AP-42 Section Number: 9.10.2.1

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Title: Emission Testing on Two Baghouses at Harris Woolf California Almonds

Steiner Environmental, Inc.

Steiner Environmental, Inc.

October 1991

Sec. 1, Ref. 10

AP-42 Section 9.10.2
Reference 10
Report Sect.
Reference

EMISSION TESTING ON TWO BAGHOUSES AT HARRIS WOOLF CALIFORNIA ALMONDS

September 23 and 27, 1991

Prepared for:

Harris Woolf California Almonds
Route 1, Box 470
Coalinga, California 93210

October 1991

Prepared by:

Steiner Environmental, Inc.
4930 Boylan Street
Bakersfield, California 93308

Report PS-91-2572/Project 7082-91

SECTION 1

INTRODUCTION

At the request of Harris Woolf California Almonds, Steiner Environmental, Inc. conducted a series of emission tests on the effluent of two baghouses located at their almond processing plant located near Coalinga, California. These tests were conducted on September 23 and September 27, 1991. The purpose of these tests was to determine compliance with Fresno County APCD Rules and Regulations.

Almonds are hauled to the plant by trucks and are bottom dumped into a pit with a conveyor. The emissions from this almond receiving/pre-cleaning facility (Permit to Operate No. 1140140101R) are controlled by a Saunco baghouse (Model No. RA12-252-5040) containing 252 polyester dacron bags each six inches in diameter and 144 inches long. The total surface area is 5040 ft^2 and the air-to-cloth ratio is 6.94 to 1.0 at an air flow of 35,000 acfm.

Almonds are hulled and shelled in another part of the plant and the emissions from these processes are also controlled by a baghouse (Permit to Operate No. 1140140102R). A Saunco baghouse (Model RA12-312-6240) with one compartment containing 312 polyester dacron bags each six inches in diameter and 144 inches long with a rated air flow of 77,500 acfm and an airleg recycle with a rated air flow of 23,000 acfm. The

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total bag surface area is 6,240 ft^2 for an air-to-cloth ratio of 12.4 to 1.0.

Triplicate particulate tests were performed using EPA Method 5 on each outlet duct from each baghouse prior to the fan. The almond receiving/pre-cleaning baghouse has one stack. The almond hulling and shelling baghouse has two stacks, both of which were tested simultaneously. No PM_{10} tests were conducted. Fresno County has agreed that if the baghouses passed the particulate tests, then they would also pass the PM_{10} tests, since PM_{10} is a fraction of the total particulate emitted from the baghouses.

Section 2 of the report presents the test matrix for this program.

SECTION 2

TEST PROGRAM

Table 2-1 presents the test matrix for this program. Both baghouses were in continuous operation during the test program. The pre-cleaning baghouse went down momentarily during Test #3, but came back on line six minutes later.

Section 3 of the report summarizes the test results.

TABLE 2-1. TEST MATRIX FOR HARRIS WOOLF CALIFORNIA ALMONDS

Date	Test Location	Test No.	Test Parameter	Test Condition (ton/hr)	Test Time
09/23/91	Receiving/Pre-Cleaning Baghouse	1	Particulates	16.6 to 18.7	11:48 am - 1:54 pm
09/23/91	Receiving/Pre-Cleaning Baghouse	2	Particulates	15.9 to 18.1	2:14 pm - 4:20 pm
09/23/91	Receiving/Pre-Cleaning Baghouse	3	Particulates	16.1	4:30 pm - 6:45 pm
09/27/91	Hulling/Shelling Baghouse - Stack A	1	Particulates	18.6	8:20 am - 10:30 am
09/27/91	Hulling/Shelling Baghouse - Stack A	2	Particulates	14.6	11:20 am - 1:25 pm
09/27/91	Hulling/Shelling Baghouse - Stack A	3	Particulates	21.4	2:15 pm - 4:20 pm
09/27/91	Hulling/Shelling Baghouse - Stack B	1	Particulates	18.6	8:30 am - 10:35 am
09/27/91	Hulling/Shelling Baghouse - Stack B	2	Particulates	14.6	11:20 am - 1:25 pm
09/27/91	Hulling/Shelling Baghouse - Stack B	3	Particulates	21.4	2:15 pm - 4:20 pm

SECTION 3

TEST RESULTS

Table 3-1 summarizes the test results for the receiving/pre-cleaning baghouse. Tables 3-2 and 3-3 summarize the results from the two stacks serving the hulling and shelling baghouse.

3.1 RECEIVING/PRE-CLEANING BAGHOUSE

The permit limits particulate (and PM_{10}) emissions to 0.004 gr/scf, 1.20 lb/hr or 28.8 lb/day based on a 24-hour operating day. The measured emissions were 0.0069 gr/scf, 1.68 lb/hr or 40.32 lb/day. This baghouse was just over the permit limits.

