxide	Certified Concentration 603.5 ppm	Analytical Uncertainty* ±1% NIST Directly Traceable
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Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type CRM 1681	Expiration Date 7/19/95	Cylinder Number ALM-024827	Concentration 966.1 ppm Carbon Monoxide in Nitrogen
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INSTRUMENTATION

Instrument/Model/Serial # CO : Beckman/864/102528	Last Date Calibrated 4/15/94	Analytical Principle Non-Dispersive Infrared
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ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Monoxide	Date: 2/8/94 Response Units: mv Z1=0.00 R1=100.00 T1=88.50 R2=100.00 Z2=0.00 T2=88.50 Z3=0.00 T3=88.50 R3=100.00 Avg. Conc. of Cust. Cyl. 603.5 ppm	Date: 4/28/94 Response Units: mv Z1=0.00 R1=100.00 T1=88.50 R2=100.00 Z2=0.00 T2=88.50 Z3=0.00 T3=88.50 R3=100.00 Avg. Conc. of Cust. Cyl. 603.5 ppm	Concentration: $A+Bx+Cx^2+Dx^3+Ex^4$ r=1.00000 CRM 1681 Constants: A=0.162700000 B=7.918200000 C=0.017444000 D=0.000000000 E=0.000000000

Special Notes

Analyst Don Eichler, Jr.

Calibrations of Test Equipment

DRY GAS METER CALIBRATION SHEET

CLIENT: SHOP Q.A.Q.C.
 PROJECT NUMBER: 95-000-PL
 MODULE: RAC # 2
 ORIFICE: 2.999

RUN BY: T.ROTH
 DATE: 5/18/95
 BAROMETRIC PRESSURE 29.99

DELTA H IN.H2O	Vw Initial	Vw Final	Vw Cub.Feet	Vd Initial	Vd Final	Vd Cub.Feet	Tw F	Tdi F	Tdo F	Td F	Time Min
0.5	8.000	12.067	4.067	676.818	720.845	4.135	66.6	86.0	77.0	81.00	10.0
1.0	13.000	18.619	5.619	680.768	733.833	5.735	66.5	89.0	78.0	83.50	10.0
1.5	20.000	26.800	6.800	687.995	751.898	6.302	67.0	92.0	80.0	88.00	10.0
2.0	29.000	36.935	7.935	697.310	770.898	6.976	67.0	92.0	80.0	88.00	10.0
3.0	39.000	48.370	9.370	707.955	777.898	6.925	67.0	98.0	82.0	89.00	10.0

DELTA H IN.H2O	DELTA H 13.6	MC/Y	YI	DELTA Ha	DELTA Ha @1	METER CORR. FACTOR	ORIFICE
0.50	0.0368	1.011	-0.015	1.837	0.088	0.996	2.999
1.00	0.0735	1.009	-0.013	1.708	0.017		
1.50	0.1103	1.007	-0.011	1.744	-0.019		
2.00	0.1471	0.977	0.019	1.708	0.017	DELTA H@1 1.725	
3.00	0.2206	0.976	0.020	1.827	-0.102		

WHERE: AH = Orifice Setting
 Vw = Volume of Gas of Wet Test Meter
 Vd = Volume of Gas of Dry Gas Meter
 Tw = Temperature of Fluid in Wet Test Meter
 Tdi = Inlet Temperature of Dry Gas Meter
 Tdo = Outlet Temperature of Dry Gas Meter
 Td = Average Temperature of Dry Gas Meter
 Time = Time Required to pull specific cubic feet
 Mc = Dry Gas Meter Correction Factor
 A Ha = Orifice setting that equates to .75 cfm of air at standard conditions
 A Ha1 = Ha tolerance; tolerance for individual values (+/-) .20 from average
 YI = Ratio of reading of Wet Test Meter to Dry Gas Meter; tolerance for individual values (+/-) .02 from average

EQUATIONS: Mc (Y)

$$\frac{Vw P_b (T_d + 460)}{Vd (P_b + AH/13.6)(T_w + 460)}$$

AH (a)

$$\frac{0.0317 AH}{P_b (T_d + 460)} \left| \frac{(T_w + 460)Time}{Vw} \right|^2$$

T. Roth

SHOP Q.A.Q.C.
 85-000-FL
 RAC # 2
 5/18/95

ORIFICE CALCULATIONS

INITIAL			POSSIBLE COMBINATIONS			
DELTA H	FV/Min	X ²				
0.5	0.4130	0.1708	1 (3.0 - 2.0)	1	3.6278	-17.64%
1.0	0.5735	0.3289	2 (3.0 - 1.5)	2	3.0070	-0.28%
1.5	0.6973	0.4862	3 (3.0 - 1.0)	3	3.0481	-1.85%
2.0	0.8378	0.7018	4 (3.0 - .50)	4	3.0994	-2.38%
3.0	0.9925	0.9851	5 (2.0 - 1.5)	5	2.3218	22.57%
			6 (2.0 - 1.0)	6	2.8833	10.51%
			7 (2.0 - .50)	7	2.9248	6.80%
			8 (1.5 - 1.0)	8	3.1781	-5.99%
			9 (1.5 - .50)	9	3.1680	-5.66%
			10 (1.0 - .50)	10	3.1570	-5.31%

AVERAGE ORIFICE 2.9986

Nozzle Calibration

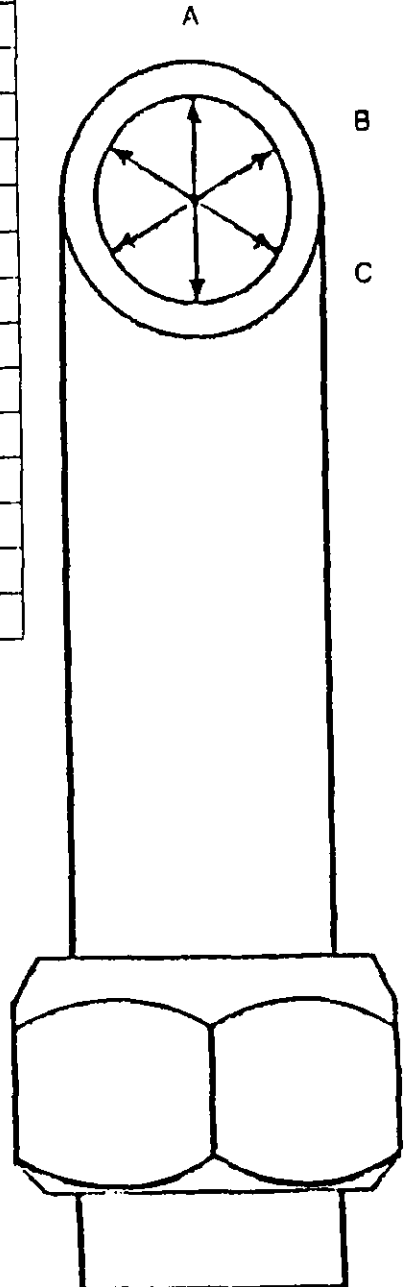
Sized By T. Roth Shop QA QC.

Date	Nozzle	Dimension			Difference	Avg. Diameter
		A	B	C		
2-21-95	F1-01	.120	.120	.120	.000	.120
2-21-95	F1-02	.137	.139	.140	.001	.137
2-21-95	F1-03	.186	.188	.187	.002	.187
2-21-95	F1-04	.187	.187	.187	.000	.187
2-21-95	F1-05					
2-21-95	F1-06	.231	.230	.232	.002	.231
2-21-95	F1-07	.250	.249	.249	.001	.249
2-21-95	F1-08	.248	.249	.248	.001	.248
2-21-95	F1-09	.250	.250	.250	.000	.250
2-21-95	F1-10	.250	.250	.250	.000	.250
2-21-95	F1-11	.252	.252	.251	.001	.252
2-21-95	F1-12	.375	.374	.375	.001	.375
2-21-95	F1-13	.302	.302	.301	.001	.302
2-21-95	F1-14	.305	.306	.306	.001	.306
2-21-95	F1-15	.314	.315	.315	.001	.315
2-21-95	F1-16	.374	.375	.374	.001	.374
2-21-95	F1-17	.372	.373	.372	.001	.372
2-21-95	F1-18	.371	.372	.372	.001	.372
2-21-95	F1-19	.370	.369	.371	.002	.370
2-21-95	F1-20	.438	.437	.438	.001	.438
2-21-95	F1-22	.501	.502	.503	.002	.502
2-21-95	F1-21	.496	.495	.496	.001	.496
2-21-95	F1-23	.501	.501	.501	.000	.501
2-21-95	F1-24	.501	.500	.501	.001	.501
2-21-95	F1-25	.494	.495	.494	.001	.494
2-21-95	F1-27	.496	.495	.498	.002	.498
2-22-95	F1-26	.753	.753	.753	.000	.753

All Dimensions are in inches.



Total Source Analysis, Inc.
Environmental Testing Consultants



Pitot Calibration Form

Client Shop Quality
 Project No. _____
 Test Location Umatilla, FL

Run By T. Roth / J. Taylor
 Date 2-27-95
 Pitot No. A-10-1-1-FL

● "A" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (In H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C_p (s)	Deviation $C_p(s) - \bar{C}_p(A)$
1	.840	1.200	.828	-0.360
2	.860	1.267	.816	-0.407
3	.903	1.200	.859	-0.397
Average		C_p (Side A)	.834	-0.355

Calculations:

$$C_p(s) = 0.99 \sqrt{\frac{\Delta P \text{ (standard)}}{\Delta P \text{ (s)}}}$$

$$\text{Deviation} = C_p(s) - \bar{C}_p(A \text{ or } B)$$

$$\text{Average Deviation} = \sigma(A \text{ or } B) = \frac{1}{3} \sum |C_p(s) - \bar{C}_p(A \text{ or } B)|$$

$$|\bar{C}_p(\text{Side A}) - \bar{C}_p(\text{Side B})| = \underline{0.013}$$

●● "B" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (In H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C_p (s)	Deviation $C_p(s) - \bar{C}_p(B)$
1	.840	1.200	.828	-0.360
2	.860	1.233	.827	-0.373
3	.903	1.200	.859	-0.397
Average		C_p (Side B)	.838	-0.343

Nozzle size used for Calibrations (inches) 1/4" F1-003

Intercomponent Spacings During Calibrations:

Pitot - Nozzle: ± 3/4"

Pitot - Thermocouple: 1/2"

Pitot - Probe Sheath: 1/2"



Total Source Analysis, Inc.
 Environmental Testing Consultants

Pitot Calibration Form

Client Shop Quality
 Project No. _____
 Test Location Umatilla, FL.

Run By T. Roth / J. Tayfel
 Date 2-27-95
 Pitot No. N-10-G1F

● "A" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	$C_p(s)$	Deviation $C_p(s) - \bar{C}_p(A)$
1	.840	1.133	.852	-0.293
2	.860	1.100	.875	-0.240
3	.903	1.100	.897	-0.197
Average		\bar{C}_p (Side A)	.875	-0.243

Calculations:

$$C_p(s) = 0.99 \sqrt{\frac{\Delta P \text{ (standard)}}{\Delta P (s)}}$$

$$\text{Deviation} = C_p(s) - \bar{C}_p \text{ (A or B)}$$

$$\text{Average Deviation} = \sigma \text{ (A or B)} = \frac{1}{n} \sum |C_p(s) - \bar{C}_p \text{ (A or B)}|$$

$$|\bar{C}_p(\text{Side A}) - \bar{C}_p(\text{Side B})| = .023^3$$

●● "B" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	$C_p(s)$	Deviation $C_p(s) - \bar{C}_p(B)$
1	.840	1.133	.852	-0.293
2	.860	1.133	.863	-0.273
3	.903	1.133	.884	-0.230
Average		\bar{C}_p (Side B)	.846	-0.265

Nozzle size used for Calibrations (inches) 3/8" F1-017

Intercomponent Spacings During Calibrations:

Pitot - Nozzle: 3/4"

Pitot - Thermocouple: 1 1/2"

Pitot - Probe Sheath: 1 1/2"



Total Source Analysis, Inc.
 Environmental Testing Consultants

Laboratory Reports

Run No. 1
 Filter No. 95-028-FL
 Acetone No. FL-01
 Amount liquid lost during transport 0.0 mL
 Acetone blank volume, ml 100.0 mL
 Acetone wash volume, ml 100 mL
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6048	.6018	.0030
2	60.4492	60.4336	.0156
Total			.0186
Less acetone blank			.0002
Weight of particulate matter			.0184

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	445.0	266.8
Initial	200.0	250.0
Liquid collected	245.0	16.8
Total Volume Collected	261.8 mL	g ✓ ml

No. 3
 Filter No. 95-030-FL
 Acetone No. FL-01
 Amount liquid lost during transport 0.0 mL
 Acetone blank volume, ml 100.0 mL
 Acetone wash volume, ml 100 mL
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6041	.5988	.0053
2	70.8370	70.8063	.0307
Total			.0360
Less acetone blank			.0002
Weight of particulate matter			.0358

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	445.0	266.4g
Initial	200.0	250.0
Liquid collected	245.0	16.4g
Total Volume Collected	261.4 mL	g ✓ ml

Run No. 2
 Filter No. 95-029-FL
 Acetone No. FL-01
 Amount liquid lost during transport 0.0 mL
 Acetone blank volume, ml 100.0 mL
 Acetone wash volume, ml 100 mL
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6090	.6061	.0029
2	71.0504	71.0154	.0350
Total			.0379
Less acetone blank			.0002
Weight of particulate matter			.0377

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	439.0	267.7g
Initial	200.0	250.0
Liquid collected	239.0	17.7
Total Volume Collected	256.7 mL	g ✓ ml

Run No. Blank
 Filter No. -
 Acetone No. FL-01
 Amount liquid lost during transport 0.0 mL
 Acetone blank volume, ml 100.0 mL
 Acetone wash volume, ml 100.0 mL
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	-	-	-
2	73.4360	73.4358	.0002
Total			.0002
Less acetone blank			-
Weight of particulate matter			.0002

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	-	-
Initial	-	-
Liquid collected	-	-
Total Volume Collected	-	- g ✓ ml

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 **See Federal Register, Method 5, 6.6, & 6.7.

Run No. 1
 Filter No. 95-031-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100 mL
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	60.08	59.37	.0071
2	80.6911	80.6842	.0069
Total			.0140
Less acetone blank			.0002
Weight of particulate matter			.0138

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	444.0	261.9
Initial	200.0	250.0
Liquid collected	244.0	17.4
Total Volume Collected	261.46	g ✓ ml

to. 3
 Filter No. 95-033-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0 ml
 Acetone blank volume, ml 100.0 ml
 Acetone wash volume, ml 100.0 ml
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	58.84	58.27	.0057
2	74.7372	74.4244	.0128
Total			.0185
Less acetone blank			.0002
Weight of particulate matter			.0183

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	456.0	269.7
Initial	200.0	250.0
Liquid collected	256.0	19.7
Total Volume Collected	275.7 ml	g ✓ ml

Run No. 2
 Filter No. 95-032-FL
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	60.72	60.22	.0050
2	74.9549	74.9429	.0120
Total			.0170
Less acetone blank			.0002
Weight of particulate matter			.0168

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	466.0	268.1
Initial	200.0	250.0
Liquid collected	266.0	18.10
Total Volume Collected	289.7	g ✓ ml

Run No. Blank
 Filter No. -
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml -
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2	73.4360	73.4358	.0002
Total			.0002
Less acetone blank			-
Weight of particulate matter			.0002

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	-	-
Initial	-	-
Liquid collected	-	-
Total Volume Collected	-	- g ✓ ml

* Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 ** See Federal Register, Method 5, 6.6, & 6.7.

Run No. 1
 Filter No. 95-034-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)**
 Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5941	.5895	.0005
2	60.4382	60.4309	.0073
Total			.0078
Less acetone blank			.0002
Weight of particulate matter			.0076

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	433.0	261.6
Initial	200.0	250.0
Liquid collected	233.0	11.6
Total Volume Collected	246.6	g <input checked="" type="checkbox"/> ml

Run No. 3
 Filter No. 95-036-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100.0
 Acetone blank concentration, mg/mg (equation 5-4)**
 Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6140	.6082	.0058
2	70.8083	70.8035	.0048
Total			.0106
Less acetone blank			.0002
Weight of particulate matter			.0104

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	444.0	270.4
Initial	200.0	250.0
Liquid collected	244.0	20.4
Total Volume Collected	264.4	g <input checked="" type="checkbox"/> ml

Run No. 2
 Filter No. 95-035-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)**
 Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6107	.6061	.0040
2	71.0246	70.9144	.0102
Total			.0142
Less acetone blank			.0002
Weight of particulate matter			.0140

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	435.0	271.4
Initial	200.0	250.0
Liquid collected	235.0	21.4
Total Volume Collected	256.4	g <input checked="" type="checkbox"/> ml

Run No. Blank
 Filter No. -
 Acetone No. F1-01
 Amount liquid lost during transport
 Acetone blank volume, ml 0.0
 Acetone wash volume, ml 100.0
 Acetone blank concentration, mg/mg (equation 5-4)**
 Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2	73.4360	73.4358	.0002
Total			.0002
Less acetone blank			
Weight of particulate matter			.0002

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g <input type="checkbox"/> ml

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\text{Increase, g} \div \text{Volume Water, ml} = 1\text{g/ml}$
 **See Federal Register, Method 5, 6.6, & 6.7.

Run No. 1
 Filter No. 95-037-F1
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Run No. 2
 Filter No. 95-038-FL
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100.
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	61.104	60.37	.0067
2	60.4495	60.4284	.0201
Total			.0268
Less acetone blank			.0002
Weight of particulate matter			.0266

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	59.16	58.39	.0077
2	71.0334	71.0145	.0189
Total			.0266
Less acetone blank			.0002
Weight of particulate matter			.0264

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	450.0	270.8
Initial	200.0	250.0
Liquid collected	250.0	20.8
Total Volume Collected	270.8	g * <input checked="" type="checkbox"/> ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	433.0	273.4
Initial	200.0	250.0
Liquid collected	233.0	23.4
Total Volume Collected	256.4	g * <input checked="" type="checkbox"/> ml

to. 3
 Filter No. 95-039-FL
 Acetone No. FL-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Run No. Blank.
 Filter No. -
 Acetone No. F1-01
 Amount liquid lost during transport 0.0
 Acetone blank volume, ml 100.0 ml
 Acetone wash volume, ml -
 Acetone blank concentration, mg/mg (equation 5-4)** -
 Acetone wash blank, mg (equation 5-5)** -

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	60.62	59.97	.0065
2	70.8138	70.8026	.0112
Total			.0177
Less acetone blank			.0002
Weight of particulate matter			.0175

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	-	-	-
2	73.4360	73.4358	.0002
Total			.0002
Less acetone blank			-
Weight of particulate matter			.0002

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	440.0	271.6
Initial	200.0	250.0
Liquid collected	240.0	21.6
Total Volume Collected	261.6	g * <input checked="" type="checkbox"/> ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	-	-
Initial	-	-
Liquid collected	-	-
Total Volume Collected	-	g * <input type="checkbox"/> ml

* Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 ** See Federal Register, Method 5, 6.6, & 6.7.

Run No. Run 1 Unit 1 Stack
 Filter No. 95-040 F
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. Run 2 Unit 1 Stack
 Filter No. 95-041 FL
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6138	.6073	.0065
2	80.6891	80.6860	.0031
Total			.0096
Less acetone blank			-.0001
Weight of particulate matter			.0095

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6100	.6066	.0034
2	73.4353	73.4294	.0059
Total			.0093
Less acetone blank			-.0001
Weight of particulate matter			.0092

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	390.0	265.1
Initial	200.0	250.0
Liquid collected	190.0	15.1
Total Volume Collected	205.1	g* ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	400.0	267.3
Initial	200.0	250.0
Liquid collected	200.0	17.3
Total Volume Collected	217.3	g* ml

Run No. Run 3 Unit 1 Stack
 Filter No. 95-042 FL
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. Blank
 Filter No. _____
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6065	.6041	.0024
2	74.9490	74.9438	.0052
Total			.0076
Less acetone blank			-.0001
Weight of particulate matter			.0075

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2	73.2579	73.2578	.0001
Total			
Less acetone blank			
Weight of particulate matter			

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	415.0	265.8
Initial	200.0	250.0
Liquid collected	215.0	15.8
Total Volume Collected	220.8	g* ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g* ml

* Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 ** See Federal Register, Method 5, 6.6, & 6.7.

SO₂ Analysis Sheet

Client J.E.A. S.J.R.P.P. Analysis Run By T. Roth Date Aug 11 1995
 Project No. 95-058-FL Plant Site Jacksonville Fla.
 Barium Perchlorate-Normality 0.0099 = $\frac{\text{Mls H}_2\text{SO}_4 \times \text{Normality}}{\text{Mls Barium Titrated}}$ = $\frac{25.0 \times .02}{50.70}$

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit #1 Stack		Blank	1000 ml	50.0 ml	0.0 / 0.0
	1	1	1600 ml	25.0 ml	10.6 / 10.4
	2	2	211.0 ml	25.0 ml	8.5 / 8.9 / 8.3
J6	3	3	224.0 ml	25.0 ml	8.7 / 8.7 /



Total Source Analysis, Inc.
 Environmental Samplers



SO₂ Analysis Sheet

Client J.E.A. S.J.R. P.P. Analysis Run By T. Roth Date Aug 12 1995
 Project No. 95-058-FL Plant Site Jacksonville Fla
 Barium Perchlorate Normality .0100 = $\frac{\text{Mis H}_2\text{SO}_4 \times \text{Normality}}{\text{Mis Barium Titrated}}$ = $\frac{350 \times .02}{49.8}$

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit #1 Stack		Blank	1000 ml	50.0 ml	0.0/0.0
	1	1	200 ml	25.0 ml	8.8 / 9.0
	2	2	175 ml	25.0 ml	11.1 / 11.4 / 11.4
	3	3	171 ml	25.0 ml	12.0 / 12.2



SO₂ Analysis Sheet

Client J.E.A. S.J.R.P.P. Analysis Run By T. Roth Date Aug 13 1995

Project No. 95- Plant Site Jacksonville Fla.

Barium Perchlorate-Normality .0100 = $\frac{\text{Mls H}_2\text{SO}_4 \times \text{Normality}}{\text{Mls Barium Titrated}} = \frac{25.0 \times .02}{49.8}$

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit # 1 Stack		Blank	1000ml	50.0ml	0.0/0.0
	1	1	196ml	25.0ml	6.6/6.5/6.5
	2	2	193ml	25.0ml	13.4/13.1/13.5
58					
	3	3	198.5ml	25.0ml	27.8/28.4/28.4



Total Source Analysis, Inc.
Environmental Samplers



SO₂ Analysis Sheet

Client J.E.A. S.J.R.P.P. Analysis Run By T. Roth Date Aug 14 1995
 Project No. 95-058-F1 Plant Site Jacksonville Fla
 Barium Perchlorate Normality .0100 = $\frac{\text{Mls H}_2\text{SO}_4 \times \text{Normality}}{\text{Mls Barium Titrated}} = \frac{25.0 \times .02}{49.80}$

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit # Stack		Blank	1000ml.	50.0ml	0.0/0.0
	1	1	193.5ml	25.0ml	9.5/9.0/8.9
	2	2	197.0ml	25.0ml	12.8/12.6
J9	3	3	165.0ml	25.0ml FR 10.0ml	7.0/7.2



Total Source Analysis, Inc.
Environmental Samplers

DEPARTMENT OF
ENVIRONMENTAL PROTECTION

OCT 06 1995

SITING COORDINATION

FINAL
BASELINE EMISSIONS
TEST REPORT
FOR
JACKSONVILLE ELECTRIC
ST. JOHNS RIVER
POWER PARK
UNIT 1

July 18-20 & August 8, 1995

95-058-FL

Report Date 9-11-95



TOTAL SOURCE ANALYSIS, INC.
ENVIRONMENTAL TESTING CONSULTANTS

September 11, 1995

I, James Tayfel, hereby certify that the emissions tests conducted at Jacksonville Electric Authority's St. Johns River Power Park, Unit 1 are in accordance with procedures established by the USEPA. This report accurately and faithfully presents the data obtained from the tests and the results determined from analysis of this data.


James Tayfel
Crew Chief

I, Carl Vineyard, P.E., hereby attest that all work on this project was completed under my supervision and this report accurately presents the emissions from the units.



Carl Vineyard, P.E.
Chief Test Engineer

I, Angel Aguiar, P.E., have reviewed the reports for completeness and accuracy.

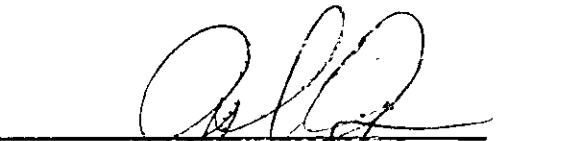

Angel Aguiar, P.E.
Florida Professional Engineer

TABLE OF CONTENTS

INTRODUCTION.....A1
SUMMARY OF TEST RESULTS.....B1-B19
SAMPLING AND ANALYTICAL PROCEDURES.....C1-C17
APPENDIX
 Sample Calculations.....D1-D6
 TSA Field Data Sheets.....E1-E24
 TSA CEMS Log.....F1-F27
 TSA Calibration Data.....G1-G16
 Gas Certification Sheets.....H1-H9
 Calibration of Test Equipment.....I1-I9
 Laboratory Reports.....J1-J8

INTRODUCTION

INTRODUCTION

This report presents the results of the emissions tests performed for Jacksonville Electric St. Johns River Power Park, Unit 1.

The purpose of the tests was to determine the emissions of the unit. The results of the tests can be found in Section II of this report.

The emissions testing was performed by Total Source Analysis, Inc., whose Florida Branch Office is located at 810 N. Central Avenue, Umatilla, Florida 32784.

The tests were performed on July 18/20 and August 8, 1995. The testing was performed in accordance with EPA reference methods as published in the July 1, 1994 Federal Register, - "Standards of Performance for New Stationary Sources" and subsequent revisions.

The testing equipment and sampling procedures are described in Section III of this report. The raw field data and equations used in determining final results are presented in the Appendix as well as the calibration data sheets for the applicable testing equipment.

SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS

The following table presents the final results of the emissions tests performed on Unit 1 at Jacksonville Electric's St. Johns River Power Park.

PARTICULATE

<u>Run No.</u>	<u>Location</u>	<u>Date</u>	<u>lbs/dscf</u>	<u>lbs/hr</u>	<u>lbs/MBtu</u>
1	Stack	7-18-95	5.09E-07	43.52	.007
2	Stack	7-18-95	5.51E-07	45.93	.007
3	Stack	7-18-95	5.18E-07	42.98	.007
Avg.			5.26E-07	44.14	.007
1	Stack	7-19-95	2.32E-07	19.96	.003
2	Stack	7-19-95	1.76E-07	14.89	.002
3	Stack	7-19-95	3.47E-07	29.67	.004
Avg.			2.52E-07	21.50	.003
1	Stack	7-20-95	1.00E-06	84.26	.013
2	Stack	7-20-95	6.54E-07	56.54	.008
3	Stack	7-20-95	6.22E-07	53.95	.008
Avg.			7.60E-07	64.92	.0096
1	Stack	8-08-95	6.14E-07	53.87	.008
2	Stack	8-08-95	5.64E-07	49.97	.007
3	Stack	8-08-95	9.08E-07	81.73	.012
Avg.			6.95E-07	61.85	.009

SO₃

Run No.	Location	Date	lbs/dscf	ppm	02%
1	Stack	7-18-95	1.686E-06	8.11	4.9
2	Stack	7-18-95	1.471E-06	7.07	5.2
3	Stack	7-18-95	1.187E-06	5.71	4.9
Avg.			1.448E-06	6.96	5.0
1	Stack	7-19-95	1.334E-06	6.41	4.2
2	Stack	7-19-95	9.278E-07	4.46	4.2
3	Stack	7-19-95	9.778E-07	4.70	4.2
Avg.			1.080E-06	5.19	4.2
1	Stack	7-20-95	1.144E-06	5.50	5.2
2	Stack	7-20-95	1.178E-06	5.67	5.2
3	Stack	7-20-95	1.141E-06	5.49	5.1
Avg.			1.154E-06	5.55	5.15
1	Stack	8-08-95	1.916E-06	9.22	5.1
2	Stack	8-08-95	1.315E-06	6.32	5.3
3	Stack	8-08-95	1.160E-06	5.58	5.3
Avg.			1.464E-06	7.04	5.2

CO

<u>Run No.</u>	<u>Location</u>	<u>Test Date</u>	<u>ppm</u>	<u>%O2</u>
1	Stack	7-18-95	11.54	4.92
2	Stack	7-18-95	9.21	5.16
3	Stack	7-18-95	10.13	4.90
Avg.			10.29	4.99
1	Stack	7-19-95	51.07	4.22
2	Stack	7-19-95	52.00	4.16
3	Stack	7-19-95	32.42	4.16
Avg.			45.16	4.18
1	Stack	7-20-95	54.99	5.19
2	Stack	7-20-95	66.40	5.16
3	Stack	7-20-95	79.60	5.09
Avg.			67.00	5.15
1	Stack	8-08-95	25.17	5.09
2	Stack	8-08-95	20.18	5.28
3	Stack	8-08-95	18.11	5.27
Avg.			21.15	5.21

The complete results can be found on the computer printouts following.

