AP-42 Section Number: 9.9.4

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Title: Source Emissions Report for Shofstall Alfalfa, Alfalfa Dehydrating Facility, Odessa, NE

AirSource Technologies

AirSource Technologies

October 1993

PLANT #2

SOURCE EMISSIONS REPORT
for
SHOFSTALL ALFALFA
Alfalfa Dehydration Facility
Odessa, Nebraska

prepared by
AirSource Technologies

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AirSource Project No. 411922

PREFACE

This report was prepared by AirSource Technologies in response to a test that was conducted at the Shofstall Alfalfa Facility in Odessa, Nebraska on September 2, 1993. Any questions concerning this report should be directed to Mr. Blane Wood, Project Manager, or to Mr. George Cobb, General Manager.

AirSource Technologies

Blane Wood
Project Manager

Approved

George R. Cobb
General Manager

Date: October 15, 1993

SECTION 1

INTRODUCTION

A stack test was conducted by AirSource Technologies on the Shofstall Alfalfa, alfalfa dehydration plant in Odessa, Nebraska on September 2, 1993.

The AirSource Technologies personnel who conducted the test were: Mr. Blane Wood, Project Manager and Mr. Tim Titus, Environmental Scientist.

The results of the test were used to evaluate the process' performance with regards to the particulate emission rate.

The appendices contain the following:

Appendix A:	Example Calculations
Appendix B:	Computer Forms
Appendix C:	Particulate Field Data Forms
Appendix D:	Laboratory and Analysis Forms
Appendix E:	Pretest Calibrations
Appendix F:	Posttest Calibrations
Appendix G:	Process Data

SECTION 2

SUMMARY OF RESULTS

The results of the particulate emissions are: 46.21 lb.hr, 36.26 lb/hr, and 29.93 lb/hr for Runs 1, 2 and 3 respectively.

The sampling and particulate results are shown in Table 1.

Table 1
SUMMARY OF SAMPLING AND PARTICULATE RESULTS
Shofstall Alfalfa
Odessa, Nebraska

Parameters	Unit of Measure	Run 1	Run 2	Run 3
Particulate Emissions				
Front Half	gr/dscf	0.1091	0.0877	0.0739
Uncorrected	gr/dscf	0.4362	0.3071	0.2586
Corrected to 7% O_2	gr/dscf	0.8725	0.7018	0.5910
Emission Rate	lb/hr	46.21	36.26	29.93
Weight	grams	0.2680	0.2135	0.1788
Isokinetics	%	91.7	93.1	94.5
Stack Flow Rate				
Actual	acfm	77,333	78,339	79,515
Standard Conditions	dscfm	49,442	48,234	47,277
Velocity	ft/min.	6,154	6,234	6,328
Sampling Results				
Sampling Volume	dscf	37.841	37.478	37.278
Avg. Stack Temperature	°F	178	190	202
Avg. ΔP	inches H_2O	2.413	2.413	2.429
Avg. ΔH	inches H_2O	1.4	1.39	1.39
Avg. Meter Temperature	°F	69	72	79
Oxygen, Orsat	%	17.5	17.0	17.0
Carbon Dioxide, Orsat	%	1.5	1.5	1.5
Static Pressure	inches H_2O	0.85	0.85	0.85
Moisture Collected	ml	164.5	180.9	197.5
Moisture	% H_2O	17.0	18.5	20.0
Sampling Time	min.	60	60	60

SECTION 3

PROCESS OPERATION

The alfalfa dehydration plant operates a Heil 105 triple pass dryer. The control equipment used are a 2-Kice CK-126 cyclone and a single compartment baghouse. The condition for each of the test runs were the same.

Table 2 summarizes the results of the process operations and Table 3 provides process data collected during the tests.

Table 2 SUMMARY OF RESULTS Process Data	
Historical Average Process Weight (@ 30% moisture)	26,000 lb/hr
Historical Maximum Process Weight (@ 30% moisture)	32,000 lb/hr
Type of Fuel Normally Burned	Natural Gas
Approximate Quantity of Fuel Burned Annually	27,000 MCF
Baghouse - Positive pressure	
Number of Bags	144
Clean Cycle	3 minutes
Fan Rated H.P.	100 H.P.
Cyclone - 2-Kire CK-126	
Diameter	10.5 ft.
ΔP	3 in. H_2O
Fan Rated H.P.	125

Table 3 PROCESS DATA			
	Gresen Hay Moisture %	**Scale Reading Tons**	**Pellet Moisture %**
08:30	-	-	33
08:45	8.0	2	34
09:15	7.8	1.5	-
09:30	7.8	1.7	-
9:45	7.5	1.7	-
10:00	7.4	1.8	33
10:15	7.5	1.9	-
10:30	7.3	2.1	-
10:45	7.2	2.1	-
11:00	7.0	2.2	35
11:15	7.1	1.9	-
11:30	7.0	2.2	-
11:45	7.3	2.0	-
12:00	7.5	2.2	33
12:15	7.0	2.0	-
12:30	7.0	2.4	-
12:45	7.1	2.3	-
13:00	7.3	2.3	33

SECTION 4

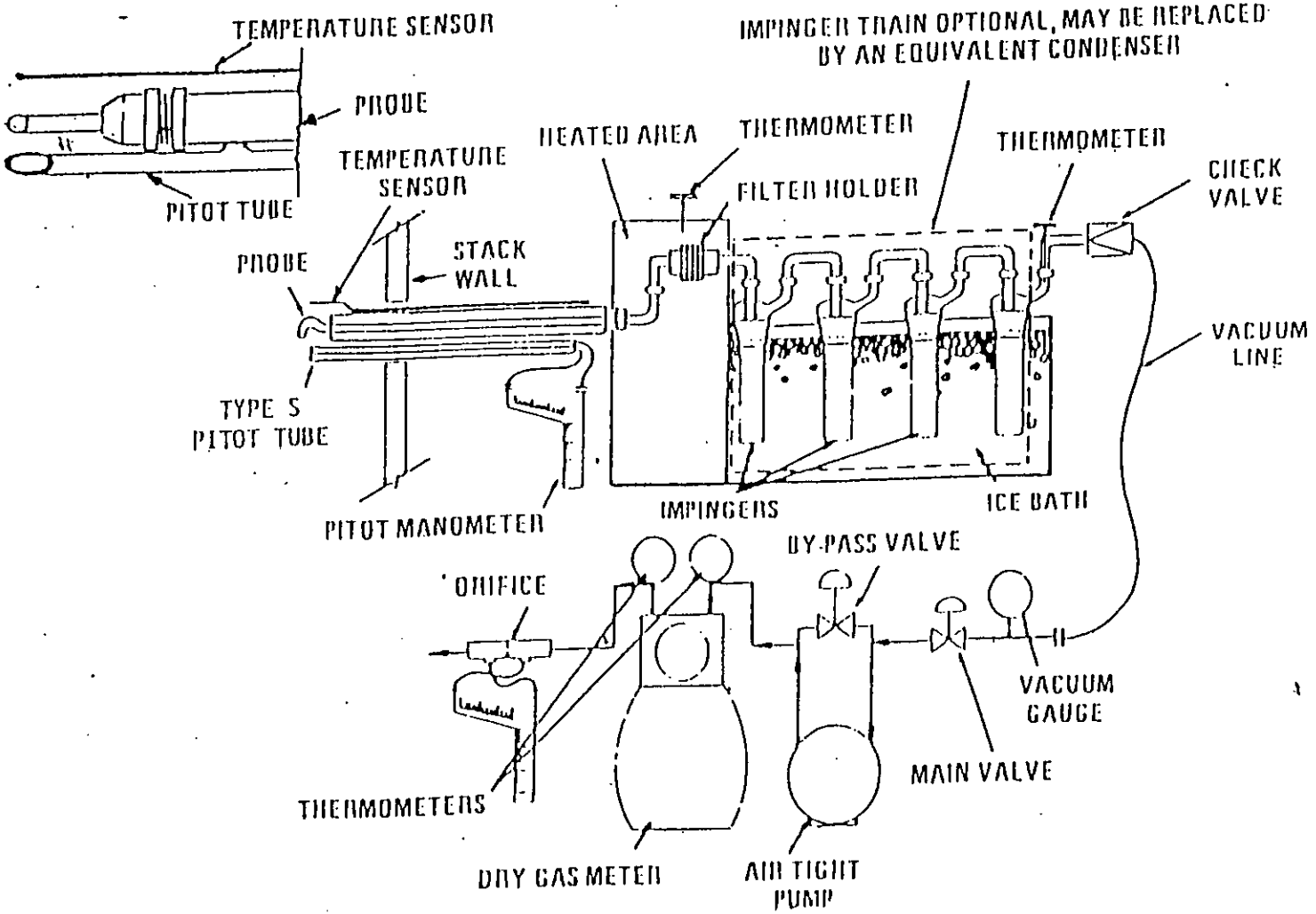
SAMPLING AND ANALYTICAL PROCEDURES

Particulates

EPA Methods 1-4 were used for the determination of traverse point locations, velocities and flows of stack gas, oxygen, carbon dioxide, and moisture. The particulate sampling and recovery of the samples were done according to EPA Method 5 recovery procedures.

Figure 1 shows a schematic of the sampling train.

Figure 2 shows a schematic of the stack and traverse locations.



Schematic of Method 5 sampling train.

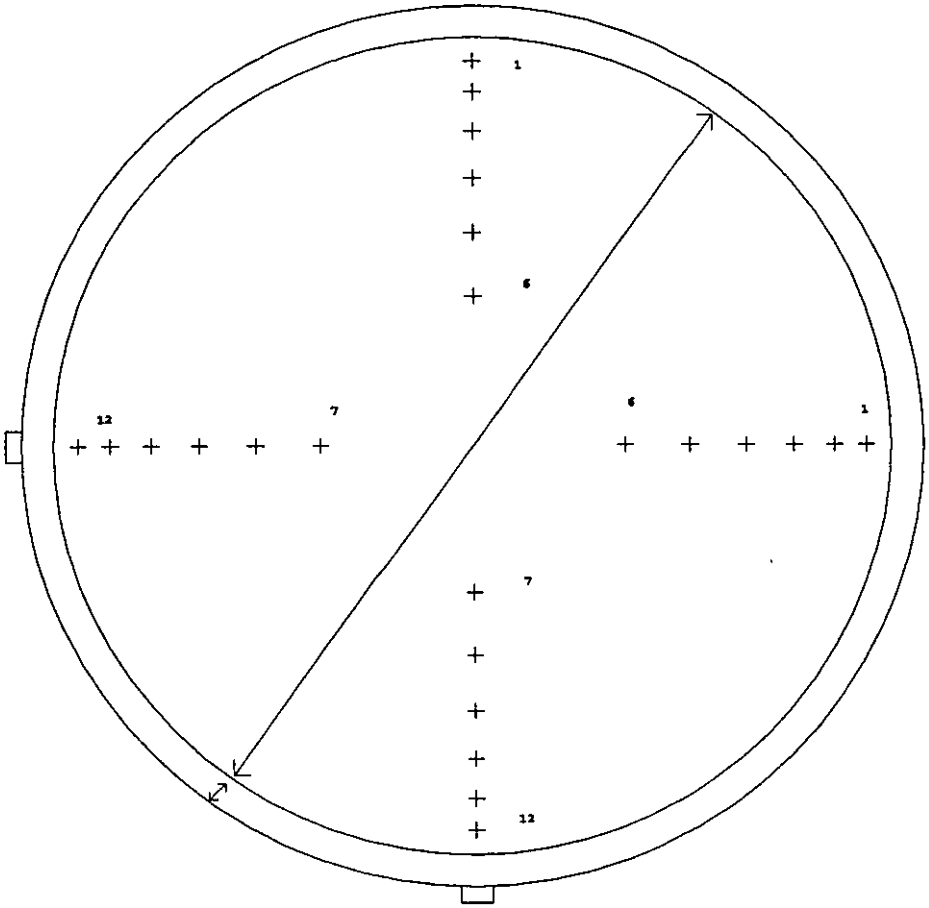
Figure 1

Stack dimensions - Shofstall Alfalfa

Inside diameter 48"
Port length 4"