3.2 HULLING AND SHELLING BAGHOUSE

The permit limits particulate (and PM_{10}) emissions to 0.0032 gr/scf, 1.50 lb/hr or 35.9 lb/day based on a 24-hour operating day. The measured emissions were 0.0020 gr/scf, 1.17 lb/hr or 28.1 lb/day. This baghouse is in compliance with the permit limits.

TABLE 3-1. SUMMARY OF SOURCE EMISSION TEST DATA (60°F)

Unit Tested: Harris Woolf California Almonds Receiving/Pre-Cleaning Baghouse

Date: September 23, 1991

	1	2	3	Average
Test Number				
Test Condition (tph)	16.6/18.1	15.9/18.1	16.1	
Barometric Pressure (in. Hg)	29.15	29.58	29.52	29.42
Stack Pressure (in. Hg)	28.75	29.18	29.12	29.02
Stack Area (ft^2)	10.08	10.08	10.08	10.08
Elapsed Sampling Time (min.)	120.00	120.00	120.00	120.00
Volume Gas Sampled (dscf)	99.715	97.196	94.826	97.246
GAS DATA				
Average Gas Velocity (fps)	54.74	53.39	50.04	52.72
Average Gas Temperature (°F)	93.29	100.17	101.08	98.18
Gas Flowrate (dscfm)	29,563	29,000	27,084	28,549
Gas Analysis (Volume %)				
Carbon Dioxide, dry	0.00	0.00	0.00	0.00
Oxygen, dry	20.90	20.90	20.90	20.90
Water	1.15	0.85	0.83	0.95
EMISSION CONCENTRATION - gr/dscf				
Filterable Particulate	0.0048	0.0076	0.0076	0.0067
Total Particulate	0.0051	0.0078	0.0079	0.0069
EMISSION RATE - lb/hr				
Filterable Particulate	1.22	1.89	1.77	1.63
Total Particulate	1.28	1.94	1.82	1.68
EMISSION FACTOR - lb/day				
Filterable Particulate	29.28	45.36	42.48	39.04
Total Particulate	30.72	46.56	43.68	40.32

TABLE 3-2. SUMMARY OF SOURCE EMISSION TEST DATA (60°F)

Unit Tested: Harris Woolf
California Almonds
Hulling/Shelling
Baghouse - Stack A

Date: September 27, 1991

Test Number	1	2	3	Average
Test Condition (tph)	18.6	14.6	21.4	
Barometric Pressure (in. Hg)	29.83	29.68	29.54	29.68
Stack Pressure (in. Hg)	29.29	29.14	29.00	29.14
Stack Area (ft^2)	19.63	19.63	19.63	19.63
Elapsed Sampling Time (min.)	120.00	120.00	120.00	120.00
Volume Gas Sampled (dscf)	155.406	139.543	134.130	143.026
GAS DATA				
Average Gas Velocity (fps)	53.53	50.43	49.16	51.04
Average Gas Temperature (°F)	77.21	92.46	99.46	89.71
Gas Flowrate (dscfm)	59,072	53,811	51,721	54,868
Gas Analysis (Volume %)				
Carbon Dioxide, dry	0.00	0.00	0.00	0.00
Oxygen, dry	20.90	20.90	20.90	20.90
Water	1.13	1.19	0.88	1.07
EMISSION CONCENTRATION - gr/dscf				
Filterable Particulate	0.0018	0.0014	0.0012	0.0015
Total Particulate	0.0020	0.0016	0.0021	0.0019
EMISSION RATE - lb/hr				
Filterable Particulate	0.90	0.65	0.54	0.70
Total Particulate	1.00	0.76	0.93	0.90
EMISSION FACTOR - lb/day				
Filterable Particulate	21.60	15.60	12.96	16.80
Total Particulate	24.00	18.24	22.32	21.60

TABLE 3-3. SUMMARY OF SOURCE EMISSION TEST DATA (60°F)

Unit Tested: Harris Woolf
California Almonds
Hulling/Shelling
Baghouse - Stack B

Date: September 27, 1991

Test Number	1	2	3	Average
Test Condition (tph)	18.6	14.6	21.4	
Barometric Pressure (in. Hg)	29.83	29.68	29.54	29.68
Stack Pressure (in. Hg)	29.32	29.20	29.13	29.22
Stack Area (ft^2)	6.31	6.31	6.31	6.31
Elapsed Sampling Time (min.)	120.00	120.00	120.00	120.00
Volume Gas Sampled (dscf)	104.218	100.036	93.630	99.295
GAS DATA				
Average Gas Velocity (fps)	41.10	42.74	41.60	41.81
Average Gas Temperature (°F)	79.46	94.04	101.46	91.65
Gas Flowrate (dscfm)	14,500	14,661	14,039	14,400
Gas Analysis (Volume %)				
Carbon Dioxide, dry	0.00	0.00	0.00	0.00
Oxygen, dry	20.90	20.90	20.90	20.90
Water	1.28	1.02	1.05	1.12
EMISSION CONCENTRATION - gr/dscf				
Filterable Particulate	0.0020	0.0015	0.0017	0.0017
Total Particulate	0.0023	0.0022	0.0021	0.0022
EMISSION RATE - lb/hr				
Filterable Particulate	0.25	0.19	0.21	0.22
Total Particulate	0.29	0.28	0.25	0.27
EMISSION FACTOR - lb/day				
Filterable Particulate	6.00	4.56	5.04	5.28
Total Particulate	6.96	6.72	6.00	6.48

SECTION 4

SAMPLING EQUIPMENT AND PROCEDURES

This section of the report describes the equipment and procedures used to conduct the particulate tests on this program.