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(07)	(08)	(09)
Date	7-18-95	7-18-95	7-18-95
Location	STACK BASELINE	STACK BASELINE	STACK BASELINE
Start time	07:37	11:35	13:58
End time	09:55	13:12	16:08
Barometric Pressure	In. Hg 29.93	29.93	29.93
Static Pressure	In. H2O -0.55	-0.55	-0.54
Volume of Condensate	Mls 222	238	246
Volume Sampled	DCF 79.324	74.776	76.303
Meter Correction Factor	1.02	1.02	1.02
Square Root of Delta P	1.126	1.110	1.110
Orifice Pressure	In. H2O 1.27	1.13	1.13
Meter Temperature	Deg. F 109	114	113
Flue Temperature	Deg. F 165	165	166
Percent CO2	% 15.90	14.50	15.30
Percent O2	% 4.90	5.20	4.90
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0174	0.0176	0.0169
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 29.89	29.89	29.89
Corrected Sample Volume	DSCF 75.31	70.35	71.91
Moisture in Flue Gas	% 12.2	13.7	13.9
Molecular Weight	Lb/LbMole 29.19	28.81	28.89
Velocity of Flue Gas	Fps 67.95	67.43	67.39
Volume of Flue Gas	ACFM 1,922,094	1,907,238	1,906,045
Volume of Flue Gas	DSCFM 1,423,811	1,387,911	1,382,507
Dust Concentration	Lb/DSCF 5.09E-07	5.51E-07	5.18E-07
Dust Concentration	Lbs/Hour 43.52	45.93	42.98
Dust Concentration	Grs/ACF 2.66E-03	2.83E-03	2.65E-03
Dust Concentration	Grs/DSCF 3.56E-03	3.86E-03	3.62E-03
Isokinetic Rate	% 108.8	104.3	107.0
Particulate Emissions	Lb/MBtu 0.007	0.007	0.007

Averages:

Stack Temperature	:	165.3	Percent O2	:	5.0
Vol Flue Gas	ACFM	: 1,911,792	DSCFM	:	1,398,076
Part Emis	Lb/DSCF	: 5.26E-07	Lb/Hour	:	44.14
	Grs/ACF	: 2.72E-03	Grs/DSCF	:	3.69E-03
	Lbs/MBtu	: 7E-03			

Total Source Analysis, Inc.
Particulate Test Analysis

Jacksonville Electric Authority
St. Johns River Power Park
Unit 1
95-058
Baseline - Trial Burn

Run Number	1	2	3
Data set	(04)	(05)	(06)
Date	7-19-95	7-19-95	7-19-95
Location	UNIT 1	UNIT 1	UNIT 1
Start time	07:02	10:06	12:30
End time	09:15	12:20	15:10
Barometric Pressure	In. Hg 30.01	30.01	30.01
Static Pressure	In. H2O -0.54	-0.55	-0.55
Volume of Condensate	Mls 246	263	258
Volume Sampled	DCF 77.789	77.375	76.610
Meter Correction Factor	1.02	1.02	1.02
Square Root of Delta P	1.140	1.137	1.149
Orifice Pressure	In. H2O 1.17	1.17	1.20
Meter Temperature	Deg. F 119	121	116
Flue Temperature	Deg. F 163	165	165
Percent CO2	% 15.02	17.01	17.01
Percent O2	% 4.22	4.16	4.16
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0077	0.0058	0.0114
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 29.97	29.97	29.97
Corrected Sample Volume	DSCF 72.93	72.35	72.29
Moisture in Flue Gas	% 13.7	14.6	14.4
Molecular Weight	Lb/LbMole 28.85	29.01	29.04
Velocity of Flue Gas	FpS 69.00	68.75	69.44
Volume of Flue Gas	ACFM 1,951,842	1,944,535	1,964,314
Volume of Flue Gas	DSCFM 1,429,061	1,404,476	1,422,188
Dust Concentration	Lb/DSCF 2.32E-07	1.76E-07	3.47E-07
Dust Concentration	Lbs/Hour 19.96	14.89	29.67
Dust Concentration	Grs/ACF 1.20E-03	9.02E-04	1.77E-03
Dust Concentration	Grs/DSCF 1.62E-03	1.23E-03	2.43E-03
Isokinetic Rate	% 105.0	106.0	104.6
Particulate Emissions	Lb/MBtu 0.003	0.002	0.004

Averages:

Stack Temperature	:	164.6	Percent O2	:	4.2
Vol Flue Gas	ACFM	1,953,564	DSCFM	:	1,418,575
Part Emis	Lb/DSCF	2.52E-07	Lb/Hour	:	21.50
	Grs/ACF	1.3E-03	Grs/DSCF	:	1.77E-03
	Lbs/MBtu	3E-03			

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number		1	2	3
Data set		(10)	(11)	(12)
Date		7-20-95	7-20-95	7-20-95
Location		STACK	STACK	STACK
		BASELINE	BASELINE	BASELINE
Start time		06:55	09:45	12:31
End time		09:25	12:03	14:35
Barometric Pressure	In. Hg	30.08	30.08	30.08
Static Pressure	In. H2O	-0.50	-0.55	-0.55
Volume of Condensate	Mls	248	251	275
Volume Sampled	DCF	76.287	77.627	78.313
Meter Correction Factor		1.02	1.02	1.02
Square Root of Delta P		1.121	1.152	1.167
Orifice Pressure	In. H2O	1.14	1.20	1.21
Meter Temperature	Deg. F	116	119	120
Flue Temperature	Deg. F	165	164	164
Percent CO2	%	15.17	15.18	15.22
Percent O2	%	5.20	5.16	5.09
Diameter of Nozzle	In	0.187	0.187	0.187
Area of Flue	Sq Ft	471.43	471.43	471.43
Sample Time	Min	120	120	120
Weight Gain	Grams	0.0327	0.0216	0.0207
F Factor	DSCF/MBtu	9780	9780	9780
Absolute Flue Pressure	In. Hg	30.04	30.04	30.04
Corrected Sample Volume	DSCF	71.88	72.78	73.29
Moisture in Flue Gas	%	14.0	13.9	15.0
Molecular Weight	Lb/LbMole	28.87	28.87	28.74
Velocity of Flue Gas	FpS	67.85	69.67	70.74
Volume of Flue Gas	ACFM	1,919,072	1,970,625	2,000,835
Volume of Flue Gas	DSCFM	1,400,050	1,440,016	1,444,038
Dust Concentration	Lb/DSCF	1.00E-06	6.54E-07	6.22E-07
Dust Concentration	Lbs/Hour	84.26	56.54	53.95
Dust Concentration	Grs/ACF	5.16E-03	3.37E-03	3.18E-03
Dust Concentration	Grs/DSCF	7.02E-03	4.58E-03	4.35E-03
Isokinetic Rate	%	105.6	103.9	104.4
Particulate Emissions	Lb/MBtu	0.013	0.008	0.008

Averages:

Stack Temperature	:	164.3	Percent O2	:	5.2
Vol Flue Gas	ACFM	1,963,511	DSCFM	:	1,428,035
Part Emis	Lb/DSCF	7.60E-07	Lb/Hour	:	64.92
	Grs/ACF	3.91E-03	Grs/DSCF	:	5.32E-03
	Lbs/MBtu	9.67E-03			

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(13)	(14)	(15)
Date	8-8-95	8-8-95	8-8-95
Location	STACK BASELINE	STACK BASELINE	STACK BASELINE
Start time	07:45	11:45	15:00
End time	11:10	14:05	17:12
Barometric Pressure	In. Hg 30.23	30.23	30.23
Static Pressure	In. H2O -0.53	-0.55	-0.55
Volume of Condensate	Mls 221	258	247
Volume Sampled	DCF 78.438	79.836	82.228
Meter Correction Factor	1.02	1.02	1.02
Square Root of Delta P	1.151	1.179	1.188
Orifice Pressure	In. H2O 1.25	1.33	1.29
Meter Temperature	Deg. F 119	121	114
Flue Temperature	Deg. F 170	170	170
Percent CO2	% 14.08	13.94	13.99
Percent O2	% 5.09	5.28	5.27
Diameter of Nozzle	In 0.187	0.187	0.187
Area of Flue	Sq Ft 471.43	471.43	471.43
Sample Time	Min 120	120	120
Weight Gain	Grams 0.0206	0.0192	0.0322
F Factor	DSCF/MBtu 9780	9780	9780
Absolute Flue Pressure	In. Hg 30.19	30.19	30.19
Corrected Sample Volume	DSCF 73.91	74.98	78.16
Moisture in Flue Gas	% 12.4	13.9	13.0
Molecular Weight	Lb/LbMole 28.92	28.71	28.84
Velocity of Flue Gas	FpS 69.71	71.67	72.06
Volume of Flue Gas	ACFM 1,971,860	2,027,159	2,038,175
Volume of Flue Gas	DSCFM 1,460,975	1,475,103	1,499,615
Dust Concentration	Lb/DSCF 6.14E-07	5.64E-07	9.08E-07
Dust Concentration	Lbs/Hour 53.87	49.97	81.73
Dust Concentration	Grs/ACF 3.22E-03	2.90E-03	4.73E-03
Dust Concentration	Grs/DSCF 4.30E-03	3.95E-03	6.35E-03
Isokinetic Rate	% 104.1	104.6	107.2
Particulate Emissions	Lb/MBtu 0.008	0.007	0.012

Averages:

Stack Temperature	:	170.0	Percent O2	:	5.2
Vol Flue Gas	ACFM	: 2,012,398	DSCFM	:	1,478,564
Part Emis	Lb/DSCF	: 6.95E-07	Lb/Hour	:	61.85
	Grs/ACF	: 3.62E-03	Grs/DSCF	:	4.87E-03
	Lbs/MBtu	: 9E-03			

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(01)	(02)	(03)
Date	7-18-95	7-18-95	7-18-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	07:50	10:40	13:00
End time	09:11	12:00	14:19
Barometric Pressure	In/Hg 29.93	29.93	29.93
Volume of Sample	Cu. Ft. 38.588	38.448	37.773
Meter Correction Factor	1.030	1.030	1.030
Meter Temperature	Deg. F 105	106	104
Percent O2	% 4.9	5.2	4.9
Volume of Solution	ML 195	208	215
Volume of Aliquot	ML 25	50	50
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 9.10	14.80	11.40
Volume of Metered Gas	DSCF 37.140	36.940	36.420
Concentration of SO3	LBS/DSCF 1.686E-06	1.471E-06	1.187E-06
Parts Per Million SO3	PPM 8.11	7.07	5.71

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(04)	(05)	(06)
Date	7-19-95	7-19-95	7-19-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	07:00	09:20	11:30
End time	08:21	10:36	12:36
Barometric Pressure	In/Hg 30.01	30.01	30.01
Volume of Sample	Cu. Ft. 38.617	38.698	39.312
Meter Correction Factor	1.030	1.030	1.030
Meter Temperature	Deg. F 116	110	110
Percent O2	% 4.2	4.2	4.2
Volume of Solution	ML 215	207	217
Volume of Aliquot	ML 50	50	50
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 12.85	9.40	9.60
Volume of Metered Gas	DSCF 36.556	37.018	37.606
Concentration of SO3	LBS/DSCF 1.334E-06	9.278E-07	9.778E-07
Parts Per Million SO3	PPM 6.41	4.46	4.70

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(07)	(08)	(09)
Date	7-20-95	7-20-95	7-20-95
Location	UNIT 1 STACK	UNIT 1 STACK	UNIT 1 STACK
Start time	06:55	09:25	11:42
End time	08:20	10:40	13:15
Barometric Pressure	In/Hg 30.08	30.08	30.08
Volume of Sample	Cu. Ft. 38.448	41.259	41.926
Meter Correction Factor	1.030	1.030	1.030
Meter Temperature	Deg. F 111	111	114
Percent O2	% 5.2	5.2	5.1
Volume of Solution	ML 215	187	175
Volume of Aliquot	ML 50	50	50
Normality of Barium	N 0.0100	0.0100	0.0100
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 11.10	14.10	14.75
Volume of Metered Gas	DSCF 36.800	39.491	39.920
Concentration of SO3	LBS/DSCF 1.144E-06	1.178E-06	1.141E-06
Parts Per Million SO3	PPM 5.50	5.67	5.49

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

Run Number	1	2	3
Data set	(10)	(11)	(12)
Date	8-8-95	8-8-95	8-8-95
Location	UNIT 1	UNIT 1	UNIT 1
	STACK	STACK	STACK
Start time	07:45	10:40	12:20
End time	09:20	11:50	13:52
Barometric Pressure	In/Hg 30.23	30.23	30.23
Volume of Sample	Cu. Ft. 37.138	39.168	39.120
Meter Correction Factor	1.030	1.030	1.030
Meter Temperature	Deg. F 117	118	119
Percent O2	% 5.1	5.3	5.3
Volume of Solution	ML 148	225	237
Volume of Aliquot	ML 50	50	50
Normality of Barium	N 0.0099	0.0099	0.0099
Volume to Titrate Blank	ML 0.00	0.00	0.00
Volume to Titrate Sample	ML 26.20	12.45	10.40
Volume of Metered Gas	DSCF 35.352	37.220	37.110
Concentration of SO3	LBS/DSCF 1.916E-06	1.315E-06	1.160E-06
Parts Per Million SO3	PPM 9.22	6.32	5.58

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
 MONITOR SPAN 100

UNIT NO: /

RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	GAS CALIBRATION GAS PPM	CORRECTED PPM, DRY BASIS
1	11.04	0.20	0.10	-0.10	27.80	28.60	0.80	29.73	11.54
2	8.90	0.10	0.10	0.00	28.60	28.40	-0.20	29.73	9.21
3	9.79	0.10	0.30	0.20	28.40	28.30	-0.10	29.73	10.13

B12

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

- C_{gas} = Effluent gas concentration, dry basis, ppm
- C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm
- C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
- C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
- C_{ma} = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
 MONITOR SPAN 25

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	CALIBRATION GAS PERCENT	CORRECTED PERCENT, DRY BASIS
1	5.13%	0.80%	0.30%	-2.00%	11.70%	11.00%	-2.80%	11.60%	4.92%
2	5.20%	0.30%	0.50%	0.80%	11.00%	11.40%	1.60%	11.60%	5.16%
3	5.08%	0.50%	0.50%	0.00%	11.40%	11.30%	-0.40%	11.60%	4.90%

B13

7-19-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS CALIBRATION DRIFT	GAS PPM	CORRECTED PPM, DRY BASIS
1	46.15	0.40	0.00	-0.40	27.30	26.60	-0.70	29.73	51.07
2	46.50	0.00	0.30	0.30	26.60	26.70	0.10	29.73	52.00
3	29.09	0.30	0.30	0.00	26.70	26.70	0.00	29.73	32.42

B14

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

- C_{gas} = Effluent gas concentration, dry basis, ppm
- C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm
- C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
- C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
- C_{ma} = Actual concentration of the upscale calibration gas, ppm

7-19-10

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
 MONITOR SPAN 25

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	CALIBRATION GAS PERCENT	CORRECTED PERCENT, DRY BASIS
1	5.13%	1.20%	1.10%	-0.40%	12.10%	12.10%	0.00%	11.60%	4.22%
2	5.08%	1.10%	1.20%	0.40%	12.10%	12.10%	0.00%	11.60%	4.16%
3	5.07%	1.20%	1.20%	0.00%	12.10%	11.90%	-0.80%	11.60%	4.16%

7-20-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSCALE GAS DRIFT	GAS CALIBRATION GAS PPM	CORRECTED PPM, DRY BASIS
1	53.61	0.30	0.20	-0.10	29.10	29.10	0.00	29.73	54.99
2	65.10	0.20	-0.20	-0.40	29.10	29.20	0.10	29.73	66.40
3	78.47	-0.20	-0.30	-0.10	29.20	29.10	-0.10	29.73	79.60

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

- C_{gas} = Effluent gas concentration, dry basis, ppm
- C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm
- C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
- C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
- C_{ma} = Actual concentration of the upscale calibration gas, ppm

B16

7-20-15

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.:

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	GAS CALIBRATION PERCENT	CORRECTED PERCENT, DRY BASIS
1	5.25%	0.10%	0.10%	0.00%	11.60%	11.60%	0.00%	11.60%	5.19%
2	5.19%	0.10%	0.10%	0.00%	11.60%	11.50%	-0.40%	11.60%	5.16%
3	5.06%	0.10%	0.20%	0.40%	11.50%	11.20%	-1.20%	11.60%	5.09%

B17

8-8-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO		MONITOR SPAN 100		UNIT NO.:						
RUN NUMBER	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	CALIBRATION GAS PPM	CORRECTED PPM, DRY BASIS	
1	23.81	0.10	0.10	0.00	58.00	59.00	1.00	62.00	25.17	
2	19.22	0.10	0.00	-0.10	59.00	58.90	-0.10	62.00	20.18	
3	17.51	0.00	0.00	0.00	58.90	61.00	2.10	62.00	18.11	

B18

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

- C_{gas} = Effluent gas concentration, dry basis, ppm
- C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm
- C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
- C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
- C_{ma} = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
 MONITOR SPAN 25

UNIT NO.: /

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GAS BIAS	FINAL UPSCALE GAS BIAS	UPSACLE GAS DRIFT	GAS CALIBRATION GAS PERCENT	CORRECTED PERCENT, DRY BASIS
1	5.19%	0.60%	0.00%	-2.40%	11.60%	11.30%	-1.20%	11.60%	5.09%
2	5.10%	0.00%	0.00%	0.00%	11.30%	11.10%	-0.80%	11.60%	5.28%
3	5.07%	0.00%	0.10%	0.40%	11.10%	11.10%	0.00%	11.60%	5.27%

SAMPLING AND ANALYTICAL PROCEDURES

TESTING EQUIPMENT - EPA METHOD 5B SAMPLING TRAIN

An Anderson Corporation Stack Sampler (Model 201415) was used at the sampling locations(s). The particulate sampling train consisted basically of a glass or stainless steel probe; a variable-heat-controlled filter oven with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 1/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; a control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated orifice; and an umbilical with various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe and oven temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressure, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20-hp sealed-head diaphragm vacuum pump, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, the percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Programmable Calculator

A Hewlett Packard, Model 32SII, programmable calculator was used to determine the isokinetic sampling rate at each sampling point.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Gelman Spectro Grade, glass-fiber-mat filters with 99.9 percent retention of 0.3-micron particles were individually numbered, placed in similarly numbered glass petri dishes, oven dried at 320 degrees Fahrenheit for two to three hours, cooled in a desiccator and individually weighed on a Mettler analytical balance (Model H54AR) to the nearest 0.1-milligram, and weighed a minimum of every six hours until two consecutive weights within ± 0.5 milligrams were obtained. Several 250 milliliter crucibles were desiccated for a minimum of 24 hours and weighed in the same manner as the filters and petri dishes. Also, several 200-gram quantities of Type 6-16 mesh indicating silica gel were weighed on an Ohaus beam balance and placed into separate airtight polypropylene storage bottles.

The number of sampling points and positions of the points in the flue at the sampling location(s), and the sampling time at each point were determined prior to the particulate testing. The sampling procedures were performed in accordance with the Environment Protection Agency's Reference Method 5B, "Determination of Particulate Emissions from Stationary Sources" in the July 1, 1994 Federal Register, "Standards of Performance for New Stationary Sources" and subsequent revisions.

Before each test run, a particulate sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of the sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling positions in the flue. A standard impinger assembly was prepared by adding 200 milliliters of distilled water, to each of the first two glass impingers. The third glass impinger was left dry and the fourth was filled with approximately 400 grams of type 6-16 mesh indicating silica gel. The entire impinger assembly was then placed in an ice bath. A disc filter was removed from its petri dish and placed inside a filter holder. The filter holder was then placed inside a filter oven and assembled to the sampling probe outlet and the impinger unit inlet. Next, an umbilical and sampling hoses were connected to the sampling probe, filter oven, impinger unit, vacuum pump and the control unit, accordingly. The probe and oven were then heated to and held at temperatures between 300 and 340 degrees Fahrenheit. The inclined draft gauges were checked and zeroed.

As soon as the probe and oven temperatures had stabilized the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the particulate sampling train had been assembled, as previously described, the particulate sampling was performed.

The sampling nozzle, probe and filter holder were washed with nanograde acetone. The acetone washing and acetone blank were collected in labeled polypropylene sample bottles and retained for later evaporation, desiccation and weighing.

Flue gas concentrations (percentage of CO_2 , percentage of O_2 , and percentage of CO) were determined by taking several orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

Prior to the particulate sampling, a preliminary temperature and velocity traverse, orsat analysis and calculations were performed to determine a correct nozzle and orifice size, and the factors that would be used in calculating the isokinetic sampling rate for each sampling point. Knowing the actual pressure differential across the pitot tube used, the isokinetic sampling rate was calculated at each sampling point using a Hewlett Packard, Model 32SII, Programmable Calculator.

Three test runs were performed at the sampling location(s). The sampling data for each test run was recorded on a field test form during each of the sampling periods.

After the completion of a test run, the following procedures were performed: A final leak-check was performed at highest vacuum during the test for one minute and the leakage rate recorded. The flue gas moisture collected in the first three impingers was measured and recorded. The moisture laden silica gel in the fourth impinger was transferred to an appropriately marked, airtight polypropylene bottle and retained for later weighing. The weight gain of the silica gel moisture collection was added to the measured moisture condensed for that test run. The sample nozzle, probe and filter holder were capped and taken to a clean area for sample recovery. At the recovery area, the disc filter was carefully removed from the filter holder and transferred to its petri dish for later weighing.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

After the field testing was completed, the following procedures were performed: Each silica gel moisture collection was weighed in its storage bottle on an Ohaus beam balance with sensitivity of 0.1-gram. Each disc filter and petri dish was oven dried at 320 degrees Fahrenheit for six hours and cooled in a desiccator for two hours before weighing. Each acetone washing and acetone blank was transferred from its sample bottle to a preweighed crucible for evaporation. When the acetone in a crucible had completely evaporated, it was oven dried at 320 degrees Fahrenheit for six hours and transferred to a desiccator for further drying at room temperature. Each acetone blank collected was used to determine the amount of residual weight each crucible retained due to acetone impurities. Each disc filter and petri dish, acetone washing and acetone blank was weighed on a Mettler analytical balance (Model H54AR) with a sensitivity of 0.1-milligram.

All test instruments were recalibrated to determine the deviation percentage.

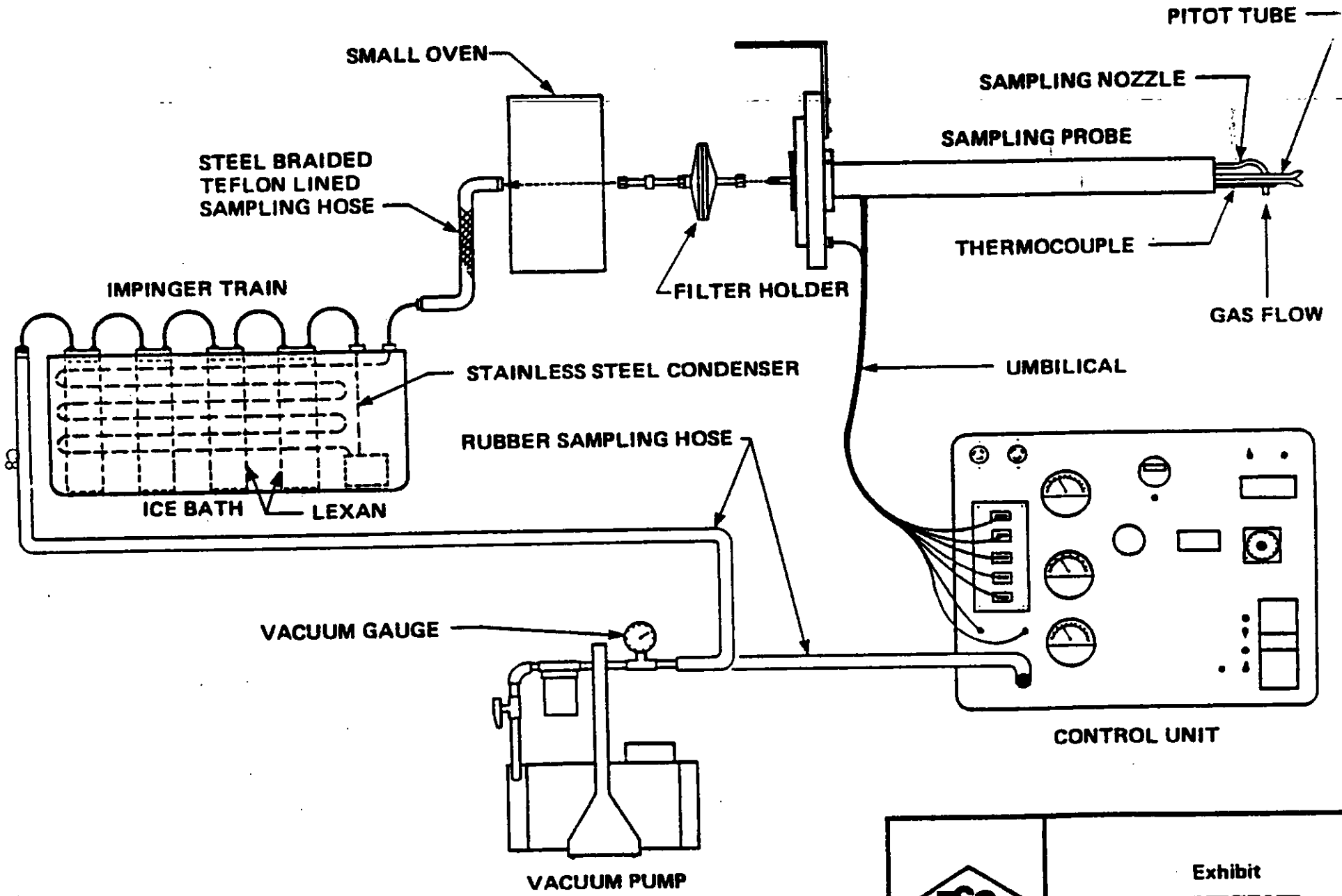
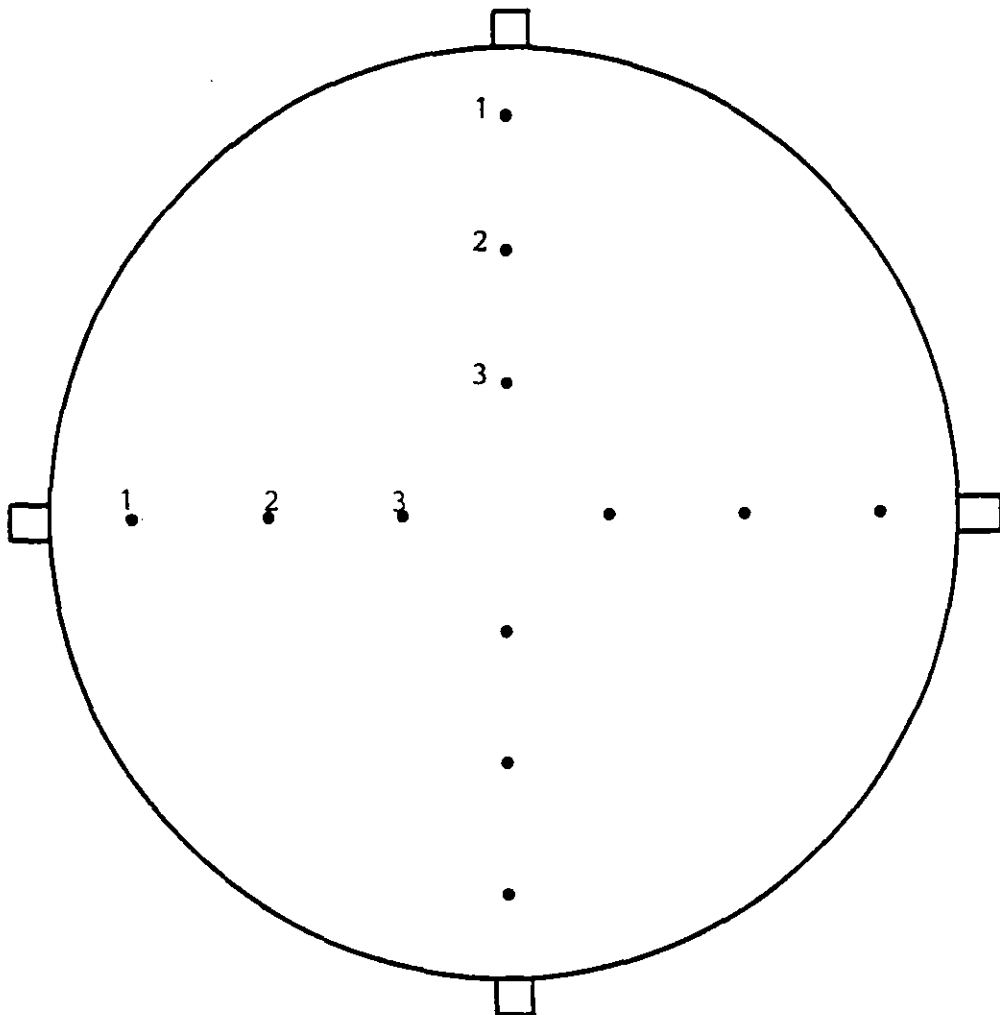


Exhibit
**PARTICULATE
 SAMPLING TRAIN**


JEA-SJRPP UNIT 1&2
 PARTICULATE SAMPLE POINTS



<u>POINTS</u>	<u>DISTANCE FROM INSIDE WALL</u>
1	12 7/8"
2	3' 6 7/8"
3	7' 3 "

DIAMETER STACK 24' 6"
CROSS SECTION AREA 471.43 FT²

NOT TO SCALE

 Total Source Analysis, Inc. Environmental Testing Consultants	Exhibit STACK TEST POINT LOCATIONS
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TESTING EQUIPMENT - EPA REFERENCE METHOD 8

Sulfuric Acid Mist and Sulfur Dioxide

A Nutech Corporation Stack Sampler (Model 2010) was used at the sampling location(s). The sampling train consisted basically of an effective length stainless steel probe, a standard glass impinger assembly with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 3/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated variable-diameter orifice; and an umbilical and various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressures, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20 hp sealed-head diaphragm vacuum pump, a Dwyer flowmeter; a plastic bag housed in a protective aluminum case, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 8 (SO₃)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Before each test run a sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of a sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling point positions in the flue. A standard impinger assembly was prepared by adding 100 milliliters of 80% Isopropanol to the first glass impinger. A glass filter holder was placed between the first and second impingers to catch sulfuric acid mist carryover, and 100 milliliters of 3% hydrogen peroxide was added to the second and third impingers. The fourth impinger was left dry and the fifth was filled with 250 grams of type 6-16 mesh indicating silica gel.