Sampling Port Location

3 Diameters upstream from disturbance
2 Diameters downstream from disturbance



Traverse Point Locations
(Excluding Port Length)

1.	1.0"	7.	30.9"
2.	3.2"	8.	36"
3.	5.7"	9.	39.5"
4.	8.5"	10.	42.3"
5.	12.0"	11.	44.8"
6.	17.1"	12.	47"

Figure 2

APPENDIX A

EXAMPLE CALCULATIONS

NOMENCLATURE

Equation No.	Symbol	Description	Units
1	Vi	Initial meter reading	dcf
	Vf	Final meter reading	dcf
	Vm	Volume meter, actual	dcf
2	Pb	Barometric pressure	in. Hg
	ΔH_{avg}	Average orifice pressure drop	in. H_2O
	Tm_{avg}	Average meter temperature	°F
	Vm_{std}	Volume meter, standard conditions	dscf
3	Vlc	Total moisture collected	grams
	Vw_{std}	Volume of water vapor collected, standard conditions	ft^3
	% H_2O	Percent moisture by volume	-
4	Mf	Mole fraction of dry gas	-
5	% CO_2	Percent carbon dioxide by volume, dry	-
	% O_2	Percent oxygen by volume, dry	-
	% CO	Percent carbon monoxide by volume, dry	-
	% N_2	Percent nitrogen by volume, dry	-
6	Md	Molecular weight, dry stack gas	lb/lb-mole
7	Ms	Molecular weight, stack gas	lb/lb-mole
8	Θi	Sampling time interval	minutes
	Dn	Diameter of nozzle	inches
	ΔPs	Velocity head of S pitot	in. H_2O
	Ts	Temperature of stack gas	°F
	Vm_i	Volume of meter per sampling interval	ft^3
9	Ps	Stack pressure, absolute	in. Hg
	Pg	Stack gas pressure	in. H_20
10	ΔPs_{avg}	Average velocity head of S pitot	in. H_2O
	Ts_{avg}	Average temperature of stack gas	°F
	Vs	Average stack gas velocity	fpm
11	Θ	Total time of test	minutes
	% I	Percent isokinetic	-
12	ID	Inside diameter of stack	inches
	As	Area of stack	in^2
13	Qs	Stack flow rate, dry standard conditions	dscfm
14	m_n	Total particulate matter collected	mg
	Cs_{std}	Concentration of particulate collected, dry basis, standard conditions	gr/dscf

15	Cs_{std}(corr 7% O_2)	Concentration of particulate collected, dry basis standard conditions	gr/dscf (corr to 7% O_2)
16	Cs_{std}(corr 12% CO_2)	Concentration of particulate collected, dry basis standard condition	gr/dscf (corr to 12% CO_2)
17	Cs_{std}	Concentration of particulate collected, actual conditions	gr/acf
18	Ep	Particulate emission rate	lb/hr

PARTICULATE CALCULATION EQUATIONS

1. $V_m = V_f - V_i$

2. $$V_{m(std)} = \frac{17.64\ (V_m)\ Y \left(P_b + \frac{\Delta H_{avg}}{13.6}\right)}{T_{m(avg)} + 460}$$

3. $V_{wc(std)} = 0.0471(V_{lc})$

$$\%\ H_2O = \frac{100(V_{wc(std)})}{V_{m(std)} + V_{wc(std)}}$$

4. $$M_f = \frac{100 - \%H_2O}{100}$$

5. $\%\ N_2 = 100 - (\%CO_2 + \%O_2 + \%CO)$

6. $M_d = (\%CO_2 \times 0.44) + (\%O_2 \times 0.32) + (\%N_2 + \%CO \times 0.28)$

7. $M_s = (M_d \times M_f) + 18(1 - M_f)$

8. $$V_{mi} = \frac{5.168(T_m + 460)(C_p)(\theta_i)(M_f)(D_n^2)}{\sqrt{P_b}} \times \sqrt{\frac{\Delta P_s}{T_S + 460}}$$

9. $$P_s = P_b + \frac{P_g}{13.6}$$

10. $$V_s = 5128.8 \times C_P \times \left(\sqrt{\Delta P_{s(avg)}}\right) \times \sqrt{\frac{T_{s(avg)} + 460}{P_s \times M_s}}$$

11. $$\%\ I = \frac{1039(T_{s(avg)} + 460)(V_{m(std)})}{V_s(\theta)(P_s)(M_f)(D_n^2)}$$

12. $A_s = \pi \left(\frac{ID}{2}\right)^2$

13. $Q_s = \frac{0.122(V_s)(A_s)(M_p)(P_s)}{T_{s(avg)} + 460}$

14. $C_{s(std)} = 0.0154\left(\frac{M_n}{V_{m(std)}}\right)$

15. $C_{s(act)} = \frac{17.64(C_{s(std)})(P_s)(M_p)}{T_{s(avg)} + 460}$

16. $E_p = 0.00857(C_{S(std)})(Q_s)$

APPENDIX B

COMPUTER FORMS

FILE NAME - ODESSA.R1 PROG.=VER 06/27/89
RUN # - ODESSA.R1 09-29-1993 09:33:05
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Feet)=	741.000		
Final Meter Volume (Cubic Feet)=	780.938		
Meter Factor=	1.019		
Final Leak Rate (cu ft/min)=	0.002		
Net Meter Volume (Cubic Feet)=	40.697		
Gas Volume (Dry Standard Cubic Feet)=	37.841		
Barometric Pressure (in Hg)=	27.79		
Static Pressure (Inches H20)=	0.85		
Percent Oxygen=	17.5		
Percent Carbon Dioxide=	1.5		
Moisture Collected (ml)=	164.5		
Percent Water=	17.0		
Average Meter Temperature (F)=	69		
Average Delta H (in H20)=	1.40		
Average Delta P (in H20)=	2.413		
Average Stack Temperature (F)=	178		
Dry Molecular Weight=	28.94		
Wet Molecular Weight=	27.08		
Average Square Root of Delta P (in H20)=	1.5530		
% Isokinetic=	91.7		
Pitot Coefficient=	0.84		
Sampling Time (Minutes)=	60.0		
Nozzle Diameter (Inches)=	0.179		
Stack Axis #1 (Inches)=	48.0		
Stack Axis #2 (Inches)=	48.0		
Circular Stack			
Stack Area (Square Feet)=	12.57		
Stack Velocity (Actual, Feet/min)=	6,154		
Flow Rate (Actual, Cubic ft/min)=	77,333		
Flow rate (Standard, Wet, Cubic ft/min)=	59,566		
Flow Rate (Standard, Dry, Cubic ft/min)=	49,442		

Particulate Loading - Front Half

Particulate Weight (g)=	0.2680	Corr. to 7% O2 & 12% CO2	
Particulate Loading, Dry Std. (gr/scf)=	0.1091	0.4362	0.8725
Particulate Loading, Actual (gr/cu ft)=	0.0697		
Emission Rate (lb/hr)=	46.21		

Particulate Loading - Total Catch Including Impingers

Particulate Weight (g)=	0.2764		
Particulate Loading, Dry Std. (gr/scf)=	0.1125	0.4499	0.8998
Particulate Loading, Actual (gr/cu ft)=	0.0719		
Emission Rate (lb/hr)=	47.66		
Percent Impinger Catch=	3.0		

* * METRIC UNITS * *

FILE NAME - ODESSA.R1 PROG.=VER 06/27/89
RUN # - ODESSA.R1 09-29-1993 09:33:06
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Meters)=	20.982		
Final Meter Volume (Cubic Meters)=	22.113		
Meter Factor=	1.019		
Final Leak Rate (cu m/min)=	0.0001		
Net Meter Volume (Cubic Meters)=	1.152		
Gas Volume (Dry Standard Cubic Meters)=	1.072		
Barometric Pressure (mm Hg)=	706		
Static Pressure (mm H20)=	22		
Percent Oxygen=	17.5		
Percent Carbon Dioxide=	1.5		
Moisture Collected (ml)=	164.5		
Percent Water=	17.0		
Average Meter Temperature (C)=	21		
Average Delta H (mm H20)=	35.7		
Average Delta P (mm H20)=	61.3		
Average Stack Temperature (C)=	81		
Dry Molecular Weight=	28.94		
Wet Molecular Weight=	27.08		
Average Square Root of Delta P (mm H20)=	7.8268		
% Isokinetic=	91.7		
Pitot Coefficient=	0.84		
Sampling Time (Minutes)=	60.0		
Nozzle Diameter (mm)=	4.55		
Stack Axis #1 (Meters)=	1.219		
Stack Axis #2 (Meters)=	1.219		
Circular Stack			
Stack Area (Square Meters)=	1.167		
Stack Velocity (Actual, m/min)=	1,876		
Flow rate (Actual, Cubic m/min)=	2,190		
Flow rate (Standard, Wet, Cubic m/min)=	1,687		
Flow rate (Standard, Dry, Cubic m/min)=	1,400		

Particulate Loading - Front Half

Particulate Weight (g)=	0.2680	Corr. to 7% O2 & 12% CO2	
Particulate Loading, Dry Std. (mg/cu m)=	250.1	1000.4	2000.7
Particulate Loading, Actual (mg/cu m)=	159.8		
Emission Rate (kg/hr)=	20.98		

Particulate Loading - Total Catch Including Impingers

Particulate Weight (g)=	0.3		
Particulate Loading, Dry Std. (mg/cu m)=	257.9	1031.7	2063.5
Particulate Loading, Actual (mg/cu m)=	164.8		
Emission Rate (kg/hr)=	21.64		
Percent Impinger Catch=	3.0		

FILE NAME - ODESSA.R1
RUN # - ODESSA.R1
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

PROG.=VER 06/27/89
09-29-1993 09:33:06

Point #	Delta P (in. H20)	Delta H (in. H20)	Stack T (F)	Meter T In(F)	Meter T Out(F)
1	2.300	1.30	177	66	66
2	2.400	1.40	173	67	66
3	2.400	1.40	177	67	66
4	2.400	1.40	176	68	67
5	2.500	1.45	178	68	67
6	2.500	1.45	177	69	67
7	2.400	1.40	177	69	67
8	2.500	1.45	175	70	68
9	2.400	1.40	175	70	68
10	2.400	1.40	176	70	68
11	2.300	1.35	177	70	69
12	2.300	1.35	177	70	68
13	2.300	1.35	177	70	68
14	2.300	1.35	178	71	68
15	2.400	1.40	180	71	68
16	2.500	1.45	181	72	68
17	2.500	1.45	182	72	69
18	2.500	1.45	182	72	69
19	2.400	1.40	179	73	69
20	2.600	1.50	180	73	69
21	2.500	1.45	180	73	69
22	2.400	1.40	180	73	68
23	2.300	1.35	180	73	69
24	2.400	1.40	181	73	69

Fraction	Final Wt. (g)	Tare Wt. (g)	Blank Wt. (g)	Net Wt. (g)
DRY CATCH	0.0000	0.0000	0.0000	0.0000
FILTER	33.5650	33.5089	-0.0003	0.0564