4.1 PRELIMINARY MEASUREMENTS

Before conducting the stack tests a series of preliminary measurements were made to determine:

- The location of the sampling site and the number and location of the sampling points to be used (EPA Method 1)
- The velocity, temperature and pressure of the gases in the stack (EPA Method 2)
- The composition of the stack gases (EPA Method 3)
- The moisture content of the stack gases (EPA Method 4)

Using the results of these preliminary measurements and the calibration constants for the sampling train, a series of calculations were made to determine the value of K, a constant, and N_d, ideal nozzle diameter, required to run an isokinetic test according to the equation:

$$\Delta H = \left[\frac{60^2\,\pi^2\,(K_p)^2\,(C_p)^2\,(1-B_{wo})^2\,P_s\,MW_d}{576^2\,(K_o)^2\,MW_s\,P_m}\right](N_d)^4\left(\frac{T_m}{T_s}\right)(\Delta P)$$

where

$$K = \left[\frac{60^2 \, \pi^2 \, (K_p)^2 \, (C_p)^2 \, (1-B_{wo})^2 \, P_s \, MW_d}{576^2 \, (K_c)^2 \, MW_s \, P_m} \right]$$

An actual nozzle, whose diameter was as close as possible to the ideal nozzle diameter, was selected for the test. Isokinetic sampling rates for each sampling point in the stack were computed using the equation:

$$\Delta H = (K) \, (N_d)^4 \left(\frac{T_m}{T_s} \right) (\Delta P)$$

Since K and N_d were known, and remain constant during a test, the only variables were the meter temperatures, the stack gas temperature and the velocity pressure for each sampling point.

4.2 PREPARATION OF THE PARTICULATE SAMPLING TRAIN

All sampling train components were cleaned in the laboratory (soap and water, tap water rinse, distilled water rinse, and IPA rinse) to eliminate previous contamination. The sampling train components were sealed and transported to the sampling site in a mobile lab. The EPA Method 5 equipment used to measure particulates (filterable and total) consisted of:

- A calibrated 316 stainless steel nozzle for isokinetic sampling
- A heated Pyrex glass sampling probe (6 feet long) equipped with an S-type pitot tube and a thermocouple to measure stack velocity, pressure and temperature

- A heated Pyrex glass filter holder containing a weighed 100-mm Whatman 934 AH glass fiber filter
- A Pyrex glass impinger train in an icebath (impingers 1 and 2 contained 100-ml distilled water; bubbler 3 was dry; bubbler 4 contained a weighed amount of silica gel)
- An umbilical to connect the probe and sample box to the control module
- A control module containing a vacuum pump, a calibrated dry gas meter and a calibrated orifice meter to measure the pressure, temperature and flowrate throughout the train.

The sampling train was charged in the mobile lab using freshly prepared reagents. Each impinger and its contents was weighed to the nearest 0.1 gm on a calibrated electronic balance. Blanks of all filters and reagents were retained for subsequent analysis. The sampling point locations were marked on the probe using a high-temperature marker. The sampling train was completely assembled and lifted to the sampling site.

4.3 SAMPLING PROCEDURES FOR PARTICULATE SAMPLING TRAIN

Prior to a test, the sampling train was heated and leak-checked at 15-inches Mercury to insure leakage was less than 0.02 cfm or 4% of the average sampling rate. The S-type pitot tube was also leak-checked. The sampling train was installed on the unirail and the probe was inserted into the stack at the farthest point. An isokinetic sampling rate was calculated using an HP-41CV calculator for each sampling point on the traverse (12 points per traverse, 2 traverses at 90°). Each point was sampled for an equal period of time (5.0 minutes) and all pertinent data were recorded on the data sheet for each point. The probe and sample box

were maintained at 250°F throughout the traverse. The gases leaving the impinger train were maintained at <68°F. At the end of a traverse, the probe was withdrawn from the stack and the entire sampling train was transferred intact to the next sampling port. The other traverse of the stack was completed and the sampling train was withdrawn for the final leak check. This leak check was performed at 15-inches Mercury or at the highest vacuum achieved during the test. The S-type pitot tube was also checked at this time. The probe, nozzle, filter holder and impinger train were sealed with aluminum foil and lowered to the mobile lab for sample recovery.