The entire impinger assembly was then placed into an ice bath. Next, an umbilical and sampling hoses were connected to the sampling probe and impinger unit, a vacuum pump and a control unit, accordingly. The probe was then heated to and held at approximately 248 degrees Fahrenheit. All magnehelic gauges were checked and zeroed. As soon as the probe temperatures had stabilized, the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the sampling train had been assembled, the probe heated, and the entire system leak-checked, as previously described, the SO₃ sampling was performed.

Flue gas concentrations (percentage of CO₂, percentage of O₂, and percentage of CO) were determined by taking several Orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 8

Container number one: A 100 ml aliquot of this solution was pipetted into a 250-ml Erlenmeyer flask, then 2 to 4 drops of thorin indicator were added, and the sample was titrated to a pink endpoint using 0.0100 normality barium perchlorate. The titration was repeated with a second aliquot of sample and titration values averaged. Replicate titrations must agree within 1 percent or ±0.2 ml., whichever is greater.

Container number two: The solution in the container holding the contents of the second and third impingers were discarded.

Blanks were prepared by adding 2 to 4 drops of thorin indicator to 100 ml of 80 percent isopropanol. The blanks were titrated in the same manner as the samples.

All test instruments were recalibrated to determine the deviation percentage.

EPA METHOD 10

DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES

1. Principle

1.1 Principle - An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a nondispersive infrared analyzer (NDIR).

2. Range and Sensitivity

2.1 Range - 0 to 1,000 ppm.

2.2 Sensitivity - minimum detectable concentration is 0.1 ppm for a 0 to 1,000 ppm span.

3. Precision and Accuracy

3.1 Precision - The precision of most NDIR analyzers is approximately ± 2 percent of span.

3.2 Accuracy - The accuracy of most NDIR analyzers is approximately ± 5 percent of span after calibration.

4. Apparatus

4.1 Probe - Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

4.2 Air-cooled Condenser or Equivalent - To remove any excess moisture.

4.3 Valve - Needle valve, or Equivalent, to adjust flow rate.

4.4 Pump - Leak-free diaphragm type, or equivalent, to transport gas.

4.5 Rate Meter - Rotometer, or equivalent, to measure a flow range from 0 to 1.0 liter per minute (0.035 cfm).

4.6 Flexible Bag - Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 feet). The bag was leak tested in the laboratory before using by evacuating the bag with a pump followed by a dry gas meter. When evacuation was complete, there was no flow through the meter.

5. Analysis

5.1 Carbon Monoxide Analyzer - A Horiba Model 321 or Fuji Model 730 nondispersive infrared analyzer is used. The instrument was demonstrated by the manufacturer to meet or exceed manufacturer's specifications and those described in this method.

6. Calibration Gases

6.1 Calibration Gases - Known concentration of CO in nitrogen for instrument span, prepurified grade of nitrogen for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases are certified by the manufacturer to be within ± 2 percent of the specified concentration.

6.2 Silica Gel - Indicating type, 6 to 16 mesh, dried at 175 degrees C (347 degrees F) for two hours.

6.3 Ascarite

7. Procedure

7.1 Continuous Sampling - Set up the equipment as shown in Figure 10-1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. CO₂ content of the gas may be determined. During the sampling system bias check, the system is operated at the normal sampling rate, no adjustments to the measurement system, other than those necessary to achieve proper calibration gas flow rates at the analyzer, are made. Alternately, introduce the zero and upscale gases until a stable response is achieved. The tester determined the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases. Note the longer of the two times as the response time. The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas.

APPENDIX

Sample Calculations

NOMENCLATURE

act	= actual cubic feet	P_f	= static pressure in flue in inches water, average
acfm	= actual cubic feet per minute	$\sqrt{\Delta P}$	= square root of velocity head in inches water, average
A	= effective area of flue in square feet	%S	= percent sulfur by weight, dry basis
acm	= actual cubic meters	scf	= standard cubic feet
acmm	= actual cubic meters per minute	scm	= standard cubic meters
A_n	= inside area of sampling nozzle in square feet	T_{std}	= absolute temperature of air in degrees Rankine at standard conditions (528 degrees)
B_{ws}	= water vapor in gas stream, proportion by volume	T_S	= absolute temperature of flue gas in degrees Rankin, average
%C	= percent carbon by weight, dry basis	T_m	= absolute temperature at meter in degrees Rankine, average
%CO	= percent carbon monoxide by volume, dry basis	V_S	= velocity of flue gas in feet (meters) per second
%CO ₂	= percent carbon dioxide by volume, dry basis	V_l	= volume of condensate through the impingers in milliliters
C_p	= pitot tube coefficient	V_{lc}	= volume of liquid collected in condenser in milliliters plus weight of liquid absorbed in silica gel in grams indicated as milliliters
D_l	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr constant	V_m	= volume of metered gas measured at meter conditions in cubic feet (meters)
D_l'	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr calculated	V_{ms}	= volume of metered gas corrected to dry standard conditions in cubic feet (meters)
dscf	= dry standard cubic feet	V_o	= volume of flue gas at actual conditions in cubic feet (meters) per minute
dscfh	= dry standard cubic feet per hour	Q_{sd}	= volume of flue gas corrected to dry standard conditions in cubic feet (meters) per hour
dscm	= dry standard cubic meters	V_t	= total volume of flue gas sampled at actual conditions in cubic feet (meters)
dscmh	= dry standard cubic meters per hour	V_w	= volume of water vapor in metered gas corrected to standard conditions in cubic feet (meters)
fps	= feet per second	V_{wc}	= volume of water condensed in impingers corrected to standard conditions
F_r	= ratio factor of dry flue gas volume to heat value of combusted fuel in dry standard cubic feet (meters) per million Btu (calories)	V_{wsg}	= volume of water collected in silica gel corrected to standard conditions
gms	= grams	W_a	= total weight of dust collected per unit volume in grains (grams) per actual cubic feet (meters)
gm-mole	= gram-mole	W_d	= total weight of dust collected per unit volume in pounds (grams) per dry standard cubic feet (meters)
grs	= grains	W_g	= total weight of dust collected in grams
ΔH	= orifice pressure drop in inches water, average	W_h	= total weight of dust collected per unit volume in pounds (grams) per hour, dry basis
%H	= percent hydrogen by weight, dry basis	W_p	= total weight of dust collected in pounds
H_c	= heat of combustion in Btu per pound, dry basis	W_s	= total weight of dust collected per unit volume in grains (grams) per dry standard cubic feet (meters)
hr	= hour	W_{sg}	= impinger silica gel weight gain in grams
%I	= percent isokinetic	Y	= metered gas volume correction factor
in. Hg	= inches mercury	θ	= total elapsed sampling time in minutes
lbs	= pounds		
lb-mole	= pound-mole		
%M	= percent moisture by volume		
mmBtu	= million Btu		
mmcal	= million calories		
mm Hg	= millimeters mercury		
mps	= meters per second		
M_s	= molecular weight in pounds (gram) per pound (gram) mole (wet basis)		
%N	= percent nitrogen by weight, dry basis		
%N ₂	= percent nitrogen by difference, dry basis		
%O	= percent oxygen by difference, dry basis		
%O ₂	= percent oxygen by volume, dry basis		
P_b	= barometric pressure in inches mercury		
P_{std}	= standard absolute pressure (29.92 in Hg)		
P_s	= absolute pressure in flue in inches (millimeters) mercury		



EPA DUST LOADING Formulas

- (1) ABSOLUTE FLUE PRESSURE (In. Hg)

$$P_s = (\pm P_f + 13.6) + P_b$$

- (2) WATER VAPOR VOLUME IN METERED GAS CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{wc} = .04707 \times V_l \quad V_{wsg} = .04715 \times W_{sg}$$

$$V_w = V_{wc} + V_{wsg}$$

- (3) METERED GAS VOLUME CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{ms} = 17.64 \times Y \times V_m \frac{P_b + (\Delta H/13.6)}{T_m}$$

- (4) PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_w}{(V_{ms} + V_w)} \%M = B_{ws} \times 100$$

- (5) AVERAGE RESULTS OF FLUE GAS ANALYSIS

$$\%N_2 \text{ dry} = 100 - (\%CO_2 + \%O_2 + \%CO)$$

- (6) APPROXIMATE MOLECULAR WEIGHT OF FLUE GAS (WET BASIS) (lb/lb-mole)

$$M_s = (18 \times B_{ws}) + ((.440 (\%CO_2) + .320 (\%O_2) + .280 (\%N_2 + \%CO)) \times (1 - B_{ws}))$$

- (7) GAS VELOCITY IN FLUE (fps)

$$V_s = 85.49 \times C_p \times (\sqrt{\Delta P}) \text{ avg. } \sqrt{\frac{T_s}{P_s \times M_s}}$$

- (8) FLUE GAS VOLUME AT ACTUAL CONDITIONS (acfm)

$$V_0 = V_s \times A \times 60$$

- (9) FLUE GAS VOLUME CORRECTED TO DRY STANDARD CONDITIONS (dscfh)

$$Q_{sd} = \frac{T_{std}}{29.92} \times \frac{P_s}{T_s} \times V_0 \times (1 - B_{ws}) \times 60$$

- (10) TOTAL FLUE GAS VOLUME SAMPLED AT ACTUAL CONDITIONS (acf)

$$V_t = \left[V_m \times Y \times \frac{T_s}{T_m} \times \left(\frac{P_b + (\Delta H/13.6)}{P_s} \right) \right] + \left(0.00287 \times V_{lc} \times \frac{T_s}{P_s} \right)$$



(11) DUST CONCENTRATION FOR INDIRECT HEATING UNIT ACTUAL CONDITIONS AND STANDARD CONDITIONS

$$W_g = \text{gms}$$

$$W_p = 0.002205 \times W_g \text{ (lb)}$$

$$W_d = \frac{V_p}{V_{ms}} \text{ (lb/dscf)}$$

$$W_h = W_d \times Q_{sd} \text{ (lb/hr dry)}$$

$$W_a = \frac{7000 \times W_p}{V_t} \text{ (gr/acf)}$$

$$W_s = 7000 \times W_d \text{ (gr/dscf)}$$

$$D_l = \frac{9780 \times 20.9 \times W_d}{(20.9 - \%O_2)} \text{ (lb/mmBtu with constant } 9780^\circ\text{F)}$$

$$F_r = \frac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{H_c} \text{ (dscf/mmBtu)}$$

$$D_l' = \frac{20.9 \times W_d \times F_r}{(20.9 - \%O_2)} \text{ (lb/mmBtu with calculated } F_r)$$

(12) PERCENT OF ISOKINETIC SAMPLING

$$\%I = \frac{1.667 \times T_s \times \left\{ 0.00267 \times V_{lc} + \left[\frac{V_m \times Y}{T_m} \times (P_b + \Delta H/13.6) \right] \right\}}{\Theta \times V_s \times P_s \times A_n}$$



SO₂ SO₃ NOMENCLATURE

%C	=	Percent carbon by weight, dry basis
C _{SO₂}	=	Concentration of sulfur dioxide, dry basis corrected to standard conditions (lb/dscf)
C _{SO₃}	=	Concentration of sulfur trioxide, dry basis corrected to standard conditions (lb/dscf)
ESO ₂	=	Emissions of SO ₂ (lb/mmBtu)
ESO ₃	=	Emissions of SO ₃ (lb/mmBtu)
F	=	F factor, ratio factor of dry flue gas volume to heat of combusted fuel in dry standard cubic feet per million Btu.
%H	=	Percent hydrogen by weight, dry basis
H _c	=	Heat of combustion, dry basis, Btu/lb.
In Hg	=	inches mercury
mls	=	Milliliters of the standard sulfuric acid used to standardize the barium perchlorate solution
MI _t	=	Milliliters required to titrate the standard sulfuric acid solution
%N	=	Percent nitrogen by weight, dry basis
N _s	=	Normality of sulfuric acid as labeled on bottle
N _t	=	normality of barium perchlorate titrant, milliequivalents/ml
%O	=	Percent oxygen by weight, dry basis
%O ₂	=	Percent oxygen by volume, dry basis
P _b	=	Barometric pressure in inches, mercury
P _{std}	=	Standard absolute pressure (29.92 in. Hg)
PPM	=	Parts per million
%S	=	Percent sulfure by weight, dry basis
T _m	=	Absolute temperature at meter in degrees Rankine, average
V _a	=	Volume of sample aliquot titrated, ml.
V _m	=	Volume dry gas as measured by the dry gas meter, (dcf)
V _{mstd}	=	Volume dry gas measured by the dry gas meter corrected to standard conditions (dscf)
V _{soln}	=	Total volume of solution in which the sulfur dioxide sample is contained, 100 ml.
V _t	=	Volume of barium perchlorate titrant used for the sample, ml (average of replicate titrations)
V _{tb}	=	Volume of barium perchlorate titrant used for the blank, ml.
Y	=	Dry gas meter calibration factor



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EPA - SO₃ FORMULAS

- (1) $N_t = \frac{(mis) \times (Ns)}{Ml_t}$
- (2) $V_{mstd} = 17.64 \frac{(Y) (V_m) (P_b)}{T_m}$
- (3) $C_{SO_3} = 1.081 \times 10^{-4} \frac{(V_t - V_{tb}) N \left(\frac{Vsolin}{Va}\right)}{V_{mstd}}$
- (4) $PPM_{SO_3} = C_{SO_3} \times 4.822 \times 10^8$
- (5) $ES_{O_3} = C_{SO_3} (F) \frac{20.9}{20.9 - \%O_2}$
- (6) $Fr = \frac{10^8 \times [(3.84 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.48 \times \%O)] (dscf/mBtu)}{Hc}$

SAMPLE CALCULATION

- (1) $N_t = \frac{(\text{---} mis) \times (\text{---} N)}{\text{---} mis}$
- (2) $dscf = 17.64 \frac{(\text{---}) (\text{---} cf) (\text{---} INHg)}{\text{---} ^\circ R}$
- (3) $lb/dscf = 1.081 \times 10^{-4} \frac{(\text{---} ml - \text{---} ml) \text{---} N \left(\frac{\text{---} ml}{\text{---} ml}\right)}{\text{---} dscf}$
- (4) $ppm = \text{---} lb/dscf \times 6.024 \times 10^8$
- (5) $lb/mBtu = \text{---} lb/dscf \times \text{---} dscf/mBtu \frac{20.9}{(20.9 - \text{---} \%)}$
- (6) $dscf/mBtu = \frac{10^8 \times [(3.84 \times \text{---}) + (1.53 \times \text{---}) + (0.57 \times \text{---}) + (0.14 \times \text{---})]}{\text{---} Btu/lb}$



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CO CALCULATION

$$\text{lb/dscf} = 0.726 \times 10^{-7} \times \text{PPM}$$

$$\text{lb/MBtu} = \text{lb/dscf} \times \text{F Factor} \times \frac{20.9}{(20.9 - \%O_2)}$$

$$\text{lb/hour} = \text{lb/dscf} \times \text{dscfm} \times 60 \text{ min./hr.}$$



TSA Field Data Sheets

Client J.E.A. S.J.R.P.P.						Date 18 JULY 95		Page 1 Of 2			
Project No. 95-058-F1			Operator O'NEILL, HARLEY			Great Analysis 3A					
Sampling Location Unit # 1 Stack				Run No. 1		CO ₂		+ O ₂		O ₂	CO
Filter No. 95-026		Acetone No.		Condensate 206.0		16.156					
Barometric Pressure 29.93			Static Pressure -.55		Probe Number A-10-1F		15.9		4.9		
Nozzle Diameter .187		Nozzle Number F23		Pilot Coefficient .834		Pilot Number A-10-1-1F					
Meter Corr. Factor 1.023			Meter-Orifice Rac # 1			3.118					
Sample Pt. Time 10min 120min Test		Assumed % Moisture 13			Leak Test		Before .005 AT 15IN		After .006 @ 15"		
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0737										* 545.625
A	1.30	1.140	2.73	168	320	68	310	68	68	2	553.655
2	1.35	1.162	1.22	165	325	67	312	112	104	2	560.381
3	1.10	1.049	0.99	161	326	67	350	117	105	2	566.329
B	1.30	1.140	1.17	163	328	67	325	106	105	2	572.915
2	1.25	1.118	1.13	167	322	66	330	116	107	2	579.649
3	1.27	1.127	1.14	165	329	67	334	120	108	2	586.101
C	1.31	1.145	1.18	164	325	66	332	111	108	2	592.905
2	1.29	1.136	1.16	162	322	66	335	121	109	2	599.388
3	1.21	1.100	1.09	167	330	67	340	123	111	2	605.511
D	1.29	1.136	1.16	164	322	67	330	112	110	2	612.284
2	1.30	1.140	1.17	165	329	66	315	121	111	2	618.689
3	1.25	1.118	1.14	167	324	66	324	123	112	2	624.949
Stop	0955										
AV →		(1.13)	(1.27)	(164.8)				(108.7)	(2)		(79.324)
		1.126									cu/ft.

Pitot Tube Leak Check: Before .005 AT 15 INCHES After .006 AT 15 INCHES
 Integrated Bag Leak Check: Before _____ After _____



E1

Client: **J.E.A. S.J.R.P.P.** Date: **7-18-95** Page 1 of 2

Project No. **95-058-F1** Operator: **H. Orisk** Orsat Analysis

Sampling Location: **Unit # Stack** Run No. **2** CO₂ **14.5** + O₂ **5.2** O₂ **5.2** CO

Filter No. **95-015 FL** Acetone No. **222.0 ml** Condensate **16.0 SG**

Barometric Pressure **29.93** Static Pressure **-.55** Probe Number **A-10-1F** **14.5** **5.2**

Nozzle Diameter **.187** Nozzle Number **FL 3** Pitot Coefficient **.834** Pitot Number **A-10-1-1F**

Meter Corr. Factor **1.023** Meter-Orifice **Rac # 3.118**

Sample Pt. Time: **10 min 120 min Test** Assumed % Moisture: _____ Leak Test: **Before .001 AT 12 INCHES .000 AT STACK After**

Sample Point	ΔP	√ΔP	ΔH	- Temperature °F						Vac. Pr. (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	11:35										* 627.147
A. 1	1.34	1.158	1.22	167	322	65	290	108	108	3	637.802
2	1.35	1.162	1.23	162	328	66	310	115	109	2	639.654
3	1.10	1.044	1.00	166	325	67	312	116	110	2	645.23
B. 1	1.21	1.100	1.10	165	329	67	320	109	105	2	651.683
2	1.35	1.162	1.23	164	330	67	322	120	110	2	657.135
3	1.12	1.058	1.02	164	328	66	322	123	111	2	664.260
C 1	1.34	1.158	1.22	165	325	67	323	121	110	2	670.708
2	1.25	1.120	1.14	165	325	67	321	123	111	2	677.161
3	1.10	1.044	1.00	167	327	66	325	123	112	2	683.136
D 1	1.35	1.162	1.23	166	324	66	329	113	111	2	689.762
2	1.32	1.149	1.20	162	325	67	330	121	111	2	696.363
3	1.08	1.039	0.98	167	331	67	322	122	112	2	701.923
Stop	1:12										

AV → (1.11) (1.13) (165) (114.1) (2) (74.786) cu/ft.

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



Project No. 95-058-F1		Operator O'NEILL, HARLEY C.		Orsat Analysis			
Sampling Location Unit # Stack		Run No. 3		CO ₂	+O ₂	O ₂	CO
Filter No. 95-016 FL	Acetone No.	Condensate 16.39 SG		15.3		4.9	
Barometric Pressure 29.93		Static Pressure -.54	Probe Number A-10-1F		15.3		4.9
Nozzle Diameter .187	Nozzle Number FL 3	Pitot Coefficient .834	Pitot Number A-10-1-1F				
Meter Corr. Factor 1.023		Meter-Orifice Rac # 3.118					

Sample Pt. Time: **10 min 120 min Test** Assumed % Moisture: _____ Leak Test: **Before .005 AT 12 INCH After .001 AT 12 INCH**

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1:58										702.619
D 1	1.35	1.162	1.23	164	323	67	329	109	108	2	710.100
2	1.34	1.158	1.22	167	329	66	328	115	108	2	716.774
3	1.38	1.175	1.26	166	325	66	325	119	109	2	723.275
A 1	1.25	1.118	1.14	166	326	67	325	110	108	2	729.749
2	1.23	1.109	1.12	167	327	67	322	119	109	2	735.998
3	1.14	1.068	1.03	165	328	66	323	121	110	2	742.473
B 1	1.30	1.140	1.17	165	328	66	328	109	109	2	748.681
2	1.32	1.149	1.19	166	327	67	325	120	110	2	754.736
3	1.08	1.039	0.98	167	324	67	326	120	111	2	760.975
C 1	1.14	1.068	1.03	165	324	66	327	113	110	2	766.992
2	1.31	1.145	1.19	166	325	67	326	122	110	2	773.389
3	1.05	1.025	0.95	167	328	67	326	122	111	2	778.917
Stop	4:08										

AV → (1.11 | 1.13 | 165.92) (~~11.3~~) (2) (76.303) cu/ft.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



Client J.E.A. S.J.R.P.P.						Date 7-19-95		Page <u>1</u> Of <u>2</u>			
Project No. 95-058-F1			Operator Harley O'Neill			Orsat Analysis					
Sampling Location Unit #1 Stack					Run No. 1	CO ₂	+ O ₂	O ₂	CO		
Filter No. 95-017FL		Acetone No.		Condensate 228 mL 17.9 SG							
Barometric Pressure 29.93 30.01		Static Pressure -.54		Probe Number A-10-1F							
Nozzle Diameter .187		Nozzle Number FL3		Pitot Coefficient .834		Pitot Number A-10-1-1F					
Meter Corr. Factor 1.023		Meter-Orifice Rac#		3.118							
Sample Pt. Time 10min 120min Test		Assumed % Moisture		Leak Test		Before 001 AT 12 INCHES		After CO.5 AT 12 INCHES			
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	7:02										*779.102
D 1	1.30	1.140	1.18	167	329	66	325	112	112	2	785.729
2	1.31	1.145	1.19	161	322	62	326	118	113	2	792.671
3	1.35	1.162	1.22	160	323	62	329	123	113	2	798.618
A 1	1.33	1.153	1.20	162	327	64	328	121	114	2	805.439
2	1.27	1.100	1.10	163	325	62	328	126	115	2	811.804
3	1.05	1.025	0.95	163	325	62	327	128	116	2	818.142
B 1	1.32	1.149	1.20	164	326	62	325	120	116	2	824.448
2	1.33	1.153	1.20	164	327	63	326	128	116	2	830.565
3	1.39	1.179	1.26	163	326	62	326	129	117	2	836.965
C 1	1.31	1.145	1.19	163	324	64	329	118	117	2	843.845
2	1.36	1.166	1.23	164	325	64	328	126	117	2	850.385
3	1.25	1.118	1.13	164	327	64	328	129	118	2	856.891
Stop	0915										
AV →		(1.14)	(1.17)	(16317)				(11925)	(2)		(77.789) cu/ft.
ES →	105.0										

Pitot Tube Leak Check: Before OK @ 3" w.c. After OK
 Integrated Bag Leak Check: Before OK After OK



Client J.E.A. S.J.R.P.P.						Date 7-19-95		Page 1 of 2			
Project No. 95-058-F1			Operator ONEILL, HARLEY C.			Orsat Analysis					
Sampling Location Unit #1 Stack			Run No. 2			CO ₂	+ O ₂	O ₂	CO		
Filter No. 95-018 FL		Acetone No.		Condensate 245 mL 17.5 SG							
Barometric Pressure 30.01			Static Pressure -.55		Probe Number A-10-1F						
Nozzle Diameter 187		Nozzle Number FL 3		Pitot Coefficient .834		Pitot Number A-10-1-1F					
Meter Corr. Factor 1.023			Meter-Orifice Rac # 1 3.118								
Sample Pt. Time 10min 120min Test		Assumed % Moisture			Leak Test		Before .006 AT 12 INCHES After .000 AT 12 INCHES				
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	10:06										*857.701
D 1	1.25	1.118	1.132	165	322	66	324	115	115	2	864.625
2	1.30	1.140	1.177	164	325	64	327	121	115	2	870.995
3	1.05	1.029	0.951	164	327	61	327	125	115	2	877.185
A 1	1.50	1.229	1.388	165	325	62	327	117	116	2	883.932
2	1.40	1.183	1.268	164	326	61	326	126	116	2	890.322
3	1.21	1.100	1.096	166	326	62	329	128	117	2	896.675
B 1	1.25	1.118	1.132	165	323	62	329	129	118	2	903.985
2	1.35	1.162	1.222	165	324	63	328	130	118	2	909.910
3	1.21	1.100	1.096	165	324	62	325	129	118	2	915.434
C 1	1.31	1.145	1.186	166	325	61	327	123	118	2	921.955
2	1.35	1.162	1.222	166	326	61	327	127	118	2	928.502
3	1.37	1.170	1.240	167	324	62	325	128	118	2	935.076
Stop	1220										
AV →		(1.137)	(1.173)	(165.167)				(120.833)	(2)		(77.375) cu/ft.