Fraction	Final Wt. (g)	Tare Wt. (g)	Vol. (ml)	Net Wt. (g)
PROBE RINSE	63.5033	63.2907	130.0	0.2116
IMPINGERS	240.9925	240.9822	200.0	0.0084

Probe Rinse Blank (mg/ml)= 0.0080 High Acetone Blank - Limit .0079
Impinger Blank (mg/ml)= 0.0095

FILE NAME - ODESSA.R2 PROG.=VER 06/27/89
RUN # - ODESSA.R2 09-28-1993 16:00:46
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Feet)=	782.453		
Final Meter Volume (Cubic Feet)=	822.238		
Meter Factor=	1.019		
Final Leak Rate (cu ft/min)=	0.002		
Net Meter Volume (Cubic Feet)=	40.541		
Gas Volume (Dry Standard Cubic Feet)=	37.478		
Barometric Pressure (in Hg)=	27.79		
Static Pressure (Inches H20)=	0.85		
Percent Oxygen=	17.0		
Percent Carbon Dioxide=	1.5		
Moisture Collected (ml)=	180.9		
Percent Water=	18.5		
Average Meter Temperature (F)=	72		
Average Delta H (in H20)=	1.39		
Average Delta P (in H20)=	2.413		
Average Stack Temperature (F)=	190		
Dry Molecular Weight=	28.92		
Wet Molecular Weight=	26.90		
Average Square Root of Delta P (in H20)=	1.5530		
% Isokinetic=	93.1		
Pitot Coefficient=	0.84		
Sampling Time (Minutes)=	60.0		
Nozzle Diameter (Inches)=	0.179		
Stack Axis #1 (Inches)=	48.0		
Stack Axis #2 (Inches)=	48.0		
Circular Stack			
Stack Area (Square Feet)=	12.57		
Stack Velocity (Actual, Feet/min)=	6,234		
Flow Rate (Actual, Cubic ft/min)=	78,339		
Flow rate (Standard, Wet, Cubic ft/min)=	59,200		
Flow Rate (Standard, Dry, Cubic ft/min)=	48,234		

Particulate Loading - Front Half

Particulate Weight (g)=	0.2135	Corr. to 7% O2 & 12% CO2	
Particulate Loading, Dry Std. (gr/scf)=	0.0877	0.3071	0.7018
Particulate Loading, Actual (gr/cu ft)=	0.0540		
Emission Rate (lb/hr)=	36.26		

Particulate Loading - Total Catch Including Impingers

Particulate Weight (g)=	0.2213		
Particulate Loading, Dry Std. (gr/scf)=	0.0909	0.3183	0.7275
Particulate Loading, Actual (gr/cu ft)=	0.0560		
Emission Rate (lb/hr)=	37.59		
Percent Impinger Catch=	3.5		

* * METRIC UNITS * *

FILE NAME - ODESSA.R2 PROG.=VER 06/27/89
RUN # - ODESSA.R2 09-28-1993 16:00:46
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Meters)=	22.156		
Final Meter Volume (Cubic Meters)=	23.282		
Meter Factor=	1.019		
Final Leak Rate (cu m/min)=	0.0001		
Net Meter Volume (Cubic Meters)=	1.148		
Gas Volume (Dry Standard Cubic Meters)=	1.061		
Barometric Pressure (mm Hg)=	706		
Static Pressure (mm H20)=	22		
Percent Oxygen=	17.0		
Percent Carbon Dioxide=	1.5		
Moisture Collected (ml)=	180.9		
Percent Water=	18.5		
Average Meter Temperature (C)=	22		
Average Delta H (mm H20)=	35.3		
Average Delta P (mm H20)=	61.3		
Average Stack Temperature (C)=	88		
Dry Molecular Weight=	28.92		
Wet Molecular Weight=	26.90		
Average Square Root of Delta P (mm H20)=	7.8267		
% Isokinetic=	93.1		
Pitot Coefficient=	0.84		
Sampling Time (Minutes)=	60.0		
Nozzle Diameter (mm)=	4.55		
Stack Axis #1 (Meters)=	1.219		
Stack Axis #2 (Meters)=	1.219		
Circular Stack			
Stack Area (Square Meters)=	1.167		
Stack Velocity (Actual, m/min)=	1,900		
Flow rate (Actual, Cubic m/min)=	2,218		
Flow rate (Standard, Wet, Cubic m/min)=	1,676		
Flow rate (Standard, Dry, Cubic m/min)=	1,366		
Particulate Loading - Front Half			
Particulate Weight (g)=	0.2135	Corr. to 7% O2 & 12% CO2	
Particulate Loading, Dry Std. (mg/cu m)=	201.2	704.1	1609.5
Particulate Loading, Actual (mg/cu m)=	123.8		
Emission Rate (kg/hr)=	16.46		
Particulate Loading - Total Catch Including Impingers			
Particulate Weight (g)=	0.2		
Particulate Loading, Dry Std. (mg/cu m)=	208.5	729.9	1668.3
Particulate Loading, Actual (mg/cu m)=	128.3		
Emission Rate (kg/hr)=	17.07		
Percent Impinger Catch=	3.5		

FILE NAME - ODESSA.R2
RUN # - ODESSA.R2
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

PROG.=VER 06/27/89
09-28-1993 16:00:47

Point #	Delta P (in. H20)	Delta H (in. H20)	Stack T (F)	Meter T In(F)	Meter T Out(F)
1	2.300	1.30	187	70	70
2	2.300	1.35	188	70	70
3	2.400	1.40	190	71	70
4	2.300	1.30	190	72	70
5	2.500	1.45	190	73	71
6	2.500	1.45	189	73	71
7	2.500	1.45	190	73	71
8	2.400	1.40	190	73	71
9	2.500	1.45	191	74	71
10	2.300	1.30	192	73	71
11	2.300	1.30	192	73	71
12	2.300	1.30	192	74	72
13	2.400	1.40	190	72	71
14	2.300	1.30	190	73	71
15	2.400	1.40	191	73	71
16	2.400	1.40	192	74	71
17	2.500	1.40	192	74	72
18	2.500	1.45	190	74	72
19	2.500	1.45	192	74	72
20	2.500	1.45	190	75	72
21	2.500	1.45	190	75	72
22	2.500	1.45	190	75	72
23	2.500	1.45	191	75	72
24	2.300	1.30	191	75	72

Fraction	Final Wt. (g)	Tare Wt. (g)	Blank Wt. (g)	Net Wt. (g)
DRY CATCH	0.0000	0.0000	0.0000	0.0000
FILTER	33.5988	33.5561	-0.0003	0.0430

Fraction	Final Wt. (g)	Tare Wt. (g)	Vol. (ml)	Net Wt. (g)
PROBE RINSE	65.4422	65.2706	140.0	0.1705
IMPINGERS	241.7733	241.7636	200.0	0.0078

Probe Rinse Blank (mg/ml)= 0.0080 High Acetone Blank - Limit .0079
Impinger Blank (mg/ml)= 0.0095

FILE NAME - ODESSA.R3 PROG.=VER 06/27/89
RUN # - ODESSA.R3 09-28-1993 16:03:14
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Feet)=	822.500	
Final Meter Volume (Cubic Feet)=	862.605	
Meter Factor=	1.019	
Final Leak Rate (cu ft/min)=	0.004	
Net Meter Volume (Cubic Feet)=	40.867	
Gas Volume (Dry Standard Cubic Feet)=	37.278	
Barometric Pressure (in Hg)=	27.79	
Static Pressure (Inches H20)=	0.85	
Percent Oxygen=	17.0	
Percent Carbon Dioxide=	1.5	
Moisture Collected (ml)=	197.5	
Percent Water=	20.0	
Average Meter Temperature (F)=	79	
Average Delta H (in H20)=	1.39	
Average Delta P (in H20)=	2.429	
Average Stack Temperature (F)=	202	
Dry Molecular Weight=	28.92	
Wet Molecular Weight=	26.74	
Average Square Root of Delta P (in H20)=	1.5583	
% Isokinetic=	94.5	
Pitot Coefficient=	0.84	
Sampling Time (Minutes)=	60.0	
Nozzle Diameter (Inches)=	0.179	
Stack Axis #1 (Inches)=	48.0	
Stack Axis #2 (Inches)=	48.0	
Circular Stack		
Stack Area (Square Feet)=	12.57	
Stack Velocity (Actual, Feet/min)=	6,328	
Flow Rate (Actual, Cubic ft/min)=	79,515	
Flow rate (Standard, Wet, Cubic ft/min)=	59,074	
Flow Rate (Standard, Dry, Cubic ft/min)=	47,277	

Particulate Loading - Front Half

Particulate Weight (g)=	0.1788	Corr. to 7% O2 & 12% CO2
Particulate Loading, Dry Std. (gr/scf)=	0.0739	0.2586 0.5910
Particulate Loading, Actual (gr/cu ft)=	0.0439	
Emission Rate (lb/hr)=	29.93	

Particulate Loading - Total Catch Including Impingers

Particulate Weight (g)=	0.1859	
Particulate Loading, Dry Std. (gr/scf)=	0.0768	0.2688 0.6145
Particulate Loading, Actual (gr/cu ft)=	0.0456	
Emission Rate (lb/hr)=	31.12	
Percent Impinger Catch=	3.8	

* * METRIC UNITS * *

FILE NAME - ODESSA.R3 PROG.=VER 06/27/89
RUN # - ODESSA.R3 09-28-1993 16:03:15
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

Initial Meter Volume (Cubic Meters)=	23.290		
Final Meter Volume (Cubic Meters)=	24.426		
Meter Factor=	1.019		
Final Leak Rate (cu m/min)=	0.0001		
Net Meter Volume (Cubic Meters)=	1.157		
Gas Volume (Dry Standard Cubic Meters)=	1.056		
Barometric Pressure (mm Hg)=	706		
Static Pressure (mm H20)=	22		
Percent Oxygen=	17.0		
Percent Carbon Dioxide=	1.5		
Moisture Collected (ml)=	197.5		
Percent Water=	20.0		
Average Meter Temperature (C)=	26		
Average Delta H (mm H20)=	35.3		
Average Delta P (mm H20)=	61.7		
Average Stack Temperature (C)=	94		
Dry Molecular Weight=	28.92		
Wet Molecular Weight=	26.74		
Average Square Root of Delta P (mm H20)=	7.8537		
% Isokinetic=	94.5		
Pitot Coefficient=	0.84		
Sampling Time (Minutes)=	60.0		
Nozzle Diameter (mm)=	4.55		
Stack Axis #1 (Meters)=	1.219		
Stack Axis #2 (Meters)=	1.219		
Circular Stack			
Stack Area (Square Meters)=	1.167		
Stack Velocity (Actual, m/min)=	1,929		
Flow rate (Actual, Cubic m/min)=	2,252		
Flow rate (Standard, Wet, Cubic m/min)=	1,673		
Flow rate (Standard, Dry, Cubic m/min)=	1,339		

Particulate Loading - Front Half

Particulate Weight (g)=	0.1788	Corr. to 7% O2 & 12% CO2	
Particulate Loading, Dry Std. (mg/cu m)=	169.4	592.9	1355.3
Particulate Loading, Actual (mg/cu m)=	100.7		
Emission Rate (kg/hr)=	13.59		

Particulate Loading - Total Catch Including Impingers

Particulate Weight (g)=	0.2		
Particulate Loading, Dry Std. (mg/cu m)=	176.1	616.5	1409.1
Particulate Loading, Actual (mg/cu m)=	104.7		
Emission Rate (kg/hr)=	14.13		
Percent Impinger Catch=	3.8		

