9.5.3 Meat Rendering Plants

Total hydrocarbon emissions of the gel bone cooker stack.

TRC Environmental Corporation for IBP, Inc.

1998 (post section publication) source test data.

April 1, 1998

Mr. Dave Meirhenry
Air Quality Compliance Section
Nebraska Department of Environmental Quality
P. O. Box 98922
Lincoln, NE 68509-8922

RE: IBP, inc., Dakota City, Nebraska
Edible Dryer VOC Test Report

Dear Mr. Meirhenry:

This letter replaces my original letter dated February 13, 1998, for the edible dryer VOC test report for the above referenced facility. Please find enclosed a copy of that report. The testing was conducted on September 8, 1997, by TRC Environmental Corporation. Volatile organic carbon testing was completed per the Nebraska Compliance Sampling Methods and was approved through protocol submittals. As shown in the detailed testing report on page 3, the average VOC (Total Hydrocarbons as Methane) emission rate from the natural gas fired edible Duske dryer is 0.54 lbs/hr as methane.

If you have any questions concerning the testing results or procedures used, please contact me at 402-241-3647 or you may contact Mr. Scott Miller, TRC Project Manager, at 630-810-1122.

Sincerely,

Rechelle Kruse
Air Pollution Control Engineer

Enclosure

c: Tom Trosper (without test report)
Angel Gogel (with test report)
Dallas Safriet (with test report)

RK98-467/DC-Stack Test

TRC Environmental Corporation

98207-E04-03

FINAL REPORT

TOTAL HYDROCARBON EMISSIONS OF THE GEL BONE COOKER STACK

Prepared for

IBP, Inc.
Dakota City, Nebraska

Prepared by

TRC ENVIRONMENTAL CORPORATION
1307 Butterfield Road, Suite 420
Downers Grove, IL 60515
TELEPHONE (630) 810-1122
FACSIMILE (630) 810-1122

TRC Project No. 22214-0000-00004

[redacted]

DISCLAIMER

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LIST OF ACRONYMS AND ABBREVIATIONS

acfm	actual cubic feet per minute
afmp	actual feet per minute
CEM	continuous emission monitor
CEMS	continuous emission monitoring system
cf	cubic feet
CO_2	carbon dioxide
dscf	dry standard cubic feet
EPA	Environmental Protection Agency
• F	degrees Fahrenheit
ft	feet
in H_2O	inches of water
in Hg	inches of mercury
lb/hr	pounds per hour
O_2	oxygen
ppm (v)	parts per million volume
QA/QC	Quality Assurance/Quality Control
scfm	standard cubic feet per minute
THC	total hydrocarbons
TRC	TRC Environmental Corporation
VOC	volatile organic compound

PROGRAM SUMMARY

The IBP, Inc. facility located in Dakota City, Nebraska has a Gel Bone Cooker in their rendering operations. TRC Environmental Corporation (TRC) was contracted by IBP, Inc. to conduct VOC emissions emission rates testing on the Gel Bone Cooker. Testing was performed only after the Nebraska Environmental Protection Agency (NEPA) reviewed and approved the test protocol. The major objectives of the test program were to collect representative flue gas samples and determine the emission rates of volatile organic compounds (VOC's) at the Gel Bone Cooker.

TRC accomplished this objective through the use of acceptable protocols performed by trained and experienced staff. IBP, Inc. personnel were responsible for maintaining the proper operations during the emission test series. The emission test program was conducted on September 8, 1997. The emission tests included sampling for total non-methane hydrocarbons (THC), volumetric flow rate, and moisture content of the Gel Bone Cooker flue gas following USEPA Methods 1 (sampling location selection), 2 (flow rate), 3 (CO_2 and O_2 for Molecular Weight), 4 (moisture), and 25A (Total Hydrocarbons and Methane).

SECTION I

INTRODUCTION

1.1 Project Scope

The IBP, Inc. facility operates a Gel Bone Cooker at its Dakota City, Nebraska facility. TRC Environmental performed stack testing on the outlet stack after the scrubber.

TRC was contracted by IBP, Inc. to conduct total non-methane hydrocarbon emission testing. The major objective of the test program was to collect representative flue gas samples and determine emission rates of VOC's for the Gel Bone Cooker. Three 1-hour tests were conducted on the exhaust gas. Flow rates, CO_2 and O_2 for molecular weight, and moisture was performed simultaneously with the THC testing.

1.2 Sampling Locations

Sampling for THC was conducted on the Gel Bone Cooker. The inside stack dimensions were measured to be 48"; therefore, the stack area equals 1809.6 square inches. Stack gas velocity, moisture, and volumetric flow rates were measured simultaneously with the THC sampling. The required number of sample points and the sample point locations for the velocity traverse were calculated according to 40 CFR Part 60, Appendix A, Method 1.

SECTION 2

SUMMARY OF RESULTS

On September 8, 1997, testing was conducted to determine emission rates of the Gel Bone Cooker at the IBP, Inc. plant in Dakota City, Nebraska. Run 1 had to be disallowed due to bad post test calibrations on the JUM VE-7 THC analyzer. The pre-test calibration pressure and run 1 sample presure could not be the same for the duration of run 1. This situation was resolved by lowering the calibration presure for the following runs. All testing for runs 2-4 was completed without incident in strict accordance with the approved source test protocol. Tests were not witnessed by a representative of the Nebraska EPA Air Pollution Control Division.

Table 2-1 summarizes the data collected on September 8, 1997 at the IBP, Inc. plant located in Dakota City, Nebraska.

Raw field data sheets are located in Appendix A, this includes CEM's data sheets, CEM's one minute averages, strip chart trending data, volumetric flow rate data sheets, and moisture data sheets.

Process data recorded by IBP, Inc. is located in Appendix B.

Equipment calibration data sheets are located in Appendix C.

Example calculations can be found in Appendix D.

All test procedures were conducted as stated in Section 3. No anomalous data is reported.

Table 2-1 Summary of Emission Test Data for the Gel Bone Cooker

GEL BONE COOKER EMISSION RATE RESULTS			
	TEST #2	**TEST #3**	**TEST #4**
Total Hydrocarbons Lbs/Hr as Methane	.774	.400	.444

AVG = .540 lbs/hr as methane

SECTION 3

FIELD SAMPLING PROCEDURES

3.1 Field Sampling Summary

After consideration of the program requirements, TRC provided a team of two experienced professionals to conduct the field effort. The personnel and their responsibilities during this test program were as follows:

David A. Wells - Team Leader and Continuous Emission Monitoring (CEM) Operator
Thomas Lundin - Moistures and Volumetric Flow Rate Measurements

3.1.1 Pre-Sampling Preparation

Equipment was inspected for proper operation and durability prior to calibration. All calibrations were performed prior to and at the conclusion of the emissions test program as shown below:

- Pitot tubes (QA Handbook Section 3.12, pp. 1-13 and USEPA Reference Method 2) - measured for appropriate spacing and dimensions or calibrated in a wind tunnel. Rejection criteria given on the calibration sheet. Post-test check to inspect for damage.

- Thermocouples (QA Handbook Section 3.4,2,pp. 15-18) - verified against a mercury-in-glass thermometer at three points including the anticipated measurement range. Acceptance limits - impinger ±2• F; DGM ±5.4• F; stack ±1.5 percent of stack temperature.

- Field barometer (QA Handbook Section 3.4.2, pp. 18-19) - compared against a mercury-in-glass barometer or use the airport station's barometric pressure and correct for elevation. Acceptance criteria - ± 0.02 in. Hg; post-test check - same.

- Dry gas meters (QA Handbook Section 3.4.2, pp. 1-12 and USEPA Method 5 Section 5.3) - calibrated against a wet test meter. Acceptance criteria - pretest $Y_i = Y \pm 0.2$; post test $Y = \pm 0.05\ Y_i$.

3.2 Sampling Methods

3.2.1 Flow Rate Measurements

Velocity measurements at the sampling locations were made following EPA Reference Methods 1 and 2 simultaneously with the total hydrocarbon sampling. A Type-S pitot tube with an attached water manometer was used to measure the exhaust velocities at the sampling ports. An attached Type-K thermocouple with remote digimite was used to determine gas temperature.

3.2.2 CO_2 and O_2 Measurement

Tedlar Bag® flue gas samples were taken concurrently with the VOC sampling. A Fyrite analyzer was used to determine percent by volume of O_2 and CO_2.

3.2.3 Moisture Measurement

Moisture was measured simultaneously on the exhaust using the impinger train technique stated in USEPA Method 4 for each test run. After completion of each test run the volumes of the first, second, and third impingers were measured and recorded. The silica gel from the last impinger was returned to its original container and weighed to obtain a final weight.

3.2.4 Total Hydrocarbons

TRC conducted total hydrocarbons (THC) monitoring at the Gel Bone Cooker following (USEPA RM25A). TRC followed procedures outlined in the EPA publication 340/1-83-016 regarding setup and operation of its THC analyzer.

The THC analyzer system consists of three subsystems: sample acquisition, sample analysis, and a data acquisition system. The sample acquisition sample line is designed to deliver a representative sample of the stack gas stream to the sample analysis subsystem. A heat traced sample line was used to eliminate in-line condensation prior to the THC analyzer.

Sample analysis was achieved using a JUM VE-7 total hydrocarbon analyzer. Accurate interpretation of each analyzers response requires the systematic calibration of the instrument against gases of known concentrations. A calibration equation is determined from a linear regression of known gas concentrations versus instrument response. The equation used to convert instrument signal to concentration units follows:

$$\text{Concentration} = m\,(\text{response}) + b$$

where: m = slope of calibration curve
response = instrument signal (volts)
b = y-intercept of calibration curve

The data acquisition subsystem consists of an ESC 8800 Datalogger and an Esterline Angus strip chart recorder. The average total hydrocarbon concentration for each test run was calculated from average measurements recorded at one-minute intervals over the entire duration of each test run. Once the THC system was set up it was connected to a power source and brought on line. Sample line and signal wires were run between the sampling and THC system location, and the sample probe was selected and placed in the stack facing away from the gas stream.

The initial phase of the instrumental analysis method required the calibration of the THC analyzer system. Prior to the start of the first test run, system calibration using zero and an upscale propane in nitrogen gas was performed. Following these initial system checks, further calibrations were performed at the end of each test run using a zero and an upscale propane in nitrogen gas.

3.2.5 Methane

TRC conducted total hydrocarbons (THC) monitoring at the Gel Bone Cooker following (USEPA RM25A). TRC followed procedures outlined in the EPA publication 340/1-83-016 regarding setup and operation of its Methane analyzer.

The methane analyzer system consists of three subsystems: sample acquisition, sample analysis, and a data acquisition system. The sample acquisition sample line is designed to deliver a representative sample of the stack gas stream to the sample analysis subsystem. A heat traced sample line was used to eliminate in-line condensation prior to the methane analyzer.

Sample analysis was achieved using a California Analytical 300M-HFID methane analyzer. Accurate interpretation of each analyzers response requires the systematic calibration of the instrument against gases of known concentrations. A calibration equation is determined from a linear regression of known gas concentrations versus instrument

The data acquisition subsystem consists of an ESC 8800 Datalogger and an Esterline Angus strip chart recorder. The average methane concentration for each test run was calculated from average measurements recorded at one-minute intervals over the entire duration of each test run. Once the methane system was set up it was connected to a power source and brought on line. Sample line and signal wires were run between the sampling and methane system location, and the sample probe was selected and placed in the stack facing away from the gas stream.

The initial phase of the instrumental analysis method required the calibration of the methane analyzer system. Prior to the start of the first test run, system calibration using zero, high, mid, and low range methane gasses was performed. Following these initial system checks, further calibrations were performed at the end of each test run using a zero and high range methane in air gas.