Pitot Tube Leak Check: Before OK @ 2" H₂O After OK.
 Integrated Bag Leak Check: Before OK After OK.



Client J.E.A. S.J.R.P.P.		Date 7-19-95	Page 1	Of 2
Project No. 95-058-F1		Operator O'NEILL, HANLEY C.		Orsat Analysis
Sampling Location Unit # 1 Stack		Run No. 3		CO ₂ + O ₂ O ₂ CO
Filter No. 95-019 FL	Acetone No.	Condensate 240 ml	17.5 SG 17.01 4.16	
Barometric Pressure 30.01		Static Pressure - .55	Probe Number A-10-1F	
Nozzle Diameter .187	Nozzle Number FL 3	# Pitot Coefficient .834	Pitot Number A-10-1-1F	
Meter Corr. Factor 1.023		Meter-Orifice Rac # 1 3.118		

Sample Pt. Time 10 min 120 min Test	Assumed % Moisture	Leak Test	Before 008 AT 1/2 INCH	After 000 AT 1/2 INCH
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	12:30										* 935.333
D. 1	1.35	1.162	1.222	164	325	62	329	113	113	2	941.950
2	1.40	1.183	1.268	165	324	60	328	117	113	2	948.415
3	1.20	1.095	1.087	165	325	61	327	121	113	2	954.878
A. 1	1.38	1.175	1.250	164	326	60	327	120	113	2	961.398
2	1.40	1.183	1.268	164	327	63	324	122	113	2	967.953
3	1.11	1.054	1.009	167	322	60	327	123	113	2	973.280
B. 1	1.35	1.162	1.222	165	323	61	326	113	112	2	980.209
2	1.40	1.183	1.268	165	325	62	328	118	112	2	986.853
3	1.39	1.179	1.359	167	327	61	331	119	112	2	992.636
C 1	1.36	1.166	1.231	166	326	61	327	114	112	2	998.876
2	1.43	1.196	1.275	168	327	64	325	121	112	2	005.715
3	1.11	1.054	1.005	164	326	63	325	123	112	2	011.943
Stop	13:10										

AV → ^{TR.} (4.248) (1.198) (165.333) (115.583) (2) (76.610) cu./ft.
1.149

Pitot Tube Leak Check: Before OK @ 3" w.c. After OK
 Integrated Bag Leak Check: Before OK After OK



Client J.E.A. S.J.R.P.P.				Date 20 July 95				Page 1 of 2			
Project No. 95-058-F1			Operator O'NEILL, HARLEY C.			Orsat Analysis					
Sampling Location Unit #1 Stack			Run No. 1			CO ₂		+ O ₂		O ₂	CO
Filter No. 95-020 FL		Acetone No.		Condensate 232 ml ^{15.856}		15.17		5.2			
Barometric Pressure 30.08			Static Pressure - 54		Probe Number A-10-1F						
Nozzle Diameter .187		Nozzle Number FL 3		Pitot Coefficient .834		Pitot Number A-10-1-1F		15.18		5.16	
Meter Corr. Factor 1.023			Meter-Orifice Rac # 1			3.118					
Sample Pt. Time 10 min 120 min Test		Assumed % Moisture 13			Leak Test		Before .004 HI PENULTS		After .000 HI 1200		
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0655										* 018.038
O 1	1.31	1.145	1.183	163	322	61	329	111	110	2	018.214
2	1.35	1.162	1.220	164	323	60	324	114	110	2	024.349
3	1.81	1.100	1.093	165	328	62	327	118	111	2	030.449
A 1	1.39	1.179	1.256	166	325	62	325	114	111	2	036.249
2	1.30	1.140	1.174	164	327	63	326	114	112	2	042.701
3	1.20	1.095	1.084	165	325	63	326	114	112	2	048.831
B 1	1.36	1.166	1.229	165	327	62	327	119	111	2	055.468
2	1.31	1.145	1.183	167	326	63	328	123	112	2	062.413
3	1.20	1.095	1.084	166	327	63	325	128	114	2	069.012
C 1	1.35	1.162	1.220	166	328	63	326	121	114	2	075.415
2	1.12	1.088	1.012	163	324	60	324	128	116	2	081.847
3	1.01	1.005	0.912	164	327	61	322	129	116	2	088.325
Stop	0925										
AV →	(1.12)	(1.138)	(1.6483)				(115.583)	(2)	(76.287)		cu/ft.
105.99/6.550											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



E7

Client J.E.A. S.J.R.P.P.		Date 20 JULY 95	Page 1 of 2	
Project No. 95-058-F1		Operator O'NEILL, HARLEY C.		Orsat Analysis
Sampling Location Unit # 1 Stack		Run No. 2	CO ₂	+ O ₂ O ₂ CO
Filter No. 95-021/FL	Acetone No.	Condensate 235 ML	15.656	
Barometric Pressure 30.08		Static Pressure 55	Probe Number A-10-1F	15.18 5.16
Nozzle Diameter .187	Nozzle Number FL3	Pitot Coefficient .834	Pitot Number A-10-1-1F	
Meter Corr. Factor 1.023	Meter-Orifice Rac#	3.118		

Sample Pt. Time 10 min	Assumed % Moisture 120 min Test	Leak Test	Before .000 AT 12 INCHES	After .000 AT 12 INCHES
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	10945										* 088.458
C 1	1.35	1.162	1.220	164	322	62	329	114	114	2	095.198
2	1.38	1.175	1.247	165	326	61	327	118	113	2	101.874
3	1.20	1.095	1.084	166	325	61	326	122	113	2	108.384
D 1	1.32	1.149	1.192	165	321	60	324	116	113	2	114.823
2	1.38	1.175	1.247	163	324	66	327	125	113	2	121.018
3	1.23	1.109	1.111	164	324	62	325	127	115	2	127.140
A 1	1.39	1.179	1.250	164	323	61	327	117	115	2	133.813
2	1.40	1.183	1.269	165	325	62	326	128	116	2	140.281
3	1.23	1.109	1.111	165	323	62	328	129	117	2	146.686
B 1	1.30	1.140	1.174	163	324	62	329	121	117	2	153.301
2	1.41	1.187	1.274	164	327	63	329	130	119	2	159.715
3	1.36	1.166	1.229	161	324	60	328	131	119	2	166.085
Stop	1203										

AV →	(1.152)	(1.207)	(164.082)					(119.250)	(2)	(77.627)	cu/ft.
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Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



Project No. **95-058-F1** Operator: **O'NEILL, HARLEY** Orsat Analysis

Sampling Location: **Unit # 1 Stack** Run No. **3** CO₂ **+ O₂** O₂ **O₂** CO **CO**

Filter No. **95-021FL** Acetone No. **257** Condensate **21.056 mL**

Barometric Pressure **30.08** Static Pressure **-.55** Probe Number **A-10-1F** ~~1.3~~

Nozzle Diameter **.187** Nozzle Number **A-10-1-1F** Pitot Coefficient **.834** Pitot Number **15.22** ~~5.09~~

Meter Corr. Factor **1.023** Meter-Orifice **Rac# 3.118**

Sample Pt. Time: **10min 120min Test** Assumed % Moisture: **CO₂ AT 12 INCHES O₂ AT 12 INCHES**

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	12:31										* 166.261
C 1	1.43	1.196	1.27	164	322	62	328	115	115	2	173.154
2	1.35	1.162	1.200	165	323	61	327	117	115	2	179.752
3	1.29	1.136	1.147	166	323	62	327	127	116	2	185.954
D 1	1.35	1.162	1.200	164	325	63	328	119	117	2	192.450
2	1.30	1.140	1.156	164	322	60	326	128	117	2	198.895
3	1.25	1.118	1.112	165	327	61	322	129	119	2	204.965
A 1	1.45	1.204	1.289	162	322	63	326	118	117	2	211.796
2	1.40	1.183	1.249	166	324	60	329	127	117	2	218.011
3	1.45	1.204	1.289	164	321	61	332	128	118	2	224.477
B 1	1.32	1.149	1.174	162	322	61	320	124	117	2	231.096
2	1.41	1.187	1.254	163	324	62	327	127	118	2	237.701
3	1.35	1.162	1.200	164	325	62	326	127	118	2	244.574
Stop	14:38										

AV →	(1.167)	(1.212)	(1.64)	(.83)			(120.417)	(2)	(78.313)		cu/ft.
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Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



Particulate Field Data Sheet

Client SJRPP UNIT #1					Date 8 Aug 1995					Page 1 Of 2	
Project No. 95058 FL			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location STACK				Run No. 1		CO ₂		+ O ₂		O ₂ CO	
Filter No. 95-025-FL		Acetone No.		Condensate 803 mL		15.3 SG					
Barometric Pressure 30.23			Static Pressure -.53		Probe Number A-10-1-F		14.03		5.9		
Nozzle Diameter .187		Nozzle Number FL4		Pitot Coefficient .834		Pitot Number A-10-1-F					
Meter Corr. Factor 1.023			Meter-Orifice 3.118								
Sample Pt. Time 10 min 120 min		Assumed % Moisture 13%			Leak Test		Before .003 @ 15" Hg		After .000 @ 3" Hg		
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
START	0745			170							942.880
A1	1.31	1.145	1.28	170	310	63	324	118	116	2	949.365
2	1.38	1.175	1.28	170	305	65	322	117	112	2	955.798
3	1.05	1.025	0.99	171	305	64	325	123	113	2	961.859
B1	1.32	1.149	1.23	170	316	62	329	115	113	2	968.342
2	1.25	1.118	1.19	169	314	63	334	126	115	2	974.754
3	1.15	1.072	1.11	168	304	65	329	130	117	2	980.945
C1	1.34	1.158	1.26	169	306	64	322	118	116	2	987.642
2	1.40	1.183	1.31	171	322	63	328	117	115	2	994.386
3	1.31	1.145	1.24	169	323	64	327	124	115	2	1000.585
D1	1.45	1.209	1.36	170	324	65	321	116	115	2	1007.476
2	1.50	1.225	1.43	170	325	65	322	125	116	3	014.501
3	1.48	1.217	1.42	171	324	64	334	129	117	3	021.318
STOP	1110										
Ave		(1.151)	(1.216)	(1.169)				(118.500)	(12.167)	(78.438)	cu ft

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK

Client: JEA S.J.R.P.P. Date: 8.8.95 Page 1 of 2

Project No. 95-058 FL Operator: HARLEY C. O'NEILL

Sampling Location: Unit 1 Stack Run No. 2

Filter No. 95-023-FL Acetone No. Condensate 241 mL 16.5

Barometric Pressure 30.23 Static Pressure -.55 Probe Number A-10-1F

Nozzle Diameter .187 Nozzle Number FL 4 Pitot Coefficient .834 Pitot Number A-10-1-1F

Meter Corr. Factor 1.023 Meter-Orifice RAC #1 3.118

Orsat Analysis: CO₂ 14.0, +O₂ 9.2, O₂ 5.2, CO 13.94, 5.28

Sample Pt. Time: 10 min. 120 min. Assumed % Moisture: 13.90 Leak Test: Before .000 @ 15" Hg After .000 @ 2" Hg

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.	
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out			
START	1145										021.487	
1	1.41	1.187	1.32	170	312	63	322	115	115	2	027.998	
A	2	1.35	1.162	1.27	169	318	64	324	119	115	2	034.989
3	1.21	1.100	1.14	169	322	63	326	126	117	2	041.268	
1	1.40	1.183	1.31	171	324	65	327	117	117	2	047.836	
B	2	1.34	1.158	1.25	170	324	66	325	126	117	2	054.439
3	1.30	1.140	1.25	169	322	63	328	130	118	2	060.775	
1	1.46	1.208	1.38	171	323	63	327	119	118	2	067.550	
C	2	1.49	1.221	1.43	170	315	63	328	125	119	2	074.248
3	1.30	1.140	1.26	170	316	64	326	131	119	2	080.592	
				165	319	66	325	127	119	2		
0	1	1.51	1.224	1.44	168	319	66	325	121	119	2	087.557
2	1.45	1.204	1.39	170	318	65	322	128	119	2	094.536	
3	1.49	1.221	1.44	171	320	64	324	131	121	2	101.323	
Stop	1405											
AVG.		(1.179)	(1.326)	(1.69.83)				(121.000)	(121)	(79.836)		

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK



Client SEA S.J.R.P.P.						Date 8-8-95		Page 1 Of 2			
Project No. 95-05EFL			Operator HARLEY C. O'NEILL			Orsat Analysis					
Sampling Location Unit 1 Stack			Run No. 3								
Filter No. 95-027-FL		Acetone No.		Condensate 225 ml		22.2		56		4/95	
Barometric Pressure 30.23			Static Pressure -55		Probe Number A-10-1F		13.99		5.27		
Nozzle Diameter .187		Nozzle Number FL 4		Pitot Coefficient .834		Pitot Number A-10-1-1F					
Meter Corr. Factor 1.023			Meter-Orifice 3.118								
Sample Pt. Time 0 min. 120 min test			Assumed % Moisture 13%			Leak Test		Before .006 @ 15" HG		After .000 @ 2" HG	
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1500										101.425
A	1.49	1.221	1.38	170	315	62	321	112	112	2	108.575
	1.37	1.170	1.27	169	319	64	324	113	111	2	119.139
	1.22	1.105	1.13	169	320	63	325	115	110	2	121.494
	1.38	1.175	1.26	171	321	63	325	110	109	2	127.901
B	1.33	1.153	1.24	170	322	64	327	118	110	2	134.469
	1.21	1.100	1.13	170	320	62	326	122	111	2	140.850
	1.48	1.217	1.37	170	327	64	329	115	111	2	149.550
C	1.53	1.237	1.42	172	324	63	327	121	112	2	156.760
	1.39	1.179	1.31	171	325	64	326	124	112	2	163.242
	1.51	1.229	1.39	170	327	60	324	114	111	2	169.998
D	1.55	1.245	1.43	171	326	61	325	118	111	2	176.989
	1.49	1.221	1.38	171	326	62	324	117	110	2	183.653
Stop	1712										
AVG.		(1.188)	(1.294)	(170.33)				(113.708)	2		(82.228)

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before OK After OK



503 Field Data Sheet

Client J.E.A. S.J.R.P.P.			Date 7-18-95	Page 1	Of 2
Project No. 95-058-FL.		Operator Teague		Gross Analysis 3A CO ₂ +O ₂ O ₂ CO	
Sampling Location Unit # 1 Stack		Run No. 1			
Filter No.	Acetone No.	Condensate 89- 27058			
Barometric Pressure 29.93		Static Pressure -.53	Probe Number N-10-61		15.9
Nozzle Diameter .187	Nozzle Number F104	Pitot Coefficient .475	Pitot Number N-10-61-1F		4.9
Meter Corr. Factor 1.03		Meter-Orifice 3.255			

Sample Pt. Time 5min 60min TEST.	Assumed % Moisture 13.0%	Leak Test	Before .0149/15"	After .0069/16"
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	750										633.002
C 1	1.5	1.225	1.479	162	313	67	309	98	98	1.0	636.39
2	1.3	1.14	1.281	163	310	67	312	98	103	1.0	639.54
3	1.0	1.00	1.005	162	317	64	312	99	106	1.0	642.87
A 1	1.5	1.225	1.505	163	313	66	315	102	102	1.0	645.71
2	1.4	1.183	1.405	164	314	66	312	101	100	1.0	649.02
3	1.1	1.049	1.104	163	310	67	318	102	109	1.0	651.99
B 1	1.5	1.225	1.509	163	306	67	323	103	105	1.0	655.29
2	1.5	1.225	1.585	164	304	66	314	104	108	1.0	659.74
3	1.2	1.095	1.225	164	308	66	311	105	112	1.0	661.81
D 1	1.4	1.183	1.430	165	304	67	315	105	109	1.0	665.09
2	1.6	1.225	1.532	164	309	65	311	105	114	1.0	668.39
3	1.3	1.140	1.327	165	307	65	309	106	114	1.0	671.590
Stop	911										
AV →		(1.10)	(1.358)	(163.5)				(104.704)			(38.538) Cu./Ft.
ISO →	100.1%										

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



SO₂ Field Data Sheet

Client J.E.A. S.J.R.P.P.						Date 23¹⁰-95		Page 1 Of 2			
Project No. 95-058-FL.				Operator T. R. R. R.		Great Analysis 3A CO ₂ +O ₂ O ₂ CO					
Sampling Location Unit # Stack				Run No. 2							
Filter No.		Acetone No.		Condensate 80		23.95G					
Barometric Pressure 29.93			Static Pressure -5.4		Probe Number N-10-G1		14.5		5.2		
Nozzle Diameter .147		Nozzle Number F104		Pitot Coefficient .475		Pitot Number N-10-G1-F1					
Meter Corr. Factor 1.03			Meter-Orifice 3.255"								
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13%			Leak Test		Before 0049715"		After 0049710"	
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1040										692.12
C 1	1.4	1.183	1.405	165	251	63	244	102	102	2.0	685.53
2	1.4	1.183	1.405	164	254	63	251	102	104	2.0	689.72
3	1.0	1.000	1.003	166	254	64	244	102	107	2.0	691.44
D 1	1.5	1.225	1.505	165	257	62	242	104	105	2.0	694.98
2	1.4	1.183	1.405	165	254	62	253	104	108	3.0	699.27
3	1.1	1.049	1.095	165	255	63	262	104	110	3.0	701.24
B 1	1.4	1.183	1.393	166	246	63	263	105	106	3.0	704.42
2	1.5	1.225	1.493	164	249	62	260	105	110	3.0	707.85
3	1.1	1.049	1.095	163	254	61	263	104	110	2.0	710.78
A 1	1.5	1.225	1.493	165	257	62	257	105	107	3.0	714.24
2	1.5	1.225	1.493	164	245	62	260	105	111	3.0	717.58
3	1.2	1.095	1.194	163	244	61	262	106	112	3.0	720.574
Stop	200										
AVG		(1.152)	(1.33)	(164.5)				(105.43)			(38.448) Cu./Ft.
ISO		101.3%									

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



SO₃ Field Data Sheet

18

Client J.E.A. S.J.R.P.P.						Date 7-18-95		Page 1 of 2			
Project No. 95-058-FL.			Operator <i>Teague</i>			Orsat Analysis CO ₂ + O ₂ O ₂ CO					
Sampling Location Unit # Stack			Run No. 3								
Filter No.		Acetone No.		Condensate 79		25.2 SG.					
Barometric Pressure 29.93			Static Pressure -.54		Probe Number N-10-G1		15.3		4.9		
Nozzle Diameter .147		Nozzle Number F1-04		Pitot Coefficient .675		Pitot Number N-10-G1-F1					
Meter Corr. Factor 1.03			Meter-Orifice 3.255								
Sample Pt. Time 5 min 60 min TEST.			Assumed % Moisture 13%			Leak Test		Before .0099 x 10⁻⁴		After .0029 x 10⁻⁴	
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	13:00										731.191
C 1	1.5	1.225	1.493	166	256	65	241	101	102	4.0	734.60
2	1.3	1.140	1.294	167	254	65	247	101	104	4.0	737.69
3	1.0	1.00	.995	167	255	63	242	101	104	9.0	740.45
D 1	1.4	1.183	1.393	164	256	66	244	102	103	4.0	743.78
2	1.5	1.225	1.493	165	250	65	242	102	106	4.0	747.02
3	1.2	1.095	1.194	165	253	65	240	103	106	4.0	750.11
A 1	1.4	1.183	1.293	167	259	63	255	104	105	3.0	753.40
2	1.4	1.183	1.392	167	261	62	257	103	104	3.0	756.20
3	1.0	1.00	.995	166	262	61	260	104	109	3.0	759.42
B 1	1.5	1.225	1.493	165	256	61	261	102	105	3.0	762.78
2	1.4	1.183	1.393	166	257	61	255	104	109	4.0	766.08
3	1.1	1.044	1.095	166	257	61	259	104	110	3.0	769.964
Stop	14:19										
AV →		(1.14)	(1.302)	(165.42)				(104.25)			(37.773)
ISO →		98.8									Cu./Ft.

Pitot Tube Leak Check: Before OH After OH
 Integrated Bag Leak Check: Before _____ After _____



SO₂ Field Data Sheet

Client J.E.A. S.J.R.P.P.						Date 7-19-95						Page 1 of 2							
Project No. 95-058-FL.				Operator <i>Scott Teague</i>				Orsat Analysis CO ₂ +O ₂ O ₂ CO											
Sampling Location Unit # 1 Stack				Run No. 1															
Filter No.		Acetone No.		Condensate 84		40.456													
Barometric Pressure 30.01			Static Pressure -.54			Probe Number N-10-61						4.23							
Nozzle Diameter 1.467		Nozzle Number FK04		Pitot Coefficient .875		Pitot Number N-10-61-F1													
Meter Corr. Factor 1.03				Meter-Orifice 2.255															
Sample Pt. Time Smin 60min TEST.				Assumed % Moisture 13				Leak Test 1049 at 12"				Before 1049 at 12"				After 1006 at 12"			
Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.								
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out										
Start	7:00											779.798							
A 1	1.5	1.225	1.52	162	242	67	241	104	109	1.0		783.20							
2	1.5	1.225	1.52	164	252	67	243	104	109	1.0		786.64							
3	1.1	1.049	1.11	164	265	67	245	108	111	1.0		787.57							
B 1	1.5	1.225	1.52	164	259	67	240	109	110	1.0		7929.5							
2	1.4	1.183	1.41	164	259	67	247	109	115	1.0		794.32							
3	1.1	1.049	1.13	164	253	67	253	110	115	1.0		799.26							
C 1	1.6	1.265	1.62	164	264	66	249	110	113	1.0		802.85							
2	1.6	1.225	1.52	165	260	66	245	110	117	1.0		806.26							
3	1.0	1.00	1.01	164	259	65	258	110	117	1.0		809.86							
D 1	1.4	1.183	1.41	165	246	63	250	110	114	2.0		812.39							
2	1.4	1.183	1.41	165	246	63	241	110	114	2.0		815.64							
3	1.1	1.049	1.13	165	253	62	247	112	117	2.0		818.615							
Stop	8:21																		
AVG				(1.155) (1.34) (164.25)						(116.04)		(39.617)							
												CU/FT.							
												6.41 ppm.							
												SO₂ 99.5%							

Pitot Tube Leak Check: Before _____ After _____
 Integrated Bag Leak Check: Before _____ After _____



SO₂ Field Data Sheet

Client J.E.A. S.J.R.P.P.				Date 7-19-95 Page 1 of 2						
Project No. 95-058-FL.			Operator TRESCO			Orsat Analysis				
Sampling Location Unit # 1 Stack			Run No. 2							
Filter No.		Acetone No.		Condensate 80ml 29.856		CO ₂	+O ₂	O ₂	CO	
Barometric Pressure 30.01			Static Pressure -.54		Probe Number N-10-61		17.02	4.16		
Nozzle Diameter .167		Nozzle Number FL-04		Pitot Coefficient .475		Pitot Number N-10-61-F1				
Meter Corr. Factor 1.03			Meter-Orifice 3.255							
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13			Leak Test		Before 000a710"	After 000a710"	

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	9:20										8324.960
D1	1.5	1.225	1.54	166	254	65	234	107	107	1.0	8324.1
2	1.3	1.140	1.31	166	244	66	241	107	109	1.0	835.58
3	1.0	1.00	1.01	164	255	66	242	107	110	1.0	838.39
C1	1.5	1.225	1.52	166	245	64	240	110	113	2.0	841.83
2	1.4	1.183	1.44	167	253	64	246	110	115	2.0	845.23
3	1.1	1.049	1.13	165	258	64	251	111	115	2.0	848.21
B1	1.6	1.265	1.62	164	252	64	247	107	109	2.0	851.68
2	1.5	1.225	1.52	165	255	63	253	108	113	2.0	855.00
3	1.1	1.049	1.11	165	261	63	254	109	114	2.0	857.95
A1	1.5	1.225	1.52	165	258	63	246	109	110	2.0	861.29
2	1.5	1.225	1.52	164	259	64	251	109	112	2.0	864.76
3	1.0	1.00	1.01	163	255	63	259	108	114	2.0	867.658
Stop	10:30										
AV →				(1.151)	(1.354)	(1.654)		(110.125)			(38.698)
Cu/FT.											
ppm SO ₂ 4.46ppm											
ISO ₂ 100.2											

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



E17

SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.				Date 7-19-95 Page 1 of 2						
Project No. 95-058-FL			Operator Teague			Orsat Analysis				
Sampling Location Unit # 1 Stack			Run No. 3							
Filter No.		Acetone No.		Condensate 92ml - 8.65g @ 7.01		CO ₂	+O ₂	O ₂	CO	
Barometric Pressure 30.01		Static Pressure -0.54		Probe Number N10-61						
Nozzle Diameter .187		Nozzle Number FL-04		Pitot Coefficient .875		Pitot Number N-10-61-FL				
Meter Corr. Factor 1.03		Meter-Orifice 3.255								
Sample Pt. Time 5min 60min TEST.			Assumed % Moisture 13			Leak Test		Before .0069715		After .0129714

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	11:30										887.925
A 1	1.5	1.225	1.52	168	258	65	253	106	107	1.0	881.41
2	1.4	1.183	1.41	167	249	63	255	107	110	2.0	884.69
3	1.0	1.00	1.010	166	257	63	257	101	111	1.0	887.46
B 1	1.5	1.225	1.52	164	251	62	258	109	110	2.0	890.88
2	1.5	1.225	1.62	165	257	64	260	109	112	2.0	894.26
3	1.2	1.095	1.21	165	264	64	256	109	114	2.0	897.35
C 1	1.4	1.183	1.41	165	259	63	263	108	110	2.0	900.62
2	1.5	1.225	1.52	165	262	62	265	109	113	2.0	904.29
3	1.1	1.049	1.11	164	254	62	264	109	115	2.0	907.34
D 1	1.6	1.265	1.62	162	258	61	258	109	110	2.0	910.73
2	1.5	1.225	1.52	166	259	62	259	110	115	2.0	914.01
3	1.2	1.095	1.21	164	256	62	261	111	115	2.0	917.243
Stop	12:36										
AVG		(1.166)	(1.38)	(165.5)				(110.208)		1	(393.12) Cu./FT.