FILE NAME - ODESSA.R3
RUN # - ODESSA.R3
LOCATION - DRYER STACK
DATE - SEPTEMBER 2, 1993
PROJECT # - 411922

PROG.=VER 06/27/89
09-28-1993 16:03:15

Point #	Delta P (in. H20)	Delta H (in. H20)	Stack T (F)	Meter T In(F)	Meter T Out(F)
1	2.300	1.30	198	76	76
2	2.300	1.30	199	77	76
3	2.300	1.30	200	78	77
4	2.400	1.40	200	78	77
5	2.400	1.40	199	79	77
6	2.500	1.40	199	79	77
7	2.500	1.45	201	80	78
8	2.500	1.40	201	80	78
9	2.500	1.45	203	80	78
10	2.500	1.45	202	81	78
11	2.500	1.40	202	81	78
12	2.400	1.40	202	81	78
13	2.400	1.40	201	80	77
14	2.400	1.40	201	80	77
15	2.300	1.30	201	82	78
16	2.500	1.45	200	82	79
17	2.500	1.40	202	82	79
18	2.600	1.50	202	82	77
19	2.500	1.45	204	82	79
20	2.500	1.40	204	82	79
21	2.500	1.45	205	83	79
22	2.400	1.40	204	84	80
23	2.300	1.30	204	84	81
24	2.300	1.30	204	84	81

Fraction	Final Wt. (g)	Tare Wt. (g)	Blank Wt. (g)	Net Wt. (g)
DRY CATCH	0.0000	0.0000	0.0000	0.0000
FILTER	34.0298	33.9864	-0.0003	0.0437

Fraction	Final Wt. (g)	Tare Wt. (g)	Vol. (ml)	Net Wt. (g)
PROBE RINSE	65.8865	65.7502	150.0	0.1351
IMPINGERS	239.5222	239.5132	200.0	0.0071

Probe Rinse Blank (mg/ml)= 0.0080 High Acetone Blank - Limit .0079
Impinger Blank (mg/ml)= 0.0095

APPENDIX C

PARTICULATE FIELD DATA FORMS

TRAVERSE POINT LOCATIONS

PROJECT NO. 4119-22

PLANT Odessa Alfalfa

DATE 9-2-93

SAMPLING LOCATION Dryer Stack

INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE (Distance A) ~~52~~

INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE (Distance B) 4

STACK I.D. (Distance A - Distance B) 48

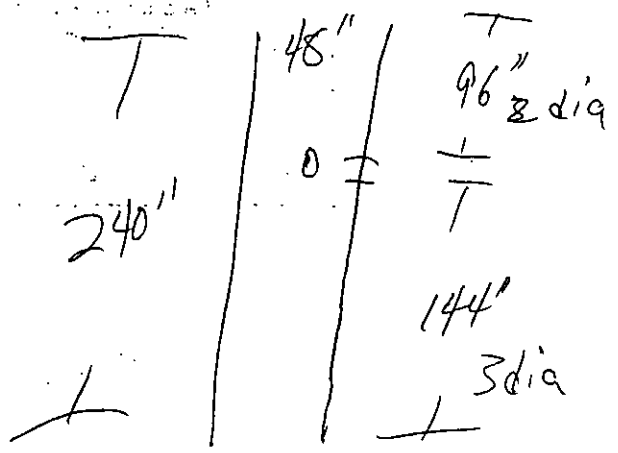
NEAREST UPSTREAM DISTURBANCE (in.) 144"

NEAREST DOWNSTREAM DISTURBANCE (in.) 96"

DIAMETERS UPSTREAM 3

DIAMETERS DOWNSTREAM 2

OPERATOR B. Wood



DRAWING OF STACK

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)	
					Decimal	Fraction to nearest 1/8 in.
1	2.1	48	1			
2	6.7		3.2			
3	11.8		5.7			
4	17.7		8.5			
5	25.0		12			
6	35.6		17.1			
7	64.4		30.9			
8	75.0		36			
9	82.3		39.5			
10	88.2		42.3			
11	93.3		44.8			
12	97.9		47			

Comments:

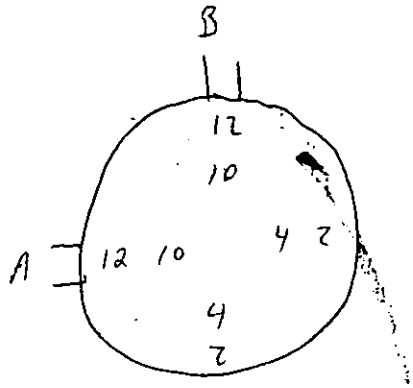
Reviewed by: _____ Date: _____

AIRSOURCE TECHNOLOGIES

11635 W 83RD TERRACE
Lenexa, Kansas 66215
(913) 492-1613
FAX: (913) 492-1012

PROJECT NO. 411927 — PROJECT LEADER Blane Wood
RUN NO. 1 — CONSOLE OPERATOR TJ Litus
DATE 9/02 — LAB PERSON TT
SAMPLE TYPE particulate — SUPPORT PERSONNEL: OB
PLANT Odessa
SAMPLING LOCATION —
TOTAL SAMPLING TIME 60 min.

METER NO. 4 — ASSUMED MOISTURE 25 %
UMBILICAL CORD I.D. NO. — — METER CORRECTION FACTOR 1.019
UMBILICAL/SAMPLER HOOKUP 8 — METER ΔH @ 1.843
OVEN BOX NO. 1 — BAROMETRIC PRESSURE 27.79 in Hg
PROBE NO. 3 — STATIC PRESSURE -.85 in H_2O
PROBE LENGTH & TYPE 5' 6mm — RECORD DATA EVERY 2.5 MIN
PITOT NO. 3-A — PITOT COEFFICIENT .84
THERMOCOUPLE I.D. NO. 3 — NOZZLE DIAMETER .179 in
NOZZLE NO. .179 — STACK AXIS #1 48
NOZZLE TYPE SS/G/Q — STACK AXIS #2 48



SCHEMATIC OF TRAVERSE POINT LAYOUT

SAMPLE TRAIN LEAK CHECKS	INITIAL	FINAL
TIME (24 HRS.)	4:40	957
VACUUM, in. Hg	≥15	8
CFM	.002	.002
PITOT LEAK CHECK ≥3" H_2O	pass	pass

INITIAL METER VOLUME	741.000
FINAL METER VOLUME	760.938

ORSAT/FYRITE

TRIAL	PERCENT CO_2	PERCENT CO_2 + O_2	PERCENT O_2
1	1.5		17.5
2	1.5		17.5
3			
AVG	1.5		17.5

RECOVERY DATA

	FINAL	INITIAL	DIFFERENCE
IMP. 1	184	100	84
IMP. 2	155	100	55
IMP. 3	9	0	9.
IMP. 4	765.3	752.8	12.5
TOTAL:			(164.5)

COMMENTS:

FILTER NO: 8-20-93-3 — % BLUE 70

REVIEWED BY: _____

Run No. 1 Project No. 411972 Location Odessa Date 9/02/93 Operator TT Page 1 of 1

Traverse Point Number	Sample Time (min)	Clock Time (24-hr)	Dry Gas Meter ft³ 741.000 Initial		Velocity Head Δp in. H_2O	Orifice ΔH in. H_2O		Stack Temp. °F	Dry Gas Meter Temperature °F		Pump VAC. in. Hg	Probe Temp. °F	Filter Temp. °F	Impinger Temp. °F	
			Desired	Actual		Desired	Actual		Inlet	Outlet					
		450													
A1			742.62	742.63	2.3	1.33	1.3	177	66	66	3	225	235	66	
2	5	455	744.27	744.29	2.4	1.40	1.4	173	67	66	3	251	234	59	
3			745.93	745.95	2.4	1.39	1.4	177	67	66	3	246	228	57	
4	10	900	747.58	747.60	2.4	1.40	1.4	176	68	67	3	250	230	55	
5			749.27	749.28	2.5	1.45	1.45	178	68	67	3	255	233	55	
6	15	905	750.96	750.94	2.5	1.45	1.45	177	69	67	3	249	230	51	
7			752.62	752.61	2.4	1.40	1.4	177	69	67	3	247	231	52	
8	20	910	754.32	754.32	2.5	1.46	1.45	175	70	68	3	251	233	52	
9			755.98	755.98	2.4	1.40	1.4	175	70	68	3	252	235	51	
10	25	915	757.64	757.65	2.4	1.40	1.4	176	70	68	3	252	237	51	
11			759.27	759.28	2.3	1.34	1.35	177	70	69	3	253	240	53	
12	30	920	760.895	760.897	2.3	1.34	1.35	177	70	68	3	250	239	54	
		925													
B1			762.52	762.53	2.3	1.34	1.35	177	70	68	3	250	238	54	
2	5	930	764.15	764.13	2.3	1.34	1.35	178	71	68	3	247	240	57	
3			765.80	765.78	2.4	1.39	1.4	180	71	68	3	247	241	58	
4	10	935	767.50	767.48	2.5	1.45	1.45	181	72	68	3	249	244	60	
5			769.19	769.17	2.5	1.45	1.45	182	72	69	3	251	243	60	
6	15	940	770.88	770.86	2.5	1.45	1.45	182	72	69	3	252	240	60	
7			772.55	772.53	2.4	1.40	1.4	179	73	69	3	254	242	57	
8	20	945	774.28	774.27	2.6	1.51	1.5	180	73	69	3	251	242	54	
9			775.97	775.95	2.5	1.46	1.45	180	73	69	3	253	242	52	
10	25	950	777.65	777.64	2.4	1.41	1.4	180	73	69	3	250	244	52	
11			779.28	779.28	2.3	1.34	1.35	180	73	69	3	247	240	52	
12	30	955	780.935	780.934	2.4	1.4	1.4	181	73	69	3	249	241	52	

AIRSOURCE TECHNOLOGIES

11635 W 83RD TERRACE
Lenexa, Kansas 66215
(913) 492-1613
FAX: (913) 492-1012

PROJECT NO. 41922 PROJECT LEADER OBW

RUN NO. 2 CONSOLE OPERATOR TT

DATE 9/02/93 LAB PERSON TT

SAMPLE TYPE pm4 SUPPORT PERSONNEL:

PLANT Alessa

SAMPLING LOCATION

TOTAL SAMPLING TIME 60 min

METER NO. 4 ASSUMED MOISTURE 25 %

UMBILICAL CORD I.D. NO. - METER CORRECTION FACTOR 1.019

UMBILICAL/SAMPLER HOOKUP 3 METER ΔH @ 1.843

OVEN BOX NO. 1 BAROMETRIC PRESSURE 27.79 in Hg

PROBE NO. 3 IN STATIC PRESSURE -.85 in H_2O see sm 1

PROBE LENGTH & TYPE 8' G RECORD DATA EVERY 7.5 MIN

PITOT NO. 3 IN PITOT COEFFICIENT .84

THERMOCOUPLE I.D. NO. 3 IN NOZZLE DIAMETER .179 in

NOZZLE NO. .179 STACK AXIS #1 4E

NOZZLE TYPE SG10 STACK AXIS #2 4S

SCHEMATIC OF TRAVERSE POINT LAYOUT

SAMPLE TRAIN LEAK CHECKS	INITIAL	FINAL
TIME (24 HRS.)	1015	1125
VACUUM, in. Hg	≥15	10"
CFM	.004	.002
PITOT LEAK CHECK ≥3" H_2O	pass	pass