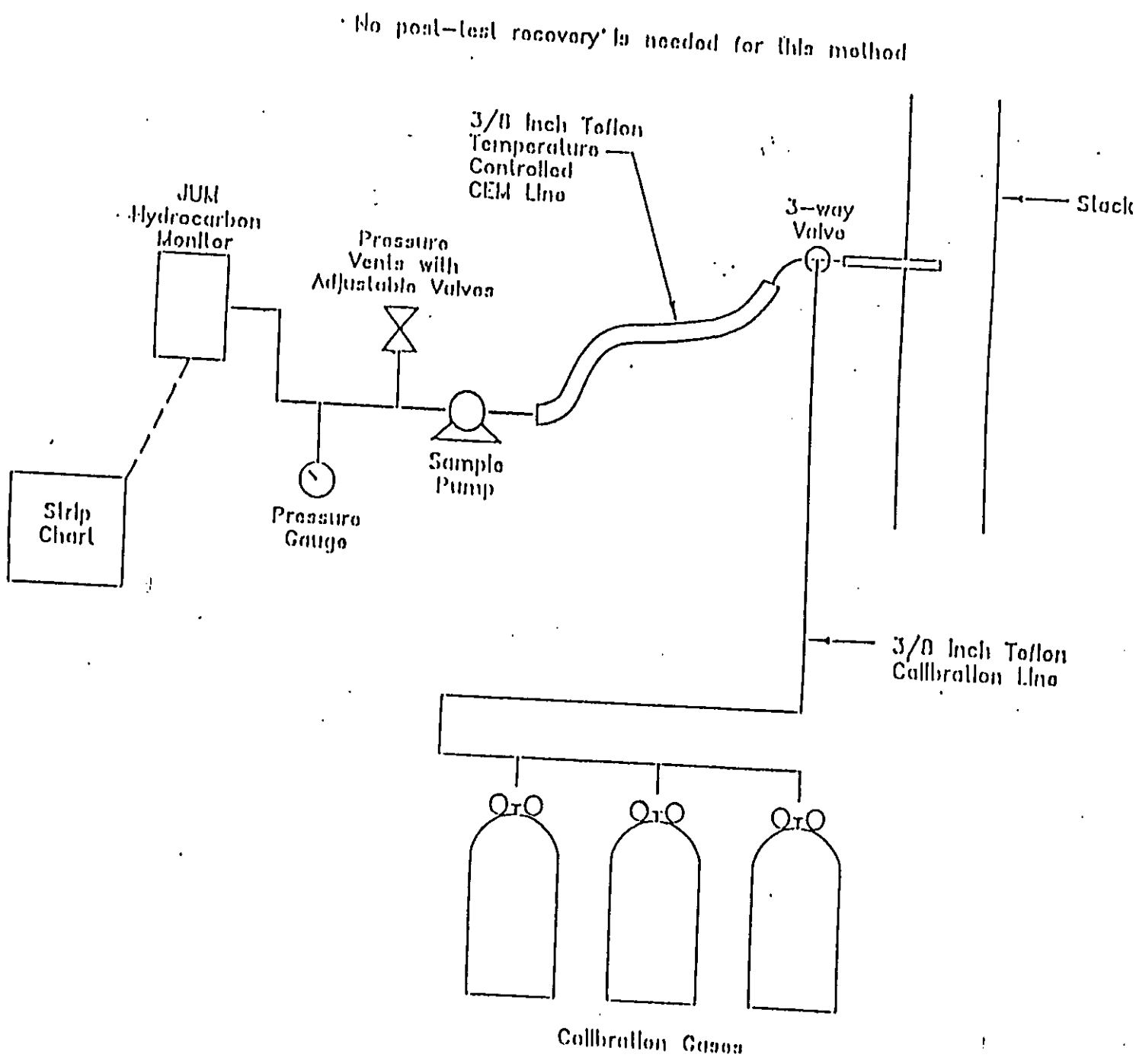

Figure 3-1 Method 25A Sampling Train

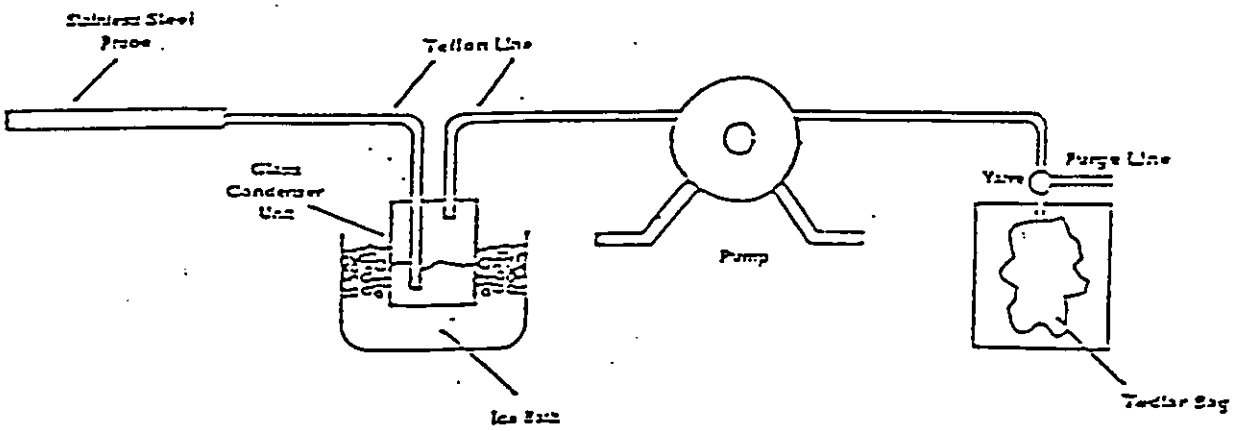

Figure 3-2 Method 2 and 4 Sampling

SECTION 4
DATA REPORTING

4.1 Data Reporting

A flow chart depicting the measurement data reporting scheme is shown in Figure 4-1. Figure 4-2 presents the analytical data validation and reporting scheme routinely used at TRC.

All data was reported in standard units depending on the measurement and the ultimate use of the data. The bulk of the data was computer processed and reported as follows:

- Gas Properties:
  a. Moisture %
  b. Flow rate, dscfm and acfm
  c. Pressure, in. Hg
  d. Temperature, • F

- ppmv Total non-methane Hydrocarbons:
- lbs/hr as Methane.

Results of the testing conducted at the IBP plant on the Gel Bone Cooker are contained in Table 4-1.

Table 4-1. Test Results - Gel Bone Cooker

IBP Dakota City Neb.	Gel Bone (Dusky)			
Run No.	4	2	3	
Date	08-Sep-97	08-Sep-97	08-Sep-97	
Start Time	13:35	10:40	12:12	
Stop Time	14:35	11:40	13:17	AVERAGES
Barometric Pressure, in. Hg	29.15	29.15	29.15	29.15
Net Sampling Time, minutes	30.0	30.0	30.0	30.0
Volume Metered, cf	24.330	23.52	24.23	24.029
Avg. DGM Temp, F	86.9	78.40	82.20	82.5
AVG Delta H, in of H2O	2.00	2.00	2.00	2.00
AVG Delta H, in of Hg	0.1471	0.1471	0.1471	0.1471
DGM Calibration Factor	1.002	1.002	1.002	1.002
Volume of Gas Collected, dscf	23.039	22.627	23.146	22.937
Total Water Collected, mL	308.0	202.0	91.0	200.3
Volume of Water Vapor, scf	14.522	9.524	4.291	9.446
Moisture, %	38.7	29.6	15.6	28.0
Dry Mole Fraction, 100-%M	0.6134	0.7038	0.8436	0.7203
CO2 at Stack, % dry	3.4	3.4	3.5	3.4
O2 at Stack, % dry	14.4	14.5	14.5	14.5
CO + N2, % dry	82.2	82.1	82.0	82.1
Dry Molecular Weight, lb/lb mole	29.12	29.12	29.14	29.13
Wet Molecular Weight, lb/lb mole	24.82	25.83	27.40	26.02
Stack Diameter, in	48	48	48	
Stack Area, sq. in. (@ pitot meas. location)	1809.6	1809.6	1809.6	1809.6
Static Pressure, in. of H2O	-0.25	-0.23	-0.24	-0.24
Stack Pressure, in. of Hg	29.13	29.13	29.13	29.13
Avg. Stack Temp., F	173.6	149.4	146.2	156.4
Avg. Sqroot of Delta P	0.3164	0.3583	0.3414	0.3387
SDE Average	7.964	8.845	8.406	8.405
Pitot Coefficient	0.84	0.84	0.84	0.84
Stack Gas Velocity, afpm	1276.3	1389.5	1282.1	1316.0
Stack Flowrate, wet acfm	16,038	17,461	16,111	16,537
Stack Flowrate, dry scfm	7,982	10,367	11,527	9,959
Stack Flowrate, dry scf/hr	478,917	622,006	691,609	
Stack Flowrate, wet scf/hr	7.8079E+05	8.8383E+05	8.1981E+05	
Total Hydrocarbons ppmv as CH4	39.00	15.51	15.49	23.33
Total Hydrocarbons Lb/Hr as CH4	0.774	0.400	0.444	0.540

Calculations

Analyte	CH4	CH4	CH4	
FWhc lbs/lb-mole	16.01	16.01	16.01	
Stack Flowrate, dry scf/hr	478,917	622,006	691,609	
Moisture, %	38.7	29.6	15.6	
Cppmv	55.55	45.23	35.71	
Cppmv minus CH4	39.00	15.51	15.49	
Hydrocarbons Emissions (lbs/hr)	0.774	0.400	0.444	

Lbs/Hr = Cppmv minus CH4 * FWhc * (Stack Flowrate(dscf/hr) / 60) * (1.554* 10^-7)

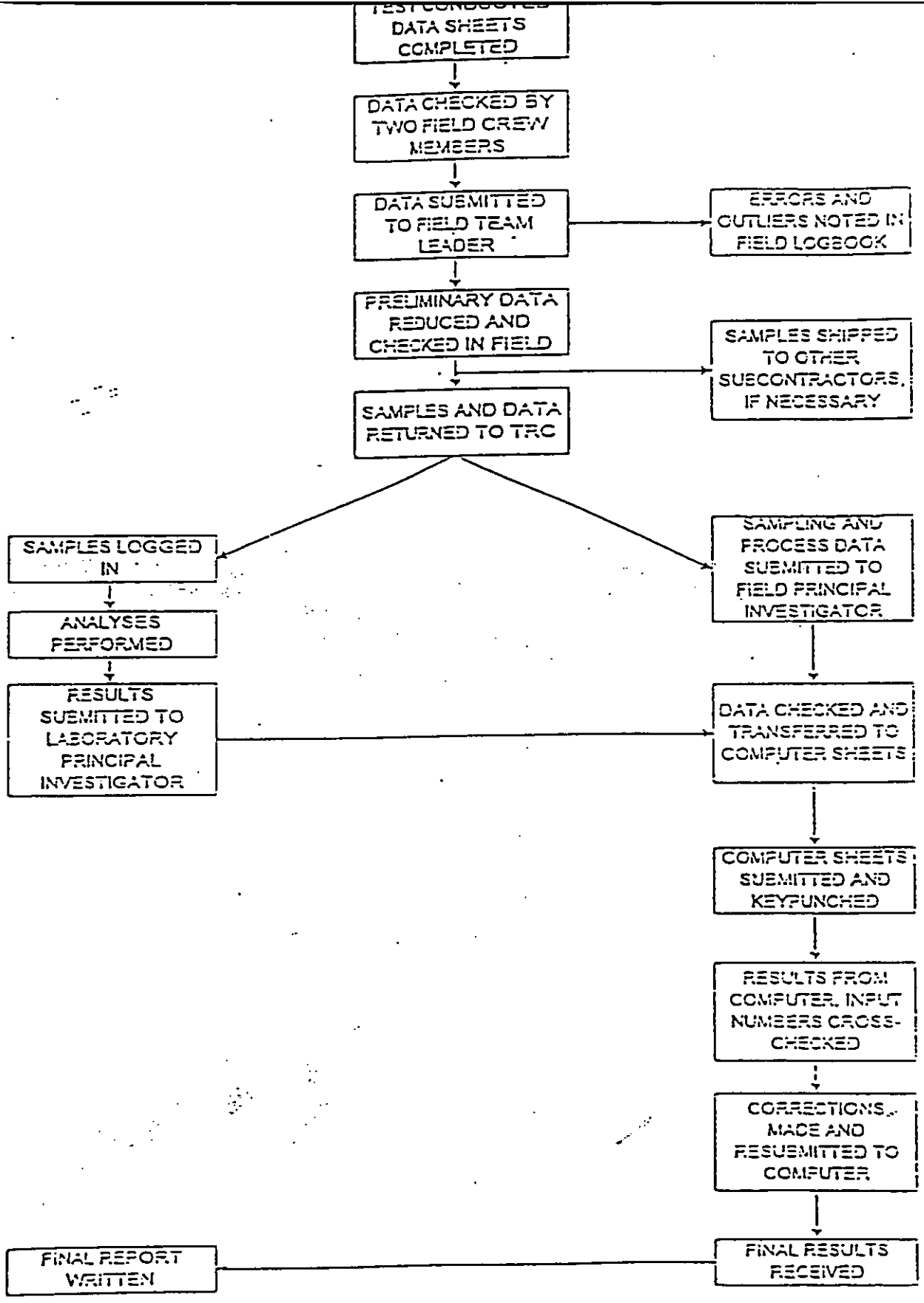

Figure 4-1. Measurement Data Flow Scheme

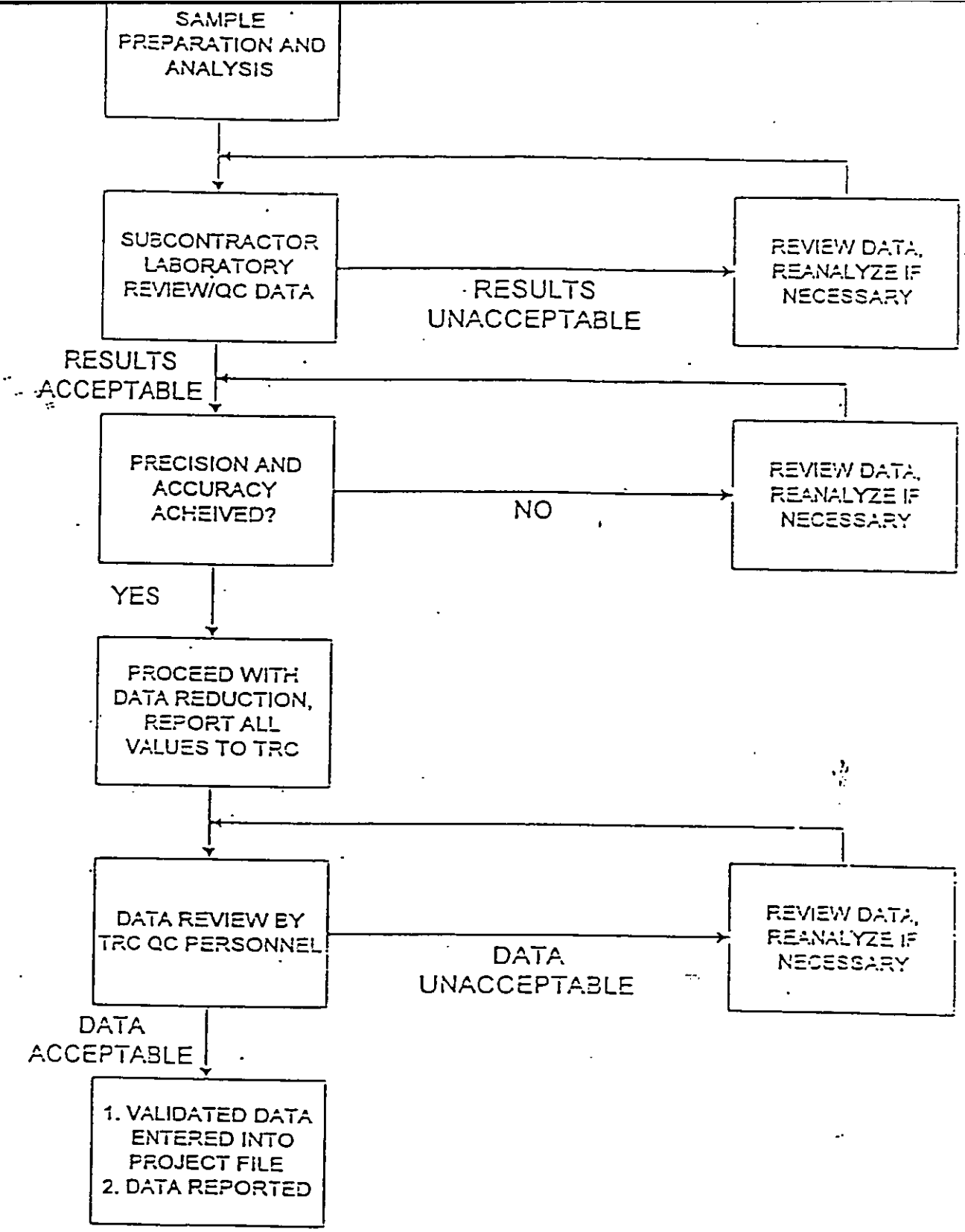

Figure 4-2. Analytical Data Report Scheme

APPENDIX A

RAW FIELD DATA SHEETS AND DATA LOGGER PRINTOUTS

IBP Dakota City Neb. Gel Bone (Dusky)