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



SO₃ Field Data Sheet

Client J.E.A. S.J.R.P.P.			Date 7-20-95		Page 1 of 2	
Project No. 95-058-FL.		Operator J. Casar			Orsat Analysis	
Sampling Location Unit # 1 Stack		Run No. 1				
Filter No.	Acetone No.	Condensate 96 mL 23.256		CO ₂	+ O ₂	O ₂
Barometric Pressure 30.04		Static Pressure -5.50		Probe Number 15.17		5.20
Nozzle Diameter .187	Nozzle Number K204	Pitot Coefficient .675		Pitot Number N-0-61-F1		
Meter Corr. Factor 1.03		Meter-Orifice 3.255				

Sample Pt. Time 5min 60min TEST.	Assumed % Moisture 13	Leak Test	Before .008 at 12"	After .012 at 12"
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	6:55										927.871
A 1	1.5	1.225	1.51	166	266	66	256	109	110	1.0	931.34
2	1.4	1.183	1.41	160	260	67	267	108	111	1.0	934.68
3	1.1	1.049	1.11	166	258	67	270	108	111	1.0	937.54
B 1	1.5	1.225	1.52	164	251	66	268	108	110	1.0	940.96
2	1.4	1.183	1.41	165	253	65	264	107	113	1.0	944.30
3	1.0	1.00	1.01	165	251	65	260	108	114	1.0	947.65
C 1	1.4	1.183	1.41	165	247	64	256	106	112	1.0	950.34
2	1.3	1.14	1.31	166	242	65	253	109	114	1.0	953.59
3	1.0	1.00	1.01	165	245	65	252	109	115	1.0	956.43
D 1	1.6	1.265	1.61	165	246	63	260	109	112	1.0	959.94
2	1.5	1.225	1.51	165	250	63	256	109	114	1.0	963.38
3	1.0	1.00	1.01	165	245	63	250	110	116	1.0	966.314
Stop	0820										
AV		(1.14)	(1.38)	(165.35)				(110.75)			(3944)
ISO		101.0%									Cu./Ft.
Seq PPM		5.50	ppm								

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____

SO₂ Field Data Sheet

Client J.E.A. S.J.R.P.P.			Date 7-20-95		Page 1 of 2
Project No. 95-0158-FL.		Operator Scott Trauger		Orsat Analysis CO ₂ +O ₂ O ₂ CO	
Sampling Location Unit # 1 Stack		Run No. 2			
Filter No.	Acetone No.	Condensate 108 mL 23.6 SG.			
Barometric Pressure 30.04		Static Pressure -1.50	Probe Number N-10-61		
Nozzle Diameter .167	Nozzle Number F1-04	Pitot Coefficient .976	Pitot Number N-10-61-F1		
Meter Corr. Factor 1.03		Meter-Orifice 3.255			

Sample Pt. Time 5min 60min TEST.	Assumed % Moisture 13	Leak Test 0.03 @ 10	Before	After
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	0925					67.5					977.386
D 1	1.5	1.225	1.512	166.0	208	67.0	193	107	107	1.0	980.794
D 2	1.4	1.183	1.411	166.0	228	67.0	211	110	106	1.0	986.086
D 3	1.4	1.183	1.411	166.0	237	66.0	217	113	107	1.0	987.631
A 1	1.5	1.225	1.512	166.0	225	63.0	218	112	108	1.0	991.300
A 2	1.4	1.183	1.411	166.0	243	63.0	223	115	109	1.0	994.531
A 3	1.3	1.140	1.310	166.0	249	63.0	226	116	109	1.0	997.904
B 1	1.5	1.225	1.512	166.0	251	63.0	234	115	109	1.0	001.503
B 2	1.4	1.183	1.411	166.0	252	63.0	243	116	110	1.0	005.113
B 3	1.2	1.095	1.209	166.0	249	63.0	240	116	110	1.0	008.516
C 1	1.5	1.225	1.512	166.0	253	63.0	241	115	110	1.0	011.924
C 2	1.4	1.183	1.411	166.0	255	63.0	242	115	110	1.0	015.375
C 3	1.2	1.095	1.209	166.0	260	63.0	239	116	110	1.0	018.645
Stop	1040										
AV →		(1.179)	(1.403)	(166.0)				(111.292)			(41.259)
TS →	105.17%										Cu/FT.
SO ₂ →	5.67 ppm										

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



503 Field Data Sheet

Client J.E.A. S.J.R.P.P.			Date 7-20-95		Page 1 Of 2
Project No. 95-058-FL.		Operator Foyfel		Orsat Analysis	
Sampling Location Unit # 1 Stack		Run No. 3			
Filter No.	Acetone No.	Condensate 92 mL 24.256			
Barometric Pressure 30.08		Static Pressure - .50	Probe Number N-10-61		15.22
Nozzle Diameter .187	Nozzle Number FL-04	Pitot Coefficient .875	Pitot Number N-10-61-FL		5.09
Meter Corr. Factor 1.03		Meter-Orifice 3.255			

Sample Pt. Time 5min 60min TEST.	Assumed % Moisture	Leak Test	Before .018 @ 5" Hg	After .014 @ 5" Hg
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Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
Start	1142										029.475
1	1.6	1.265	1.613	165.0	244.0	66.0	219	113	109	1.0	033.325
C 2	1.5	1.225	1.512	166.0	252.0	66.0	229	116	109	1.0	036.675
3	1.3	1.140	1.310	166.0	243.0	66.0	235	117	110	1.0	040.014
1	1.6	1.265	1.613	166.0	234.0	66.0	288	116	110	1.0	043.572
B 2	1.5	1.225	1.512	166.0	240.0	66.0	273	118	111	1.0	047.115
3	1.3	1.140	1.310	166.0	238.0	66.0	243	118	112	1.0	050.419
1	1.6	1.265	1.613	166.0	239.0	67.0	252	116	112	1.0	054.040
A 2	1.5	1.225	1.512	167.0	251.0	64.0	249	116	112	1.0	057.456
3	1.3	1.140	1.310	167.0	255.0	64.0	251	117	112	1.0	060.854
1	1.6	1.265	1.613	167.0	257.0	64.0	249	116	112	1.0	064.581
D 2	1.5	1.225	1.512	167.0	258.0	65.0	256	119	113	1.0	068.161
3	1.3	1.140	1.310	167.0	258.0	64.0	256	117	113	1.0	071.401
Stop	1315										
AV		(1.210)	(1.493)	(166.33)				(113.92)			(41.926) Cu/FT.
ISO9	162.2%										
SO2	5.4%										

Pitot Tube Leak Check: Before OK After OK
 Integrated Bag Leak Check: Before _____ After _____



Client: <u>SEA / St. Johns</u>						Date: <u>8-75</u>		Page 1 of 2			
Project No. <u>95-050 - FL</u>			Operator: <u>C. Coatt</u>			Orsat Analysis					
Sampling Location: <u>STACK UNIT 1</u>					Run No. <u>1</u>	CO ₂	+ O ₂	O ₂	CO		
Filter No. <u>N/A</u>	Acetone No. <u>N/A</u>		Condensate <u>108 ML</u>		<u>X9</u>	<u>X3</u>					
Barometric Pressure <u>30.23</u>		Static Pressure <u>-0.53</u>		Probe Number <u>C-10</u>		<u>14.08</u>	<u>5.09</u>				
Nozzle Diameter <u>187</u>	Nozzle Number		Pitot Coefficient <u>0.875</u>		Pitot Number <u>N10-1</u>						
Meter Corr. Factor <u>1.03</u>	Area of Flue		Meter-Orifices <u>1-N</u>		<u>3.694</u>						
Sample Pt. Time <u>5 min</u>		Assumed % Moisture <u>13%</u>		Leak Test		Before <u>0.008 @ 10"</u>		After <u>0.015 @ 10"</u>			
Temperature °F											
Sample Point	ΔP	√ΔP	ΔH	Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
<u>START 7:45</u>											<u>240.315</u>
<u>2 1.5</u>	<u>1.225</u>	<u>1.112</u>	<u>174</u>	<u>238</u>	<u>60</u>	<u>273</u>	<u>112</u>	<u>112</u>	<u>7.0</u>		<u>243.657</u>
<u>2 1.5</u>	<u>1.225</u>	<u>1.112</u>	<u>172</u>	<u>252</u>	<u>60</u>	<u>251</u>	<u>119</u>	<u>112</u>	<u>7.0</u>		<u>246.978</u>
<u>3 1.2</u>	<u>1.095</u>	<u>1.048</u>	<u>171</u>	<u>254</u>	<u>62</u>	<u>257</u>	<u>116</u>	<u>112</u>	<u>6.0</u>		<u>249.243</u>
<u>C 1.3</u>	<u>1.140</u>	<u>1.070</u>	<u>172</u>	<u>252</u>	<u>61</u>	<u>258</u>	<u>116</u>	<u>113</u>	<u>5.0</u>		<u>253.021</u>
<u>2 1.4</u>	<u>1.183</u>	<u>1.081</u>	<u>172</u>	<u>252</u>	<u>63</u>	<u>253</u>	<u>118</u>	<u>114</u>	<u>6.0</u>		<u>256.221</u>
<u>3 1.1</u>	<u>1.049</u>	<u>1.026</u>	<u>171</u>	<u>283</u>	<u>64</u>	<u>251</u>	<u>119</u>	<u>115</u>	<u>5.0</u>		<u>259.132</u>
<u>A 1.4</u>	<u>1.183</u>	<u>1.081</u>	<u>172</u>	<u>255</u>	<u>62</u>	<u>256</u>	<u>119</u>	<u>116</u>	<u>5.0</u>		<u>262.331</u>
<u>2 1.3</u>	<u>1.140</u>	<u>1.070</u>	<u>171</u>	<u>283</u>	<u>64</u>	<u>259</u>	<u>120</u>	<u>116</u>	<u>5.0</u>		<u>265.468</u>
<u>3 1.1</u>	<u>1.049</u>	<u>1.026</u>	<u>172</u>	<u>253</u>	<u>63</u>	<u>252</u>	<u>121</u>	<u>117</u>	<u>4.0</u>		<u>268.573</u>
<u>2 1.3</u>	<u>1.140</u>	<u>1.070</u>	<u>172</u>	<u>252</u>	<u>57</u>	<u>253</u>	<u>120</u>	<u>112</u>	<u>5.0</u>		<u>271.523</u>
<u>2 1.3</u>	<u>1.140</u>	<u>1.070</u>	<u>172</u>	<u>254</u>	<u>59</u>	<u>259</u>	<u>121</u>	<u>118</u>	<u>5.0</u>		<u>274.642</u>
<u>3 1.0</u>	<u>1.000</u>	<u>1.015</u>	<u>171</u>	<u>252</u>	<u>62</u>	<u>260</u>	<u>119</u>	<u>117</u>	<u>4.0</u>		<u>277.453</u>
<u>STOP 9:20</u>											
	<u>(1.131)</u>	<u>(1.073)</u>	<u>(171.60)</u>					<u>(116.67)</u>			<u>(37.138)</u>

Pitot Tube Leak Check: Before O.K After O.K
 Integrated Bag Leak Check: Before _____ After _____



Project No. 95-088-F1 Operator: C. Galt

Sampling Location: Stack Unit 1 Run No. 2

Filter No. N/A Acetone No. N/A Condensate

Barometrd Pressure: 30.23 Static Pressure: -33 Probe Number: 610

Nozzle Diameter: .1875 Nozzle Number: Pitot Coefficient: 0.75 Pitot Number:

Meter Corr. Factor: 1.03 Area of Flue: Meter-Orifice: 1-N 3.627

Orsat Analysis

CO ₂	+O ₂	O ₂	CO
13.94		5.28	

Sample Pt. Time: 5 min Assumed % Moisture: 13.96 Leak Test: Before OK After OK

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Proce	Imp. Out	Oven	Meter In	Meter Out		
START 10:40											277.968
B 1 1.3	1.140	1.49	172	262	56	258	116	115	5.0	281.112	
2 1.3	1.140	1.49	171	258	59	256	117	115	5.0	284.193	
3 1.0	1.000	1.15	172	256	60	256	119	115	4.0	282.172	
A 1 1.5	1.225	1.72	172	255	57	258	118	116	5.0	290.302	
2 1.4	1.183	1.61	172	252	58	253	117	116	5.0	293.758	
3 1.3	1.140	1.49	173	255	60	256	119	116	4.0	296.922	
D 1 1.6	1.265	1.81	172	253	61	257	119	117	6.0	300.216	
2 1.6	1.265	1.81	173	252	62	255	120	117	6.0	303.871	
3 1.3	1.140	1.49	172	255	63	253	121	118	5.0	307.054	
C 1 1.5	1.225	1.72	173	253	58	248	121	118	5.0	310.401	
2 1.5	1.225	1.72	172	252	61	255	121	119	5.0	313.768	
3 1.2	1.075	1.38	171	256	63	252	121	118	4.0	312.136	
STOP 11:50	1.170	1.578	172								39.168

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before After



Client: TEA / St. Johns Date: 8-95 Page 1 of 2

Project No. 95-088-F1 Operator: C. Coak Orsat Analysis

Sampling Location: STACK UNIT 1 Run No. 3 CO₂ 10.0 + O₂ 4.9 O₂ 4.9 CO

Filter No. N/A Acetone No. N/A Condensate

Barometric Pressure 30.23 Static Pressure -.53 Probe Number 610 13.49 5.27

Nozzle Diameter .187 Nozzle Number Pitot Coefficient .875 Pitot Number

Meter Corr. Factor 1.03 Area of Flue Meter-Orifice 1.0 3.694

Sample Pt. Time 5 min. Assumed % Moisture 13% Leak Test Before OK @ 12" After OK @ 10"

Sample Point	ΔP	√ΔP	ΔH	Temperature °F						Vac. Pr. (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Stack	Probe	Imp. Out	Oven	Meter In	Meter Out		
<u>START 12:30</u>											<u>317.362</u>
<u>E 1</u>	<u>1.5</u>	<u>1.225</u>	<u>1.72</u>	<u>171</u>	<u>257</u>	<u>56</u>	<u>263</u>	<u>117</u>	<u>117</u>	<u>6.0</u>	<u>320.772</u>
<u>2</u>	<u>1.5</u>	<u>1.225</u>	<u>1.72</u>	<u>122</u>	<u>255</u>	<u>59</u>	<u>258</u>	<u>119</u>	<u>117</u>	<u>6.0</u>	<u>324.213</u>
<u>3</u>	<u>1.3</u>	<u>1.140</u>	<u>1.47</u>	<u>172</u>	<u>256</u>	<u>61</u>	<u>257</u>	<u>120</u>	<u>112</u>	<u>8.0</u>	<u>327.428</u>
<u>P1</u>	<u>1.5</u>	<u>1.225</u>	<u>1.72</u>	<u>172</u>	<u>258</u>	<u>59</u>	<u>257</u>	<u>120</u>	<u>118</u>	<u>6.0</u>	<u>330.782</u>
<u>2</u>	<u>1.6</u>	<u>1.265</u>	<u>1.84</u>	<u>123</u>	<u>256</u>	<u>63</u>	<u>252</u>	<u>120</u>	<u>118</u>	<u>6.0</u>	<u>334.213</u>
<u>3</u>	<u>1.3</u>	<u>1.140</u>	<u>1.47</u>	<u>173</u>	<u>255</u>	<u>62</u>	<u>252</u>	<u>121</u>	<u>119</u>	<u>5.0</u>	<u>337.311</u>
<u>A1</u>	<u>1.4</u>	<u>1.183</u>	<u>1.61</u>	<u>172</u>	<u>256</u>	<u>60</u>	<u>257</u>	<u>120</u>	<u>118</u>	<u>5.0</u>	<u>340.558</u>
<u>2</u>	<u>1.5</u>	<u>1.225</u>	<u>1.72</u>	<u>173</u>	<u>256</u>	<u>62</u>	<u>255</u>	<u>120</u>	<u>118</u>	<u>6.0</u>	<u>343.762</u>
<u>3</u>	<u>1.2</u>	<u>1.095</u>	<u>1.38</u>	<u>172</u>	<u>257</u>	<u>63</u>	<u>252</u>	<u>120</u>	<u>119</u>	<u>5.0</u>	<u>347.072</u>
<u>B1</u>	<u>1.4</u>	<u>1.183</u>	<u>1.61</u>	<u>172</u>	<u>252</u>	<u>59</u>	<u>253</u>	<u>119</u>	<u>118</u>	<u>6.0</u>	<u>350.328</u>
<u>3</u>	<u>1.3</u>	<u>1.140</u>	<u>1.49</u>	<u>172</u>	<u>253</u>	<u>60</u>	<u>255</u>	<u>121</u>	<u>119</u>	<u>6.0</u>	<u>353.512</u>
<u>3</u>	<u>1.1</u>	<u>1.049</u>	<u>1.26</u>	<u>171</u>	<u>254</u>	<u>63</u>	<u>255</u>	<u>121</u>	<u>119</u>	<u>6.0</u>	<u>356.482</u>

STOP 13:52

				<u>1.175</u>	<u>1.546</u>	<u>172.2</u>				<u>118.0</u>	<u>349.120</u>
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Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



TSA CEMS Log

Client : JEA SJRPP
 Site : 0000
 Unit : Unit 1 stack
 Project : 95-058
 Comment : Run 1
 Test Date : 7/18/95 Time : 07:50 thru 08:50

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
07:50:52	5.08	16.31	31.54
07:51:52	5.19	16.19	14.61
07:52:52	5.13	16.25	10.76
07:53:52	5.19	16.20	18.61
07:54:52	5.23	16.14	7.68
07:55:52	5.40	15.98	4.99
07:56:52	5.33	16.06	4.10
07:57:52	5.21	16.17	4.89
07:58:52	5.05	16.32	9.27
07:59:52	4.99	16.37	59.33
08:00:52	5.10	16.28	15.44
08:01:52	5.23	16.17	7.00
08:02:52	5.48	15.89	5.29
08:03:52	5.41	15.98	3.58
08:04:52	5.06	16.32	9.78
08:05:51	5.27	16.10	5.99
08:06:51	5.28	16.11	4.48
08:07:51	5.10	16.27	4.09
08:08:51	5.22	16.16	11.85
08:09:51	5.25	16.13	5.58
08:10:51	5.07	16.30	7.18
08:11:51	4.82	16.58	13.23
08:12:51	5.04	16.33	29.54
08:13:51	5.02	16.35	12.53
08:14:51	5.18	16.19	6.99
08:15:51	5.64	15.74	3.89
08:16:51	4.86	16.52	4.38
08:17:51	5.20	16.16	7.37
08:18:51	5.32	16.05	6.09
08:19:51	4.96	16.40	45.21
08:20:51	5.22	16.14	7.68
08:21:51	4.88	16.49	30.39
08:22:51	5.39	15.99	11.33
08:23:51	4.89	16.48	8.97
08:24:51	5.07	16.30	8.27
08:25:51	5.17	16.21	4.99
08:26:51	4.96	16.40	6.38
08:27:51	5.16	16.21	4.18
08:28:51	5.10	16.27	4.49
08:29:51	5.27	16.10	4.38
08:30:51	4.87	16.52	10.60
08:31:51	4.97	16.39	21.02
08:32:51	5.15	16.23	7.96
08:33:51	5.10	16.27	5.08
08:34:51	5.05	16.32	6.58
08:35:51	5.14	16.25	10.60

Client :JEA SJRPP
 Site :0000
 Unit : Unit 1
 Project :95-058
 Comment : stack Run 1
 Test Date :7/18/95 Time :07:50 thru 08:50

Time	1030 02 %	1029 CO2 %	1028 CO PPm
08:36:51	5.04	16.33	10.27
08:37:51	5.26	16.13	6.89
08:38:51	5.10	16.29	4.48
08:39:51	5.11	16.27	6.78
08:40:51	5.18	16.21	5.69
08:41:51	5.07	16.31	11.13
08:42:51	5.06	16.33	7.18
08:43:51	4.85	16.52	25.74
08:44:51	5.12	16.27	18.53
08:45:51	5.27	16.11	8.07
08:46:51	5.08	16.29	6.49
08:47:51	5.09	16.29	6.09
08:48:51	5.03	16.33	11.90
08:49:51	5.0	16.3	5.2

avg for 1hr. - 5.13 16.24 11.04

COgas = 4.92 15.89 11.54

(1) NOIR =

Client : JEA SJRPP
Site : 0000
Unit :
Project : 95-058
Comment : Run # 2
Test Date : 7/18/95

Time : 11:00 thru 12:00:08

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:00:02	5.26	15.14	15.22
11:01:02	5.07	15.32	7.57
11:02:02	5.13	15.25	21.90
11:03:02	5.32	15.08	9.68
11:04:02	5.16	15.23	9.47
11:05:01	5.25	15.16	6.38
11:06:01	5.27	15.13	11.13
11:07:01	5.24	15.16	5.48
11:08:01	5.24	15.16	5.29
11:09:01	5.28	15.11	4.09
11:10:01	5.33	15.08	5.29
11:11:01	5.26	15.14	3.69
11:12:01	5.17	15.23	3.58
11:13:01	5.10	15.26	7.76
11:14:01	5.31	15.08	9.96
11:15:01	5.30	15.10	4.89
11:16:01	5.27	15.12	3.58
11:17:01	5.18	15.17	4.49
11:18:01	5.31	15.08	8.75
11:19:01	5.00	15.39	9.07
11:20:01	5.23	15.16	6.89
11:21:01	5.23	15.14	6.68
11:22:01	5.28	15.09	15.43
11:23:01	5.14	15.25	39.54
11:24:01	5.33	15.07	8.48
11:25:01	5.23	15.17	4.98
11:26:01	5.19	15.21	11.14
11:27:01	5.41	14.98	4.58
11:28:01	5.46	14.95	3.97
11:29:01	4.91	15.46	34.20
11:30:01	5.02	15.35	11.46
11:31:01	5.17	15.21	6.78
11:32:01	5.11	15.28	35.42
11:33:01	5.25	15.16	9.07
11:34:01	5.28	15.11	6.49
11:35:01	5.59	14.82	3.88
11:36:01	5.05	15.33	5.78
11:37:01	5.02	15.35	5.29
11:38:01	5.32	15.08	6.09
11:39:01	5.22	15.16	5.08
11:40:01	5.04	15.33	12.51
11:41:01	5.01	15.37	9.87
11:42:01	5.02	15.33	13.75
11:43:01	5.53	14.88	5.39
11:44:01	5.11	15.26	6.78
11:45:01	5.34	15.07	6.28

Client :JEA SJRPP
 Site :0000
 Unit :
 Project :95-058
 Comment : Run #2
 Test Date :7/18/95

Time :11:00 thru 12:00:08

Page 2

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:46:01	5.19	15.19	10.90
11:47:01	5.14	15.23	11.85
11:48:01	5.31	15.08	5.98
11:49:01	4.99	15.38	6.18
11:50:01	5.03	15.36	11.03
11:51:01	5.16	15.23	11.35
11:52:00	5.25	15.16	7.77
11:53:00	5.23	15.16	6.49
11:54:00	5.28	15.12	4.49
11:55:00	5.20	15.20	4.78
11:56:00	5.13	15.25	4.98
11:57:00	5.40	15.02	4.38
11:58:00	5.22	15.19	4.09
11:59:00	5.12	15.26	6.18
12:00:00	5.21	15.18	4.27
12:00:08	5.21	15.18	4.11

Averages
 for 62
 Points 5.20 15.17 8.90

Egas → 5.16 14.54 9.21

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Run #3
Test Date :7/18/95

Time :13:19 thru 14:22:17

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
13:19:35	5.09	15.70	6.18
13:20:35	5.00	15.77	35.08
13:21:35	5.27	15.50	15.32
13:22:35	5.32	15.47	11.41
13:23:35	4.94	15.83	9.56
13:24:35	4.89	15.87	10.59
13:25:34	5.41	15.36	29.92
13:26:34	5.18	15.58	6.98
13:27:34	5.02	15.75	6.49
13:28:34	5.14	15.66	5.27
13:29:34	4.97	15.78	4.98
13:30:34	4.87	15.90	8.56
13:31:34	5.25	15.53	5.98
13:32:34	5.05	15.72	6.08
13:33:34	5.28	15.49	5.78
13:34:34	4.88	15.89	10.06
13:35:34	5.09	15.68	11.09
13:36:34	5.22	15.57	9.36
13:37:34	4.97	15.81	10.75
13:38:34	5.20	15.58	8.07
13:39:34	5.15	15.63	16.82
13:40:34	4.86	15.92	9.86
13:41:34	5.04	15.74	21.41
13:42:34	5.17	15.59	22.93
13:43:34	5.25	15.52	12.26
13:44:34	5.21	15.56	5.57
13:45:34	5.07	15.67	6.18
13:46:34	5.14	15.64	7.66
13:47:34	5.14	15.60	6.78
13:48:34	5.10	15.59	7.37
13:49:34	5.03	15.64	4.68
13:50:34	5.06	15.59	6.58
13:51:34	5.10	15.56	7.47
13:52:34	5.03	15.61	9.27
13:53:34	5.08	15.57	4.37
13:54:34	5.17	15.47	4.28
13:55:34	4.95	15.69	7.37
13:56:34	4.90	15.73	15.52
13:57:34	5.12	15.52	21.93
13:58:34	5.21	15.41	13.12
13:59:34	5.32	15.30	4.98
14:00:34	4.88	15.75	4.77
14:01:34	5.06	15.57	8.26
14:02:34	4.96	15.66	8.07
14:03:34	5.01	15.61	9.87
14:04:34	5.05	15.58	6.89

Client :JEA SJRPP
 Site :0000
 Unit :
 Project :95-058
 Comment : Run #3
 Test Date :7/18/95

Time :13:19 thru 14:22:17

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
14:05:34	4.96	15.66	8.57
14:06:34	5.02	15.61	8.57
14:07:34	5.40	15.22	4.38
14:08:34	4.95	15.66	4.58
14:09:34	5.11	15.51	9.47
14:10:34	4.98	15.63	16.30
14:11:34	5.00	15.61	11.57
14:12:33	5.01	15.62	8.26
14:13:33	5.08	15.54	5.48
14:14:33	5.05	15.60	5.38
14:15:33	5.23	15.39	5.58
14:16:33	4.94	15.67	15.82
14:17:33	5.28	15.34	6.59
14:18:33	4.94	15.69	8.88
14:19:33	5.00	15.62	12.94
14:20:33	5.08	15.53	10.94
14:21:33	5.05	15.56	5.08
14:22:17	5.06	15.55	6.78

Averages
 for 64
 Points 5.08 15.61 9.79

E gas → 4.90 15.25 10.13

Client : JEA SJRPP
Site : 0000
Unit : /
Project : 95-058
Comment : Run 1
Print Date : 7/19/95

Time : 07:50 thru 08:50

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
07:50:35	5.22	16.49	31.98
07:51:35	5.08	16.69	35.17
07:52:35	5.16	16.55	39.91
07:53:35	5.00	16.77	40.08
07:54:35	5.01	15.26	66.94
07:55:35	5.18	15.09	35.22
07:56:35	5.11	14.90	38.06
07:57:35	5.32	14.39	21.77
07:58:35	5.33	14.39	17.73
07:59:35	5.30	14.48	13.76
08:00:35	5.18	14.60	47.35
08:01:35	5.36	14.44	15.23
08:02:35	5.11	14.67	22.32
08:03:35	5.26	14.53	64.48
08:04:35	5.21	14.59	34.42
08:05:35	4.80	14.93	88.95
08:06:35	5.38	14.41	100.03
08:07:35	5.33	14.48	22.42
08:08:35	4.92	14.83	100.05
08:09:35	5.29	14.49	58.82
08:10:35	5.28	14.54	32.58
08:11:35	5.02	14.73	71.39
08:12:35	5.27	14.53	25.00
08:13:35	5.16	14.63	18.83
08:14:35	4.96	14.80	83.16
08:15:35	5.28	14.51	55.47
08:16:35	5.21	14.60	25.75
08:17:35	5.01	14.76	37.85
08:18:35	5.17	14.61	28.21
08:19:35	5.09	14.68	36.57
08:20:35	5.38	14.43	28.84
08:21:35	5.01	14.77	27.44
08:22:35	5.16	14.64	50.78
08:23:35	5.02	14.74	36.44
08:24:35	5.28	14.51	34.00
08:25:35	5.05	14.73	30.63
08:26:35	4.99	14.78	51.79
08:27:35	5.30	14.48	40.75
08:28:35	5.07	14.70	51.69
08:29:35	5.04	14.73	64.52
08:30:35	5.14	14.63	46.54
08:31:35	5.05	14.72	69.14
08:32:35	4.96	14.81	100.03
08:33:35	5.20	14.59	51.59
08:34:35	5.10	14.67	55.55
08:35:35	5.04	14.73	31.73

Client :JEA SJRPP
 Site :0000
 Unit : 1
 Project :95-058
 Comment : Run 1
 Test Date :7/19/95

Time :07:50 thru 08:50

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:36:35	5.27	14.53	27.53
08:37:34	4.92	14.84	38.35
08:38:34	5.11	14.66	57.74
08:39:34	5.24	14.56	14.42
08:40:34	4.90	14.85	99.89
08:41:34	5.11	14.66	44.24
08:42:34	5.05	14.72	53.90
08:43:34	5.34	14.45	33.11
08:44:34	5.03	14.76	26.55
08:45:34	4.98	14.78	90.95
08:46:34	5.28	14.51	51.64
08:47:34	4.86	14.88	71.32
08:48:34	5.59	14.23	26.42
08:49:34	4.86	14.88	52.05
Averages			
for 60			
Points	5.13	14.78	46.15
<i>e gas</i>	<i>→ 4.22</i>	<i>15.02</i>	<i>51.07</i>

Client : JEA SJRPP
File : 0000
Unit : 1
Project : 95-058
Document : Run #2
Test Date : 7/19/95