4.4 SAMPLE RECOVERY PROCEDURES FOR PARTICULATE SAMPLING TRAIN

Sample recovery for the nozzle and probe occurred on the stack. The nozzle and probe were brushed and rinsed three times using ACS reagent grade acetone into a polyethylene sample bottle. Sample recovery for the filter holder and impinger train occurred in the mobile lab. The 100-mm filter was removed from the 4-inch filter holder and sealed in its petri dish. The front half of the 4-inch glass filter holder was brushed and rinsed with acetone. Each impinger was removed from the icebath, wiped dry and weighed to the nearest 0.1 gm. The contents of impinger 1 were transferred to a polyethylene sample bottle. The back half of the 4-inch glass filter holder, the glass connectors, impingers 1, 2 and 3 were rinsed with distilled water and the rinsings were transferred to this same bottle. All sample bottles and petri dishes were marked and labeled. A chain-of-custody log was completed and the field data sheet was also labeled with the sample ID numbers. The sampling train was then recharged in preparation for the next test.

SECTION 5

ANALYTICAL PROCEDURES

This section of the report describes the procedures used to analyze the samples collected during the test program. All analyses were performed in the Steiner Environmental, Inc. climate-controlled laboratory located in Bakersfield, California.

5.1 ANALYSIS OF PARTICULATE SAMPLES

5.1.1 Nozzle, Probe, Filter Holder Wash

The volume of the acetone washings was measured and the washings were transferred to clean, tared, aluminum weighing dishes. The dishes were placed on temperature-controlled water bath under a fume hood and gently heated to dryness (100°F). The dishes with the dry residue were desiccated and weighed repeatedly at 6-hour intervals until a constant weight was achieved (to the nearest 0.01 mg with a tolerance of <0.1 mg between weighings). The ACS reagent grade acetone blank was treated in the same manner.

5.1.2 Filter

The 100-mm filter was removed from its petri dish and transferred to an oven where it was heated for 2 hours at 105°C. The filter was then desiccated and weighed repeatedly at 6-hour intervals until a constant weight was achieved (to nearest 0.01 mg with a tolerance of <0.1 mg

between weighings). An unused, tared blank filter was treated in the same manner.

5.1.3 Condensible Particulate

The volume of sample was measured and the entire volume was transferred to a clean, tared glass evaporating dish. The dish was placed on a temperature-controlled hot plate under a fume hood and gently heated to dryness (150°F). The dish with the dry residue was desiccated and weighed repeatedly at 6-hour intervals until a constant weight was achieved (to nearest 0.01 mg with a tolerance of <0.1 mg between weighings). A blank of the distilled water was treated in the same manner.

SECTION 6

QUALITY ASSURANCE

This section of the report describes the QA/QC procedures employed on the test program.

6.1 PARTICULATE SAMPLING EQUIPMENT

A detailed record of repair and maintenance to each sampling train is kept. Preventative maintenance to each system is performed periodically to avoid complete component breakdown during a field test.

A detailed record of sampling system calibrations is also kept. Calibration data for the sampling nozzles, pitot tubes, dry gas meters and orifice meters are available for review. Results of the EPA Quality Assurance Branch bi-annual audits of the dry gas meter and orifice meter combinations are also logged and verify our in-house calibration data. The calibration data for the equipment used on this program can be found in the Appendix of this report.

6.2 LAB ANALYSIS

All field samples are assigned a label and an ID number. This ID is also affixed to a chain-of-custody log and to the field data sheet to eliminate any chance of sample mixup.

Prior to analysis, all glassware is thoroughly cleaned (soap and water, tap water rinse, distilled water rinse, IPA rinse) to eliminate

any contamination. The evaporating dishes used to evaporate the washings are treated the same as a sample (dried in an oven, desiccated and weighed repeatedly at 6-hour intervals until a constant weight is achieved). The glassware used to measure volumes and make transfers and dilutions are all NBS Class A to insure accurate measurements. All weighings are carried out on a Sartorius Research Model R160P electronic semi-micro balance supported by a marble table in a separate room from the main analytical laboratory. The balance is calibrated regularly against an NBS Class S-1 weight.

All reagents used in the field and in the laboratory are ACS reagent grade and blanks of these reagents are evaluated for every set of tests. Blanks are taken in the field from the squeeze bottles and not the original container. Records are kept on these blanks to insure consistent quality of the reagents.

APPENDIX A

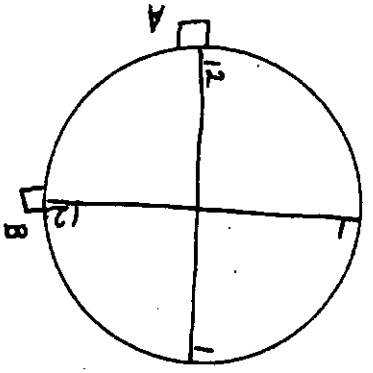
STEINER ENVIRONMENTAL RAW DATA

Steiner Environmental, Inc.