INITIAL METER VOLUME	782.453
FINAL METER VOLUME	822.238

ORSAT/FYRITE

TRIAL	PERCENT CO_2	PERCENT CO_2 + O_2	PERCENT O_2
1	1.5		17.0
2	1.5		17.0
3			
AVG	1.5		17.0

RECOVERY DATA

	FINAL	INITIAL	DIFFERENCE
IMP. 1	199	100	99
IMP. 2	163	100	63
IMP. 3	5	0	5
IMP. 4	795.4	781.5	13.9
TOTAL:			(180.9)

COMMENTS:

FILTER NO.: 8-20-93-13 % BLUE 80

REVIEWED BY:

Run No. 2 Project No. 411922 Location Oakes Date 9/02/93 Operator TI Page 1 of 1

Traverse Point Number	Sample Time (min)	Clock Time (24-hr)	Dry Gas Meter ft³ Initial 782.453		Velocity Head Δp in. H_2O	Orifice ΔH in. H_2O		Stack Temp. °F	Dry Gas Meter Temperature °F		Pump VAC. in. Hg	Probe Temp. °F	Filter Temp. °F	Impinger Temp. °F	
			Desired	Actual		Desired	Actual		Inlet	Outlet					
		1020													
A 1			784.07	784.05	2.3	1.32	1.3	187	70	70	3	246	232	63	
2	5	1025	785.69	785.67	2.3	1.34	1.35	188	70	70	3	245	231	60	
3			787.34	787.33	2.4	1.37	1.4	190	71	70	3	246	233	55	
4	10	1030	788.96	788.96	2.3	1.32	1.3	190	72	70	3	245	232	49	
5			790.64	790.64	2.5	1.44	1.45	190	73	71	3	245	231	45	
6	15	1035	792.33	792.34	2.5	1.44	1.45	189	73	71	3	247	233	47	
7			794.02	794.03	2.5	1.44	1.45	190	73	71	3	246	235	45	
8	20	1040	795.67	795.69	2.4	1.38	1.4	190	73	71	3	245	232	46	
9			797.36	797.38	2.5	1.44	1.45	191	74	71	3	246	234	46	
10	25	1045	798.98	798.98	2.3	1.32	1.3	192	73	71	3	246	237	46	
11			800.59	800.58	2.3	1.32	1.3	192	73	71	3	245	235	47	
12	30	1050	802.210	802.208	2.3	1.32	1.3	192	74	72	3	244	240	47	
		1057													
B 1			803.86	803.86	2.4	1.38	1.4	190	72	71	3	244	241	45	
2	5	1054	805.48	805.48	2.3	1.32	1.3	190	73	71	3	243	239	45	
3			807.13	807.14	2.4	1.38	1.4	191	73	71	3	242	239	50	
4	10	1103	808.78	808.80	2.4	1.38	1.4	192	74	71	4	243	238	50	
5			810.47	810.46	2.5	1.43	1.4	192	74	72	3	244	233	50	
6	15	1108	812.16	812.15	2.5	1.44	1.45	190	74	72	3	240	232	51	
7			813.85	813.85	2.5	1.43	1.45	192	74	72	3	241	231	50	
8	20	1113	815.54	815.54	2.5	1.44	1.45	190	75	72	3	243	233	50	
9			817.23	817.24	2.5	1.44	1.45	190	75	72	3	240	235	49	
10	25	1118	818.92	818.93	2.5	1.44	1.45	190	75	72	3	239	233	49	
11			820.61	820.62	2.5	1.44	1.45	191	75	72	3	241	237	51	
12	30	1123	822.235	822.236	2.3	1.32	1.3	191	75	72	3	243	236	51	

AIRSOURCE TECHNOLOGIES

11635 W 83RD TERRACE
Lenexa, Kansas 66215
(913) 492-1613
FAX: (913) 492-1012

PROJECT NO. 411922 — PROJECT LEADER BW

RUN NO. 3 — CONSOLE OPERATOR TT

DATE 9/02/93 — LAB PERSON TT

SAMPLE TYPE gastite — SUPPORT PERSONNEL:

PLANT Odessa

SAMPLING LOCATION -

TOTAL SAMPLING TIME

METER NO. 4 — ASSUMED MOISTURE 25 %

UMBILICAL CORD I.D. NO. - — METER CORRECTION FACTOR 1.019

UMBILICAL/SAMPLER HOOKUP 3 — METER ΔH @ 1.843

OVEN BOX NO. 1 — BAROMETRIC PRESSURE 27.79 in Hg

PROBE NO. 3-1 — STATIC PRESSURE .85 in H_2O (see run)

PROBE LENGTH & TYPE 3' G — RECORD DATA EVERY 2.5 MIN

PITOT NO. 3-1 — PITOT COEFFICIENT .84

THERMOCOUPLE I.D. NO. 3-1 — NOZZLE DIAMETER .179 in

NOZZLE NO. .179 — STACK AXIS #1 48

NOZZLE TYPE SS/G/Q — STACK AXIS #2 48

SCHEMATIC OF TRAVERSE POINT LAYOUT

SAMPLE TRAIN LEAK CHECKS	INITIAL	FINAL
TIME (24 HRS.)	1135	1147
VACUUM, in. Hg	15	10"
CFM	.006	.004
PITOT LEAK CHECK ≥3" H_2O	pass	pass

INITIAL METER VOLUME	822.500
FINAL METER VOLUME	862.605

ORSAT/FYRITE

TRIAL	PERCENT CO_2	PERCENT CO_2 + O_2	PERCENT O_2
1	1.5		17.0
2	1.5	"	17.0
3			
AVG	1.5		17.0

RECOVERY DATA

	FINAL	INITIAL	DIFFERENCE
IMP. 1	221	100	121
IMP. 2	168	100	58
IMP. 3	5	0	5
IMP. 4	682.6	669.1	13.5
TOTAL:			(197.5)

COMMENTS:

FILTER NO: 8-20-93-2 — % BLUE

REVIEWED BY:

Run No. 3 Project No. 411922 Location Odessa Date 9/02/93 Operator TJ Page 1 of 1

Traverse Point Number	Sample Time (min)	Clock Time (24-hr)	Dry Gas Meter ft³ Initial 822.500 Desired	Dry Gas Meter ft³ Actual	Velocity Head Δp in. H_2O	Orifice ΔH in. H_2O Desired	Orifice ΔH in. H_2O Actual	Stack Temp. °F	Dry Gas Meter Temperature °F Inlet	Dry Gas Meter Temperature °F Outlet	Pump VAC. in. Hg	Probe Temp. °F	Filter Temp. °F	Impinger Temp. °F	
		1140													
A1			824.12	824.12	2.3	1.31	1.3	198	76	76	7	250	245	66	
2	5	1145	825.74	825.73	2.3	1.31	1.3	199	77	76	7	248	247	64	
3			827.36	827.37	2.3	1.31	1.3	200	78	77	7	252	250	60	
4	10	1150	829.02	829.03	2.4	1.37	1.4	200	78	77	7	253	251	59	
5			830.68	830.68	2.4	1.37	1.4	199	79	77	7	251	250	58	
6	15	1155	832.38	832.40	2.5	1.43	1.4	199	79	77	7	252	249	56	
7			834.07	834.08	2.5	1.43	1.45	201	80	78	7	247	248	58	
8	20	1200	835.77	835.78	2.5	1.43	1.4	201	80	78	7	246	251	60	
9			837.46	837.46	2.5	1.43	1.45	203	80	78	7	240	250	60	
10	25	1205	839.15	839.14	2.5	1.43	1.45	202	81	78	7	237	250	61	
11			840.65	—	2.5	1.43	1.4	202	81	78	7	239	251	59	
12	30	1210	842.51	842.51	2.4	1.37	1.4	202	81	78	7	241	252	58	
		14													
B1			844.17	844.17	2.4	1.37	1.4	201	80	77	7	240	250	60	
2	5	1219	845.83	845.84	2.4	1.37	1.4	201	80	77	7	244	251	60	
3			847.46	847.47	2.3	1.32	1.3	201	82	78	7	243	253	61	
4	10	1224	849.16	849.16	2.5	1.44	1.45	200	82	79	7	245	250	61	
5			850.86	850.86	2.5	1.43	1.4	202	82	79	7	245	252	60	
6	15	1229	852.59	852.60	2.6	1.49	1.5	202	82	77	7	245	251	57	
7			854.28	854.30	2.5	1.43	1.45	204	82	79	7	247	249	57	
8	20	1234	855.98	856.00	2.5	1.43	1.4	204	82	79	7	250	247	56	
9			857.67	857.68	2.5	1.43	1.45	205	83	79	7	250	250	54	
10	25	1239	859.34	859.34	2.4	1.37	1.4	204	84	80	7	246	250	52	
11			860.97	860.98	2.3	1.32	1.3	204	84	81	7	247	251	51	
12	30	1244	862.605	862.605	2.3	1.32	1.3	204	84	81	7	247	251	51	

APPENDIX D

LABORATORY AND ANALYSIS FORMS

AIRSOURCE TECHNOLOGIES

11635 WEST 83RD TERRACE
LENEXA KS 66214
(913) 492-1613
FAX: (913) 492-1613

Alfalfa Hssa.

			PROBE RINSE BLANK 0.008 mg/ml			FILTER BLANK -0.0003 g	
STACK ID	RUN NO.		FIL/BEAKER NO.	FINAL WEIGHT	TARE WEIGHT	ml	COMMENTS
Mathews	1	F	8-20-93-1	31.7829	31.6539		
		PR	8-23-23	76.3760	76.3159	140	
	2	F	93-82	45.8202	45.5358		
		PR	8-23-25	68.3028	68.2018	150	
	3	F	57-116	91.4028	91.2927		
		PR	8-23-26	76.3396	76.2661	140	
Olson	1	F	8-20-93-3	33.5650	33.5089		
		PR	8-23-28	63.5033	63.2907	130	
	2	F	8-20-93-13	33.5988	33.5561		
		PR	8-23-29	65.4402	65.2706	140	
	3	F	8-20-93-2	34.0298	33.9864		
		PR	8-23-32	65.8865	65.7502	150	
	BL	F	8-20-93-15	33.9739	33.9742		
	BL	PR	8-23-33	74.9297	74.9289	100	
		F					
		PR					
		F					
		PR					
		F					
		PR					
		F					
		PR					
		F					
		PR					
		F					
		PR					
		F					
		PR					
		F					

FINAL FILTER WEIGHING

Project No.: 411992 HY	Analyst: CH
Filter Type and Size: 85 mm fiberglass	Weight Unit: grams

Filter Treatment:

X Desiccate 24 hours/6 hours between weighings

____ Oven Treated

____ Other

Balance Check:				
Weight Value(g)	9+35	35	35	
Initial Check(g)	35.0000	35.0003	35.0001	
Final Check(g)	35.0001	35.0002	35.0000	
Date:	9-10-93	9-11-93	9-12-93	
Time (24 hr):	1225	1845	1050	
Filter No.	Weigh No. 1	Weigh No. 2	Weigh No. 3	Average
8-20-93-2	34.0291	34.0300	34.0295	34.0298
-3	33.5640	33.5652	33.5647	33.5650
-13	33.5986	33.5989		33.5988
-15	33.9737	33.9740		33.9739
93-82	45.8220	45.8224		45.8222
5-7-116	91.4044	91.4024	91.4024	91.4024
8-20-93-1	31.7826	31.7831		31.7829

INITIAL FILTER WEIGHING

Analyst: Cobb	bottom only
Filter Type and Size: 85 mm Teflon w/ Poly Coll	**Weight Unit:** grams

Filter Treatment:

X Desiccate 24 hours/6 hours between weighings
____ Oven Treated
____ Other

Balance Check:				
Weight Value(g)	30	30		
Initial Check(g)	30.0001	30.0002		
Final Check(g)	30.0002	30.0001		
Date:	8-21-93	8-22-93		
Time (24 hr):	1300	1230		
Filter No.	Weigh No. 1	Weigh No. 2	Weigh No. ____	Average
F-20-93- 1	31.6537	31.6540		31.6539
-2	33.9863	33.9864		33.9864
-3	33.5089	33.5088		33.5089
-4	44.7618	44.7619		44.7619
-5	32.8210	32.8212		32.8211
-6	37.6922	37.6926		37.6924
-7	33.48384	33.4384		33.4384
-8	50.2424	50.2426		50.2425
-9	31.5228	31.5229		31.5229
-10	36.9209	36.9209		36.9209
-11	31.8142	31.8144		31.8143
-12	33.8494	33.8495		33.8495
-13	33.5561	33.5561		33.5561
-14	42.2211	42.2214		42.2213
-15	33.9741	33.9742		33.9742
-16	31.0860	31.0861		31.0861
-17	32.2630	32.2628		32.2629

FINAL BEAKER WEIGHING

Project No.: 411992 aff.	Analyst: CH
Beaker Size: 150 ml	Weight Unit: grams

Beaker Treatment:

X Desiccate 24 hours/6 hours between weighings

___ Other

Balance Check:					
Weight Value(g)	70	70	70		
Initial Check(g)	70.0000	69.9998	69.9997		
Final Check(g)	70.0002	69.9999	69.9998		
Date:	9-10-93	9-11-93			
Time (24 hr):	1405	1710			

Beaker No.	Weigh No. 1	Weigh No. 2	Weigh No. 3	Average	ml.
8-23-23	76.3760	76.3760		76.3760	140
-25	68.3027	68.3028		68.3028	150
-26	76.3394	76.3397		76.3396	140
8-23-28	63.5061	63.5030	63.5035	63.5033	130
29	65.4437	65.4423	65.4420	65.4422	140
32	65.8865	65.8864		65.8865	150
8-23-33	74.9291	74.9297		74.9297	110

INITIAL BEAKER WEIGHING

Analyst: Cobb	
Beaker Size: 150 ml	Weight Unit: grams

Beaker Treatment:
- X Desiccate 24 hours/6 hours between weighings
- ____ Other

Balance Check:

Weight Value(g)	70	70	70	
Initial Check(g)	69.9999	69.9998	69.9998	
Final Check(g)	69.9997	70.0000	69.9998	
Date:	8-23-93	8-24-93	8-24-93	
Time (24 hr):	1700	0830	1825	
Beaker No.	Weigh No. 1	Weigh No. 2	Weigh No. 3	Average
8-23-18	68.3417	68.3450	68.3422	→
-19	75.2457	75.2502	25.2472	→
-20	68.9971	69.0013	68.9991	→
-21	67.5494	67.5536	67.5508	→
-22	67.7590	67.7629	67.7614	→
-23	76.3139	76.3189	76.3159	→
-24	67.6512	67.6554	67.6531	→
-25	68.2014	68.2045	68.2028	→
8-23-26	76.2650	76.2688	76.2670	→
-27	69.7655	69.7691	69.7675	→
-28	63.2897	63.2934	63.2916	→
-29	65.2695	65.2725	65.2714	→
-30	70.9722	70.9754	70.9737	→
-31	68.2015	68.2052	68.2027	→
-32	65.7497	65.7540	65.7515	→
-33	74.9287	74.9315	74.9299	→
8-23-34	69.0180	69.0204	69.0195	→

INITIAL BEAKER WEIGHING

Analyst: Cobb	
Beaker Size: 150	Weight Unit: grams

Beaker Treatment:

X Desiccate 24 hours/6 hours between weighings

___ Other

Balance Check:				
Weight Value(g)	70	70	70	
Initial Check(g)	69.9997	69.9999	69.9997	
Final Check(g)	69.9996	69.9998	69.9997	
Date:	8-25-93	8-25-93	8-26-93	
Time (24 hr):	0920	1530	0930	
Beaker No.	Weigh No. 4	Weigh No. 5	Weigh No. 6	Average
8-23-18	68.3420	68.3418		68.3419
-19	75.2464	75.2461		75.2463
-20	68.9968	68.9978	68.9974	68.9976
-21	67.5497	67.5497		67.5497
-22	67.7601	67.7601		67.7601
-23	76.3148	76.3161	76.3156	76.3159
-24	67.6525	67.6523		67.6524
-25	68.2013	68.2020	68.2016	68.2018
8-23-26	76.2655	76.2663	76.2659	76.2661
-27	69.7662	69.7666		69.7664
-28	63.2900	63.2907	63.2907	63.2907
-29	65.2700	65.2707	65.2705	65.2706
-30	70.9722	70.9725		70.9724
-31	68.2022	68.2021		68.2022
-32	65.7503	65.7501		65.7502
-33	74.9288	74.9289		74.9289
8-23-34	69.0180	69.0181		69.0181

APPENDIX E

PRETEST CALIBRATIONS

BAROMETER CALIBRATION SHEET

Date	8-15-93
Barometer Number	#1
Ambient Temperature	74°
Calibrator	Ryder

Barometer Reading	28.85
Reference Barometer Reading	28.80
Difference	.05

Acceptance Criteria: Difference ≤ 0.1 inch

CONSOLE WORKSHEET

NAME Rigdon K FACTOR .5312 PROJECT # _____

DATE 8/16/93 TRAIN ID #4 PREVIOUS Y FACTOR 1.026

ORIFICE # 2 PYROMETER # _____

	RUN NUMBER 1	=	2
DGM			
FINAL READING	178,24		181,84
INITIAL READING	174,80		178,40
INLET & OUTLET TEMPERATURES			
INITIAL	80 / 79		82 / 80
FINAL	82 / 80		83 / 80
TIME Sec	300		300
ORIFICE RDG. ^E	1,50		1,50
BAR. PRESSURE	28,85		28,85
ROOM TEMP.	75 / 75		75 / 75
PUMP VACUUM Hg"	15"		15"
	,109		,165

CONSOLE CALIBRATION

Project	411775	Orifice number	2
Date	AUG 16 93	Orifice K factor	.5312
Operator	RIGDON	Previous Y factor	1.026
Console Number	4		

	Run 1	Run 2
Final DGM Volume	178.240	181.840
Inital DGM Volume	174.800	178.400
Net DGM Volume (Vm)	3.440	3.440
In/Out DGM Temp.		
Inlet Deg. F		
initial	80.0	82.0
final	82.0	83.0
Outlet Deg. F		
initial	79.0	80.0
final	80.0	80.0
Avg. DGM Temp Deg. F	80.3	81.3
Time, sec.	300.0	300.0
Orifice DH, in. H2O	1.50	1.50
Baro. Press., in. Hg	28.85	28.85
Room temp., Deg. F		
initial	75.0	75.0
final	75.0	75.0
Avg.Room Temp.	75.0	75.0
Pump Vacuum, in. Hg	15	15
Vcr (std)	3.313	3.313
Vm (std)	3.253	3.247
Y Factor	1.018	1.020
Delta H@	1.845	1.841

Average Y	1.019
Average Delta H@	1.843

+/- 2% criteria	
Percent of Avg Y	.09
	PASS
+/- 5% criteria	
Percent of final Y	.65
	PASS

BRACKETING WORKSHEET

NAME Rigdon K.FACTOR 1. 3/99 2. 6465

PROJECT # _____ DATE 8/16/93 TRAIN I.D. #4

ORIFICE # 1. 4 2. 2

DGM	1	2
Final Reading	184.15	189.17
Initial reading	182.10	186.00
Difference		
INLET & OUTLET TEMP.		
Initial	83 / 80	85 / 81
Final	85 / 81	89 / 84
Avg. Temp.		
Time	300	300
Orifice rdg. ^H	.55	2.25
Bar. Pressure	28.85	28.85
Room Temp.	75 / 75	75 / 75
Pump Vacuum	16	15

ORFICE BRACKETING

Project	962002	Bracket Orfices:
Date	AUG 16 93	Orifice No. 1 4.
Operator	RIGDON	Orifice N0.1 K factor .
Orfice Number	4	Orifice No. 2 7.
Orfice Y factor	1.019	Orifice N0.2 K factor .

	Orfice #1	Orfice #2
Final DGM Volume	184.150	189.170
Inital DGM Volume	182.100	185.000
Net DGM Volume (Vm)	2.050	4.170
In/Out DGM Temp.		
Inlet		
initial	83.0	85.0
final	85.0	89.0
Outlet		
initial	80.0	81.0
final	81.0	82.0
Avg. DGM Temp	82.3	84.3
Time, sec.	300.0	300.0
Orifice DH, in. H2O	.55	2.25
Baro. Press., in. Hg	28.85	28.85
Room temp., Deg. F		
initial	75.0	75.0
final	75.0	75.0
Avg. Room Temp.	75.0	75.0
Pump Vacuum, in. Hg	16	15
Vcr (std)	1.995	3.994
Vm (std)	1.927	3.922
Y Factor (brackets)	1.035	1.019
+/- 2% criteria		
Percent of Y	1.62	.04
	PASS	PASS

DRY GAS METER THERMOCOUPLE CALIBRATION SHEET

Date 8/16/93	Thermocouple Number	# 4
Calibrator Bigelow	Reference Mercury-In-glass	Astm
	Other	

Thermocouple	Source	Reference Thermometer Temperature (°F)	Thermocouple Potentiometer Temperature (°F)	Temperature Difference* (°F)
Inlet	Ambient Air	76°	76	0°
	Hot Water Bath	132°	132	0°
Outlet	Ambient Air	76°	77	+1°
	Hot Water Bath	132°	131°	-1°

* Reference Temperature -- Thermocouple Temperature ≤ ± 5.4 °F

TYPE S PITOT TUBE CALIBRATION

PITOT # 9/4B

Calibrator: Bigdon	Project no.:
Date: 8-15-93	Probe no.: 5-3

Pitot Tube Assembly Level? (Y) / N

Pitot Tube Openings Damaged? Y / (N) (If yes explain below)

α^1 0 ° (<10°) β^1 0 ° (<5°)

α^2 0 ° (<10°) β^2 1 ° (<5°)

Y = 0 O = 0 A = .923 in.

Z = A sin Y 0 in. (<1/8 in.)

W = A sin O 0 in. (<1/32 in.)

P^{α} .461 in. P^{β} .461 in.

DT = .371 in.

Calibration Required? Y / (N) (If yes explain below)

Comments:

STACK THERMOCOUPLE CALIBRATION SHEET

Date 8-15-93 Thermocouple Number S-1

Ambient Temp. _____ F Barometric Pressure 28.80 in. Hg

Calibrator Rigolosa Reference: mercury-in-glass Astm

Other _____

Reference Point Number[a]	Source[b] (Specify)	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[c] %
1	Ambient	74°	75°	+1°
2	Tube oven	248°	250	+2°

[a] Every 50°F for each reference point

[b] Type of calibration system used

[c] $\frac{(\text{ref temp, °F} + 460) - (\text{test thermom temp, °F} + 460)}{\text{ref temp, °F} + 460}$ 100 ≤ 1.5%.