Time : 09:25 thru 10:25

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:25:07	5.08	16.38	17.09
09:26:07	5.11	16.34	51.99
09:27:07	5.17	16.30	27.27
09:28:07	4.81	16.71	61.87
09:29:07	5.10	16.36	61.16
09:30:07	5.24	16.27	18.25
09:31:07	4.80	16.70	99.96
09:32:07	5.37	16.12	45.46
09:33:07	4.98	16.49	54.22
09:34:07	5.25	16.20	71.91
09:35:07	5.15	16.34	22.21
09:36:07	4.88	16.63	100.02
09:37:07	5.23	16.24	42.45
09:38:07	5.04	16.45	38.88
09:39:07	5.13	16.34	44.93
09:40:07	5.19	16.32	33.89
09:41:07	5.04	16.46	65.87
09:42:07	5.04	16.44	33.45
09:43:07	5.39	16.11	17.45
09:44:07	5.02	16.48	28.91
09:45:07	5.07	16.41	30.56
09:46:07	4.98	16.54	35.89
09:47:07	5.28	16.21	32.20
09:48:07	5.17	16.34	15.41
09:49:07	5.23	16.26	26.52
09:50:07	5.02	16.47	37.01
09:51:06	5.14	16.36	27.55
09:52:06	5.16	16.34	29.85
09:53:06	4.97	16.53	60.91
09:54:06	5.10	16.37	33.19
09:55:06	5.12	16.37	22.12
09:56:06	5.28	16.20	25.46
09:57:06	5.34	16.19	10.65
09:58:06	4.85	16.68	100.02
09:59:06	5.24	16.25	61.35
10:00:06	5.00	16.47	40.14
10:01:06	5.17	16.33	30.04
10:02:06	4.93	16.55	89.54
10:03:06	5.16	16.34	37.35
10:04:06	5.24	16.25	33.43
10:05:06	4.96	16.55	24.34
10:06:06	5.04	16.44	53.79
10:07:06	4.89	16.63	41.55
10:08:06	5.13	16.34	61.47
10:09:06	5.00	16.46	62.36
10:10:06	5.13	16.38	35.52

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run # 2
 Test Date : 7/19/95

Time : 09:25 thru 10:25

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:11:06	5.02	16.47	34.11
10:12:06	4.98	16.52	69.33
10:13:06	4.81	16.71	100.04
10:14:06	5.16	16.34	35.62
10:15:06	5.25	16.24	25.57
10:16:06	5.09	16.39	28.93
10:17:06	5.23	16.26	20.42
10:18:06	5.01	16.49	17.83
10:19:06	4.77	16.77	75.17
10:20:06	5.07	16.41	71.11
10:21:06	4.88	16.61	100.03
10:22:06	5.47	16.02	71.75
10:23:06	5.12	16.35	86.96
10:24:06	4.77	16.79	57.68
Averages for 60 Points	5.08	16.40	46.50
<i>Gas →</i>	<i>4.16</i>	<i>17.02</i>	<i>92.00</i>

Client : JEA SJRPP
Site : 0000
Unit : 1
Project : 95-058
Comment : Run # 3
Test Date : 7/19/95

Time : 11:00 thru 12:00

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:00:15	5.15	16.31	24.96
11:01:15	5.04	16.43	17.83
11:02:15	4.92	16.53	55.36
11:03:15	5.19	16.31	27.21
11:04:15	4.92	16.53	100.03
11:05:15	5.02	16.45	39.34
11:06:15	5.09	16.38	42.62
11:07:15	5.22	16.25	16.35
11:08:15	5.18	16.30	7.77
11:09:15	4.89	16.59	32.94
11:10:15	4.92	16.54	34.41
11:11:15	5.04	16.42	15.63
11:12:15	4.98	16.49	26.12
11:13:15	4.88	16.63	32.42
11:14:14	4.88	16.62	50.87
11:15:14	4.90	16.59	100.03
11:16:14	4.99	16.47	49.28
11:17:14	4.99	16.49	34.25
11:18:14	5.13	16.33	38.97
11:19:14	5.19	16.30	21.30
11:20:14	5.12	16.35	29.56
11:21:14	5.20	16.29	22.13
11:22:14	5.22	16.27	11.56
11:23:14	4.94	16.57	16.25
11:24:14	5.15	16.32	22.33
11:25:14	5.16	16.31	18.69
11:26:14	4.98	16.48	35.49
11:27:14	5.51	15.99	10.65
11:28:14	5.27	16.22	8.76
11:29:14	5.12	16.35	19.91
11:30:14	5.22	16.25	12.75
11:31:14	5.28	16.20	17.64
11:32:14	4.91	16.59	31.44
11:33:14	5.25	16.22	26.34
11:34:14	5.10	16.39	12.35
11:35:14	5.17	16.29	32.16
11:36:14	5.28	16.22	8.08
11:37:14	4.92	16.59	22.38
11:38:14	5.33	16.14	20.13
11:39:14	5.16	16.31	37.61
11:40:14	4.99	16.47	30.80
11:41:14	4.94	16.55	15.59
11:42:14	5.14	16.33	10.43
11:43:14	5.05	16.44	6.99
11:44:14	5.02	16.44	31.91
11:45:14	5.23	16.26	15.94

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run # 3
 Test Date : 7/19/95

Time : 11:00 thru 12:00

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:46:14	5.07	16.41	23.76
11:47:14	5.01	16.47	47.42
11:48:14	4.98	16.49	35.71
11:49:14	4.91	16.61	24.75
11:50:14	4.86	16.65	61.72
11:51:14	5.09	16.39	18.34
11:52:14	4.93	16.56	21.22
11:53:14	5.19	16.30	61.23
11:54:14	5.10	16.36	37.58
11:55:14	5.01	16.46	27.33
11:56:14	5.41	16.06	15.24
11:57:14	5.02	16.46	13.82
11:58:14	4.98	16.49	22.32
11:59:14	5.00	16.45	39.83
Averages for 60 Points			
	5.07	16.39	29.09
<i>egas</i> →	<i>4.16</i>	<i>17.01</i>	<i>32.42</i>

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Document : Run#1
 Test Date : 7/20/95

Time : 06:55 thru 07:55

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
06:55:54	5.11	14.51	94.68
06:56:54	5.27	14.34	80.77
06:57:54	5.49	14.15	29.34
06:58:54	5.06	14.59	26.94
06:59:54	5.30	14.32	84.46
07:00:54	5.19	14.45	30.67
07:01:54	5.23	14.41	79.45
07:02:54	5.45	14.20	39.68
07:03:54	5.24	14.44	63.73
07:04:54	5.19	14.46	100.03
07:05:54	5.38	14.27	53.77
07:06:54	5.37	14.36	24.57
07:07:54	5.00	14.61	48.34
07:08:54	5.23	14.42	68.60
07:09:54	5.22	14.43	58.54
07:10:54	5.06	14.61	54.05
07:11:54	5.30	14.38	73.42
07:12:54	5.48	14.21	31.31
07:13:54	5.22	14.46	15.55
07:14:54	5.36	14.26	68.88
07:15:54	5.52	14.19	14.52
07:16:54	5.21	14.45	33.80
07:17:54	5.10	14.56	26.42
07:18:54	4.98	14.64	55.56
07:19:54	5.23	14.45	53.98
07:20:54	5.07	14.57	100.05
07:21:54	5.27	14.39	51.18
07:22:53	5.40	14.31	40.05
07:23:53	5.25	14.42	23.95
07:24:53	5.30	14.36	36.56
07:25:53	5.45	14.26	21.54
07:26:53	5.26	14.40	45.90
07:27:53	5.16	14.50	59.90
07:28:53	5.31	14.38	44.81
07:29:53	5.08	14.58	100.01
07:30:53	5.32	14.35	100.03
07:31:53	5.42	14.28	41.76
07:32:53	5.10	14.59	76.22
07:33:53	5.17	14.45	100.04
07:34:53	5.64	14.11	25.61
07:35:53	5.01	14.68	41.67
07:36:53	5.14	14.47	85.96
07:37:53	5.48	14.25	27.33
07:38:53	5.19	14.49	54.74
07:39:53	5.26	14.41	41.94
07:40:53	5.29	14.39	62.89

Client : JEA SJRPP
 Site : 0000
 Unit :
 Project : 95-058
 Comment : Run # 1
 Test Date : 7/20/95

Time : 06:55 thru 07:55

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
07:41:53	5.11	14.54	49.08
07:42:53	5.23	14.45	91.64
07:43:53	5.22	14.44	95.01
07:44:53	5.44	14.27	38.33
07:45:53	5.16	14.54	29.93
07:46:53	5.19	14.46	45.14
07:47:53	5.49	14.22	51.78
07:48:53	5.09	14.63	60.96
07:49:53	4.91	14.71	100.02
07:50:53	5.49	14.21	38.17
07:51:53	5.20	14.50	38.77
07:52:53	5.27	14.38	25.05
07:53:53	5.52	14.20	20.94
07:54:53	5.10	14.58	38.74
Averages			
for 60			
Points			
	5.25	14.41	53.61
Gas →	5.195	15.17	54.99

Client : JEA SJRPP
File : 0000
Unit : 1
Project : 95-058
Document : Run #2
Print Date : 7/20/95

Time : 08:15 thru 09:15:08

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:15:23	5.32	14.36	41.00
08:16:23	5.22	14.50	49.49
08:17:23	4.95	14.70	100.05
08:18:23	5.17	14.48	59.84
08:19:23	5.20	14.49	51.48
08:20:23	5.13	14.52	74.35
08:21:23	5.20	14.49	42.91
08:22:23	5.01	14.65	74.57
08:23:23	5.25	14.42	87.53
08:24:23	5.09	14.57	100.03
08:25:23	5.22	14.45	53.78
08:26:23	5.46	14.27	22.86
08:27:23	5.08	14.56	38.15
08:28:23	5.19	14.51	71.56
08:29:23	5.09	14.56	93.91
08:30:23	5.11	14.56	44.15
08:31:23	5.09	14.58	83.06
08:32:23	5.23	14.40	100.04
08:33:23	5.40	14.33	32.06
08:34:23	5.00	14.66	80.17
08:35:23	5.04	14.59	100.04
08:36:23	5.56	14.18	28.84
08:37:23	5.07	14.60	47.83
08:38:23	5.03	14.63	100.06
08:39:23	5.17	14.50	100.03
08:40:23	5.18	14.50	60.87
08:41:23	5.21	14.46	61.17
08:42:23	5.27	14.45	34.12
08:43:23	5.22	14.43	100.06
08:44:23	5.34	14.39	24.23
08:45:23	5.07	14.57	39.32
08:46:22	5.23	14.46	22.50
08:47:22	5.34	14.35	14.67
08:48:22	5.16	14.52	100.02
08:49:22	5.03	14.61	100.05
08:50:22	5.64	14.05	55.41
08:51:22	5.15	14.58	29.52
08:52:22	5.28	14.38	100.06
08:53:22	5.26	14.40	66.68
08:54:22	5.12	14.59	74.18
08:55:22	4.99	14.65	100.04
08:56:22	5.32	14.34	58.49
08:57:22	5.50	14.21	16.33
08:58:22	5.12	14.55	36.99
08:59:22	5.24	14.41	64.38
09:00:22	5.34	14.37	65.29

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run # 2
 Test Date : 7/20/95

Time : 08:15 thru 09:15:08

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:01:22	5.09	14.54	100.03
09:02:22	5.22	14.45	52.66
09:03:22	5.18	14.47	100.06
09:04:22	5.03	14.57	100.00
09:05:22	5.33	14.34	75.90
09:06:22	5.18	14.50	51.70
09:07:22	5.12	14.49	100.05
09:08:22	5.31	14.39	32.65
09:09:22	5.05	14.59	87.66
09:10:22	5.23	14.42	61.37
09:11:22	5.07	14.57	46.54
09:12:22	5.15	14.51	40.97
09:13:22	5.12	14.53	72.06
09:14:22	5.08	14.57	98.96
09:15:08	5.60	14.06	48.53
Averages for 61 Points	5.19	14.47	65.10
<i>E gas</i> →	<i>5.16</i>	<i>15.18</i>	<i>66.40</i>

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Run# 3
Test Date :7/20/95

Time :11:42 thru 12:42:08

Page 1

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
11:42:43	5.23	14.42	42.74
11:43:43	4.97	14.62	71.26
11:44:43	4.83	14.73	100.06
11:45:43	5.12	14.47	88.91
11:46:43	5.24	14.36	92.97
11:47:43	5.41	14.21	33.35
11:48:43	4.97	14.64	64.53
11:49:43	4.94	14.66	81.17
11:50:43	4.98	14.56	87.67
11:51:43	5.06	14.51	100.06
11:52:43	5.32	14.31	46.54
11:53:43	4.75	14.81	100.00
11:54:43	5.01	14.57	100.06
11:55:43	5.08	14.51	54.68
11:56:43	5.11	14.47	84.65
11:57:43	5.21	14.37	51.01
11:58:43	5.06	14.54	61.92
11:59:43	4.97	14.59	100.00
12:00:43	5.11	14.49	70.99
12:01:43	5.08	14.51	100.05
12:02:43	4.93	14.62	100.03
12:03:43	5.20	14.42	78.69
12:04:43	4.87	14.71	90.19
12:05:43	5.02	14.53	100.06
12:06:43	5.13	14.46	50.61
12:07:43	4.94	14.63	90.76
12:08:43	4.91	14.62	100.03
12:09:43	5.14	14.48	73.27
12:10:43	5.10	14.49	70.69
12:11:43	5.11	14.48	100.03
12:12:43	4.93	14.63	100.02
12:13:43	5.05	14.50	86.04
12:14:42	5.04	14.52	100.03
12:15:42	4.99	14.56	92.76
12:16:42	5.13	14.42	81.28
12:17:42	4.92	14.66	100.07
12:18:42	4.92	14.63	99.96
12:19:42	5.16	14.44	73.99
12:20:42	5.15	14.45	69.73
12:21:42	5.08	14.48	99.14
12:22:42	5.12	14.47	48.24
12:23:42	5.11	14.45	52.00
12:24:42	5.15	14.43	28.86
12:25:42	5.11	14.47	40.35
12:26:42	4.97	14.58	39.52
12:27:42	5.08	14.49	60.87

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : Run # 3
 Test Date : 7/20/95

Time : 11:42 thru 12:42:08

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
2:28:42	5.07	14.50	80.91
2:29:42	5.10	14.45	81.02
2:30:42	4.89	14.67	67.87
2:31:42	5.10	14.47	38.57
2:32:42	5.02	14.51	99.97
2:33:42	5.18	14.38	74.88
2:34:42	5.05	14.51	100.05
2:35:42	5.11	14.45	100.00
2:36:42	5.08	14.48	71.59
2:37:42	4.94	14.63	80.37
2:38:42	5.05	14.46	80.41
2:39:42	5.26	14.31	68.90
2:40:42	5.01	14.54	100.03
2:41:42	5.11	14.44	100.00
2:42:08	5.18	14.39	82.37

Averages
 for 61
 Points 5.06 14.51 78.47

E gas ⇒ 5.09 15.22 79.60

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : *Run#4 Used For Run#3 Rm-5B.*
Post Date :7/20/95 Time :12:55 thru 13:48:15

	1030	1029
	O2	CO2
Time	%	%
12:55:14	5.0	14.4
12:56:14	4.9	14.5
12:57:14	5.0	14.4
12:58:14	5.3	14.2
12:59:14	5.0	14.4
13:00:14	5.3	14.2
13:01:14	4.9	14.5
13:02:14	5.0	14.5
13:03:14	5.3	14.1
13:04:14	5.2	14.3
13:05:14	5.0	14.5
13:06:14	4.8	14.7
13:07:14	4.9	14.5
13:08:14	5.3	14.2
13:09:14	5.0	14.5
13:10:14	5.1	14.3
13:11:14	5.1	14.4
13:12:14	5.2	14.3
13:13:14	5.1	14.4
13:14:14	4.9	14.5
13:15:14	4.9	14.5
13:16:14	5.2	14.3
13:17:14	5.0	14.4
13:18:14	5.1	14.3
13:19:14	5.1	14.4
13:20:14	5.0	14.4
13:21:14	5.1	14.4
13:22:14	5.0	14.4
13:23:14	4.9	14.6
13:24:14	5.2	14.3
13:25:14	5.3	14.2
13:26:14	5.0	14.4
13:27:14	5.0	14.5
13:28:13	5.0	14.4
13:29:13	4.9	14.6
13:30:13	5.1	14.4
13:31:13	5.2	14.3
13:32:13	5.1	14.3
13:33:13	5.2	14.3
13:34:13	5.1	14.4
13:35:13	5.2	14.3
13:36:13	5.1	14.3
13:37:13	4.8	14.6
13:38:13	5.0	14.4
13:39:13	5.0	14.4
13:40:13	5.3	14.1

Client : JEA SJRPP
 Site : 0000
 Unit : 1
 Project : 95-058
 Comment : 4 *Used For Run #3 Rm-50*
 Test Date : 7/20/95 Time : 12:55 thru 13:48:15

	1030	1029
	O2	CO2
Time	%	%
13:41:13	4.9	14.4
13:42:13	5.2	14.3
13:43:13	5.0	14.3
13:44:13	5.1	14.3
13:45:13	5.0	14.4
13:46:13	5.0	14.3
13:47:13	5.0	14.4
13:48:13	5.0	14.3
13:48:15	5.0	14.3

Averages
 for 55
 Points 5.0 14.3

C gas 5.02 19.00

Client : JEA SJRPP
 Site : 0000
 Unit :
 Project : 95-058
 Comment : Run#
 Start Date : 8/8/95

Time : 07:35 thru 08:35:19

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
07:35:22	5.35	13.66	12.66
07:36:22	5.42	13.60	12.66
07:37:21	5.21	13.81	19.36
07:38:21	5.12	13.87	20.14
07:39:21	5.42	13.60	13.17
07:40:21	5.19	13.80	20.78
07:41:21	5.40	13.61	16.57
07:42:21	5.18	13.80	24.09
07:43:21	5.25	13.75	24.73
07:44:21	5.09	13.89	29.46
07:45:21	5.31	13.65	35.38
07:46:21	5.44	13.59	20.84
07:47:21	5.36	13.63	22.74
07:48:21	5.31	13.74	18.63
07:49:21	4.97	13.96	44.27
07:50:21	5.41	13.61	24.94
07:51:21	5.14	13.85	19.61
07:52:21	5.40	13.59	21.92
07:53:21	5.24	13.81	13.99
07:54:21	4.93	14.02	14.41
07:55:21	5.39	13.61	8.06
07:56:21	5.11	13.91	13.99
07:57:21	5.06	13.91	25.05
07:58:21	5.39	13.62	11.13
07:59:21	5.18	13.81	22.63
08:00:21	5.16	13.84	14.34
08:01:21	5.21	13.78	11.25
08:02:21	5.18	13.81	18.94
08:03:21	5.20	13.82	21.02
08:04:21	5.08	13.88	34.70
08:05:21	5.32	13.67	14.78
08:06:21	5.10	13.91	13.32
08:07:21	5.10	13.85	21.95
08:08:21	5.36	13.67	10.94
08:09:21	5.23	13.75	15.27
08:10:21	5.01	13.97	12.05
08:11:21	5.07	13.87	18.92
08:12:21	5.49	13.53	27.96
08:13:21	4.93	14.03	30.46
08:14:21	5.13	13.85	25.30
08:15:21	5.08	13.87	30.02
08:16:21	5.25	13.72	31.90
08:17:21	5.37	13.62	19.53
08:18:21	5.02	13.98	30.84
08:19:21	5.04	13.92	31.20
08:20:21	5.26	13.71	25.13

Client : JEA SJRPP
Site : 0000
Unit : 1
Project : 95-058
Comment : Run #1
Test Date : 8/8/95

Time : 07:35 thru 08:35:19

Page 2

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
08:21:21	5.14	13.85	26.20
08:22:21	5.07	13.88	23.21
08:23:21	5.10	13.83	56.29
08:24:20	5.35	13.66	21.93
08:25:20	5.01	13.94	15.89
08:26:20	5.15	13.81	34.93
08:27:20	5.07	13.89	43.08
08:28:20	5.27	13.73	38.96
08:29:20	5.23	13.77	27.93
08:30:20	4.93	13.98	28.95
08:31:20	5.26	13.74	17.01
08:32:20	5.02	13.93	36.55
08:33:20	5.37	13.62	40.30
08:34:20	5.12	13.88	34.44
08:35:19	4.95	13.98	35.93
Averages for 61 Points	5.19	13.79	23.81
	51.087	14.078	25.172

Client : JEA SJRPP
File : 0000
Unit : 1
Project : 95-058
Document : Run 2
Test Date : 8/8/95 Time : 09:00 thru 10:01:11

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:00:21	5.21	13.79	11.00
09:01:21	5.07	13.90	12.83
09:02:21	5.25	13.74	17.96
09:03:21	5.33	13.67	32.95
09:04:21	5.19	13.82	17.98
09:05:21	4.71	14.22	29.98
09:06:21	5.38	13.62	29.31
09:07:21	5.39	13.62	15.79
09:08:21	5.16	13.83	14.05
09:09:21	5.27	13.71	15.89
09:10:21	5.11	13.86	8.75
09:11:21	5.54	13.49	7.25
09:12:21	5.17	13.84	14.69
09:13:21	4.69	14.24	28.18
09:14:21	5.29	13.71	23.82
09:15:21	5.41	13.60	12.94
09:16:21	4.99	14.00	14.37
09:17:21	4.78	14.15	24.60
09:18:21	5.55	13.50	12.35
09:19:21	5.03	13.96	13.61
09:20:21	4.82	14.11	15.71
09:21:21	5.23	13.75	11.03
09:22:21	5.54	13.49	12.20
09:23:21	4.56	14.38	27.07
09:24:21	5.18	13.77	39.03
09:25:21	5.24	13.74	14.31
09:26:21	5.58	13.44	8.43
09:27:21	4.54	14.42	21.45
09:28:21	5.28	13.74	54.31
09:29:21	4.97	14.01	26.31
09:30:21	4.97	14.01	11.54
09:31:21	5.06	13.92	14.39
09:32:21	5.11	13.89	9.14
09:33:21	5.18	13.79	17.54
09:34:21	5.20	13.80	15.14
09:35:21	5.13	13.85	7.53
09:36:21	5.19	13.81	8.87
09:37:21	5.21	13.80	8.87
09:38:21	5.10	13.88	9.96
09:39:21	5.30	13.68	17.54
09:40:21	5.18	13.82	7.93
09:41:21	5.08	13.88	14.79
09:42:21	5.22	13.75	33.56
09:43:21	5.09	13.87	23.57
09:44:21	5.05	13.91	17.80
09:45:21	5.02	13.93	16.39

Client : JEA SJRPP
 Site : 0000
 Unit :
 Project : 95-058
 Comment : RUC 2
 Test Date : 8/8/95

Time : 09:00 thru 10:01:11

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
09:46:20	4.98	13.95	32.10
09:47:20	5.35	13.61	11.80
09:48:20	4.90	14.05	13.82
09:49:20	5.01	13.91	22.50
09:50:20	5.14	13.80	9.84
09:51:20	5.02	13.90	21.88
09:52:20	5.08	13.85	13.60
09:53:20	5.06	13.85	7.94
09:54:20	4.94	13.98	14.85
09:55:20	4.98	13.91	14.77
09:56:20	4.74	14.12	22.02
09:57:20	4.77	14.06	64.93
09:58:20	4.90	13.98	53.88
09:59:20	5.00	13.87	41.92
10:00:20	5.20	13.68	11.42
10:01:11	5.13	13.76	12.18
Averages			
for 62			
Points			
	5.10	13.85	19.22
	5.292	13.942	20.179

Client : JEA SJRPP
Site : 0000
Unit :
Project : 95-058
Comment : Run #3
Start Date : 8/8/95

Time : 10:30 thru 11:30:13

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
10:30:40	4.99	13.95	17.73
10:31:40	5.18	13.78	14.87
10:32:40	4.97	13.96	18.86
10:33:40	5.26	13.70	16.93
10:34:40	5.02	13.94	28.92
10:35:40	5.15	13.78	35.88
10:36:40	4.98	13.98	13.88
10:37:40	5.12	13.83	19.86
10:38:40	5.02	13.94	10.88
10:39:40	4.92	14.00	14.86
10:40:40	5.28	13.71	8.92
10:41:40	5.01	13.94	10.85
10:42:40	5.18	13.78	12.93
10:43:40	5.15	13.81	8.92
10:44:40	5.04	13.92	13.90
10:45:40	5.10	13.86	46.86
10:46:40	5.01	13.94	17.02
10:47:40	5.09	13.86	16.97
10:48:40	5.20	13.78	12.97
10:49:40	5.13	13.84	15.85
10:50:40	5.15	13.81	28.97
10:51:40	4.92	14.03	22.85
10:52:40	5.10	13.88	31.87
10:53:40	5.14	13.85	10.90
10:54:40	5.05	13.91	9.90
10:55:40	5.05	13.90	20.94
10:56:40	5.04	13.90	16.97
10:57:40	5.16	13.81	11.86
10:58:40	5.09	13.88	6.07
10:59:40	5.06	13.89	7.02
11:00:40	4.85	14.09	6.08
11:01:40	5.13	13.83	13.92
11:02:40	5.19	13.81	14.91
11:03:39	5.03	13.95	21.93
11:04:39	5.12	13.85	13.90
11:05:39	5.01	13.95	8.93
11:06:39	4.96	13.99	33.98
11:07:39	5.23	13.76	17.94
11:08:39	5.13	13.84	13.87
11:09:39	4.98	13.94	11.86
11:10:39	5.07	13.89	11.86
11:11:39	5.15	13.82	7.03
11:12:39	5.09	13.89	12.93
11:13:39	5.17	13.81	10.93
11:14:39	5.11	13.87	9.90
11:15:39	4.99	13.95	12.92

Client : JEA SJRPP
 Site : 0000
 Unit :
 Project : 95-058
 Comment : Run #3
 Test Date : 8/8/95

Time : 10:30 thru 11:30:13

Page 2

Time	1030 O2 %	1029 CO2 %	1028 CO PPm
1:16:39	5.12	13.87	8.94
1:17:39	4.82	14.10	59.88
1:18:39	5.00	13.94	49.95
1:19:39	5.02	13.93	15.88
1:20:39	5.12	13.85	10.90
1:21:39	4.89	14.05	25.96
1:22:39	5.11	13.84	29.96
1:23:39	5.11	13.85	12.96
1:24:39	5.08	13.87	11.84
1:25:39	5.00	13.94	14.87
1:26:39	5.02	13.93	23.85
1:27:39	5.07	13.89	16.92
1:28:39	5.12	13.84	11.88
1:29:39	5.11	13.85	16.98
1:30:13	5.17	13.79	9.60
Averages			
for 61			
Points			
	5.07	13.88	17.51
	5.27	13.99	18.11

Client :JEA SJRPP
 Site :0000
 Unit :
 Project :95-058
 Comment :
 Test Date :8/8/95

Time :15:10 thru 15:52:27

	1030	1029
	O2	CO2
Time	%	%
15:10:44	5.10	13.79
15:11:44	5.04	13.89
15:12:44	5.07	13.90
15:13:44	5.04	13.93
15:14:44	4.80	14.16
15:15:44	4.88	14.06
15:16:44	5.23	13.77
15:17:44	4.96	14.01
15:18:44	5.06	13.92
15:19:44	4.85	14.12
15:20:44	4.97	13.99
15:21:44	4.82	14.15
15:22:44	4.92	14.04
15:23:44	5.13	13.85
15:24:44	5.03	13.94
15:25:44	4.77	14.18
15:26:44	4.95	14.01
15:27:44	5.13	13.85
15:28:44	4.90	14.07
15:29:44	5.10	13.86
15:30:44	4.98	13.99
15:31:43	4.94	14.01
15:32:43	5.01	13.98
15:33:43	5.00	13.97
15:34:43	5.03	13.95
15:35:43	4.89	14.06
15:36:43	5.18	13.81
15:37:43	4.93	14.03
15:38:43	4.99	13.97
15:39:43	5.04	13.92
15:40:43	4.78	14.15
15:41:43	4.92	14.03
15:42:43	4.81	14.12
15:43:43	4.99	13.95
15:44:43	5.04	13.91
15:45:43	4.91	14.02
15:46:43	5.09	13.86
15:47:43	4.80	14.13
15:48:43	4.90	14.02
15:49:43	5.16	13.79
15:50:43	4.90	14.03
15:51:43	5.03	13.89
15:52:27	5.10	13.86
Averages for 43 Points	4.98	13.97