Run No.	4	2	3	
Date	08-Sep-97	08-Sep-97	08-Sep-97	
Start Time	13:35	10:40	12:12	
Stop Time	14:35	11:40	13:17	AVERAGES
Barometric Pressure, in. Hg	29.15	29.15	29.15	29.15
Net Sampling Time, minutes	30.0	30.0	30.0	30.0
Volume Metered, cf	24.330	23.52	24.23	24.029
Avg. DGM Temp, F	86.9	78.40	82.20	82.5
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AVG Delta H, in of Hg	0.1471	0.1471	0.1471	0.1471
DGM Calibration Factor	1.002	1.002	1.002	1.002
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Total Water Collected, mL	308.0	202.0	91.0	200.3
Volume of Water Vapor, scf	14.522	9.524	4.291	9.446
Moisture, %	38.7	29.6	15.6	28.0
Dry Mole Fraction, 100-%M	0.6134	0.7038	0.8436	0.7203
CO2 at Stack, % dry	3.4	3.4	3.5	3.4
O2 at Stack, % dry	14.4	14.5	14.5	14.5
CO + N2, % dry	82.2	82.1	82.0	82.1
Dry Molecular Weight, lb/lb mole	29.12	29.12	29.14	29.13
Wet Molecular Weight, lb/lb mole	24.82	25.83	27.40	26.02
Stack Diameter, in	48	48	48	
Stack Area, sq. in. (@ pitot meas. location)	1809.6	1809.6	1809.6	1809.6
Static Pressure, in. of H2O	-0.25	-0.23	-0.24	-0.24
Stack Pressure, in. of Hg	29.13	29.13	29.13	29.13
Avg. Stack Temp., F	173.6	149.4	146.2	156.4
Avg. Sqroot of Delta P	0.3164	0.3583	0.3414	0.3387
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Total Hydrocarbons ppmv as CH4	39.00	15.51	15.49	23.33
Total Hydrocarbons Lb/Hr as CH4	0.774	0.400	0.444	0.540

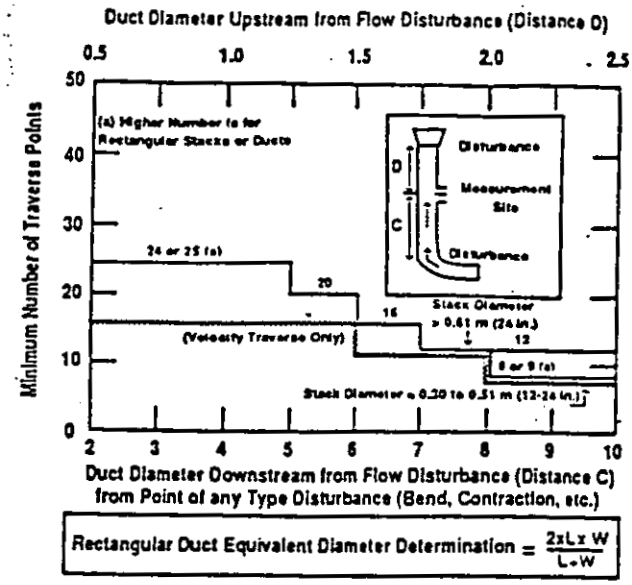
Calculations

Analyte	CH4	CH4	CH4	
FWhc lbs/lb-mole	16.01	16.01	16.01	
Stack Flowrate, dry scf/hr	478,917	622,006	691,609	
Moisture, %	38.7	29.6	15.6	
Cppmv	55.55	45.23	35.71	
Cppmv minus CH4	39.00	15.51	15.49	
Hydrocarbons Emissions (lbs/hr)	0.774	0.400	0.444	

Lbs/Hr = Cppmv minus CH4 * FWhc * (Stack Flowrate(dscf/hr) / 60) * (1.554 * 10^-7)

Traverse Point Location for Circular and Rectangular Ducts

Project No.: 22214-04
Client: IBP Dakota City NE
Date: 9-8-97
Sampling Location: Jell bone Cooker
Internal Stack Diameter: 48.0" (EDIBLE Dusky)
Nipple Length: 1.5"
Total Stack Diameter: 49.5"
Nearest Upstream Disturbance (C): 13'
Nearest Downstream Disturbance (D): 15'
Calculator: SM



Rectangular Duct Equivalent Diameter Determination = $\frac{2 \times L \times W}{L + W}$

Traverse Point Number	1 Fraction of Stack ID ($\frac{1}{100}$)	2 Stack ID	3 Traverse Point (1 × 2=Point)	4 Nipple Length	5 Traverse Point Inside of Far Wall to Outside of Port Nipple (3 + 4 = Point)
1	.021	48.0	1.0	1.5	2.50
2	.067		3.21		4.71
3	.113		5.42		6.92
4	.177		8.49		9.99
5	.250		12.0		13.5
6	.355		17.04		18.54
7	.644		30.91		32.41
8	.750		36.0		37.5
9	.823		39.5		41.04
10	.882		42.33		43.83
11	.933		44.78		46.28
12	.979		46.99		48.49
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Location of Traverse Points in Circular Stacks

	4	6	8	10	12	14	16	18	20	22	24
1	5.7	4.4	3.2	2.5	2.1	1.3	1.5	1.4	1.3	1.1	1.1
2	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3	75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4	93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5		85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6		95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7			89.5	77.4	64.4	36.6	28.3	23.6	20.4	18.0	16.1
8			96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9				91.8	82.3	73.1	62.5	38.2	30.6	26.2	23.0
10				97.4	88.2	79.9	71.7	61.8	38.8	31.5	27.2
11					93.3	85.4	78.0	70.4	61.2	39.3	32.3
12					97.9	90.1	83.1	76.4	69.4	60.7	39.8
13						94.3	87.5	81.2	75.0	68.5	60.2
14						98.2	91.5	85.4	79.6	73.8	67.7
15							95.1	89.1	83.5	78.2	72.8
16							98.4	92.5	87.1	82.0	77.0
17								95.6	90.3	85.4	80.6
18								98.6	93.3	88.4	83.9
19									96.1	91.3	86.8
20									98.7	94.0	89.5
21										96.5	92.1
22										98.9	94.5
23											96.8
24											98.9

Location of Traverse Points in Rectangular Stacks

	2	3	4	5	6	7	8	9	10	11	12
1	25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2	75.0	50.0	37.5	30.0	25.0	21.4	18.8	15.7	15.0	13.6	12.5
3		83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4			87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5				90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6					91.7	78.6	68.8	61.1	55.0	50.0	45.8
7						92.9	81.3	72.2	65.0	59.1	54.2
8							93.8	83.3	75.0	68.2	62.5
9								94.4	85.0	77.3	70.8
10									95.0	86.4	79.2
11										95.5	87.5
12											95.8

TRC

Run 2

DATE:	Sept 8, 1997	**CLIENT REP:**	Rechelle Kruse
PLANT:	IBP	**WITNESSED?:**	yes
VOC TYPE	CH4	**BURNER TYPE:**	N/A
OPERATOR:	SM, DW	**GENERATOR TYPE:**	N/A
TEST LOCATION:	Gel Bone (Du	**O2 GENERATOR TYPE:**	N/A

CALIBRATION GASES

O2	CO2	CH4	S02	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		29.68
N/A	N/A	47.83	N/A		59.67
		83.35			83.47

END TIME	SAMPLE POINT	O2 wet	CO2 %	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
1040	1	14.4	3.4		45.45	29.79		
1140								
	AVERAGES	14.4	3.4	ERR	45.45	29.79	ERR	

Barometric Pres: 29.15

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	THC Inlet	THC Outlet	CH4	NOx
PRE ZERO	0		0	0.8	0.6	0
POST ZERO	0		0	0.4	0.7	0
ACT SPAN	N/A	N/A	N/A	59.67	29.12	N/A
PRE SPAN	0		0	58.3	28.4	0
POST SPAN	0		0	61.1	30	0
GAS CONC.	ERR	ERR	ERR	45.283	29.722	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA CITY
GEL BONE (DUSKY)
R2 VOLTS + CH4
0-100 SCALE

```
DCN#R1>
01   10.97 -  13.64
02   58.20 -  30.80
03    .3974    .4208
04   .0000D   .0000D
05    0000D   .0000D
06    0004D   .0000D
07  -.0000D  -.0007D

Mon - 09/08/97  DAY= 251 10:40:02 - START  R2

01   12.15 -  10.97
02   50.35 -  58.20
03    .4039    .3974
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0004D
07  -.0004D  -.0000D

Mon - 09/08/97  DAY= 251 10:41:02

01   14.27 -  12.15
02   51.59 -  50.35
03    .4300    .4039
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0007D  -.0004D

Mon - 09/08/97  DAY= 251 10:42:03

01   16.84 -  14.27
02   48.27 -  51.59
03    1294    .4300
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0007D  -.0007D

Mon - 09/08/97  DAY= 251 10:43:02

01   11.69 -  16.84
02   49.66 -  48.27
03    .4029    .4294
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0004D  -.0007D

Mon - 09/08/97  DAY= 251 10:44:02

01   18.11 -  11.69
02   47.87 -  49.66
03    .4389    .4029
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0004D   .0000D
07  -.0004D  -.0004D

Mon - 09/08/97  DAY= 251 10:45:02

01   16.34 -  18.11
02   57.39 -  47.87
03    .4245    .4389
04   .0000D   .0000D
05   .0000D   .0000D
```

```
01   15.85   16.34
02   57.15   57.39
03   .4101    .4245
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 10:47:02

01   10.97   15.85
02   50.61   57.15
03   .3908    .4101
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0007D   .0000D
07  -.0004D   .0000D

Mon - 09/08/97  DAY= 251 10:48:02

01   16.74   10.97
02   50.13   50.61
03   .3899    .3908
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0004D  -.0007D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 10:49:02

01   16.40   16.74
02   45.69    50.13
03   .3988    .3899
04    0000D   .0000D
05    0000D   .0000D
06   .0000D  -.0004D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 10:50:02

01   19.92   16.40
02   44.08   45.69
03   .3895    .3988
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 10:51:03

DCN#R1>

CN#R1> REPEAT READ 00

CN#R1>

DCN#R1>

CN#R1> ID
RE   TE ID = R1
RE_ _RT ID = CNF SPRINGFIELD
CN#R1>
01   15.07   19.92
02   39.43   44.08
03   .4180    .3895
```

Mon - 09/08/97 DAY= 251 10:52:03

01	20.04	15.07
02	37.59	39.43
03	.3884	.4180
04	.0000D	.0000D
05	.0000D	.0000D
06	.0004D	.0004D
07	-.0004D	-.0000D

Mon - 09/08/97 DAY= 251 10:53:02

01	23.29+	20.04
02	31.27	37.59
03	.4077	.3884
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	-.0004D
07	-.0004D	-.0004D

Mon - 09/08/97 DAY= 251 10:54:02

01	20.57	23.29+
02	36.12	31.27
03	.4204	.4077
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	.0000D
07	-.0004D	-.0004D

Mon - 09/08/97 DAY= 251 10:55:02

01	23.51	20.57
02	41.93	36.12
03	.3926	.4204
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	.0000D
07	-.0004D	-.0004D

Mon - 09/08/97 DAY= 251 10:56:02

01	24.92	23.51
02	50.25	41.93
03	.4124	.3926
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0004D	.0000D
07	.0000D	-.0004D

Mon - 09/08/97 DAY= 251 10:57:02

01	27.19+	24.92
02	41.38	50.25
03	.3950	.4124
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	-.0004D
07	.0000D	.0000D

Mon - 09/08/97 DAY= 251 10:58:02

01	16.99+	27.19+
02	35.68	41.38
03	.4079	.3950
04	.0000D	.0000D
05	.0000D	.0000D

```
01   19.30   16.99+
02   37.39   35.68
03   .4201   .4079
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0004D  -.0004D
07   .0007D  .0000D

Mon - 09/08/97  DAY= 251 11:00:02

01   33.72+  19.30
02   29.28   37.39
03   .4087   .4201
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0008D  -.0004D
07   .0000D  -.0007D

Mon - 09/08/97  DAY= 251 11:01:02

01   38.67   33.72+
02   31.68   29.28
03   .4139   .4087
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0000D  -.0008D
07   .0007D  .0000D

Mon - 09/08/97  DAY= 251 11:02:02

01   32.50   38.67
02   54.35   31.68
03   .4357   .4139
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0004D  -.0000D
07  -.0004D  .0007D

Mon - 09/08/97  DAY= 251 11:03:03

01   38.25+  32.50
02   46.55   54.35
03   .4099   .4357
04   .0000D  .0000D
05   .0000D  .0000D
06   .0000D  -.0004D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 11:04:03

01   35.42   38.25+
02   39.05   46.55
03   .4155   .4099
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0004D  .0000D
07   .0000D  .0000D

Mon - 09/08/97  DAY= 251 11:05:02

01   35.03+  35.42
02   [illegible].91   39.05
03   [illegible]3929   .4155
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0004D  -.0004D
07   .0000D  .0000D
```

```
03   .4232    .3929
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D  -.0004D
07   .0000D   .0000D

M    - 09/08/97  DAY= 251 11:07:02

01   43.79+   34.61-
02   40.26-   40.19-
03   .4155    .4232
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0004D   .0000D

Mon - 09/08/97  DAY= 251 11:08:02

01   38.32-   43.79+
02   46.47-   40.26
03   .3835    .4155
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 11:09:02

01   35.37-   38.32
02   52.30-   46.47
03   .3964    .3835
04   .0000D   .0000D
05   .0000D   .0000D
06    0000D   .0000D
07    0004D   .0000D

Mon - 09/08/97  DAY= 251 11:10:02

01   35.99-   35.37
02   52.88-   52.30
03   .4232    .3964
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 11:11:02

01   35.76+   35.99
02   54.41-   52.88
03   .3752    .4232
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 11:12:02

01   36.70+   35.76+
02   56.57-   54.41
03   .4238    .3752
04    0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 11:13:02
```

```
05   .0000D   .0000D
06   .0014D   .0000D
07   .0014D   .0000D

 Mon - 09/08/97  DAY= 251 11:14:02

01   35.67-   34.55-
02    6.18-   51.33-
03   .3950    .4030
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0014D
07  -.0007D   .0014D

 Mon - 09/08/97  DAY= 251 11:15:02

01   37.37-   35.67
02   46.40-   46.18
03   .4183    .3950
04   .0007D   .0000D
05   .0004D   .0000D
06   .0007D   .0000D
07  -.0000D  -.0007D

 Mon - 09/08/97  DAY= 251 11:16:02

01   38.07-   37.37
02   46.08-   46.40
03   .4277    .4183
04   .0000D   .0007D
05   .0000D   .0004D
06  -.0004D   .0007D
07  -.0004D  -.0000D

 M(   - 09/08/97  DAY= 251 11:17:02

01   33.07-   38.07
02   46.83-   46.08
03   .4115    .4277
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D  -.0004D
07   .0000D  -.0004D

 Mon - 09/08/97  DAY= 251 11:18:03

01   32.51-   33.07
02   41.31-   46.83
03   .4169    .4115
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0004D   .0000D

 Mon - 09/08/97  DAY= 251 11:19:02

01   33.32+-  32.51
02   43.12-   41.31
03   .4009    .4169
04   .0000D   .0000D
05   .0000D   .0000D
06   .0011D   .0000D
07   .0004D  -.0004D

 Mon - 09/08/97  DAY= 251 11:20:02

01   32.24    33.32+
```