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 8-22-93	Thermocouple Number	2
Calibrator B. Wood	Reference:mercury-in-glass	
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[a] F
Ambient Air	90	91	1
Ice Bath	39	39	0

[a]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 8-22-93	Thermocouple Number	3
Calibrator B. Wood	Reference:mercury-in-glass	
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[n] F
Ambient Air	91	91	0
Ice Bath	40	40	0

[n]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 8-22-93	Thermocouple Number	8
Calibrator B. Wood	Reference:mercury-in-glass	
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[a] F
Ambient Air	92	91	1
Ice Bath	40	39	1

[a]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

APPENDIX F

POSTTEST CALIBRATIONS

CONSOLE WORKSHEET

NAME Rigdon K FACTOR 5312 PROJECT # _____

DATE 9/7/93 TRAIN ID #4 PREVIOUS Y FACTOR 1.019

ORIFICE # _____ PYROMETER # _____

	RUN NUMBER 1	= 2
DGM		
FINAL READING	866.93	870.62
INITIAL READING	863.50	867.20
INLET & OUTLET TEMPERATURES		
INITIAL	64 / 64	68 / 64
FINAL	68 / 64	70 / 65
TIME Sec	300	300
ORIFICE RDG. ^H	1.55	1.55
BAR. PRESSURE	29.20	29.20
ROOM TEMP.	63 / 63	63 / 63
PUMP VACUUM Hg"	15	15

BAROMETER CALIBRATION SHEET

Date	9-15-93
Barometer Number	#1
Ambient Temperature	72°
Calibrator	Bigsby

Barometer Reading	29.00
Reference Barometer Reading	29.05
Difference	.05

Acceptance Criteria: Difference ≤ 0.1 inch

CONSOLE CALIBRATION

Project	411775	Orifice number	2
Date	SEP 7 93	Orifice K factor	.5312
Operator	RIGDON	Previous Y factor	1.019
Console Number	4		

	Run 1	Run 2
Final DGM Volume	866.930	870.620
Inital DGM Volume	863.500	867.200
Net DGM Volume (Vm)	3.430	3.420
In/Out DGM Temp.		
Inlet Deg. F		
initial	64.0	68.0
final	68.0	70.0
Outlet Deg. F		
initial	64.0	64.0
final	64.0	65.0
Avg. DGM Temp Deg. F	65.0	66.8
Time, sec.	300.0	300.0
Orifice DH, in. H2O	1.55	1.55
Baro. Press., in. Hg	29.20	29.20
Room temp., Deg. F		
initial	63.0	63.0
final	63.0	63.0
Avg.Room Temp.	63.0	63.0
Pump Vacuum, in. Hg	15	15
Vcr (std)	3.391	3.391
Vm (std)	3.378	3.357
Y Factor	1.004	1.010
Delta H@	1.863	1.868

Average Y	1.007
Average Delta H@	1.865

+/- 2% criteria		
Percent of Avg Y	.31	
	PASS	
+/- 5% criteria		
Percent of final Y	1.20	
	PASS	

GRC 6/8/90

CONSOLE CALIBRATION

Project	411775	Orifice number	2
Date	SEP 7 93	Orifice K factor	.5312
Operator	RIGDON	Previous Y factor	1.019
Console Number	4		

	Run 1	Run 2

BRACKETING WORKSHEET

NAME Bigdon K.FACTOR 1. 3199 2. .6405

PROJECT # _____ DATE 9/7/93 TRAIN I.D. 4#

ORIFICE # 1. 4 2. 5

DGM	1	2
Final Reading	873.61	878.32
Initial reading	871.50	874.20
Difference	_____	_____
INLET & OUTLET TEMP.		
Initial	70/65	71/66
Final	71/66	71/66
Avg. Temp.	_____	_____
Time	300	300
Orifice rdg. ^H	.56	2.25
Bar. Pressure	29.20	29.26
Room Temp.	64/64	64/64
Pump Vacuum	13"	16"

ORFICE BRACKETING

Project	962002	Bracket Orfices:	
Date	SEP 7 93	Orifice No. 1	4.
Operator	RIGDON	Orifice N0.1 K factor	.
Orfice Number	5	Orifice No. 2	7.
Orfice Y factor	1.008	Orifice N0.2 K factor	.

	Orfice #1	Orfice #2
Final DGM Volume	873.610	878.320
Inital DGM Volume	871.500	874.200
Net DGM Volume (Vm)	2.110	4.120
In/Out DGM Temp.		
Inlet		
initial	70.0	71.0
final	71.0	71.0
Outlet		
initial	65.0	66.0
final	66.0	66.0
Avg. DGM Temp	68.0	68.5
Time, sec.	300.0	300.0
Orifice DH, in. H2O	.55	2.25
Baro. Press., in. Hg	29.20	29.20
Room temp., Deg. F		
initial	64.0	64.0
final	64.0	64.0
Avg. Room Temp.	64.0	64.0
Pump Vacuum, in. Hg	17	16
Vcr (std)	2.040	4.085
Vm (std)	2.061	4.038
Y Factor (brackets)	.990	1.012
+/- 2% criteria		
Percent of Y	1.80	.36
	PASS	PASS

GRC 6/11/90

ORFICE BRACKETING

Project	962002	Bracket Orfices:	
Date	SEP 7 93	Orifice No. 1	4.
Operator	RIGDON	Orifice N0.1 K factor	.
Orfice Number	5	Orifice No. 2	7.
Orfice Y factor	1.008	Orifice N0.2 K factor	.

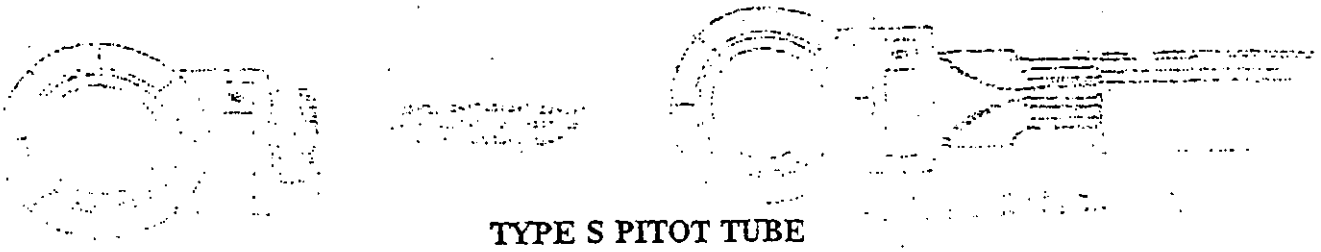
	Orfice #1	Orfice #2
Final DGM Volume	873.610	878.320
Inital DGM Volume	871.500	874.200
Net DGM Volume (Vm)	2.110	4.120

DRY GAS METER THERMOCOUPLE CALIBRATION SHEET

Date 9/7/93	Thermocouple Number	#4
Calibrator Bigdon	Reference Mercury-In-glass	
	Other	

Thermocouple	Source	Reference Thermometer Temperature (°F)	Thermocouple Potentiometer Temperature (°F)	Temperature Difference* (°F)
Inlet	Ambient Air	64°	64°	0°
	Hot Water Bath	134°	133°	-1°
Outlet	Ambient Air	64°	65°	+1°
	Hot Water Bath	134°	135°	+1°

* Reference Temperature -- Thermocouple Temperature ≤ ± 5.4 °F



TYPE S PITOT TUBE CALIBRATION

PITOT # 9/4/13 (5-3)

Calibrator: Bigelow	Project no.:
Date: 9-15-93	Probe no.: 5-3

Pitot Tube Assembly Level?	(Y) / N
Pitot Tube Openings Damaged?	Y / (N) (If yes explain below)

α^1 0 ° (<10°)	β^1 0 ° (<5°)
α^2 0 ° (<10°)	β^2 1 ° (<5°)

Y = 0 O = 0 A = .922 in.

Z = A sin Y 0 in. (<1/8 in.)

W = A sin O 0 in. (<1/32 in.)

P^- .461 in. P^+ .461 in.

DT = .372 in.

Calibration Required? Y / N (If yes explain below)

Comments:

STACK THERMOCOUPLE CALIBRATION SHEET

Date 9-15-93 Thermocouple Number 5-1

Ambient Temp. _____ F Barometric Pressure 29.05 in. Hg

Calibrator Rigalosa Reference: mercury-in-glass Astm

Other _____

Reference Point Number[a]	Source[b] (Specify)	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[c] %
1	Ambient	72°	73°	+1°
2	Tube oven	240°	242°	+2°

[a] Every 50°F for each reference point

[b] Type of calibration system used

[c] $\frac{(\text{ref temp, °F} + 460) - (\text{test thermom temp, °F} + 460)}{\text{ref temp, °F} + 460}$ 100 ≤ 1.5%.

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 9/15/93	Thermocouple Number	2
Calibrator Rigdon	Reference:mercury-in-glass	Astro
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[1] F
Ambient Air	72°	72°	0°
Ice Bath	33°	33°	0°

[1]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 9/15/93	Thermocouple Number	3
Calibrator Rigdon	Reference:mercury-in-glass	Astm
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[a] F
Ambient Air	72°	72°	0°
Ice Bath	33°	32°	-1°

[a]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

UMBILICAL HOOKUP THERMOCOUPLE CALIBRATION SHEET

Date 9-15-93	Thermocouple Number	8
Calibrator Rigdon	Reference:mercury-in-glass	Astm
	Other	

Source	Reference Thermometer Temperature F	Thermocouple Potentiometer Temperature F	Temperature Difference[a] F
Ambient Air	72°	73°	+1°
Ice Bath	33°	33	0°

[a]ReferenceTemperature - Thermocouple Temperature ≤ ± 2°F

APPENDIX G

PROCESS DATA

PARTICULATE EMISSION TEST OPERATING DATA

(Type of Source)

Owner	SHOFSTALL ALFALFA	Run No.	
Source I.D.		Date	9-2-93

	lbs/hr
Maximum Continuous Process Weight (Manufacturer's Rating)	
Historical Average Process Weight	26,000 @ 30% Moisture
Historical Maximum Process Weight	32,000 @ 30% Moisture

Type and Sources of Fuels Normally Burned	NATURAL GAS KANSAS - NEBRASKA
Approximate Quantities of Each of Above Fuels Burned Annually	27000 MCF 1992)

	Yes	No
Recycling Capability	X	

Process Data During Run (Averaged)		
Process Weight (dry)	lbs/hr	
Percent Moisture	%	
Process Weight (wet)	lbs/hr	
How Process Weight Determined		

Type of Fuel Burned During Run	

	Yes	No
Recycling in Progress	X	

Person Responsible for Data: LARRY DURFEE

Signature: Larry Durfee

Title/Position: Manager

* Averages of operating data taken during actual test run, unless requested otherwise.

PROCESS DATA

Plant	SHOFSTALL ALFALFA	Location	ODESSA, NE
Source Type		Rated Production	
Date	Time:	Actual Production	
Air Flow Data		Run No.	

Mechanical Collector N/A

Tube Diameter (in.)		No. of Tubes		Design ΔP _____ in. H_2O @ Gas Temp. _____ °F	
Observed ΔP _____ in. H_2O				Design cfm/tube @ Observed ΔP _____ @ _____ °F	
Fan Rated H.P.		Operating Volts		Operating Amps	

Electrostatic Precipitator N/A

Field No.	Primary Voltage (volts)	Primary Current (amps)	Secondary Voltage (kV)	Secondary Current (ma)	Spark Rate (per min.)

Scrubber N/A

Type		ΔP (across scrubber) _____ in. H_2O			
Fan Rated H.P.		Operating Volts		Operating Amps	
Liquid Circulation Rate (gal/min)		% Make-up		Blowdown (gpm)	
Scrubbing Water Change Interval					
Settling Tank Cleaning Interval					

Baghouse

Pressure-Positive	X	Negative		No. Compartments	144 bags
Type Cleaning		Clean Cycle (min.)	3		
Average Baghouse ΔP _____ in. H_2O		ΔP Range _____ in. H_2O			
Fan Rated H.P.	100	Operating Volts		Operating Amps	

Cyclone

Type	2- KICE CK-126	ΔP 3 in. H_2O		Diameter	10' 6"
Fan Rated H.P.	125	Operating Volts		Operating Amps	

Person Responsible for Data: LARRY DURFEE

Signature: Larry Durfee

Title/Position: Manager

*Average of operating data taken during actual test run, unless requested otherwise.