Test Calibration Data

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
MID-RANGE GAS	<u>29.73</u>	<u>29.10</u>	<u>.63</u>	<u>.63</u>
HIGH-RANGE GAS	<u>62.0</u>	<u>61.9</u>	<u>.10</u>	<u>.10</u>

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
MID-RANGE GAS	<u>11.70</u>	<u>11.60</u>	<u>-.10</u>	<u>-.50</u>
HIGH-RANGE GAS	<u>17.2</u>	<u>17.2</u>	<u>0.0</u>	<u>0.0</u>

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
MID-RANGE GAS	<u>11.60</u>	<u>11.60</u>	<u>0.0</u>	<u>0.0</u>
HIGH-RANGE GAS <u>Amb</u>	<u>20.90</u>	<u>20.5</u>	<u>-.40</u>	<u>1.60</u>

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

29.93

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE IDENTIFICATION Unit # 1 Stack OPERATOR T. Roth

RUN NO: / GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>.20</u>	<u>.1</u>	<u>.10</u>	<u>.16</u>
UPSCALE GAS	<u>29.1</u>	<u>27.8</u>	<u>1.30</u>	<u>28.6</u>	<u>.50</u>	<u>.80</u>

$C_{ma} = 29.73$

$C_0 = .150$

$C_m = 28.2$

RUN NO: / GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.50</u>	<u>.20</u>	<u>1.0</u>	<u>.50</u>
UPSCALE GAS	<u>11.60</u>	<u>11.6</u>	<u>0.0</u>	<u>12.4</u>	<u>.80</u>	<u>.80</u>

$C_{ma} = 11.70$

$C_0 = .150$

$C_m = 12.6$

RUN NO: / GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.8</u>	<u>3.2</u>	<u>.3</u>	<u>1.2</u>	<u>2.9</u>
UPSCALE GAS	<u>11.60</u>	<u>11.70</u>	<u>.40</u>	<u>11.0</u>	<u>2.4</u>	<u>2.8</u>

$C_{ma} = 11.60$

$C_0 = .550$

$C_m = 11.35$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

RUN NO: 2 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>0.0</u>
UPSCALE GAS	<u>29.1</u>	<u>28.1</u>	<u>.50</u>	<u>28.4</u>	<u>.70</u>	<u>.20</u>

$C_{MA} = 29.73$

$C_0 = .10$

$C_M = 28.5$

RUN NO: 2 GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>1.0</u>	<u>.20</u>	<u>1.0</u>	<u>0.0</u>
UPSCALE GAS	<u>11.60</u>	<u>12.4</u>	<u>.80</u>	<u>12.1</u>	<u>2.5</u>	<u>1.5</u>

$C_{MA} = 11.70$

$C_0 = .20$

$C_M = 12.25$

RUN NO: 2 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.30</u>	<u>1.2</u>	<u>.50</u>	<u>2.0</u>	<u>.80</u>
UPSCALE GAS	<u>11.60</u>	<u>11.0</u>	<u>2.4</u>	<u>11.4</u>	<u>.80</u>	<u>1.60</u>

$C_{MA} = 11.60$

$C_0 = .40$

$C_M = 11.20$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

4/7/95

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95
SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO</u>						
SPAN: <u>100</u>						
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.10</u>	<u>.30</u>	<u>.30</u>	<u>.20</u>
UPSCALE GAS	<u>29.1</u>	<u>28.4</u>	<u>.70</u>	<u>28.3</u>	<u>.80</u>	<u>.10</u>

$C_{ma} = 29.73$ $C_0 = .20$ $C_m = 28.35$

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO2</u>						
SPAN: <u>30</u>						
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>1.0</u>	<u>0.0</u>	<u>0.0</u>	<u>1.0</u>
UPSCALE GAS	<u>11.60</u>	<u>12.1</u>	<u>2.5</u>	<u>12.9</u>	<u>1.50</u>	<u>1.0</u>

$C_{ma} = 11.70$ $C_0 = .10$ $C_m = 12.0$

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>O2</u>						
SPAN: <u>25</u>						
ZERO GAS	<u>0.0</u>	<u>.50</u>	<u>2.0</u>	<u>.50</u>	<u>2.0</u>	<u>0.0</u>
UPSCALE GAS	<u>11.60</u>	<u>11.4</u>	<u>.80</u>	<u>11.3</u>	<u>1.20</u>	<u>.40</u>

$C_{ma} = 11.60$ $C_0 = .50$ $C_m = 11.35$

RUN NO:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:						
SPAN:						
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: CO SPAN: 100	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS N ₂	0.0	0.0	0.0	0.0
MID-RANGE GAS	29.73	29.30	.43	.43
HIGH-RANGE GAS	62.0	62.3	.30	.30

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: CO ₂ SPAN: 20	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS N ₂	0.0	0.0	0.0	0.0
MID-RANGE GAS	11.70	11.3 ^{col} _{11.5}	.20 ^{.20}	2.0 ^{1.0}
HIGH-RANGE GAS	17.2	17.2	0.0	0.0

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: O ₂ SPAN: 25	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS N ₂	0.0	0.0	0.0	0.0
MID-RANGE GAS	11.60	11.70	.10	.46
HIGH-RANGE GAS Anal	20.90	20.70	.20	.80

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95
 SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

RUN NO: / GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.40</u>	<u>.40</u>	<u>0</u>	<u>0.0</u>	<u>.40</u>
UPSCALE GAS	<u>29.30</u>	<u>27.3</u>	<u>2.0</u>	<u>26.6</u>	<u>2.70</u>	<u>.70</u>

$CMA = 29.73$

$Cb = .20$

$Cm = 26.95$

RUN NO: GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.50</u>	<u>.20</u>	<u>1.0</u>	<u>.50</u>
UPSCALE GAS	<u>11.5</u>	<u>11.7</u>	<u>1.0</u>	<u>11.4</u>	<u>.50</u>	<u>1.50</u>

$CMA = 11.70$

$Cb = .150$

$Cm = 11.55$

RUN NO: GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE TR	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>1.2</u>	<u>4.8</u>	<u>1.1</u>	<u>4.40</u>	<u>.40</u>
UPSCALE GAS	<u>11.70</u>	<u>12.1</u>	<u>1.6</u>	<u>12.1</u>	<u>1.60</u>	<u>0.0</u>

$CMA = 11.60$

$Cb = 1.150$

$Cm = 12.10$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

RUN NO: 2 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	0.0	0.0	0.30	0.30	0.30
UPSCALE GAS	29.30	26.6	2.70	26.7	2.6	0.10

$C_{ma} = 29.73$ $C_0 = .150$ $C_m = 26.65$

RUN NO: 2 GAS TYPE: <u>CO₂</u> SPAN: <u>30</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	0.20	1.0	0.30	1.5	0.50
UPSCALE GAS	11.50	11.40	0.50	11.30	1.00	0.50

$C_{ma} = 11.70$ $C_0 = .250$ $C_m = 11.35$

RUN NO: 2 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	1.1	4.40	1.2	4.8	0.40
UPSCALE GAS	11.70	12.00	1.60	12.1	1.60	0.6

$C_{ma} = 11.60$ $C_0 = 1.150$ $C_m = 12.1$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95
 SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

RUN NO: 3 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.30</u>	<u>.30</u>	<u>.30</u>	<u>.30</u>	<u>0.0</u>
UPSCALE GAS	<u>29.30</u>	<u>26.7</u>	<u>2.6</u>	<u>26.7</u>	<u>2.60</u>	<u>0.0</u>

$C_{ma} = 29.73$ $C_0 = .30$ $C_m = 26.7$

RUN NO: 3 GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.30</u>	<u>1.50</u>	<u>.20</u>	<u>1.0</u>	<u>.50</u>
UPSCALE GAS	<u>11.50</u>	<u>11.30</u>	<u>1.00</u>	<u>11.4</u>	<u>.50</u>	<u>.50</u>

$C_{ma} = 11.70$ $C_0 = .250$ $C_m = 11.35$

RUN NO: 3 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>1.2</u>	<u>4.8</u>	<u>1.2</u>	<u>4.80</u>	<u>0.0</u>
UPSCALE GAS	<u>11.70</u>	<u>12.1</u>	<u>1.60</u>	<u>11.9</u>	<u>.80</u>	<u>.80</u>

$C_{ma} = 11.60$ $C_0 = 1.20$ $C_m = 12.0$

RUN NO:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95

SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
MID-RANGE GAS	<u>29.73</u>	<u>29.40</u>	<u>.33</u>	<u>.33</u>
HIGH-RANGE GAS	<u>62.0</u>	<u>62.7</u>	<u>.70</u>	<u>.70</u>

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
MID-RANGE GAS	<u>11.70</u>	<u>11.30</u>	<u>.40</u>	<u>2.0</u>
HIGH-RANGE GAS	<u>17.2</u>	<u>17.6</u>	<u>.40</u>	<u>2.0</u>

CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	CYLINDER VALUE % or ppm	ANALYZER RESPONSE	ABSOLUTE DIFFERENCE % or ppm	DIFFERENCE % OF SPAN
ZERO GAS <u>N₂</u>	<u>0.0</u>	<u>.10</u>	<u>.10</u>	<u>.40</u>
MID-RANGE GAS	<u>11.60</u>	<u>11.9</u>	<u>.30</u>	<u>1.20</u>
HIGH-RANGE GAS <u>Air</u>	<u>20.90</u>	<u>20.80</u>	<u>.10</u>	<u>.40</u>

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95
 SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

RUN NO: 1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO</u>						
SPAN: <u>100</u>						
ZERO GAS	<u>0.0</u>	<u>.30</u>	<u>.30</u>	<u>.20</u>	<u>.20</u>	<u>.10</u>
UPSCALE GAS	<u>29.40</u>	<u>29.10</u>	<u>.30</u>	<u>29.10</u>	<u>.30</u>	<u>.10</u>

$C_{ma} = 29.73$ $C_0 = 2.50$ $C_m = 29.10$

RUN NO: 1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO₂</u>						
SPAN: <u>20</u>						
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.50</u>	<u>.20</u>	<u>1.0</u>	<u>.50</u>
UPSCALE GAS	<u>11.30</u>	<u>11.20</u>	<u>.80</u>	<u>11.20</u>	<u>.50</u>	<u>.50</u>

$C_{ma} = 11.70$ $C_0 = .150$ $C_m = 11.150$

RUN NO: 1	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>O₂</u>						
SPAN: <u>25</u>						
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.40</u>	<u>.10</u>	<u>.40</u>	<u>0.0</u>
UPSCALE GAS	<u>11.90</u>	<u>11.60</u>	<u>1.20</u>	<u>11.60</u>	<u>1.20</u>	<u>0.0</u>

$C_{ma} = 11.60$ $C_0 = .10$ $C_m = 11.60$

RUN NO:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:						
SPAN:						
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95
 SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

RUN NO: 2 GAS TYPE: <u>CO</u> SPAN: <u>100</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>.20</u>	<u>.20</u>	<u>.20</u>	<u>.40</u>
UPSCALE GAS	<u>29.40</u>	<u>29.10</u>	<u>.30</u>	<u>29.2</u>	<u>.20</u>	<u>.10</u>

$C_{ma} = 29.73$ $C_0 = 0.0$ $C_m = 29.150$

RUN NO: 2 GAS TYPE: <u>CO₂</u> SPAN: <u>20</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>1.0</u>	<u>.20</u>	<u>1.0</u>	<u>0.0</u>
UPSCALE GAS	<u>11.30</u>	<u>11.20</u>	<u>.50</u>	<u>11.20</u>	<u>.50</u>	<u>0.0</u>

$C_{ma} = 11.70$ $C_0 = .20$ $C_m = 11.20$

RUN NO: 2 GAS TYPE: <u>O₂</u> SPAN: <u>25</u>	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.40</u>	<u>.10</u>	<u>.40</u>	<u>0.0</u>
UPSCALE GAS	<u>11.90</u>	<u>11.80</u>	<u>1.20</u>	<u>11.50</u>	<u>1.60</u>	<u>.40</u>

$C_{ma} = 11.60$ $C_0 = .10$ $C_m = 11.550$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95
 SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO</u>						
SPAN: <u>100</u>						
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>.20</u>	<u>-.30</u>	<u>.30</u>	<u>.20</u>
UPSCALE GAS	<u>29.40</u>	<u>29.20</u>	<u>.20</u>	<u>29.1</u>	<u>.30</u>	<u>.10</u>

$C_{ma} = 29.73$

$C_0 = -.250$

$C_m = 29.150$

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>CO₂</u>						
SPAN: <u>20</u>						
ZERO GAS	<u>0.0</u>	<u>.20</u>	<u>1.0</u>	<u>.20</u>	<u>1.0</u>	<u>0.0</u>
UPSCALE GAS	<u>11.30</u>	<u>11.20</u>	<u>.50</u>	<u>11.2</u>	<u>.50</u>	<u>0.6</u>

$C_{ma} = 11.70$

$C_0 = .20$

$C_m = 11.20$

RUN NO: 3	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE: <u>O₂</u>						
SPAN: <u>25</u>						
ZERO GAS	<u>0.0</u>	<u>.10</u>	<u>.40</u>	<u>.20</u>	<u>.80</u>	<u>.40</u>
UPSCALE GAS	<u>11.90</u>	<u>11.50</u>	<u>1.80</u>	<u>11.20</u>	<u>2.8</u>	<u>1.2</u>

$C_{ma} = 11.60$

$C_0 = 11.25 .150$

$C_m = 11.35$

RUN NO:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
GAS TYPE:						
SPAN:						
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

Client T.E.A. S.J.R.P.P. Project # 95-058 F1 Test Date 8-8-95

Source Identification Unit # 1 Stack Operator T. Roth

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>100</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS		14.74			
MID-RANGE GAS		29.73	29.70	.03	.03
HIGH-RANGE GAS		62.0	62.0	0.0	0.0

Calibration Data For Sampling Runs: <u>O2 1-</u> Gas Type: <u>O2</u> Span: <u>25</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS	0.0	0.0	.10	.10	.40
LOW-RANGE GAS		—			
MID-RANGE GAS		11.60	11.60	0.0	0.0
HIGH-RANGE GAS		20.90	20.80	.10	.40

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO2</u> Span: <u>20</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS		—			
MID-RANGE GAS		10.90	11.0	.10	.50
HIGH-RANGE GAS		17.20	17.1	.10	.50

Calibration Data For Sampling Runs: <u>1-</u> Gas Type: <u>CO</u> Span: <u>1000</u>	Cylinder Number	Cylinder Value % or PPM	Analyzer Response	Absolute Difference % or PPM	Difference % of Span
ZERO GAS		0.0	0.0	0.0	0.0
LOW-RANGE GAS					
MID-RANGE GAS		302.0	305.4	3.40	.340
HIGH-RANGE GAS		603.5	603.0	.50	.05

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 TEST DATE 8-8-95
 SOURCE IDENTIFICATION Unit # 1 Stack OPERATOR T. Roth

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
1 CO 1000						
ZERO GAS	0.0	.10	.01	.10	.010	0
UPSCALE GAS	62.0	58.0	.40	59.0	.30	.10

Cm = 62.0 *Co = .10* *Cm = 58.5*

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
1 O2 25						
ZERO GAS	.10	.60	2.0	0.0	.4	2.4
UPSCALE GAS	11.60	11.60	0.0	11.3 11.3	1.2	1.2

Cm = 11.6% *Co = .30* *Cm = 11.45*

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
1 CO2 20						
ZERO GAS	0.0	.10	.50	0.1	.5	0
UPSCALE GAS	11.0	10.50	2.5	10.9	2.0 2.0	2.0

Cm = 10.90 *Co = .10* *Cm = 10.7*

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$



SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # AS-058-F1 TEST DATE 8-8-95
 SOURCE IDENTIFICATION Unit #1 Stock OPERATOR T. Roth

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
2 CO 1000						
ZERO GAS	0.0	1.10	1.010	0.0	0.0	1.01
UPSCALE GAS	62.0	59.0	1.30	58.9	.31	.01

$C_{max} = 62.0$ $C_0 = .05$ $C_m = 58.95$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
2 O ₂ 25						
ZERO GAS	0.0	0.0	.4	0.0	0.0	0.0
UPSCALE GAS	11.60	11.3	1.2	11.1	2.0	0.8

$C_{max} = 11.60$ $C_0 = 0.0$ $C_m = 11.1$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
2 CO ₂ 21						
ZERO GAS	0.0	0.1	.5	0.1	0.5	0.0
UPSCALE GAS	11.6	10.9	.50	10.8	1.0	.50

$C_{max} = 10.90$ $C_0 = .10$ $C_m = 10.85$

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

SYSTEM CALIBRATION BIAS = $\frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$

DRIFT = $\frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEAL SJR.P.P. PROJECT # 95-058 FL DATE 8-8-75
 SOURCE IDENTIFICATION Unit # 1 STACK OPERATOR Tyfel

RUN NO: 3 GAS TYPE: CO SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	0.0	0.0	0.0	0.0	0.0
UPSCALE GAS	62.0	58.9	.31	61.0	.10	.21

Cma = 62.0 Co = 0.0 Cm = 59.95

RUN NO: 3 GAS TYPE: O2 SPAN: 25	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	0.0	0.0	.10	.40	.40
UPSCALE GAS	11.0	11.1	2.0	14.1	2.0	0.6

Cma = 11.0 Co = .05 Cm = 11.10

RUN NO: 3 GAS TYPE: CO2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	0.1	0.5	.20	1.0	.50
UPSCALE GAS	11.0	10.8	1.0	10.9	.50	.50

Cma = 10.90 Co = .150 Cm = 10.25

RUN NO:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

Cma = Co = Cm =

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

G16

$$C_{gas} = \bar{C} - C_o \times \frac{C_{ma}}{C_m - C_o}$$

Gas Certification Sheets



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH, 44090

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1344
Scott Project # 558885

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM023664 **Certification Date** 12-8-93 **Expiration Date** 12-7-96
Cylinder Pressure 1900 psig **Previous Certification Dates** None

ANALYZED CYLINDER

Components **Certified Concentration** **Analytical Uncertainty***
Carbon Monoxide 14.74 ppm ±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type CRM 1678 **Expiration Date** 5-12-94 **Cylinder Number** AAL6302 **Concentration** 45.76 PPM CO IN N₂

INSTRUMENTATION

Instrument/Model/Serial # CO: Beckman/867/0100157 **Last Date Calibrated** 11-10-93 **Analytical Principle** Non-Dispersive Infrared

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

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Monoxide	Date: 11-29-93 Response Units: mv Z1=0.00 R1=46.80 T1=15.20 R2=46.80 Z2=0.00 T2=15.20 Z3=0.00 T3=15.20 R3=46.80 Avg. Conc. of Cust. Cyl. 14.74 ppm	Date: 12-8-93 Response Units: mv Z1=0.00 R1=46.80 T1=15.20 R2=46.80 Z2=0.00 T2=15.20 Z3=0.00 T3=15.20 R3=46.80 Avg. Conc. of Cust. Cyl. 14.74 ppm	Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴ r=0.99999 CRM 1678 Constants: A=0.3465483 B=0.9339077 C=0.00095399 D=0.000003327 E=0
			Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴
			Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴

Special Notes

Tim Sanderson
Analyst Tim Sanderson



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory

Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 2004

Scott Project # : 575700

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM028243
Cylinder Pressure + : 1900 psig

Certificate Date : 1/13/95
Previous Certificate Date : None

Expiration Date : 1/13/98

ANALYZED CYLINDER

Components

Carbon Monoxide

Certified Concentration

29.73 ppm

Analytical Uncertainty*

±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1679	8/11/96	ALM037782	97.10 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO:Horiba/OPE-135/565607092

Last Date Calibrated
1/13/95

Analytical Principle
Non-Dispersive Infrared

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

Components

Carbon Monoxide

First Triad Analysis

Date: 1/6/95	Response Units: mv		
Z1=0.00	R1=80.00	T1=25.00	
R2=80.00	Z2=0.00	T2=25.00	
Z3=0.00	T3=25.00	R3=80.00	
Avg. Conc. of Cust. Cyl. 29.87 ppm			

Second Triad Analysis

Date: 1/13/95	Response Units: mv		
Z1=0.00	R1=80.00	T1=25.10	
R2=80.00	Z2=0.00	T2=25.10	
Z3=0.00	T3=25.10	R3=80.00	
Avg. Conc. of Cust. Cyl. 29.79 ppm			


Calibration Curve

Concentration=A+Bx+Cx ² +Dx ³ +Ex ⁴	
r=1.00000	NTRM 1679
Constants:	A=0.058415000
B=1.202500000	C=-0.001100400
D=0.000015397	E=0.000000000

Special Notes

Mail

H2


Analyst



610-691-2474
FAX # 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER S/T CANTON

P.O NUMBER 49763

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE	49.7 PPM GMIS VS. 1678C	CAL-6763	45.2 PPM

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

COMPONENT	CARBON MONOXIDE	49.7 PPM	ANALYZER MAKE-MODEL-S/N	SIEMENS ULTRANAT 5E	EE-800				
ANALYTICAL PRINCIPLE	NON-DISPERSIVE INFRARED		LAST CALIBRATION DATE		03/31/95				
FIRST ANALYSIS DATE	04/17/95		SECOND ANALYSIS DATE		04/25/95				
Z 0.00	R 50.8	C 63.4	CONC.	62.0	Z 0.00	R 50.6	C 63.2	CONC.	62.1
R 50.8	Z 0.00	C 63.4	CONC.	62.0	R 50.6	Z 0.00	C 63.2	CONC.	62.1
Z 0.00	C 63.4	R 50.8	CONC.	62.0	Z 0.00	C 63.2	R 50.6	CONC.	62.1
U/M	PPM	MEAN TEST ASSAY		62.0	U/M	PPM	MEAN TEST ASSAY		62.1

THIS CYLINDER NO.	SA6640	CERTIFIED CONCENTRATION	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R93/224	CARBON MONOXIDE	62.0 ppm
OF TRACEABILITY PROTOCOL NO.	REV. 9/93	NITROGEN	BALANCE
PROCEDURE	G1		
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE		
CYLINDER PRESSURE	1650PSIG		
CERTIFICATION DATE	04/25/95		
EXPIRATION DATE	04/25/98		

ANALYZED BY

Daniel J. Day
DANIEL J. DAY, H3

CERTIFIED BY

Robert Hillard
ROBERT HILLARD



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1477
Scott Project # : 568881

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM049209
Cylinder Pressure + : 1900 psig

Certificate Date : 7/25/94
Previous Certificate Date : None

Expiration Date : 7/25/97

ANALYZED CYLINDER

Components
Carbon Dioxide

Certified Concentration
10.9 %

Analytical Uncertainty*
±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
SRM 2745	11/3/96	SX20311	15.75 % Carbon Dioxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO2:Horiba/PIR-2000/02609015

Last Date Calibrated
7/14/94

Analytical Principle
Non-Dispersive Infrared

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

Components
Carbon Dioxide

First Triad Analysis

Date:	Response Units: mV		
7/25/94	Z1=0.00	R1=120.90	T1=65.90
	R2=120.90	Z2=0.00	T2=65.90
	Z3=0.00	T3=65.90	R3=120.90
Avg. Conc. of Cust. Cyl. 10.9 %			

Second Triad Analysis

Empty box for Second Triad Analysis data.

Calibration Curve

Concentration = A + Bx - Cx ² - Dx ³	
r=1.00000	SRM 2745
Constant:	A=-1.418800000
B=0.140670000	C=-0.000842590
D=0.000005416	B=0.000000000

Special Notes

H4

Analyst Rhonda Lundy

AGA Gas, Inc.

Specialty & Medical Gases Division

CERTIFICATE OF ANALYSIS

EPA PROTOCOL

PERFORMED ACCORDING TO SECTION 2.2, PROCEDURE G1

Production Number: 12940090

Cylinder Number: CC7791

Cylinder Pressure: 2000 psi

NOTICE, THIS CYLINDER IS NOT TO BE USED WHEN PRESSURE IS UNDER 150 psig

Certified Component	Certified Concentration	Date of Certification	Analytical Method
Carbon Dioxide	13.93% ± 1%	1/23/95	Non-Dispersive Infrared

Expiration Date: 1/23/98

Balance Gas: Nitrogen

REFERENCE STANDARD DATA:

SRM Number	Cylinder Number	Concentration
GMIS	CC4109	13.93% Carbon Dioxide

CERTIFIED AT:

AGA Gas Inc.
Specialty & Medical Gas Division
5421 Monclova Road
Maumee, Ohio 43537


Michael Sickmiller
Quality Control Supervisor



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX: (810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory

Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1477

Scott Project # : 568881

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM049101
Cylinder Pressure + : 1900 psig

Certificate Date : 7/25/94
Previous Certificate Date : None

Expiration Date : 7/25/97

ANALYZED CYLINDER

Components

Carbon Dioxide

Certified Concentration

17.2 %

Analytical Uncertainty*

±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
SRM 2745	11/3/96	SX20311	15.75 % Carbon Dioxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO2:Horiba/PIR-2000/02609015

Last Date Calibrated
7/14/94

Analytical Principle
Non-Dispersive Infrared

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

Components
Carbon Dioxide

First Triad Analysis

Date: 7/25/94	Response Units: mv		
Z1=0.00	R1=120.90	T1=127.10	
R2=120.90	Z2=0.00	T2=127.10	
Z3=0.00	T3=127.10	R3=120.90	
Avg. Conc. of Cust. Cyl. 17.2 %			

Second Triad Analysis



Calibration Curve

Concentration = A + Bx + Cx ² + Dx ³ - Ex ⁴	
r=1.00000	SRM 2745
Constants:	A=-1.415500000
B=0.140570000	C=-0.000842590
D=0.000005416	E=0.000000000

Special Notes

Analyst Rhonda Lundy

Air Products and Chemicals, Inc.

SPECIALTY GAS DEPARTMENT
12722 S. WENTWORTH AVENUE
CHICAGO, IL 60628

Certificate of Analysis - EPA Protocol Gas Standard

PERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

Customer:
APCI
5420 WARNER RD.
VALLEY VIEW
CLEVELAND OH 44125

Notes:

Order No: 231-019520-
Batch No: 861-23317
Cylinder No: SG9133258BA
Cylinder Pressure*: 2000 psig
Certification Date: 01/23/95
Expiration Date: 01/23/98

PO: Rel:

*** Certified Concentration *** ***** Reference Standards ***** ***** Analytical Instrumentation *****

Component	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
OXYGEN	11.6 ±.10 %	SG9113455BAL	GMIS	15.0500 %	Shimadzu GC-8A	32029	01/18/95	GC-TCD

Balance Gas: Nitrogen

* Standard should not be used below 150 psig

H7

Analyst: Shaher Aboor
Shaher Aboor

Approved By: Robert McNear
Robert McNear



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1433
Scott Project # : 565319

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards: Procedure G1; September, 1993.

Cylinder Number : ALM028068
Cylinder Pressure + : 1900 psig

Certificate Date : 4/28/94
Previous Certificate Date : None

Expiration Date : 4/28/97

ANALYZED CYLINDER

Components

Carbon Monoxide

Certified Concentration
302.0 ppm

Analytical Uncertainty*
±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 1681	7/19/95	ALM-024827	966.1 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO : Beckman/864/102528

Last Date Calibrated
4/15/94

Analytical Principle
Non-Dispersive Infrared

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

Components
Carbon Monoxide

First Triad Analysis

Date:	Response Units: mv		
3/15/94	Z1=0.00	R1=100.00	T1=35.40
	R2=100.00	Z2=0.00	T2=35.40
	Z3=0.00	T3=35.40	R3=100.00
	Avg. Conc. of Cust. Cyl. 302.0 ppm		

Second Triad Analysis

Date:	Response Units: mv		
4/28/94	Z1=0.00	R1=100.00	T1=35.40
	R2=100.00	Z2=0.00	T2=35.40
	Z3=0.00	T3=35.40	R3=100.00
	Avg. Conc. of Cust. Cyl. 302.0 ppm		

Calibration Curve

Concentrations $A+Bz+Cz^2+Dz^3+ Ez^4$	
r=1.00000	CRM 1681
Constants:	A=0.182780000
B=7.918200000	C=0.017444000
D=0.000000000	E=0.000000000

Special Notes

H8

Don Eichler, Jr.
Analyst Don Eichler, Jr



Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 1433
Scott Project # : 565319

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards: Procedure G1; September, 1993.