N E S W

SAMPLING POINT LOCATION DATA SHEET

Plant Harris - Woolf
Date 9-23-91
Test Location Pre-Cleaning Bag House
Upstream Dist./Dia. 41.0" / 1.0 Ø
Downstream Dist./Dia. 328.0" / 7.6 Ø
No. of Sampling Points 24
Stack Dimension 43.0"
Coupling Length 4.0"
2, 3-inch MPT/FPT/Flange



setup CH on ground no rope
100' power ; high -ve static, bring stack tube
step ladder from plant to reach ports

XEQ PNT

Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
B- 1	4.9						
2	6.9						
3	9.1						
4	11.6						
5	14.8						
6	19.3						
7	31.7						
8	36.3						
9	39.4						
10	41.9						
11	44.1						
12	46.1						

SAMPLING POINT RELOCATION: NONE
PORT B 16.0" Lower than East Port

Steiner Environmental, Inc.

SAMPLING POINT LOCATION DATA SHEET

Plant HARRIS - WHOLE

Date 9-24-91

Test Location SHELLING BAGHOUSE OUTLET A

Upstream Dist./Dia. 144.0" / 2.4 ϕ

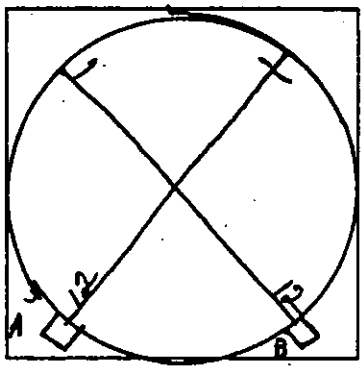
Downstream Dist./Dia. 108.0" / 1.8 ϕ

No. of Sampling Points 24

Stack Dimension 60.0"

Coupling Length 3.5"

2-3 -inch MPT/FPT/Flang



high -ve static (bring pitot tube)
HAS HOOKS, SET UP ON ROOF; 50' rope
100' POWER CORD; need ladder from plant or lift.

XEQ PNT

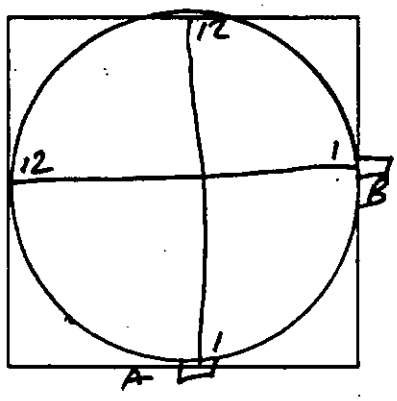
Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
1	4.8						
2	7.5						
3	10.6						
4	14.1						
5	18.5						
6	24.8						
7	42.2						
8	48.5						
9	52.9						
10	56.4						
11	59.5						
12	62.2						

SAMPLING POINT RELOCATION: NONE

Steiner Environmental, Inc.

SAMPLING POINT LOCATION DATA SHEET

Plant HARRIS - WOOLF
Date 9-24-91
Test Location SHELLING BAGHOUSE - DUCT B
Upstream Dist./Dia. 58" / 1.7 Ø
Downstream Dist./Dia. 367.5" / 10.8 Ø
No. of Sampling Points 24
Stack Dimension 34"
Coupling Length 3.5"
2-3 -inch MPT/FPT/Flang



NEED 12' LADDER OR MANLIFT
HAS HOOKS - 100' POWER CORD
HIGH NEGATIVE FLOW - NEED FOR STATIC SLACK MANOMETER

XEQ PNT

Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
1	4.2						
2	5.8						
3	7.5						
4	9.5						
5	12.0						
6	15.6						
7	25.4						
8	29.0						
9	31.5						
10	33.5						
11	35.2						
12	36.8						

SAMPLING POINT RELOCATION: NONE

Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD-5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-23-91 Barometric Pressure 29.15
Test Location PRE-CLEANING BAGHOUSE Static in.wg. -5.50
Run Number 1 Probe Type/Length 6L-6'
Stack Diameter 43.0" Pitot Coefficient 0.84
Operator SC/SW Meter Box No./γ 779/1.0081
Filter No. 457 Nozzle No./Size #1458/0.2333

INPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	539.0	553.7	-14.7		0.0	20.9	
DI	581.5	567.5	14.0				
DRY	468.1	463.8	4.3				
				Leakrate	cfm		"Hg
S.G.	654.8	633.3	21.5	Initial	0.017		15
		TOTAL	25.1	Final	0.003		5"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	1048												
A-1	0	0.75	2.49	746.754	87	253	230	68	91	92	2.0	0.866	PITOT OK
2	5	0.86	2.88	750.975	91	259	266	67	103	94	2.0	0.927	
3	10	0.89	2.98	755.543	93	257	264	65	108	96	2.0	0.943	30605 BH#1
4	15	0.89	3.01	760.216	91	254	242	66	112	97	2.0	0.943	
5	20	0.88	2.99	764.962	91	249	245	63	115	100	2.0	0.938	30604 AMD-1
6	25	0.89	3.03	769.695	91	252	255	64	117	102	2.0	0.943	
7	30	0.79	2.70	774.431	92	252	262	63	119	104	2.0	0.889	30603 MF-1
8	35	0.80	2.74	778.908	92	258	259	68	120	106	2.0	0.894	
9	40	0.75	2.57	783.903	93	256	251	67	120	108	2.0	0.866	
10	45	0.68	2.33	788.298	93	249	260	65	122	109	2.0	0.825	
11	50	0.87	2.99	792.476	93	254	256	64	123	110	2.0	0.933	
12	55	1.25	4.33	797.109	91	257	256	65	124	112	2.0	1.118	
	60			802.697									