07 .0000D -.0004D

Mon - 09/08/97 DAY= 251 11:21:02

01 31.87 32.24
02 42.06 39.74
03 3902 .3971
04 0004D .0000D
05 -.0004D .0000D
06 .0004D -.0004D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 11:22:03

01 36.56 31.87
02 43.31 42.06
03 .3915 .3902
04 .0000D -.0004D
05 -.0004D -.0004D
06 -.0007D .0004D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 11:23:02

01 36.44 36.56
02 43.10 43.31
03 .3915 .3915
04 .0011D .0000D
05 .0004D -.0004D
06 -.0007D -.0007D
07 .0004D -.0004D

Mon - 09/08/97 DAY= 251 11:24:02

01 5.37 36.44
02 01.16 43.10
03 .3790 .3915
04 .0007D .0011D
05 .0007D .0004D
06 -.0007D -.0007D
07 -.0007D .0004D

Mon - 09/08/97 DAY= 251 11:25:02

01 37.81 36.37
02 55.89 61.16
03 .4051 .3790
04 .0000D .0007D
05 .0000D .0007D
06 -.0004D -.0007D
07 -.0000D -.0007D

Mon - 09/08/97 DAY= 251 11:26:02

01 36.64 37.81
02 62.82 55.89
03 .3767 .4051
04 -.0000D .0000D
05 .0004D .0000D
06 .0000D -.0004D
07 -.0008D -.0000D

Mon - 09/08/97 DAY= 251 11:27:02

01 34.62 36.64
02 51.47 62.82
03 .4125 .3767

Mon - 09/08/97 DAY= 251 11:28:03

01	35.05	34.62
02	46.63	51.47
03	.4096	.4125
04	.0000D	.0000D
05	.0000D	.0000D
06	.0004D	.0011D
07	-.0004D	.0007D

Mon - 09/08/97 DAY= 251 11:29:02

01	37.26	35.05
02	40.41	46.63
03	.3898	.4096
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	-.0004D
07	-.0004D	-.0004D

Mon - 09/08/97 DAY= 251 11:30:02

01	33.82	37.26
02	40.45	40.41
03	.3849	.3898
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0007D	.0000D
07	.0000D	-.0004D

Mon - 09/08/97 DAY= 251 11:31:02

01	34.67	33.82
02	40.97	40.45
03	.3762	.3849
04	.0000D	.0000D
05	.0000D	.0000D
06	.0000D	-.0007D
07	.0000D	.0000D

Mon - 09/08/97 DAY= 251 11:32:02

01	31.64	34.67
02	38.78	40.97
03	.4034	.3762
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0007D	.0000D
07	.0000D	.0000D

Mon - 09/08/97 DAY= 251 11:33:02

01	31.98	31.64
02	35.47	38.78
03	.3690	.4034
04	.0011D	.0000D
05	.0011D	.0000D
06	-.0004D	-.0007D
07	-.0004D	.0000D

Mon - 09/08/97 DAY= 251 11:34:02

01	34.38	31.98
02	40.48	35.47
03	.3891	.3690
04	.0000D	.0011D
05	.0000D	.0011D

```
01   30.69    34.38
02   41.14    40.48
03   .3799    .3891
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07    0007D   .0000D

Mon - 09/08/97  DAY= 251 11:36:02

01   34.42    30.69
02   41.75    41.14
03   .3780    .3799
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0007D

Mon - 09/08/97  DAY= 251 11:37:02

01   35.54    34.42
02   43.73    41.75
03   .3842    .3780
04   .0000D   .0000D
05   .0000D   .0000D
06   .0004D   .0000D
07   .0004D   .0000D

Mon - 09/08/97  DAY= 251 11:38:02

01   34.04    35.54
02   44.68    43.73
03   .3758    .3842
04    0000D   .0000D
05    )000D   .0000D
06   .0000D   .0004D
07  -.0004D   .0004D

Mon - 09/08/97  DAY= 251 11:39:02

01   37.67    34.04
02   45.14    44.68
03   .3888    .3758
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 11:40:02

01   50.07    37.67
02   43.86    45.14
03   .3617    .3888
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 11:41:02

01   57.33    50.07
02    1.53    43.86
03   3774     .3617
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D
```

1817.35 (61)
2772.36 (61)

VOL's 45.45

C114 29.79

STOP R2

MOISTURE DETERMINATION

Plant Name: IBP DAKOTA City Unit: Gel Bowl	Ambient Temperature: 70°F
Date: 9/8/97	Barometric Pressure: (BP): 29.15 Elevation: ground
Sampling Location: STACK Elevation: 20'	Probe Length & Type: 3' SS
Run Number: 2	Meter Box Number: 1 Gamma: (Y): 1.0017
Operator: DW Reviewer:	Leak Check: Pre-test: 0.005 Post-test: 0.005

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft^3)	DELTA H ($in\ H_2O$)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum (Hg")
1	0	10:40	172.643	2.0	65	76	75	9
			186.2	↓	61	78	76	9
	10		180.2		58	79	76	9
			184.2		59	82	76	9
	20		188.1		61	83	77	9
			192.2		62	85	78	9
	30	11:10	196.166					
			Vm = 23.523	ΔH = 2.0		Avg.:	Avg.:	

T_m = 78.4

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	270	120	2	210	
Initial	100	100	—	200	
Net Gain	170 +	020 +	2 +	10 =	V_L (grams) Total 202

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 23.523 cu. ft.

Average absolute meter temperature (T_m + 460) = 538.4 °R

$$\text{Percent moisture} = M = \frac{4.707\ (\text{ml})}{.04707\ (\text{ml}) + \frac{17.64\ (Y)\ (Vm)\ (BP)}{(Tm + 460)}}$$

REF: CFR 60, App. A, Method 4

TRC

VELOCITY TRAVERSE

Plant: IBP DAKOTA CITY	Date: 9/8/97
Unit Number: GEL BONE (Dusky)	Stack Diameter (in.): 48"
Load Condition: Norm	Stack Gauge Pressure ("H$_2$0): -.24
Run No.: 2	Operators: DW, TL
Project No.:	
Barometric Pressure at Ground Level ("Hg): 29.15	
Pitot Tube ID: 325	
Pitot Tube Coefficient: .84	Port Change Pitot Leak Check — Pass / Fail
Estimated Stack CO_2%: 3.4 O_2%: 14.5 H_2O%: —	Port #1 — —
Platform Elevation (feet): 20'	Port #2 — —
Schematic of Stack Cross Section:	Port #3 — —
R1	Port #4 — —
	$\sqrt{\Delta P}_{avg}$ = .3583
	T_{savg} = 149.4

Traverse Point Number	Velocity Head (In H$_2$0)	Stack Temp. (F)
1	.08	148
2	.08	148
3	.09	149
4	.09	150
5	.095	151
6	.11	151
7	.18	151
8	.21	150
9	.21	150
10	.22	150
11	.30	148
12	.32	148
Average:		

Traverse Point Number	Velocity Head (In H$_2$0)	Stack Temp. (F)
1	.06	148
2	.05	149
3	.05	149
4	.04	149
5	.05	150
6	.09	150
7	.20	151
8	.21	151
9	.21	150
10	.16	149
11	.14	148
12	.10	148
Average:		

Reference: 40 CFR 60, Appendix A, Method 2

TRC

Run 3

DATE:	Sept 8, 1997	CLIENT REP:	Rechelle Kruse
PLANT:	IBP	WITNESSED?:	N/A
VOC TYPE	CH4	BURNER TYPE:	N/A
OPERATOR:	SM, DW	GENERATOR TYPE:	N/A
TEST LOCATION:	Gel Bone (Du	O2 GENERATOR TYPE:	N/A

CALIBRATION GASES

O2	CO2	CH4	S02	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		29.68
N/A	N/A	47.83	N/A		59.67
		83.35			83.47

END TIME	SAMPLE POINT	O2 wet	CO2 ppm	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
1212	1	14.5	3.5		36.55	20.09		
1317								
	AVERAGE	14.5	3.5	ERR	36.55	20.09	ERR	

Barometric Pres: 29.15

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	THC Inlet	THC Outlet	CH4	NOx
PRE ZERO	0		0	0.4	0.7	0
POST ZER	0		0	0.7	0.8	0
ACT SPAN	N/A	N/A	29.12	59.67	29.12	N/A
PRE SPAN	0		0	61.1	30	0
POST SPA	0		0	60.3	27.2	0
GAS CON	ERR	ERR	ERR	35.713	20.222	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA CITY
9/8/97
R3 GELBONE (DUSKY)
VOC's + CH4
0-100 SCALE

```
DCN#R1>
01   19.07   17.95
02   24.91   25.96
03   .3717   .3813
04   .0000D -.0007D
05    0000D -.0007D
06   .0000D -.0004D
07  -.0004D -.0007D

Mon - 09/08/97  DAY= 251 12:12:02  — START  R3

01   20.15   19.07
02   25.86   24.91
03   .3754   .3717
04  -.0004D  .0000D
05  -.0004D  .0000D
06  -.0007D  .0000D
07   .0000D -.0004D

Mon - 09/08/97  DAY= 251 12:13:03

01   19.33   20.15
02   28.80   25.86
03   .3793   .3754
04   .0000D -.0004D
05   .0000D -.0004D
06   .0000D -.0007D
07   .0000D  .0000D

Mon - 09/08/97  DAY= 251 12:14:02

01   18.91   19.33
02   29.46   28.80
03    3676   .3793
04   .0000D  .0000D
05   .0000D  .0000D
06  -.0004D  .0000D
07  -.0007D  .0000D

Mon - 09/08/97  DAY= 251 12:15:02

01   37.42   18.91
02   28.40   29.46
03   .3775   .3676
04  -.0004D  .0000D
05  -.0004D  .0000D
06  -.0007D -.0004D
07  -.0004D -.0007D

Mon - 09/08/97  DAY= 251 12:16:03

01   35.16   37.42
02   39.69   28.40
03   .3724   .3775
04  -.0000D -.0004D
05  -.0004D -.0004D
06   .0004D -.0007D
07  -.0000D -.0004D

Mon - 09/08/97  DAY= 251 12:17:02

01   31.80   35.16
02   65.05   39.69  242.17
03   .3648   .3724
04   .0014D -.0000D
05   .0000D -.0004D
```

```
01   18.08   31.80
02   56.58   65.05
03   .3808   .3648
04   .0007D  .0014D
05  -.0004D  .0000D
06  -.0004D  .0000D
07    0000D  .0000D

 Mon - 09/08/97  DAY= 251 12:19:02

01   14.08   18.08
02   36.21   56.58
03   .3961   .3808
04   .0004D  .0007D
05   .0000D -.0004D
06  -.0004D -.0004D
07  -.0004D  .0000D

 Mon - 09/08/97  DAY= 251 12:20:02

01   13.48   14.08
02   16.27   36.21
03   .3795   .3961
04  -.0004D  .0004D
05  -.0004D  .0000D
06  -.0004D -.0004D
07  -.0004D -.0004D

Mon - 09/08/97  DAY= 251 12:21:03

01   13.03   13.48
02   11.60   16.27
03   .3754   .3795
04  - 0011D -.0004D
05    )007D -.0004D
06  -.0004D -.0004D
07  -.0011D -.0004D

Mon - 09/08/97  DAY= 251 12:22:03

01   12.89   13.03
02   9.844   11.60
03   .3683   .3754
04   .0000D -.0011D
05   .0000D -.0007D
06   .0000D -.0004D
07  -.0007D -.0011D

 Mon - 09/08/97  DAY= 251 12:23:02

01   12.66   12.89
02   9.982   9.844
03   .3754   .3683
04  -.0011D  .0000D
05  -.0011D  .0000D
06   .0000D  .0000D
07  -.0004D -.0007D

 Mon - 09/08/97  DAY= 251 12:24:02

01   13.91   12.66
02     316   9.982
03    3551   .3754
04  -.0004D -.0011D
05  -.0007D -.0011D
06  -.0007D  .0000D
07  -.0004D -.0004D
```

```
03   .3680    .3551
04  -.0004D  -.0004D
05  -.0011D  -.0007D
06   .0000D  -.0007D
07   .0000D  -.0004D

M    - 09/08/97  DAY= 251 12:26:02

01  14.21    12.94
02  13.03    8.656
03   .3734    .3680
04  -.0004D  -.0004D
05  -.0004D  -.0011D
06  -.0007D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 12:27:03

01  14.53    14.21
02  14.86    13.03
03   .3611    .3734
04   .0004D  -.0004D
05   .0000D  -.0004D
06  -.0004D  -.0007D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 12:28:02

01  14.28    14.53
02  17.77    14.86
03   .3947    .3611
04  -.0004D   .0004D
05  -.0004D   .0000D
06   0000D   -.0004D
07   0000D    .0000D

Mon - 09/08/97  DAY= 251 12:29:02

01  15.28    14.28
02  18.28    17.77
03   .3974    .3947
04   .0000D  -.0004D
05   .0000D  -.0004D
06   .0000D  -.0000D
07  -.0007D  -.0000D

Mon - 09/08/97  DAY= 251 12:30:03

01  28.29    15.28
02  18.33    18.28
03   .3926    .3974
04  -.0014D   .0000D
05  -.0014D   .0000D
06  -.0007D   .0000D
07   .0000D  -.0007D

Mon - 09/08/97  DAY= 251 12:31:02

01  19.68    28.29
02  28.52    18.33
03   3895    .3926
04   0000D  -.0014D
05  .0004D  -.0014D
06   .0000D  -.0007D
07  -.0007D   .0000D

Mon - 09/08/97  DAY= 251 12:32:02
```

```
05   .0000D   .0004D
06   .0000D   .0000D
07   .0000D  -.0007D

Mon - 09/08/97  DAY= 251 12:33:02

01   12.50    15.42     214.00 cm4
02   21.48    38.16     334.96 Vccs
03   .3823    .3830
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0007D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 12:34:02

01   21.53    22.50
02   23.06    21.48
03   .3856    .3823
04   .0000D   .0000D
05   .0004D   .0000D
06  -.0004D  -.0007D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 12:35:02  -RESTART R3

01   17.68    21.53
02   41.55    23.06
03   .3673    .3856
04  -.0000D   .0000D
05  -.0007D   .0004D
06   .0000D  -.0004D
07  -.0004D   .0000D

M    - 09/08/97  DAY= 251 12:36:03

01   17.25    17.68
02   34.96    41.55
03   .3998    .3673
04  -.0014D  -.0000D
05  -.0021D  -.0007D
06   .0000D   .0000D
07  -.0004D  -.0004D

Mon - 09/08/97  DAY= 251 12:37:02

01   19.11    17.25
02   27.19    34.96
03   .3950    .3998
04  -.0014D  -.0014D
05  -.0024D  -.0021D
06  -.0004D   .0000D
07  -.0007D  -.0004D

Mon - 09/08/97  DAY= 251 12:38:02

01   19.80    19.11     309.37
02   30.33    27.19     492.05
03   .3875    .3950
04  -.0028D  -.0014D
05  -.0038D  -.0024D
06   .0004D  -.0004D
07  -.0004D  -.0007D

Mon - 09/08/97  DAY= 251 12:39:02

01   21.50    19.80
```

```
07 -.0004D -.0004D

Mon - 09/08/97  DAY= 251 12:40:02

01  20.74  21.50
02  34.94  31.77
03   3721   .4043
04  .0018D -.0052D
05 -.0042D -.0059D
06  .0000D  .0000D
07 -.0004D -.0004D

Mon - 09/08/97  DAY= 251 12:41:02

01  21.33  20.74
02  37.52  34.94
03  .3786   .3721
04 -.0035D -.0018D
05 -.0062D -.0042D
06 -.0007D  .0000D
07  .0000D -.0004D

Mon - 09/08/97  DAY= 251 12:42:02

01  20.82  21.33
02  36.97  37.52
03  .3734   .3786
04 -.0042D -.0035D
05 -.0049D -.0062D
06 -.0004D -.0007D
07 -.0004D  .0000D

Mon - 09/08/97  DAY= 251 12:43:02

01   4.68  20.82
02  36.90  36.97
03  .3762   .3734
04 -.0052D -.0042D
05 -.0086D -.0049D
06 -.0004D -.0004D
07  .0000D -.0004D

Mon - 09/08/97  DAY= 251 12:44:02

01  26.73  24.68
02  35.31  36.90
03  .3834   .3762
04 -.0008D -.0052D
05 -.0042D -.0086D
06 -.0004D -.0004D
07  .0000D  .0000D

Mon - 09/08/97  DAY= 251 12:45:03

01  24.97  26.73  470.14
02  48.23  35.31  753.69
03  .3954   .3834
04 -.0018D -.0008D
05 -.0084D -.0042D
06 -.0007D -.0004D
07  .0000D  .0000D

Mon - 09/08/97  DAY= 251 12:46:02
```