INTER-OFFICE MEMO

TO _____ DATE 9-2-93

Pellets		Green Hay		
9:00	8.0	8:30	=	33%
9:15	7.8	9:00	=	34%
9:30	7.8	10:00	=	33%
9:45	7.5	11:00	=	35%
10:00	7.4	12:00	=	33%
10:15	7.6	1:00	=	33%
10:30	7.3	2:00	=	
10:45	7.2	3:00	=	
11:00	7.0			
11:15	7.1			
11:30	7.0			
11:45	7.3			
12:00	7.5			

Scale			
9:00	=	2	ton
9:15	=	1.5	"
9:30	=	1.7	"
9:45	=	1.7	"
10:00	=	1.8	"
10:15	=	1.9	"
10:30	=	2.1	"
10:45	=	2.1	"
11:00	=	2.2	"
11:15	=	1.9	"
11:30	=	2.2	"
11:45	=	2.0	"
12:00	=	2.2	"

BY _____

GREIF BROS. CONTAINERS

INTER-OFFICE MEMO

TO _____ DATE _____

Pellets		Scale		
12:15	7.0	2.0	=	ton
12:30	7.0	2.4	=	"
12:45	7.1	2.3	=	"
1:00	7.3	2.3	=	"
1:15			=	"
1:30			=	"
1:45			=	"
2:00			=	"
2:15			=	"
2:30			=	"
2:45			=	"
3:00			=	"

BY _____

GREIF BROS. CONTAINERS

CONSOLIDATED BLENDERS, INC.

OPERATOR'S REPORT

LANT: ODESSA SHIFT NO. 1 DATE: 9-2-93

HAY CUSTOMER	CUT NO.	TIME START	TIME FINISH	SCALE READ. FINISH	SCALE READ. START	NET WEIGHT
EICHENEKER #3	3rd	8:30			109125	

PRODUCT DISPOSITION

O: (CAR, NO. TRUCK TANK, WAREHOUSE, STORAGE TANK ETC.)	SCALE READ. FINISH	SCALE READ. START	NET WEIGHT
TANK W		109125	

DOWN TIME

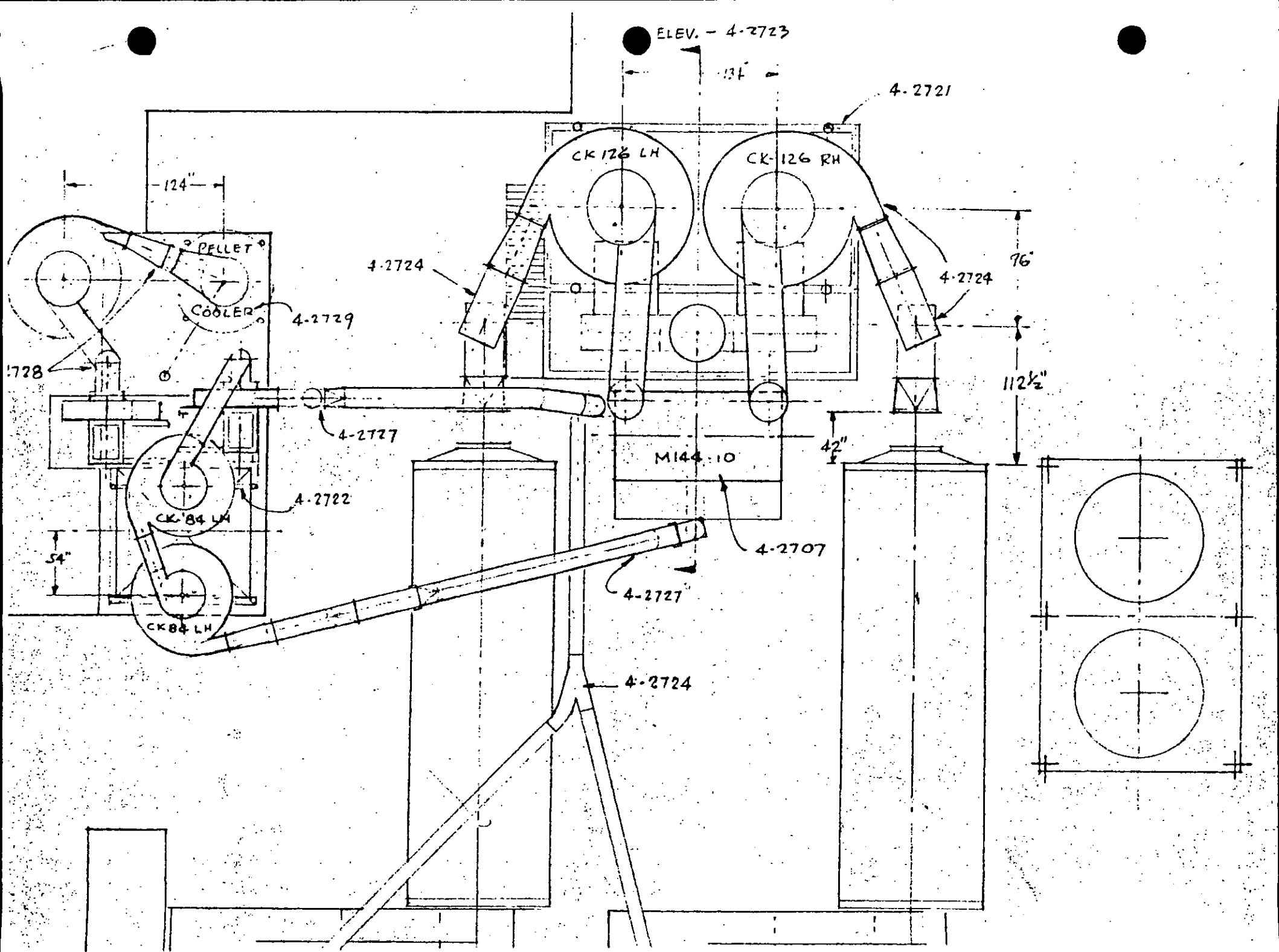
DRUM NO.	TIME OFF	TIME ON	DOWN TIME	REASON
STARTED		8:30		

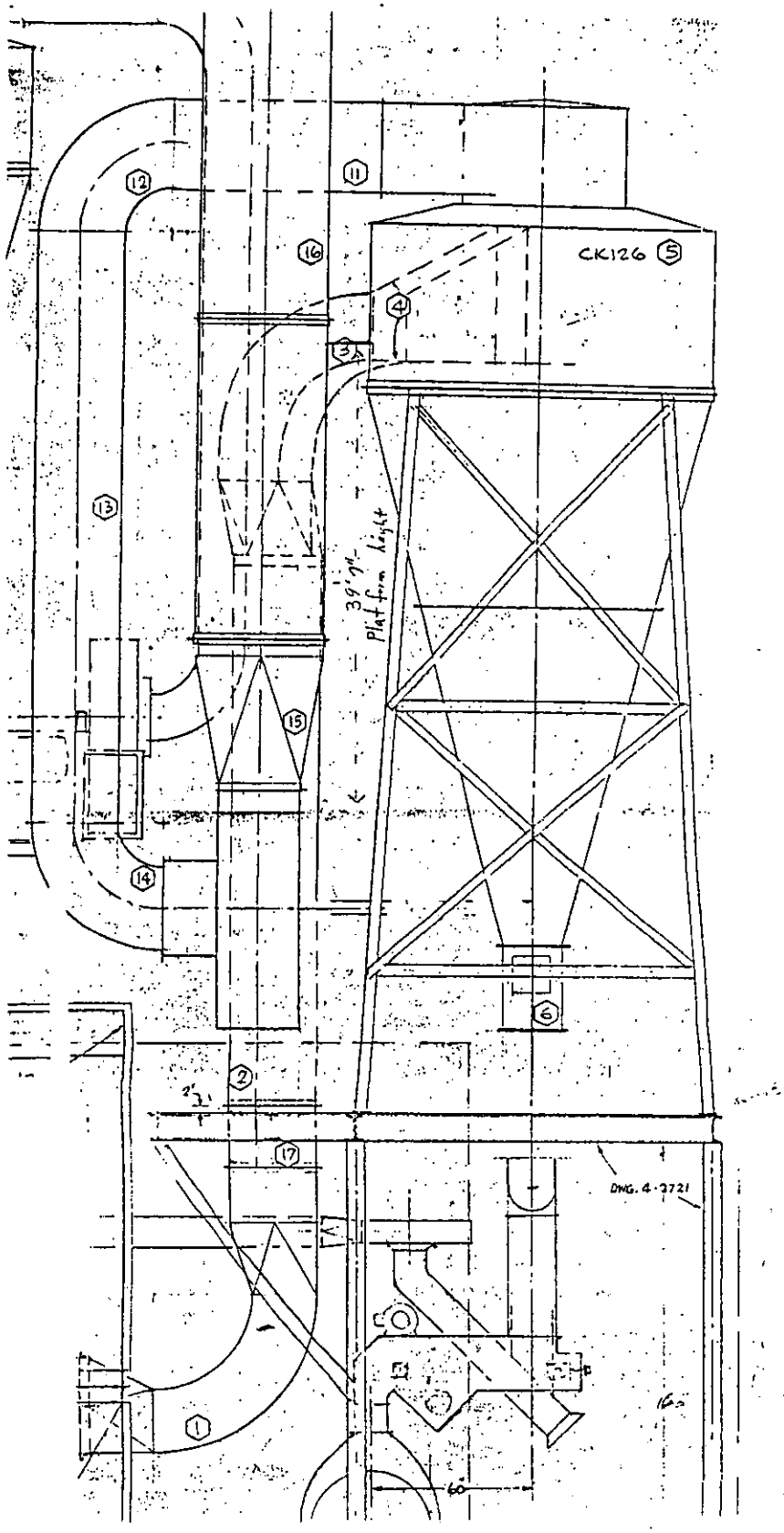
POLLUTION CONTROL DATA

TIME:	TOTAL 200 POUND BAGS PRODUCED		AVERAGE FURNACE TEMPERATURES		AVERAGE DISCHARGE TEMPERATURES		MOISTURE CONTENT OF GREEN CHOPPED ALFALFA- %		MOISTURE CONTENT OF DEHYDRATED ALFALFA- %		PELLET MOISTURE		VISUAL OPACITY	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
-7	125													
7-8														
8-9	145	20	220	170				33%		9.4		8.0		
9-10	210	65	233	183				34%		9.2		7.8		
10-11	295	85	226	180				33%		9.0		7.4		
11-12	375	80	236	208				35%		9.0		7.3		
12-1	465	90	227	200				33%		9.2		7.0		
1-2														
2-3														
3-4														
4-5														
5-6														

Edward Myers

OPERATOR'S SIGNATURE


ELEV. - 4-2723
134"
4-2721
CK 126 LH
CK-126 RH
124"
PELLET
COOLER
4-2729
4-2724
4-2724
76"
4-2728
4-2727
112½"
42"
M144.10
4-2722
CK 84 LH
54"
4-2707
4-2727
CK84 LH
4-2724


CK126
39'2"
Platform height
DWG. 4-3721
60

Alfalfa
Sec. #4
Ref. #6