30608 ACET-BLK = 30607 DI-BLK = 30606 MP BLK

Forms: Fielddat.frm

A-5

Steiner Environmental, Inc.

PLANT Harris-Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-23-91 RUN NO. 1
TEST LOCATION Rec Cleaning Bag House OPERATOR SC/SW

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	12:54												
A- 1	0	0.72	2.99	802.697	91	262	251	64	124	112	2.0	0.849	
2	5	0.85	2.91	806.951	95	257	255	62	120	112	2.0	0.922	
3	10	0.91	3.12	811.582	96	260	250	63	124	113	2.0	0.954	
4	15	0.87	2.99	816.373	96	259	256	61	125	113	2.0	0.933	
5	20	0.88	3.03	821.045	96	253	249	63	126	114	2.0	0.938	
6	25	0.85	2.93	825.732	96	257	252	64	127	116	2.0	0.922	
7	30	0.88	3.04	830.327	96	259	258	66	127	116	2.0	0.938	
8	35	0.84	2.91	835.028	96	255	252	63	129	117	2.0	0.917	
9	40	0.67	2.32	839.644	95	257	252	63	129	118	2.0	0.819	
10	45	0.77	2.66	843.781	97	253	251	63	129	118	2.0	0.877	
11	50	1.30	4.52	848.138	93	250	253	62	129	118	2.0	1.140	
12	55	1.10	3.84	853.574	92	257	254	66	130	118	2.0	1.049	
	120			858.130									
T/A	120 min		2.99	111.3760	93.29				114.75			0.9310	
											2.0		Pitot ✓ OK

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Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD-5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-23-91 Barometric Pressure 29.58
Test Location PRE-CIGARING BAGHOUSE Static in.wg. -5.43
Run Number 2 Probe Type/Length GC-6'
Stack Diameter 43.0" Pitot Coefficient 0.84
Operator SW Meter Box No./Y 779 / 1.0081
Filter No. 484 Nozzle No./Size 1458/.2333

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	531.9	548.2	-16.3				
DI	525.8	518.2	7.6				
DRY	464.2	461.4	2.8				
				Leakrate	cfm		"Hg
S.G.	690.4	666.5	23.9	Initial	0.013		15"
		TOTAL	48.0	Final	0.007		8"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	14:14												
B-1	0	0.79	2.67	858.650	98	257	258	64	111	112	8.5	0.889	Pitot OK
2	5	0.86	2.91	863.035	99	247	254	63	115	111	8.5	0.927	
3	10	0.89	3.02	867.555	99	250	259	67	119	111	8.5	0.943	30602 BHW-2
4	15	0.86	2.92	872.168	100	255	258	65	120	112	8.5	0.927	
5	20	0.85	2.89	876.767	99	254	268	64	122	112	8.5	0.922	30601 FHW-2
6	25	0.84	2.86	881.345	100	263	253	61	123	114	8.5	0.917	
7	30	0.80	2.74	885.874	99	259	258	63	124	115	8.5	0.894	30600 MF-2
8	35	0.85	2.90	890.293	100	253	258	62	124	115	8.5	0.922	
9	40	0.71	2.43	894.932	99	252	254	62	124	116	8.5	0.843	
10	45	0.68	2.33	899.358	99	254	255	62	124	115	8.5	0.825	
11	50	0.85	2.91	903.511	98	255	250	63	125	115	8.5	0.922	
12	55	1.35	4.64	908.586	97	251	248	62	124	116	8.5	1.162	
	60			913.662									