Mon - 09/08/97 DAY= 251 12:47:02

01 22.17 24.74
02 46.09 47.34
03 .3902 .3908
04 -.0035D -.0063D
05 0073D -.0105D
06 0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 12:48:02

01 22.32 22.17
02 43.66 46.09
03 .3868 .3902
04 -.0004D -.0035D
05 -.0052D -.0073D
06 -.0004D .0000D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 12:49:02

01 23.19 22.32
02 38.36 43.66
03 .3645 .3868
04 -.0038D -.0004D
05 -.0073D -.0052D
06 .0000D -.0004D
07 -.0007D -.0004D

Mon - 09/08/97 DAY= 251 12:50:03

01 22.86 23.19
02 37.13 38.36
03 3627 .3645
04 -.0077D -.0038D
05 -.0074D -.0073D
06 -.0025D .0000D
07 -.0035D -.0007D

Mon - 09/08/97 DAY= 251 12:51:02

01 24.80 22.86
02 37.78 37.13
03 .3930 .3627
04 -.0062D -.0077D
05 -.0103D -.0074D
06 .0004D -.0025D
07 .0004D -.0035D

Mon - 09/08/97 DAY= 251 12:52:02

01 27.14 24.80
02 40.75 37.78
03 .3803 .3930
04 -.0038D -.0062D
05 -.0079D -.0103D
06 .0000D .0004D
07 .0000D .0004D

Mon - 09/08/97 DAY= 251 12:53:02

01 3.72 27.14 666.08
02 45.32 40.75 1090.12
03 .3829 .3803
04 -.0015D -.0038D
05 -.0074D -.0079D

```
01   25.64   28.72
02   47.15   45.32
03   .3923   .3829
04 -.0049D -.0015D
05 -.0100D -.0074D
06   .0004D -.0007D
07    0004D -.0011D

 Mon - 09/08/97  DAY= 251 12:55:03

01   24.45   25.64
02   46.04   47.15
03   .3783   .3923
04 -.0015D -.0049D
05 -.0039D -.0100D
06 -.0004D  .0004D
07 -.0007D  .0004D

 Mon - 09/08/97  DAY= 251 12:56:02

01   23.04   24.45
02   43.50   46.04
03   .3645   .3783
04 -.0069D -.0015D
05 -.0097D -.0039D
06 -.0007D -.0004D
07 -.0011D -.0007D

Mon - 09/08/97  DAY= 251 12:57:02

01   21.94   23.04
02   41.18   43.50
03   .3815   .3645
04  -0032D -.0069D
05   0063D -.0097D
06 -.0007D -.0007D
07 -.0014D -.0011D

Mon - 09/08/97  DAY= 251 12:58:02

01   26.18   21.94
02   35.50   41.18
03   .3991   .3815
04 -.0069D -.0032D
05 -.0097D -.0063D
06 -.0007D -.0007D
07 -.0014D -.0014D

 Mon - 09/08/97  DAY= 251 12:59:02

01   25.01   26.18
02   46.42   35.50
03   .3662   .3991
04 -.0000D -.0069D
05 -.0073D -.0097D
06   .0000D -.0007D
07   .0000D -.0014D

 Mon - 09/08/97  DAY= 251 13:00:03

01   14.26   25.01   826.60
02   ).88    46.42   1403.79
03   3662    .3662
04 -.0015D -.0000D
05 -.0025D -.0073D
06   .0000D  .0000D
07   .0000D  .0000D
```

13:01

03 .3772 .3662
04 -.0045D -.0015D
05 -.0100D -.0025D
06 .0000D .0000D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 13:02:02

01 12.39 12.43
02 37.07 39.50
03 .3642 .3772
04 -.0038D -.0045D
05 -.0021D -.0100D
06 -.0004D .0000D
07 .0000D -.0004D

Mon - 09/08/97 DAY= 251 13:03:02

01 12.49 12.39
02 36.50 37.07
03 .3744 .3642
04 -.0058D -.0038D
05 -.0089D -.0021D
06 .0004D -.0004D
07 -.0000D .0000D

Mon - 09/08/97 DAY= 251 13:04:02

01 12.59 12.49
02 22.57 36.50
03 .3611 .3744
04 -.0073D -.0058D
05 -.0069D -.0089D
06 .0000D .0004D
07 0004D -.0000D

Mon - 09/08/97 DAY= 251 13:05:02

01 15.28 12.59
02 22.94 22.57
03 .3856 .3611
04 -.0058D -.0073D
05 -.0089D -.0069D
06 -.0004D .0000D
07 .0000D -.0004D

Mon - 09/08/97 DAY= 251 13:06:02

01 15.41 15.28
02 23.36 22.94
03 .3745 .3856
04 -.0066D -.0058D
05 -.0090D -.0089D
06 -.0004D -.0004D
07 -.0007D .0000D

Mon - 09/08/97 DAY= 251 13:07:02

01 12.13 15.41 919.32
02 26.37 23.36 1412.10
03 .3812 .3745
04 0051D -.0066D
05 0065D -.0090D
06 .0000D -.0004D
07 -.0004D -.0007D

Mon - 09/08/97 DAY= 251 13:08:02

```
05 -.0069D -.0065D
06  .0000D  .0000D
07  .0000D -.0004D

 Mon - 09/08/97  DAY= 251 13:09:02

01  12.93-  13.45
02   5.75   25.83
03   .3961   .3871
04 -.0058D -.0021D
05 -.0065D -.0069D
06 -.0004D  .0000D
07  .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:10:02

01  13.01-  12.93
02  30.00   25.75
03   .3771   .3961
04 -.0041D -.0058D
05 -.0058D -.0065D
06 -.0004D -.0004D
07 -.0011D  .0000D

 Mon - 09/08/97  DAY= 251 13:11:03

01  16.96+  13.01
02  29.83   30.00
03   .3860   .3771
04 -.0060D -.0041D
05 -.0091D -.0058D
06  .0000D -.0004D
07  .0000D -.0011D

 M(  - 09/08/97  DAY= 251 13:12:02

01  14.13   16.96+
02  29.56   29.83
03   .3649   .3860
04 -.0028D -.0060D
05 -.0086D -.0091D
06  .0000D  .0000D
07  .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:13:02

01  13.13   14.13
02  39.12-  29.56
03   .3649   .3649
04 -.0038D -.0028D
05 -.0112D -.0086D
06 -.0004D  .0000D
07  .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:14:03

01  12.53-  13.13   1015.46
02  38.50   39.12   1830.69
03   .4005   .3649
04 -.0059D -.0038D
05 -.0069D -.0112D
06(  0000D -.0004D
07(  0004D  .0000D

 Mon - 09/08/97  DAY= 251 13:15:03
```

07 .0000D -.0004D

Mon - 09/08/97 DAY= 251 13:16:03

01 15.69 13.54 1044.69 CH4 (52)
02 36.38 33.44 1900.51 VOC's (52)
03 3827 .3727
04 0073D -.0097D
05 -.0097D -.0124D
06 -.0004D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 13:17:03

VOC's	CH4
36.55	20.09

MOISTURE DETERMINATION

Plant Name: IBP DAKOTA CITY Unit: GEL BOWL	Ambient Temperature: 70°F
Date: 9/8/97	Barometric Pressure: (BP): Elevation: ground
Sampling Location: STACK Elevation: 20'	Probe Length & Type: 3' S
Run Number: 3	Meter Box Number: 1 Gamma: (Y): 1.0017
Operator: DW Reviewer:	Leak Check: Pre-test: 0.001 Post-test: 0.001

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft^3)	DELTA H ($in\ H_2O$)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum ($in\ Hg$)
1	0	12:12	196.728	2.0	65	80	74	14
			200.8	↓	58	81	79	14
	10		204.8	↓	54	82	79	14
			208.9		56	86	80	14
	20		213.0		58	88	81	14
			217.0		59	89	82	14
	30	12:32	220.961					
			Vm = 24.233	ΔH = 2.0		Avg.:	Avg.:	

T_m = 82.2

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	176	110	—	205	
Initial	100	100	—	200	
Net Gain	76 +	10 +	0 +	5 =	V_t (grams) Total 91

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 24.233 cu. ft.

Average absolute meter temperature (T_m + 460) = 542.2 °R

$$\text{Percent moisture} = M = \frac{4.707\,(ml)}{.04707\,(ml) + \frac{17.64\,(Y)\,(Vm)\,(BP)}{(Tm + 460)}}$$

REF: CFR 60, App. A, Method 4

TRC

VELOCITY TRAVERSE

Plant: IBP DAKOTA CITY	Date: 9/8/97
Unit Number: GEI BONE	Stack Diameter (in.): 48"
Load Condition: NORM	Stack Gauge Pressure ("H_2O): -.24
Run No.: 3	Operators: MW, TL
Project No.:	
Barometric Pressure at Ground Level ("Hg): 29.65	
Pitot Tube ID: 325	
Pitot Tube Coefficient: .84	Port Change Pitot Leak Check — Pass / Fail
Estimated Stack CO_2%:__ O_2%:__ H_2O%:__	Port #1 ___ ___
Platform Elevation (feet): 20'	Port #2 ___ ___
Schematic of Stack Cross Section:	Port #3 ___ ___
P1	Port #4 ___ ___
	$\sqrt{\Delta P}_{avg}$ = .3414
	T_{savg} = 146.2

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	.08	146
2	.08	146
3	.08	146
4	.09	147
5	.09	147
6	.095	147
7	.15	148
8	.18	148
9	.21	146
10	.25	146
11	.28	146
12	.280	146
Average:		

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	.05	145
2	.04	145
3	.04	146
4	.04	146
5	.04	146
6	.07	146
7	.15	145
8	.17	146
9	.17	147
10	.15	147
11	.14	146
12	.12	146
Average:		

Reference: 40 CFR 60, Appendix A, Method 2

TRC

Run 4

DATE:	**Sept 8, 1997**	**CLIENT REP:**	**Rechelle Kruse**
PLANT:	**IBP**	**WITNESSED?:**	**yes**
VOC TYPE	**CH4**	**BURNER TYPE:**	**N/A**
OPERATOR:	**SM, DW**	**GENERATOR TYPE:**	**N/A**
TEST LOCATION:	**Gel Bone (Dus**	**O2 GENERATOR TYPE:**	**N/A**

CALIBRATION GASES

O2	CO2	CH4	S02	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		30
N/A	N/A	47.83	N/A		59.67
		83.35			77.7

END TIME	SAMPLE POINT	O2 %	CO2 %	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
1335	1	14.4	3.4		56.3	15.89		
1435								
	AVERAGES	14.4	3.4	ERR	56.30	15.89	ERR	

Barometric Pres: 29.15

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	SO2	THC Outlet	CH4	NOx
PRE ZERO	0		0	0.7	0.8	0
POST ZERO	0		0	1.2	0.5	0
ACT SPAN	N/A	N/A	N/A	59.67	29.12	N/A
PRE SPAN	0		0	60.3	27.2	0
POST SPAN	0		0	60.5	27.7	0
GAS CONC.	ERR	ERR	ERR	55.55	16.56	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA City, NE
Gel Bone (Husky)
R4 VOC's + CH4 0-100

```
 01   11.27-  6.280
 02   47.31-  20.04
 03   .3772   .3882
 04  -.0000D -.0069D
 05  -.0059D -.0114D
 06   .0000D  .0000D
 07   .0000D -.0007D

 Mon - 09/08/97  DAY= 251 13:35:02  - START R4

 01   13.10-  11.27
 02   50.83-  47.31
 03   .3700   .3772
 04  -.0018D -.0000D
 05  -.0069D -.0059D
 06   .0000D  .0000D
 07   .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:36:02

 01   15.35-  13.10
 02   57.85-  50.83
 03   .3875   .3700
 04   .0014D -.0018D
 05  -.0018D -.0069D
 06   .0000D  .0000D
 07   .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:37:02

 01   12.38-  15.35
 02   50.73-  57.85
 03   .3707   .3875
 04   .0025D  .0014D
 05   .0059D -.0018D
 06   .0004D  .0000D
 07   .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:38:03

 01   16.60-  12.38
 02   55.45-  50.73
 03   .3832   .3707
 04  -.0011D -.0025D
 05  -.0018D -.0059D
 06  -.0004D  .0004D
 07   .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:39:02

 01   17.60+- 16.60
 02   67.99-  55.45
 03   .4006   .3832
 04   .0028D -.0011D
 05   .0018D -.0018D
 06   .0000D -.0004D
 07   .0000D  .0000D

 Mon - 09/08/97  DAY= 251 13:40:02

 01   10.84-  17.60+   97.14
 02    5.95-  67.99    396.11
 03   .3992   .4006
 04   .0014D  .0028D
 05  -.0008D  .0018D
 06   .0000D  .0000D
 07   .0000D  .0000D
```

```
03   .3943    .3992
04   .0007D   .0014D
05  -.0008D  -.0008D
06   .0000D   .0000D
07   .0000D   .0000D

M    - 09/08/97  DAY= 251 13:42:02

01   18.04    15.30+
02   49.89    61.44
03   .3902    .3943
04  -.0004D   .0007D
05  -.0014D  -.0008D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 13:43:02

01   19.58    18.04
02   42.80    49.89
03   .3878    .3902
04  -.0014D  -.0004D
05   .0004D  -.0014D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 13:44:03

01   15.86+   19.58
02   42.81    42.80
03   .3964    .3878
04  -.0011D  -.0014D
05  -.0007D   .0004D
06    0000D   .0000D
07    0000D   .0000D

Mon - 09/08/97  DAY= 251 13:45:02

01   13.12    15.86+
02   48.25    42.81
03   .4084    .3964
04   .0011D  -.0011D
05   .0007D  -.0007D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 13:46:03

01   23.58+   13.12
02   43.88    48.25
03   .4037    .4084
04  -.0004D   .0011D
05  -.0008D   .0007D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 13:47:02

01   19.83    23.58+   227.45
02   41.98    43.88    727.16
03   .3861    .4037
04   .0018D  -.0004D
05   .0055D  -.0008D
06  -.0004D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 13:48:02
```