Cylinder Number : ALM012900
Cylinder Pressure + : 1900 psig

Certificate Date : 4/28/94
Previous Certificate Date : None

Expiration Date : 4/28/97

ANALYZED CYLINDER

Components
Carbon Monoxide

Certified Concentration
603.5 ppm

Analytical Uncertainty*
±1% NIST Directly Traceable

Balance Gas: Nitrogen

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

*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 1681	7/19/95	ALM-024827	966.1 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #
CO : Beckman/864/102528

Last Date Calibrated
4/15/94

Analytical Principle
Non-Dispersive Infrared

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

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Monoxide	Date: 2/8/94 Response Units: mv Z1=0.00 R1=100.00 T1=66.50 R2=100.00 Z2=0.00 T2=66.50 Z3=0.00 T3=66.50 R3=100.00 Avg. Conc. of Cust. Cyl. 603.5 ppm	Date: 4/28/94 Response Units: mv Z1=0.00 R1=100.00 T1=66.50 R2=100.00 Z2=0.00 T2=66.50 Z3=0.00 T3=66.50 R3=100.00 Avg. Conc. of Cust. Cyl. 603.5 ppm	$Concentration = A + Bx + Cx^2 + Dx^3 + Ex^4$ r=1.00000 CRM 1681 Constant: A=0.162760000 B=7.918200000 C=0.017444000 D=0.000000000 E=0.000000000

Special Notes

H9

Don Eichler
Analyst Don Eichler, Jr

Calibrations of Test Equipment

DRY GAS METER CALIBRATION SHEET

CLIENT: SHOP Q.A.Q.C.
 PROJECT NUMBER: 95-000-FL
 MODULE: RAC # 1
 ORIFICE: 3.118

RUN BY: T.ROTH
 DATE: 5/18/95
 BAROMETRIC PRESSURE 29.95

DELTA H IN.H2O	Vw Initial	Vw Final	Vw Cub.Feet	Vd Initial	Vd Final	Vd Cub.Feet	Tw F	TDi F	TDo F	Td F	Time Min
0.5	29.000	33.385	4.385	285.647	290.041	4.394	69.0	98.0	86.0	92.00	10.0
1.0	34.000	39.943	5.943	290.621	296.595	5.974	69.5	100.0	87.0	93.50	10.0
1.5	41.000	48.119	7.119	297.683	304.940	7.257	69.5	101.0	87.0	94.00	10.0
2.0	49.000	57.076	8.076	305.898	314.198	8.300	69.5	101.0	88.0	94.50	10.0
3.0	58.000	67.565	9.565	315.362	325.274	9.912	70.0	102.0	88.0	95.00	10.0

DELTA H IN.H2O	DELTA H 13.6	MC/Y	Yi
0.50	0.0368	1.040	-0.017
1.00	0.0735	1.037	-0.014
1.50	0.1103	1.023	0.001
2.00	0.1471	1.014	0.009
3.00	0.2206	1.003	0.020

DELTA Ha	DELTA Ha @i
1.395	0.184
1.518	0.061
1.585	-0.006
1.641	-0.062
1.757	-0.177

METER CORR.
FACTOR

1.023

ORIFICE
3.118

DELTA H@i
1.579

WHERE: AH = Orifice Setting
 Vw = Volume of Gas of Wet Test Meter
 Vd = Volume of Gas of Dry Gas Meter
 Tw = Temperature of Fluid in Wet Test Meter
 Tdi = Inlet Temperature of Dry Gas Meter
 Tdo = Outlet Temperature of Dry Gas Meter
 Td = Average Temperature of Dry Gas Meter
 Time = Time Required to pull specific cubic feet
 Mc = Dry Gas Meter Correction Factor
 A Ha = Orifice setting that equates to .75 cfm of air
 at standard conditions
 A Hai = Ha tolerance; tolerance for individual
 values (+/-) .20 from average
 Yi = Ratio of reading of Wet Test Meter to Dry Gas
 Meter; tolerance for individual values
 (+/-) .02 from average


EQUATIONS: Mc (Y)

$$\frac{Vw P_b (T_d + 460)}{Vd (P_b + AH/13.6)(T_w + 460)}$$

AH (a)

$$\frac{0.0317 AH}{P_b (T_d + 460)}$$

$$\frac{(T_w + 460)Time^2}{Vw}$$



SHOP Q.A.Q.C.
 95-000-FL
 RAC # 1
 5/18/95

ORIFICE CALCULATIONS

INITIAL			POSSIBLE COMBINATIONS		
DELTA H	Ft/Min	X ²			
0.5	0.4394	0.1931	1 (3.0 - 2.0)	1 3.4063	-9.26%
1.0	0.5974	0.3569	2 (3.0 - 1.5)	2 3.2907	-5.55%
1.5	0.7257	0.5266	3 (3.0 - 1.0)	3 3.1970	-2.55%
2.0	0.8300	0.6889	4 (3.0 - .50)	4 3.1669	-1.59%
3.0	0.9912	0.9825	5 (2.0 - 1.5)	5 3.0815	1.16%
			6 (2.0 - 1.0)	6 3.0119	3.39%
			7 (2.0 - .50)	7 3.0252	2.96%
			8 (1.5 - 1.0)	8 2.9454	5.52%
			9 (1.5 - .50)	9 2.9979	3.84%
			10 (1.0 - .50)	10 3.0522	2.09%

AVERAGE ORIFICE 3.1175

J. Ash

Dry Gas Meter Calibration Sheet

Client: _____ Run By: Bruce Horwedel
 Project No. _____ Date: 5/31/95
 Module: 09 N Barometric Press. 29.38
 Orifice: 3.255

Δx In. H ₂ O	V _w initial	V _w final	V _w ft. ³	V _d initial	V _d final	V _d ft. ³	t _w °F	t _{di} °F	t _{do} °F	t _d	Time 8 min.
.5	872.153	880.623	4.450	735.42	739.81	4.52	68	77	69	73	10
1.2	862.115	888.153	6.043	741.30	747.05	5.930	68	80	70	75	10
1.5	851.42	896.678	7.183	748.55	755.61	7.02	68	82	71	76.5	10
2.2	838.225	906.287	8.264	752.973	755.19	8.146	68	82	72	77	10
3.2	812.438	922.412	9.981	771.194	781.070	9.822	67	82	73	77.5	10

Δx	$\frac{\Delta x}{13.5}$	Kc(Y)		Yi	ΔH_0 (For Small Orifice Size)		ΔH_{0i}
		$\frac{V_w \text{ (at } t_w = 460)}{V_d \text{ (at } t_d = 460)}$	$\frac{0.0317 \Delta H}{P_b \text{ (at } t_d = 460)}$		$\frac{(P_w - 460)}{V_w}$		
.5	.0368	1.03			1.425		
1.2	.0757	1.03			1.540		
1.5	.110	1.03			1.630		
2.2	.147	1.03			1.640		
3.2	.227	1.03			1.632		
Average		1.03			1.585		

- Δx = Orifice Setting
- V_w = Volume of Gas of Wet Test Meter
- V_d = Volume of Gas of Dry Gas Meter
- t_w = Temperature of Fluid in Wet Test Meter
- t_{di} = Inlet Temperature of Dry Gas Meter
- t_{do} = Outlet Temperature of Dry Gas Meter
- t_d = Average Temperature of Dry Gas Meter
- θ = Time required to pull specified cubic feet
- K_c = Dry Gas Meter Correction Factor
- ΔH_0 = Orifice setting that would pull .75 cfm of air at standard conditions
- Y_i = Ratio of reading of wet test meter to dry test meter ±.02 from average

DeltaH	Vd3
.5	4.530
1.0	5.950
1.5	7.076
2.0	8.146
3.0	9.876

Possible Combinations

(3.0 - 2.0) / (.975 - .663) =	3.207
(3.0 - 1.5) / (.975 - .500) =	3.160
(3.0 - 1.0) / (.975 - .354) =	3.218
(3.0 - .5) / (.975 - .205) =	3.246
(2.0 - 1.5) / (.663 - .500) =	3.069
(2.0 - 1.0) / (.663 - .354) =	3.230
(2.0 - .5) / (.663 - .205) =	3.272
(1.5 - 1.0) / (.500 - .354) =	3.408
(1.5 - .5) / (.500 - .205) =	3.384
(1.0 - .5) / (.354 - .205) =	3.359

Average orifice: 3.255

Dry Gas Meter Calibration Sheet

Client _____ Run By Brent A. Meyer
 Project No. _____ Date 7-17-95
 Module 01/N Barometric Press. 29.54
 Orifice 3.694

ΔH in. H ₂ O	Vw initial	Vw final	Vw ₃ ft. ³	Vd initial	Vd final	Vd ₃ ft. ³	tw °F	tdi °F	tdo °F	td	Time θ min.
.5	917.205	921.161	3.956	055.715	059.564	3.851	83.5	87	85	86	10
1.0	921.484	926.971	5.487	059.812	066.227	5.369	83.5	86	84	85	10
1.5	927.218	933.869	6.651	065.466	071.936	6.470	84	87	85	86	10
2.0	943.348	960.985	7.637	081.127	088.567	7.441	84	89	85	87	10
3.0	951.222	960.671	9.449	088.186	097.897	9.106	84	90	86	88	10

ΔH	$\frac{\Delta H}{13.6}$	Mc(Y)		Yf	ΔH_a (For Small Orifice Only)		ΔH_{ai}
		$\frac{Vw}{Vd(Pb + \Delta H/13.6)(tw + 460)}$	$\frac{Vd}{Pb(td + 460)}$		$\frac{0.0317\Delta H}{Pb(td + 460)}$	$\frac{(tw + 460)\theta}{Vw}$	
.5	.0368		1.03			1.855	
1.0	.0737		1.02			1.932	
1.5	.110		1.03			1.972	
2.0	.147		1.03			1.991	
3.0	.221		1.04			1.947	
Average			1.03			1.939	

- ΔH = Orifice Setting
- Vw = Volume of Gas of Wet Test Meter
- Vd = Volume of Gas of Dry Gas Meter
- tw = Temperature of Fluid in Wet Test Meter
- tdi = Inlet Temperature of Dry Gas Meter
- tdo = Outlet Temperature of Dry Gas Meter
- td = Average Temperature of Dry Gas Meter
- θ = Time required to pull specified cubic feet
- Mc = Dry Gas Meter Correction Factor
- ΔH_a = Orifice setting that would pull .75 cfm of air at standard conditions
- Yf = Ratio of reading of wet test meter to dry test meter $\pm .02$ from average
- ΔH_{ai} = H_a tolerance for individual values $\pm .20$ from average.

DeltaH	Vd3
.5	3.851
1.0	5.365
1.5	6.470
2.0	7.437
3.0	9.106

01/N

Possible Combinations	
(3.0 - 2.0) / (.829 - .553)	= 3.621
(3.0 - 1.5) / (.829 - .418)	= 3.653
(3.0 - 1.0) / (.829 - .287)	= 3.694
(3.0 - .5) / (.829 - .148)	= 3.671
(2.0 - 1.5) / (.553 - .418)	= 3.718
(2.0 - 1.0) / (.553 - .287)	= 3.769
(2.0 - .5) / (.553 - .148)	= 3.705
(1.5 - 1.0) / (.418 - .287)	= 3.823
(1.5 - .5) / (.418 - .148)	= 3.699
(1.0 - .5) / (.287 - .148)	= 3.583

Average orifice: 3.694

Nozzle Calibration

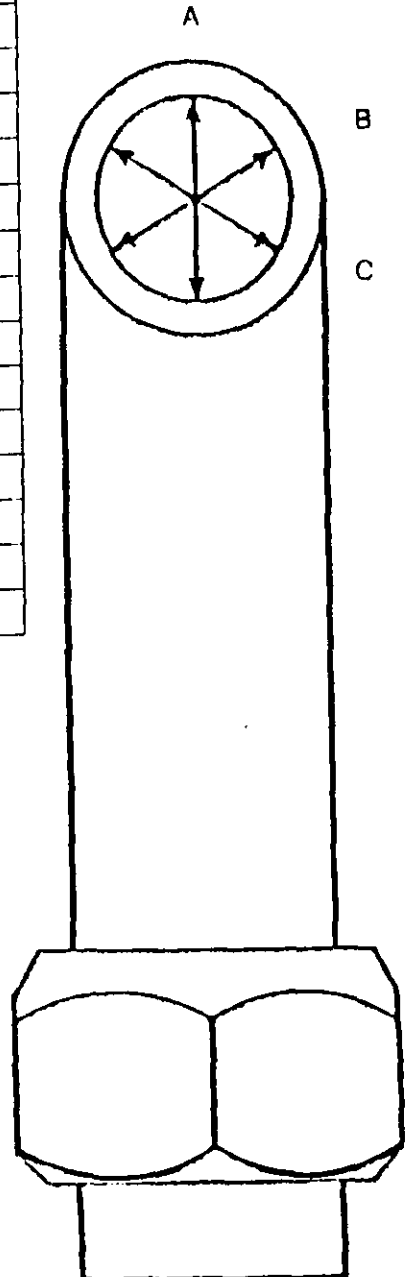
Sized By J. Roth Shop QA QC.

Date	Nozzle	Dimension			Difference	Avg. Diameter
		A	B	C		
2-21-95	F1-01	.120	.120	.120	.000	.120
2-21-95	F1-02	.137	.139	.140	.001	.137
2-21-95	F1-03	.186	.188	.187	.002	.187
2-21-95	F1-04	.187	.187	.187	.000	.187
2-21-95	F1-05					
2-21-95	F1-06	.231	.230	.232	.002	.231
2-21-95	F1-07	.250	.249	.249	.001	.249
2-21-95	F1-08	.248	.249	.248	.001	.248
2-21-95	F1-09	.250	.250	.250	.000	.250
2-21-95	F1-10	.250	.250	.250	.000	.250
2-21-95	F1-11	.252	.252	.251	.001	.252
2-21-95	F1-12	.375	.374	.375	.001	.375
2-21-95	F1-13	.302	.302	.301	.001	.302
2-21-95	F1-14	.305	.306	.306	.001	.306
2-21-95	F1-15	.314	.315	.315	.001	.315
2-21-95	F1-16	.374	.375	.374	.001	.374
2-21-95	F1-17	.372	.373	.372	.001	.372
2-21-95	F1-18	.371	.372	.372	.001	.372
2-21-95	F1-19	.370	.369	.371	.002	.370
2-21-95	F1-20	.438	.437	.438	.001	.438
2-21-95	F1-22	.501	.502	.503	.002	.502
2-21-95	F1-21	.496	.495	.496	.001	.496
2-21-95	F1-23	.501	.501	.501	.000	.501
2-21-95	F1-24	.501	.500	.501	.001	.501
2-21-95	F1-25	.494	.495	.494	.001	.494
2-21-95	F1-27	.496	.498	.498	.002	.498
2-22-95	F1-26	.753	.753	.753	.000	.753

All Dimensions are in inches.



Total Source Analysis, Inc.
Environmental Testing Consultants



Pitot Calibration Form

Client Shop Quality
 Project No. _____
 Test Location Umatilla, FL.

Run By T. Roth / J. Taylor
 Date 2-27-95
 Pitot No. A-10-1-1-FL

● "A" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C _p (s)	Deviation C _p (s) - \bar{C}_p (A)
1	.840	1.200	.828	-0.360
2	.860	1.267	.816	-0.407
3	.903	1.200	.859	-0.297
Average		C _p (Side A)	.834	-0.355

Calculations:

$$C_p(s) = 0.99 \sqrt{\frac{\Delta P \text{ (standard)}}{\Delta P(s)}}$$

$$\text{Deviation} = C_p(s) - \bar{C}_p \text{ (A or B)}$$

$$\sum_{i=1}^3 |C_p(s) - \bar{C}_p \text{ (A or B)}|$$

$$\text{Average Deviation} = \sigma \text{ (A or B)} = \frac{1}{3}$$

$$|\bar{C}_p \text{ (Side A)} - \bar{C}_p \text{ (Side B)}| = \frac{3}{-0.012}$$

●● "B" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C _p (s)	Deviation C _p (s) - \bar{C}_p (B)
1	.840	1.200	.828	-0.360
2	.860	1.233	.827	-0.373
3	.903	1.200	.859	-0.297
Average		C _p (Side B)	.838	-0.343

Nozzle size used for Calibrations (inches) 1/4" F1-003

Intercomponent Spacings During Calibrations:

Pitot - Nozzle: ± 3/4"

Pitot - Thermocouple: 1/2"

Pitot - Probe Sheath: 1/2"



Total Source Analysis, Inc.
 Environmental Testing Consultants

Pitot Calibration Form

Client Shop Quality
 Project No. _____
 Test Location Umatilla, FL

Run By T. Roth / J. Tayfel
 Date 2-27-95
 Pitot No. N-10-GIF

● "A" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C _p (s)	Deviation C _p (s) - \bar{C}_p (A)
1	.840	1.133	.852	-0.293
2	.860	1.100	.875	-0.240
3	.903	1.100	.897	-0.197
Average		\bar{C}_p (Side A)	.875	-0.243

Calculations:

$$C_p(s) = 0.99 \sqrt{\frac{\Delta P \text{ (standard)}}{\Delta P (s)}}$$

$$\text{Deviation} = C_p(s) - \bar{C}_p \text{ (A or B)}$$

$$\text{Average Deviation} = \sigma \text{ (A or B)} = \frac{1}{3} \sum |C_p(s) - \bar{C}_p \text{ (A or B)}|$$

$$|\bar{C}_p \text{ (Side A)} - \bar{C}_p \text{ (Side B)}| = .023^3$$

●● "B" Side Calibration

Run No.	ΔP_{std} cm H ₂ O (in H ₂ O)	ΔP (s) cm H ₂ O (in. H ₂ O)	C _p (s)	Deviation C _p (s) - \bar{C}_p (B)
1	.840	1.133	.852	-0.293
2	.860	1.133	.863	-0.273
3	.903	1.133	.884	-0.230
Average		\bar{C}_p (Side B)	.866	-0.265

Nozzle size used for Calibrations (inches) 3/8" F1-017

Intercomponent Spacings During Calibrations:

Pitot - Nozzle: 3/4"

Pitot - Thermocouple: 1 1/2"

Pitot - Probe Sheath: 1 1/2"



Total Source Analysis, Inc.
 Environmental Testing Consultants

Laboratory Reports

Analytical Data Sheet

Client JEI - SWRPP Project No. 95-058-FL Date July 18, '95

Run No. 1
 Filter No. 95-014
 Acetone No. 1-2
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. 2
 Filter No. 95-015
 Acetone No. 2-2
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5887	.5859	.0028
2	73.5001	73.4855	.0146
Total			
Less acetone blank			.0000
Weight of particulate matter			.0174

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5883	.5857	.0026
2	70.1648	70.1498	.0150
Total			
Less acetone blank			.0000
Weight of particulate matter			.0176

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	406	266.1
Initial	200	250.0
Liquid collected	206	16.1
Total Volume Collected	222.1	g* ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	422	266
Initial	200	250.0
Liquid collected	222	16.0
Total Volume Collected	238	g* ml

Run No. 3
 Filter No. 95-016
 Acetone No. 3-2
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. Blank Acetone
 Filter No. NA
 Acetone No. _____
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5933	.5902	.0031
2	70.8660	70.8522	.0138
Total			
Less acetone blank			.0000
Weight of particulate matter			.0169

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2	70.1444	70.1444	.0000
Total			
Less acetone blank			
Weight of particulate matter			

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	430	266.3
Initial	200	250.0
Liquid collected	230	16.3
Total Volume Collected	246.3	g* ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g* ml

* Convert weight of water to volume by dividing total weight increase by density of water (1g/ml); Increase, g = Volume Water, ml
 ** See Federal Register, Method 5, 6.6, & 6.7.

Analytical Data Sheet

Client JEA SJRPP Project No. 95-058 Date July 19, '95

Run No. 1
 Filter No. 95-017
 Acetone No. FL-01
 Amount liquid lost during transport -0-
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** -0-

Run No. 2
 Filter No. 95-018
 Acetone No. FL-01
 Amount liquid lost during transport -0-
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** -0-

Container Number	Weight of Particulate Collected		
	g		
	Final Weight	Tare Weight	Weight Gain
1	.5878	.5841	.0037
2	73.4409	73.4369	.0040
Total			.0077
Less acetone blank			.0000
Weight of particulate matter			.0077

Container Number	Weight of Particulate Collected		
	g		
	Final Weight	Tare Weight	Weight Gain
1	.5899	.5856	.0043
2	70.0920	70.0875	.0045
Total			.0088
Less acetone blank			.0000
Weight of particulate matter			.0088

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	428	267.9
Initial	200	250.0
Liquid collected	228	17.90
Total Volume Collected	295.9	g

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	445.0	267.5
Initial	200.0	250.0
Liquid collected	245.0	17.50
Total Volume Collected	262.5	g

Run No. 3
 Filter No. 95-019 FL
 Acetone No. FL-01
 Amount liquid lost during transport -0-
 Acetone blank volume, ml 100ml
 Acetone wash volume, ml 100ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** -0-

Run No. _____
 Filter No. _____
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected		
	g		
	Final Weight	Tare Weight	Weight Gain
1	.5874	.5854	.0020
2	70.8202	70.8105	.0097
Total			.0117
Less acetone blank			.0000
Weight of particulate matter			.0117

Container Number	Weight of Particulate Collected		
	g		
	Final Weight	Tare Weight	Weight Gain
1			
2			
Total			
Less acetone blank			
Weight of particulate matter			

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final	440.0	267.5
Initial	200.0	250.0
Liquid collected	240.0	17.5
Total Volume Collected	257.5	g

	Volume of Liquid Water Collected	
	Impinger Volume, ml	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 ** See Federal Register, Method 5, 6.6, & 6.7.

Analytical Data Sheet

Client J.E.A. SJR.P.P.

Project No. 95-058-FL

Date 7-21-95

Run No. 1
 Filter No. 95-020 FL
 Acetone No. FL01
 Amount liquid lost during transport - 0 -
 Acetone blank volume, ml 100 ml
 Acetone wash volume, ml 100 ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. 2
 Filter No. 95-021-FL
 Acetone No. FL-01
 Amount liquid lost during transport - 0 -
 Acetone blank volume, ml 100 ml
 Acetone wash volume, ml 100 ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5913	.5846	.0067
2	73.4629	73.4369	.0260
Total			.0327
Less acetone blank			.0000
Weight of particulate matter			.0327

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5909	.5883	.0026
2	70.1065	70.0875	.0190
Total			.0216
Less acetone blank			.0000
Weight of particulate matter			.0216

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	432.0	265.8
Initial	200.0	250.0
Liquid collected	232.0	15.8
Total Volume Collected	247.8	g ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	435.0	265.6
Initial	200.0	250.0
Liquid collected	235.0	15.6
Total Volume Collected	250.6	g ml

Run No. 3
 Filter No. 95-022 FL
 Acetone No. FL-01
 Amount liquid lost during transport - 0 -
 Acetone blank volume, ml 100 ml
 Acetone wash volume, ml 100 ml
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. _____
 Filter No. _____
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.5952	.5917	.0035
2	70.8280	70.8108	.0172
Total			.0207
Less acetone blank			.0000
Weight of particulate matter			.0207

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2			
Total			
Less acetone blank			
Weight of particulate matter			

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	454.0	271.0
Initial	200.0	250.0
Liquid collected	254.0	21.0
Total Volume Collected	275.0	g ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g ml

* Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 ** See Federal Register, Method 5, 8.6, & 8.7.
 1g/ml \rightarrow .9982

Run No. 1
 Filter No. 95-025
 Acetone No. _____
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. 2
 Filter No. 95-023
 Acetone No. _____
 Amount liquid lost during transport 0
 Acetone blank volume, ml 100
 Acetone wash volume, ml 100
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	5893	5834	.0059
2	60.4549	60.4400	.0149
Total			.0208
Less acetone blank			.0002
Weight of particulate matter			.0206

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	5909	5893	.0016
2	71.0430	71.0252	.0178
Total			.0194
Less acetone blank			.0002
Weight of particulate matter			.0192

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	403	268.3
Initial	200	250
Liquid collected	203	18.3
Total Volume Collected		g [*] ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	441	266.5
Initial	200	250
Liquid collected	241	16.5
Total Volume Collected		g [*] ml

Run No. 3
 Filter No. 95-027
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Run No. ACETONE BLANK
 Filter No. _____
 Acetone No. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml _____
 Acetone blank concentration, mg/mg (equation 5-4)** _____
 Acetone wash blank, mg (equation 5-5)** _____

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	16094	6037	.0057
2	70.8457	70.8190	.0267
Total			.0324
Less acetone blank			.0002
Weight of particulate matter			.0322

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2	73.4317	73.4315	.0002
Total			
Less acetone blank			
Weight of particulate matter			

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	425	272.2
Initial	200	250
Liquid collected	225	22.2
Total Volume Collected		g [*] ml

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g [*] ml

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}} = \text{Volume Water, ml}$
 **See Federal Register, Method 5, 6.6, & 6.7.

SO₂ Analysis Sheet

Client JEA - SJRPP Analysis Run By HES Date July 18, '95
 Project No. 95-058-FL Plant Site JACKSONVILLE, FL
 Barium Perchlorate Normality .0100 = Mls H₂SO₄ X Normality = X
 Mls Barium Titrated

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit 1 stack		Blank	1000	50 ml	0.0 / 0.0
	↓	1	195	25/25	9.1/9.1
	2	2	208	50	14.7/14.9
	3	3	215	50	11.5/11.3

JS

DAY 2 BASELINE

SO₂ Analysis Sheet

Client JEAN-SRPP Analysis Run By HES Date July 19, 1995
Project No. 95-058-FL Plant Site JACKSONVILLE, FL
Barium Perchlorate Normality .0100 Mls H₂SO₄ X Normality = _____ X
Mls Barium Titrated = _____

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
UNIT 1 STACK		BLANK	1000	50 ml	0.0/0.0
	1	1	215ml	50ml	12.8/12.9
	2	2	207ml	50ml	9.8/9.3/9.5
56					
	3	3	217ml	50ml	9.5/9.7/



Total Source Analysis, Inc.
Environmental Samplers



Day 3 Baseline

SO₂ Analysis Sheet

Client J.E.A. S.J.R.P.P.

Analysis Run By T. Roth

Date July 20, 1995

Project No. 95-058-F1.

Plant Site Jacksonville, Fla

Mls H₂SO₄ X Normality

X

Barium Perchlorate Normality .0100

Mls Barium Titrated

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit # 1 Gade		Blank	1000ml	50ml	0.0 / 0.0
	1	1	215ml	50ml	11.2 / 11.0
	2	2	187ml	50ml	13.7 / 14.0 / 14.2
57					
	3	3	175ml	50ml	14.8 / 14.7



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Environmental Samplers

Client JEI - SJRPP Analysis Run By _____ Date Aug 19 95
 Project No. 95-058-FL Plant Site JACKSONVILLE, FL
 Barium Perchlorate Normality .0099 Mis H₂SO₄ X Normality 25.0 X .02
 Mis Barium Titrated 50.70

Sampling Location	Run No.	Sample #	Volume of Solution	Volume of Aliquot	Volume to Titrate
Unit 1 stock		Blank	1000	50ml	0.0 / 0.0
	1	1	148ml	50ml	26.14 / 26.3
	2	2	235	50ml	12.4 / 12.5
	3	3	237	50ml	10.3 / 10.5



Total Source Analysis, Inc.
Environmental Samplers



CERTIFIED MAIL

RECEIVED
JUL 25 1995
Bureau of
Air Regulation



SJRO LC 95 120

July 20, 1995

Mr. Clair Fancy
Fla. Dept. of Environmental Protection
Bureau of Air Regulation
Mail Station 5505
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

RE: Site Certification No. RA 81-13
St. Johns River Power Park (SJRPP) Unit 1
Notification of Petroleum Coke/Coal Test Burn Delay

Dear Mr. Fancy:

The above referenced testing at SJRPP has been delayed due to pulverizer mechanical repairs. The unit loading of petroleum coke is now anticipated to commence August 7, 1995. Please note that the baseline testing was completed July 20, 1995, however, these repairs have become necessary to ensure that the unit will remain available throughout the pet coke testing period.

Please contact me at (904) 751-7729 if you have any questions.

Sincerely,

Jay Worley
Environmental & Safety Manager

JAW/pct

xc: R. Breitmoser - FAX 632-7376