Forms: Fielddat.frm

i-Steps Sales Analysis Jan 30,1993

COMPANY	RATING	NO.	LAST CONTACT	ACTION
ALCOA	A	5	28-Jan	MEET PLANTS
ARCO CHEMICAL	A	5	21-Jan	MEET GROUP
B.P. OIL	A	10	27-Jan	RFP
BABCOCK ULTR PWR	A	1	7-Dec	QUOTE
CHAMPION INT.PAPR	A	4	14-Dec	MEET CORP
DuPONT	A	25	21-Jan	PILOT INSTALL'T'N
JAMES RIVER	A	8	14-Dec	FEB 9 CORP MTG
MAINE RUBBER	A	1	7-Jan	FEB INSTALL
PSE & G	A	3	7-Dec	AUTOCAD INSTALL
R.J. REYNOLDS	A	7	21-Jan	INSTALL
RHONE POULAC	A	6	19-Dec	CORP MEET
SUN OIL	A	7	21-Jan	RFP FOLLOW UP
U S STEEL	A	8	25-Jan	RFP
UNION CARBIDE	A	8	6-Oct	CORP FOLLOW UP
BETHLEHEM STEEL	B	4	28-Jan	CORP RFP
BIO ENERGY	B	1	6-Oct	RFP
CHRYSLER	B	12	23-Nov	CORP FOLLOW UP
CORN PRODUCTS	B	5	7-Dec	CHICAGO MEETING
ELF ATOCHEM	B	25	5-Jan	RFP FOLLOW UP
EMERY CHEMICAL	B	7	15-Nov	CORP PRESENTATION
GEON COMPANY	B	1	27-Jan	RFP
GETTY PETROLEUM	B	4	12-Oct	CORP MEETING
HARBISON-WALKER	B	1	7-Jan	QUOTE
LINCOLN PULP & PR	B	2	12-Oct	CORP MEETING
MAINE ENERGY	B	1	13-Oct	RFP FOLLOW UP
MALLINCKRODT	B	3	14-Jan	CORP MEETING
NABISCO	B	1	21-Jan	QUOTE
PSN H	B	5	14-Dec	CORP PRESENTATON
PHILIP MORRIS	B	12	14-Dec	CORP PRESNTATION
ROHM & HAAS	B	7	14-Dec	WEST VA VISIT
SHISEIDO AMERICA	B	3	14-Dec	CORP PRESENTAION
STAR ENTERPRISES	B	5	16-Oct	CORP PRESENTATION
WESTINGHOUSE	B	16	7-Jan	RFP FOLLOW UP
WEYERHAEUSER	B	5	8-Jan	CORP PRESENTATION
WHITEFIELD PWR	B	1	17-Oct	RFP FOLLOW UP
ALCAN	C	6	15-Dec	CORP MEETING
BATESVILLE	C	2	16-Dec	CORP MEETING
EASTERN FINE PAPR	C	1	17-Oct	RFP
FORD	C	12	16-Nov	CORP MEETING
FREUDENBERG NOK	C	3	14-Dec	RFP
GENERAL MOTORS	C	12	21-Nov	CORP MEETING
JOHNSON MATTHEY	C	1	15-Dec	RFP
KRAFT FOODS	C	2	7-Dec	QUOTE
MAGRUDER CLR	C	1	13-Dec	RFP
PFISTER CHEM	C	1	8-Dec	RFP
PPG INTERNATIONAL	C	8	7-Jan	CORP MEETING
S. D. WARREN	C	2	16-Oct	RFP
WAUSAU PAPER	C	2	13-Oct	RFP
"A" POTENTAL	98	TOTAL	$931,000	
"B" POTENTIAL	121	TOTAL	$1,149,500	
"C" POTENTIAL	54	TOTAL	$513,000	

Steiner Environmental, Inc.

PLANT Harris - Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-23-91 RUN NO. 2
TEST LOCATION Pre-Cleaning Bag House OPERATOR SW

Sample Point	Time 15:20	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
A: 1	0	0.72	2.45	913.662	97	257	262	62	113	114	7.5	0.849	
2	5	0.80	2.72	917.961	100	259	257	64	120	116	8.0	0.894	
3	10	0.88	2.99	922.327	100	253	249	63	121	114	8.0	0.938	
4	15	0.82	2.79	926.935	101	243	256	63	122	115	8.0	0.906	
5	20	0.85	2.88	931.405	103	247	252	62	122	115	8.5	0.922	
6	25	0.84	2.84	935.898	104	252	257	64	123	115	8.5	0.917	
7	30	0.82	2.78	940.407	104	256	255	62	123	116	8.5	0.906	
8	35	0.87	2.95	944.908	103	263	245	65	124	115	8.5	0.933	
9	40	0.79	2.68	949.409	103	262	242	68	124	116	8.5	0.889	
10	45	0.69	2.35	953.878	102	251	247	66	124	116	7.5	0.831	
11	50	0.83	2.83	958.018	102	253	248	66	125	116	7.5	0.911	
12	55	0.72	2.47	962.150	98	249	256	69	125	116	7.5	0.849	
	60			966.312									
T/A	120 min		2.83	107.662	100.17				118.10			0.9088	Pitot ✓ OK

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Forms 1B: Fielddat.frm 1/91

Steiner Environmental, Inc.