05 -.0025D -.0055D
06 -.0004D -.0004D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 13:49:02

01 1.76 11.84
02 7.45 40.90
03 .3882 .4043
04 -.0014D -.0004D
05 -.0014D -.0025D
06 .0004D -.0004D
07 .0004D -.0004D

Mon - 09/08/97 DAY= 251 13:50:02

01 8.632 11.76
02 37.67 47.45
03 .4012 .3882
04 -.0025D -.0014D
05 -.0014D -.0014D
06 .0000D .0004D
07 .0000D .0004D

Mon - 09/08/97 DAY= 251 13:51:02

01 11.60+ 8.632
02 31.75 37.67
03 .4022 .4012
04 -.0021D -.0025D
05 -.0052D -.0014D
06 .0000D .0000D
07 .0000D .0000D

M - 09/08/97 DAY= 251 13:52:02

01 10.73 11.60+
02 34.77 31.75
03 .4142 .4022
04 -.0028D -.0021D
05 -.0025D -.0052D
06 .0000D .0000D
07 -.0007D .0000D

Mon - 09/08/97 DAY= 251 13:53:02

01 9.439 10.73
02 35.75 34.77
03 .3940 .4142
04 -.0011D -.0028D
05 -.0017D -.0025D
06 .0000D .0000D
07 .0000D -.0007D

Mon - 09/08/97 DAY= 251 13:54:02

01 17.43+ 9.439 303.881
02 37.10 35.75 992.55
03 .4047 .3940
04 -.0004D -.0011D
05 .0018D -.0017D
06 .0004D .0000D
07 -.0007D .0000D

Mon - 09/08/97 DAY= 251 13:55:02

01 9.292 17.43+

07 .0000D -.0007D

Mon - 09/08/97 DAY= 251 13:56:02

01 9.934 9.292
02 50.82 47.91
03 .4145 .3806
04 .0007D .0007D
05 .0004D -.0000D
06 .0000D -.0004D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 13:57:02

01 11.59+ 9.934
02 42.67 50.82
03 .3878 .4145
04 .0000D .0007D
05 -.0004D .0004D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 13:58:02

01 11.87 11.59+
02 41.05 42.67
03 .4026 .3878
04 .0000D .0000D
05 -.0004D -.0004D
06 .0000D .0000D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 13:59:02

01 7.43 11.87
02 55.37 41.05
03 .4037 .4026
04 .0000D .0000D
05 .0000D -.0004D
06 .0000D .0000D
07 .0000D -.0004D

Mon - 09/08/97 DAY= 251 14:00:02

01 11.44 17.43
02 59.15 55.37
03 .4166 .4037
04 .0004D .0000D
05 .0004D .0000D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:01:03

01 15.26+ 11.44
02 61.07 59.15
03 .3881 .4166
04 .0000D .0004D
05 .0000D .0004D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:02:03

01 11.84 15.26+
02 61.34 61.07
03 .4256 .3881

14 11 93

Mon - 09/08/97 DAY= 251 14:03:02

01 12.06 11.84
02 56.86 61.34
03 .4060 .4256
04 .0000D .0004D
05 .0000D .0004D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:04:03

01 13.31 12.06
02 59.00 56.86
03 .4113 .4060
04 .0000D .0000D
05 .0000D .0000D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:05:02

01 16.61 13.31
02 61.70 59.00
03 .4117 .4113
04 .0000D .0000D
05 .0000D .0000D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:06:02

01 11.34 16.61
02 55.07 61.70
03 .4094 .4117
04 .0000D .0000D
05 .0000D .0000D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:07:02

01 10.93 11.34
02 65.50 65.07
03 .4332 .4094
04 .0000D .0000D
05 .0000D .0000D
06 .0000D .0000D
07 .0000D .0000D

Mon - 09/08/97 DAY= 251 14:08:02

01 12.50 10.93
02 67.01 65.50
03 .3971 .4332
04 .0004D .0000D
05 -.0000D .0000D
06 .0000D .0000D
07 -.0004D .0000D

Mon - 09/08/97 DAY= 251 14:09:02

01 16.82 12.50 496.107
02 64.53 67.01 1851.60
03 .4307 .3971
04 .0000D .0004D
05 .0000D -.0000D

```
01   19.38   16.82
02   74.78   64.53
03   .4061    .4307
04   .0004D   .0000D
05   .0004D   .0000D
06  -.0000D  -.0004D
07    0000D   .0000D

Mon - 09/08/97  DAY= 251 14:11:03

01   17.00   19.38
02   73.67   74.78
03   .4200    .4061
04   .0000D   .0004D
05   .0000D   .0004D
06   .0000D   .0000D
07   .0000D   .0000D

 Mon - 09/08/97  DAY= 251 14:12:03

01   14.77   17.00
02   74.20   73.67
03   .4256    .4200
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 14:13:03

01   21.52+  14.77
02   67.70   74.20
03   .4225    .4256
04    0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 14:14:02

01   24.37-  21.52+
02   72.76   67.70
03   .3985    .4225
04  -.0000D   .0000D
05   .0007D   .0000D
06   .0000D   .0000D
07  -.0007D   .0000D

Mon - 09/08/97  DAY= 251 14:15:02

01   17.62   24.37
02   75.87   72.76
03   .4402    .3985
04  -.0000D  -.0000D
05  -.0000D   .0007D
06  -.0000D   .0000D
07  -.0000D  -.0007D

 Mon - 09/08/97  DAY= 251 14:16:02

01   14.88   17.62   625.647
02   72.46   75.87   2373.04
03   .4350    .4402
04   .0007D  -.0000D
05  -.0004D  -.0000D
06   .0004D  -.0000D
07  -.0004D  -.0000D
```

```
03   .4138    .4350
04   .0004D   .0007D
05  -.0004D  -.0004D
06   .0007D   .0004D
07   .0007D  -.0004D

M    - 09/08/97  DAY= 251 14:18:02

01   12.71-   15.63/
02   60.17-   56.45/
03   .4098    .4138
04   .0004D   .0004D
05   .0004D  -.0004D
06   .0004D   .0007D
07  -.0000D   .0007D

Mon - 09/08/97  DAY= 251 14:19:02

01   17.92/   12.71
02   57.52/   60.17
03   .3971    .4098
04   .0000D   .0004D
05   .0000D   .0004D
06   .0000D   .0004D
07   .0000D  -.0000D

Mon - 09/08/97  DAY= 251 14:20:02

01   17.14/   17.92
02   60.89/   57.52
03   .4108    .3971
04  -.0004D   .0000D
05   .0000D   .0000D
06   0000D    .0000D
07   0000D    .0000D

Mon - 09/08/97  DAY= 251 14:21:03

01   19.40+   17.14
02   60.01/   60.89
03   .4162    .4108
04   .0000D  -.0004D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 14:22:02

01   13.77/   19.40+
02   67.82/   60.01
03   .4280    .4162
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D   .0000D

Mon - 09/08/97  DAY= 251 14:23:02

01   16.10-   13.77   733.317
02   61.11/   67.82   1797.01
03    3943    .4280
04    0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0004D   .0000D

Mon - 09/08/97  DAY= 251 14:24:02
```

```
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0004D

 Mon - 09/08/97  DAY= 251 14:25:02

01   12.96    22.50
02   51.02    53.53
03   .4065    .4047
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07  -.0004D   .0000D

Mon - 09/08/97  DAY= 251 14:26:02

01   17.43    12.96
02   52.40    61.02
03   .4046    .4065
04   .0000D   .0000D
05  -.0007D   .0000D
06   .0000D   .0000D
07  -.0004D  -.0004D

Mon - 09/08/97  DAY= 251 14:27:02

01   14.17    17.43
02   55.94    52.40
03   .4287    .4046
04   .0000D   .0000D
05   .0000D  -.0007D
06   .0000D   .0000D
07   .0000D  -.0004D

M    - 09/08/97  DAY= 251 14:28:02

01   23.63+   14.17
02   49.77    55.94
03   .4047    .4287
04  -.0004D   .0000D
05   .0000D   .0000D
06  -.0004D   .0000D
07   .0000D   .0000D

 Mon - 09/08/97  DAY= 251 14:29:02

01   19.09    23.63+
02   50.48    49.77
03   .4094    .4047
04   .0000D  -.0004D
05   .0000D   .0000D
06   .0000D  -.0004D
07  -.0004D   .0000D

Mon - 09/08/97  DAY= 251 14:30:02

01   18.77    19.09        866.867
02   63.28    50.48
03   .4119    .4094        3183.43
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D   .0000D
07   .0000D  -.0004D

Mon - 09/08/97  DAY= 251 14:31:02
```

```
  18.95   18.77+
2 63.55   63.28
3 .4029   .4119
  .0000D  .0000D
  .0000D  .0000D
6 .0004D  .0000D
7 .0004D  .0000D

on - 09/08/97  DAY= 251 14:32:02

  28.36   18.95
  58.34   63.55
  .4106   .4029
  .0000D  .0000D
 -.0004D  .0000D
  .0000D  .0004D
  .0000D  .0004D

n - 09/08/97  DAY= 251 14:33:02

  31.33   28.36
  59.70   58.34
  .4238   .4106
  .0000D  .0000D
  .0000D -.0004D
  .0000D  .0000D
 -.0004D  .0000D

  - 09/08/97  DAY= 251 14:34:03

 23.72   31.33
 59.9    59.70
 .4      .4238
.0000D   .0000D
 .0000D  .0000D
 .0000D  .0000D
.0000D  -.0004D

1 - 09/08/97  DAY= 251 14:35:02
```

969.227 (61)

3434.21 (61)

VOC's	CH4
56.3	15.89

MOISTURE DETERMINATION

Plant Name: IBP DAKOTA CITY Unit: GAS BONE (DUSKY)	Ambient Temperature: 75°F
Date: 9/8/97	Barometric Pressure: (BP): 29.05 Elevation: ground
Sampling Location: STACK Elevation: 20'	Probe Length & Type: 8' SS
Run Number: 4	Meter Box Number: 1 Gamma: (Y): 1.017
Operator: DW, TL Reviewer:	Leak Check: Pre-test: 0.001 Post-test: 0.001

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft^3)	DELTA H ($in\ H_2O$)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum ($Hg^"$)
1	0	1335	221.245	2.0	68	84	83	8
			225.3	↓	66	35	73	8
	10		229.3		61	89	84	8
			233.4		60	91	85	8
	20		237.6		64	93	86	8
			241.6		66	94	86	8
	30	1405	245.575					
			Vm = 24.330	ΔH = 2.0		Avg.:	Avg.:	

T_m = 86.9

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	352	148	—	218	
Initial	100	100	—	210	
Net Gain	252 +	48 +	0 +	8 =	V_t (grams) Total 308

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 24.330 cu. ft.

Average absolute meter temperature (T_m + 460) = 546.9 °R

$$\text{Percent moisture} = M = \frac{4.707\,(\text{ml})}{.04707\,(\text{ml}) + \frac{17.64\,(Y)\,(Vm)\,(BP)}{(Tm + 460)}}$$

REF: CFR 60, App. A, Method

TRC

VELOCITY TRAVERSE

Plant: IBP DAKOTA CITY, NE	Date: 9/8/97
Unit Number: GE1 BOILER (HUSKY)	Stack Diameter (in.): 48"
Load Condition: NORM	Stack Gauge Pressure ("H_2O): -.25
Run No.: 4	Operators: DW, TL
Project No.:	
Barometric Pressure at Ground Level ("Hg): 29.15	
Pitot Tube ID: 325	
Pitot Tube Coefficient: .84	Port Change Pitot Leak Check — Pass — Fail
Estimated Stack CO_2%: 3.5 O_2%: 14.5 H_2O%: —	Port #1 — —
Platform Elevation (feet): 20'	Port #2 — —
Schematic of Stack Cross Section:	Port #3 — —
R1	Port #4 — —
	$\sqrt{\Delta P}_{avg}$ = .3164
	T_{savg} = 173.6

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	.03	174
2	.05	174
3	.06	173
4	.07	173
5	.08	174
6	.08	174
7	.12	174
8	.16	175
9	.18	174
10	.24	173
11	.25	172
12	.26	172
Average:		

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	.04	172
2	.03	173
3	.03	174
4	.04	174
5	.05	175
6	.07	175
7	.21	176
8	.22	174
9	.21	174
10	.14	174
11	.14	172
12	.10	172
Average:		

Reference: 40 CFR 60, Appendix A, Method 2

TRC

linearity 0-100 SCALE

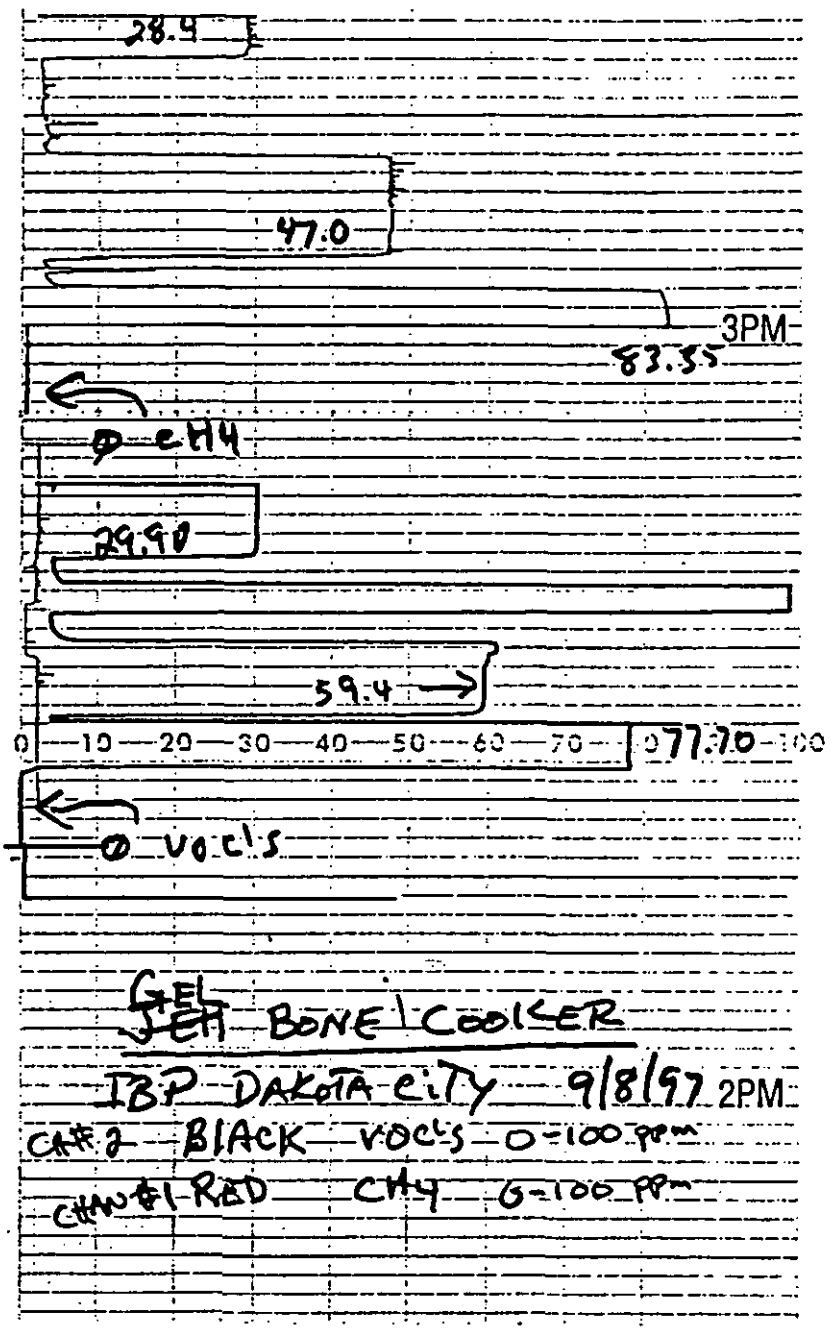
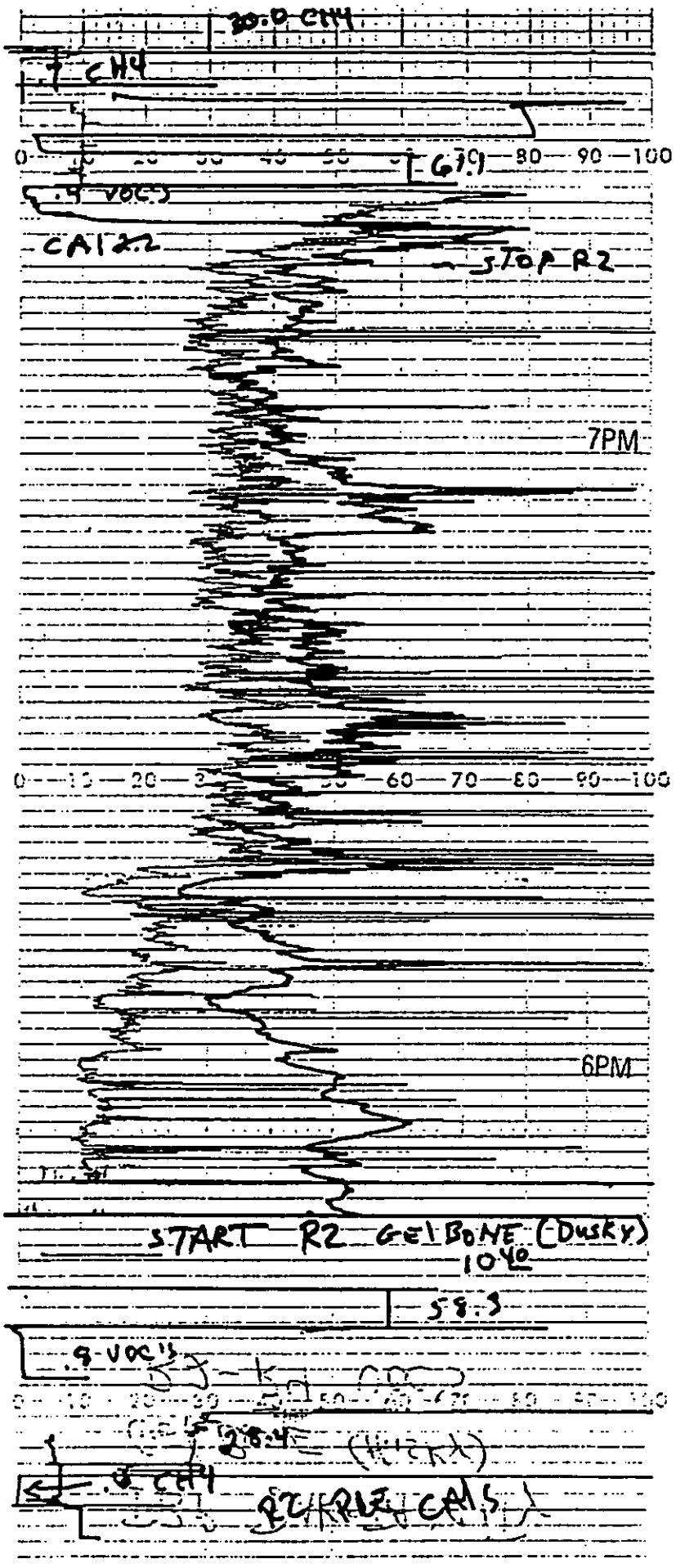


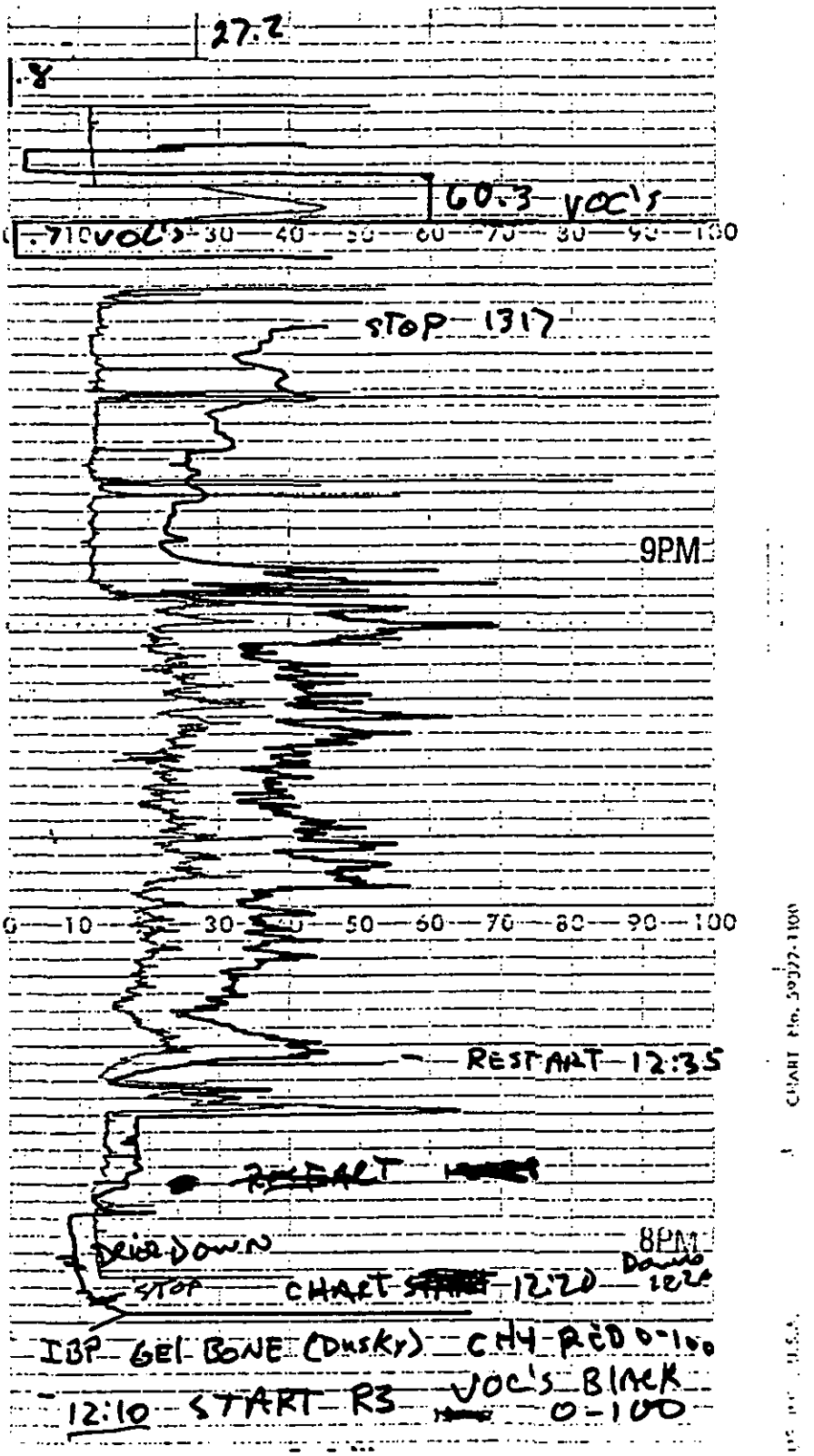
CHART No. 59322-100

U.S.A.

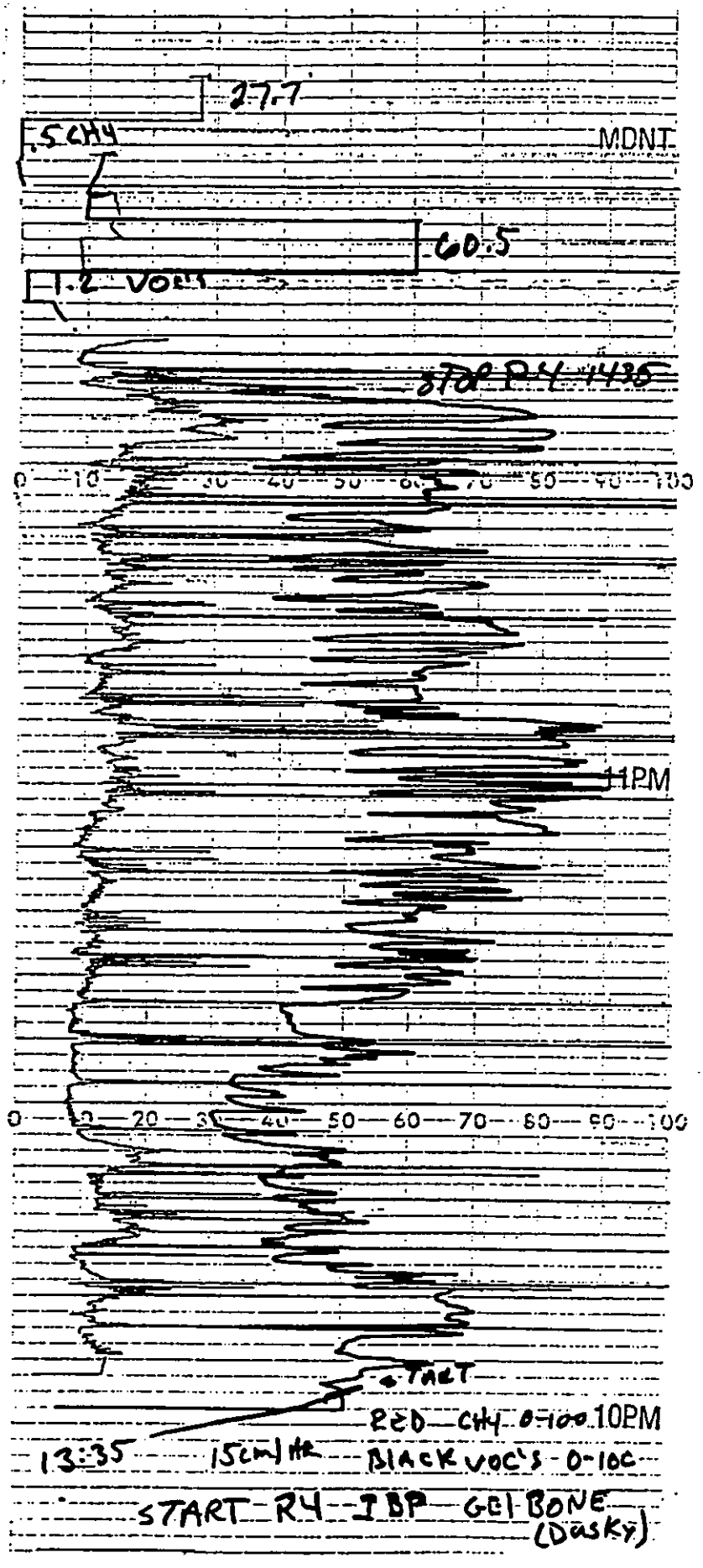
RUN 2 0-100 SCALE



RUN 3 0-100 SCALE

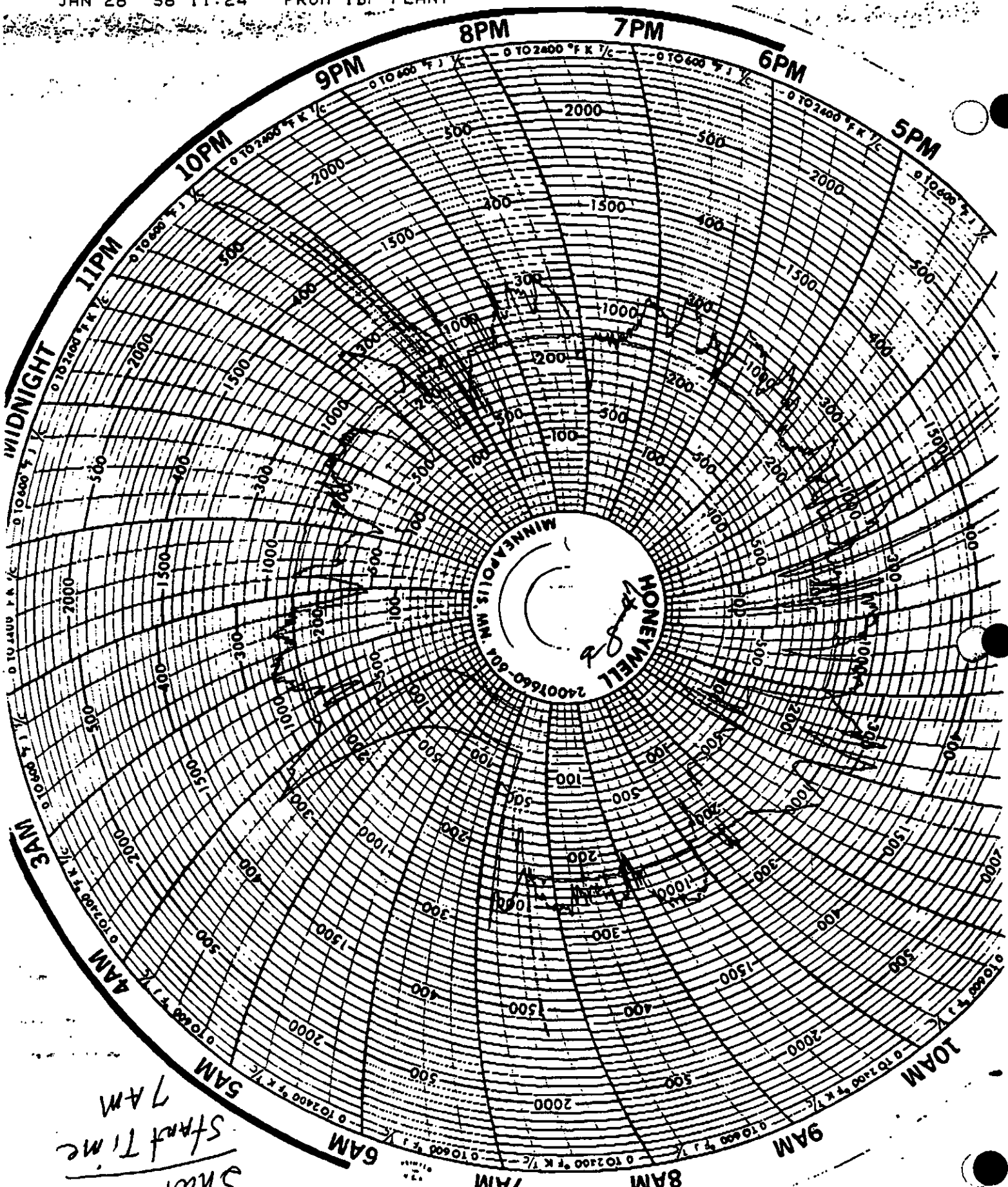


RUN 4 0-100 SCALE



APPENDIX B

PROCESS DATA



4AM Time & Shut down.

Start Time 7AM

D.C. Dusk Drill

Beef Edible - Natural Gas
Dakota City Edible VOC Test

Tested September 8, 1997 at Dakota City , Nebraska on Duske Edible Dryer

Test #1	0.774
Test #2	0.400
Test #3	0.444
	0.539

Head Kill	2442
Edible Opeation Hours	18
Gel Bone Yield lbs/hd	13
Lo Pro Yield lbs/hd	37

	lbs/hr	tons/hr
Edible Processed lbs/hr	6783.33	3.39

Emission Rate (lb/ton)	0.134

Heat Capacity MMBtu/hr	30
Emission Factor VOC- NG	2.78E-06

VOC emission from Combus	0.0834
VOC emission from blood	0.455933

APPENDIX C

EQUIPMENT CALIBRATION

PRETEST DRY GAS METER CALIBRATION DATA FORM (ENGLISH UNITS)

METER BOX NUMBE 1

DRY GAS METER NUMBER: 1197397

DATE: 07/02/97

FERENCE TEST METER NUMBER 27865

DELTA-H@	0	0.5	1	1.5	2	2.5	3	3.5	4
Vwr	427.276	432.620	440.052	449.010	455.391	471.452	478.198	483.646	489.274
Vdr	672.985	678.390	685.928	695.018	701.492	717.813	724.688	730.249	735.975
Tw		71	72	72	72	73	73	73	74
Tdi		77	82	87	89	91	93	94	95
Tdo		75	77	79	81	84	85	86	86
Td(AVE)		76	79.5	83	85	87.5	89	90	90.5
THETA		13.1	13.0	13.0	8.0	18.0	7.0	5.1	5.0
VAC.		1	1	1	1	1	1	1	1
Yi		0.9968	0.9973	1.0020	1.0046	1.0045	1.0031	1.0020	1.0031
DELTA-H@i		1.7163	1.7564	1.8017	1.7864	1.7829	1.8290	1.7336	1.7895
Vw		5.344	7.432	8.958	6.381	16.061	6.746	5.448	5.628
Vd		5.405	7.538	9.09	6.474	16.321	6.875	5.561	5.726
Vd/Min.		0.4141762	0.5798462	0.6992308	0.80925	0.9067222	0.9821429	1.0903922	1.1452

Y(AVE)	1.0017
DELTA-H@(AVE)	1.7745
Pbar	28.97

CALIBRATED BY D.W.

Vwr=REFERENCE TEST METER READING

=DRY GAS METER READING

Vw=GAS VOLUME PASSING THROUGH THE REFERENCE TEST METER, CUBIC FEET

Vd=GAS VOLUME PASSING THROUGH THE DRY GAS METER, CUBIC FEET

Tw=TEMPERATURE OF THE GAS IN THE REFERENCE TEST METER, DEGREES F

Tdi=TEMPERATURE OF THE INLET GAS OF THE DRY GAS METER, DEGREES F

Tdo=TEMPERATURE OF THE OUTLET GAS OF THE DRY GAS METER, DEGREES F

Td=AVERAGE TEMPERATURE OF THE GAS IN THE DRY GAS METER, DEGREES F

DELTA-H=PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. WATER

Yi=RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER FOR EACH RUN

Y=AVERAGE RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER

DELTA-H@i=ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg., INCHES OF WATER

DELTA-H@=AVERAGE ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg.,INCHES OF WATER

TOLERENCE OF Yi=PLUS OR MINUS 0.020 FROM Y

TOLERENCE OF DELTA-H@i=PLUS OR MINUS 0.20 FROM DELTA-H@

Pbar=BAROMETRIC PRESSURE,in. Hg.

THETA=TIME OF CALIBRATION RUN, Min.

Thermocouple Calibration Form

Meter Box #1

Thermocouple Number	Temperature Reading #1	Reference Temp #1	Temperature Reading #2	Reference Temp #2	Temperature Reading #3	Reference Temp #3
1	72	73	180	181	289	286
2	72	73	179	181	290	286
3	73	73	181	181	290	286
4	74	73	180	181	289	286
5	73	73	180	181	289	286
6	40	39	73	74	107	108
7	39	39	72	74	107	108

Calibrated By: SRM
Date: 4-8-96

Criteria:Absolute temp reading cant excede 1.5% of Absolute reference temp

PRETEST DRY GAS METER CALIBRATION DATA FORM (ENGLISH UNITS)									
METER BOX NUMBER		1							
DRY GAS METER NUMBER		1197397							
DATE		09/30/97							
REFERENCE TEST METER NUMBER				27865					
DELTA-H		2.00	2.00	2.00					
Vwr	495.749	508.304	514.499	518.461					
Vdr	753.179	765.880	772.168	776.184					
Tw		70	70	70					
Tdi		79	81	83					
Tdo		71	72	74					
Td(AVE)		75.0	76.5	78.5					
THETA		16.0	8.0	5.0					
VAC.		5.0	10.0	15.0					
Yi		0.9928	0.9923	0.9974					
DELTA-H@i		1.8508	1.8951	1.8032					
Vw		12.555	6.195	3.962					
Vd		12.701	6.288	4.016					
Vd/Min.		0.7938	0.7860	0.8032					
Y(AVE)		0.9942							
DELTA-H@(AVE)		1.8497		CALIBRATED BY		DW			
Pbar		29.21							

Vwr=REFERENCE TEST METER READING

Vdr=DRY GAS METER READING

Vw=GAS VOLUME PASSING THROUGH THE REFERENCE TEST METER, CUBIC FEET

Vd=GAS VOLUME PASSING THROUGH THE DRY GAS METER, CUBIC FEET

Tw=TEMPERATURE OF THE GAS IN THE REFERENCE TEST METER, DEGREES F

Tdi=TEMPERATURE OF THE INLET GAS OF THE DRY GAS METER, DEGREES F

Tdo=TEMPERATURE OF THE OUTLET GAS OF THE DRY GAS METER, DEGREES F

Td=AVERAGE TEMPERATURE OF THE GAS IN THE DRY GAS METER, DEGREES F

DELTA-H=PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. WATER

Yi=RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER FOR EACH RUN

Y=AVERAGE RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER

DELTA-H@i=ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg., INCHES OF WATER

DELTA-H@=AVERAGE ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg.,INCHES OF WATER

TOLERENCE OF Yi=PLUS OR MINUS 0.020 FROM Y

TOLERENCE OF DELTA-H@i=PLUS OR MINUS 0.20 FROM DELTA-H@

Pbar=BAROMETRIC PRESSURE,in. Hg.

THETA=TIME OF CALIBRATION RUN, Min.

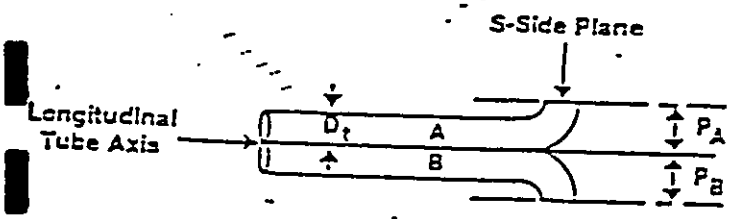
Type S Pitot Inspection Form

Pitot Tube No. 321

Tubing Diameter, D_t 3/8 in. $\left(\frac{3}{16} < D_t < \frac{3}{8}\right)$

Pitot Tube Assembly Level? (Yes)/No

Pitot Tube Opening Damaged? Yes/(No)



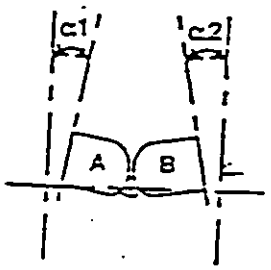
Note:

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

P_A = 7/16 in.

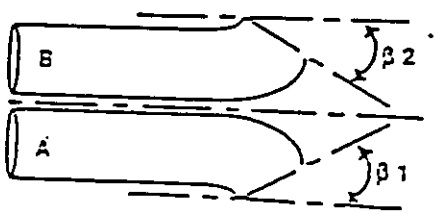
P_B = 7/16 in.



$\alpha 1$ = 1 °

$\alpha 2$ = 0 °

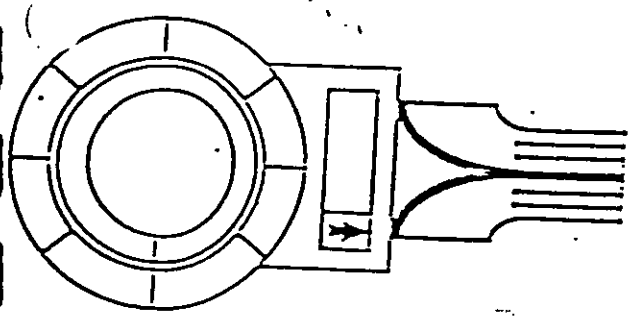
(< 10°)

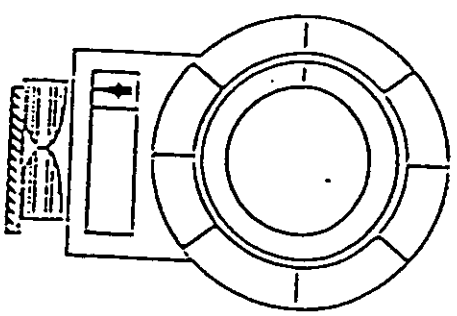


$\beta 1$ = 0 °

$\beta 2$ = 0 °

(< 5°)





Level Position to find γ = 0

$Z = A^* \sin\gamma$ 0 in. (< 1/8 in.)

Level Position to find θ = 0

$W = A^* \sin\theta$ 0 in. (< 1/32 in.)

Comments:

Checked by: DW

Date: 5/17/97

Calibration Required? NO

D_t = External Tube Diameter

A^* = Distance Between Tips (P_A - P_B) inches

BAROMETER CALIBRATION FORM

Barometer # 1
Cal'd Against Hg BAROMETER

DATE	REFERENCE BAROMETER (in. Hg.)	DIAL BAROMETER (in. Hg.)	DIFFERENCE
8/12/97	29.36	29.37	+.01
9/29/97	28.72	28.71	-.01

APPENDIX D

EXAMPLE CALCULATIONS

CALCULATION FORMULAS

Linearity Percent Difference = $\frac{\text{Analyzer Response - Cylinder Value}}{\text{Span}} \times 100$

Bias System Bias = $\frac{\text{System Response - Analyzer Response}}{\text{Span}} \times 100$

Drift System Drift = $\frac{\text{System Response - Previous System Response}}{\text{Span}} \times 100$

Moisture Moisture = $\frac{100 \times \text{Volume water vapor (scf)}}{\text{(Volume Gas (dscf) + Volume water vapor)}}$

Stack Area Area = 3.14 x Radius^2

AFPM Actual Feet per Minute = 5130 x .84 x SDE Avg x (1 / (stack pres. Hg x wet MW)) ^.5

ACFM Actual Cubic Feet/Min = AFPM x Stack Area (sqaure feet)

DSCFM Dry Std. Cubic Feet/Min = $\frac{\text{(ACFM x 528 x Dry Mole Fraction x Stack pres. Hg)}}{\text{(29.92 x (Stack Temperature + 460))}}$

DSCF/HR Dry Std. Cubic Feet/Hr = SCFM x 60 min

Humidity Humidity (gal H2O/gal. air) Taken From Chart (Wet bulb / Dry bulb temps)

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) x (Span Conc/(Avg Span Cal - Avg Zero Cal))

LBS/HR CH4 Pounds per Hour as Methane = PPMv (VOC's less Methane) x 16.01 x DSCFM x 1.554E-7

LBS/HR Carbon Pounds per Hour as Carbon = PPMv (VOC's less Methane) x 12.01 x DSCFM x 1.554E-7

Since the stack gas total hydrocarbon concentrations will be measured as methane and the stack methane gas will be measured, the methane fraction can be subtracted straight out of the stack gas concentrations.

The calibration of the FID (JUM) analyzer will be with Propane as a Methane concentration. The following is an example:

FID (JUM): Propane ($C_3 H_8$) = 17 ppm. There are three Carbons in propane. Calibrate as 51 ppm CH_4.
FID (CAI): Methane (CH_4) = 50 ppm. There is only one Carbon in methane. Calibrate as 50 ppm CH_4.

Propane equivalent to Methane would be 17 x 3 = 51 ppm as methane.

80 ppm (JUM) - 60 ppm (CAI) = 20 ppm total hydrocarbons as methane.

The final test results will be reported in lbs/hr as Carbon.