PLANT Harris - Woolf TEST TYPE METHOD-5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-23-91 Barometric Pressure 29.52
Test Location PRE-CLEANING BAGHOUSE Static in.wg. -5.40
Run Number 3 Probe Type/Length 6C-6'
Stack Diameter 43.0" Pitot Coefficient 0.84
Operator SW Meter Box No./Y 279/1.0081
Filter No. 490 Nozzle No./Size 1458/.2333

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
	523.9	537.8	-13.9				
	544.3	537.0	7.3				
	448.5	445.4	3.1				
				Leakrate	cfm		"Hg
S.G.	643.6	622.9	20.7	Initial	0.013		15"
		TOTAL	17.2	Final	0.004		6"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	1630												
B-1	0	0.80	2.71	966.465	99	263	243	63	113	113	5.75	0.894	Pitot OK
2	5	0.93	3.14	971.338	105	255	248	62	122	114	6.0	0.964	30599 BHW-3
3	10	0.93	3.14	976.114	105	256	259	63	124	114	6.0	0.964	
4	15	0.86	2.92	980.874	104	264	241	63	126	115	6.0	0.927	30598 FHW-3
5	20	0.83	2.82	985.540	104	257	248	64	126	116	6.0	0.911	
6	25	0.84	2.86	990.157	104	266	252	61	127	116	6.0	0.917	30597 MF-3
7	30	0.80	2.72	994.768	104	251	247	62	127	116	6.0	0.894	
8	35	0.77	2.62	999.294	103	240	250	64	127	116	6.0	0.877	
9	40	0.72	2.45	003.773	103	269	249	63	127	116	5.0	0.849	1.17
10	45	0.72	2.46	008.138	101	243	262	62	126	116	5.0	0.849	UNIT
11	50	0.74	2.53	012.362	99	253	255	64	125	116	5.0	0.860	DOWN
12	55	0.72	2.48	016.681	96	257	257	66	127	115	5.0	0.849	17:23
	60			021.015									UP

Forms: Fielddat.frm

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Steiner Environmental, Inc.

PLANT Harris - Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-23-91 RUN NO. 3
TEST LOCATION Pre Cleaning Bag House OPERATOR SW

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
	12:45				Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
A - 1	0	0.79	2.69	021.015	96	249	260	65	114	112	5.0	0.889	
2	5	0.77	2.61	025.998	102	251	269	65	122	113	5.0	0.877	
3	10	0.80	2.72	029.721	102	263	266	65	123	114	5.0	0.894	
4	15	0.83	2.82	034.145	101	258	263	65	125	114	5.0	0.911	
5	20	0.81	2.76	038.648	102	247	257	64	125	114	5.0	0.900	
6	25	0.83	2.83	043.088	101	252	248	63	125	114	5.25	0.911	
7	30	0.78	2.66	047.594	101	248	254	65	125	114	5.5	0.883	
8	35	0.84	2.87	051.967	100	248	249	66	125	114	5.5	0.917	
9	40	0.81	2.76	056.448	101	251	257	67	125	115	5.5	0.900	
10	45	0.72	2.46	060.924	100	253	249	67	124	115	5.0	0.849	
11	50	0.32	1.10	065.205	97	257	251	67	125	115	3.0	0.566	
12	55	0.03	0.10	068.200	96	259	247	68	122	114	1.0	0.173	
	60			072.004									
T/A	120		2.55	105.539	101.08				119.29			0.8511	Pitot √ O.K

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Forms 1B: Fielddat.frm 1/0*

Steiner Environmental, Inc.

PLANT Harris - Woolf TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 Barometric Pressure 29.83
Test Location HOLLINGSHEAD Static in.wg. -7.4
Run Number 1-A Probe Type/Length GL/8'
Stack Diameter 60" Pitot Coefficient 0.84
Operator SW Meter Box No./γ 644/0.9812
Filter No. 485 Nozzle No./Size #1555/0.2792

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	520.0	547.9	-27.9				
DI	588.7	567.5	21.2				
DRY	425.3	413.3	12.0				
				Leakrate	cfm		"Hg
S.G.	653.4	620.3	33.1	Initial	.009		16"
		TOTAL	38.4	Final	.008		12"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	08:20												
A-1	0	0.73	4.61	668.734	72	241	259	47	70	71	6.75	0.854	Pitot OK.
2	5	0.68	4.35	674.742	73	253	251	49	81	76	6.75	0.825	
3	10	0.69	4.43	680.746	74	250	256	49	84	79	6.75	0.831	30596 BNW-1-A
4	15	0.73	4.71	686.814	75	258	258	49	87	82	7.0	0.854	
5	20	0.74	4.79	693.049	75	256	260	50	89	84	7.0	0.860	30595 PNW-1-A
6	25	0.78	5.06	699.365	75	258	259	49	90	86	8.0	0.883	
7	30	0.94	6.10	705.853	76	257	255	48	91	87	9.0	0.970	30594 MF 1-A
8	35	0.96	6.25	713.145	76	257	258	49	92	89	9.0	0.980	
9	40	1.15	7.49	720.237	76	257	255	51	93	89	11.0	1.072	
10	45	0.86	5.62	728.129	75	259	258	50	93	90	8.5	0.927	
11	50	0.88	5.75	735.058	75	261	263	51	93	91	8.5	0938	
12	55	1.45	9.60	742.115	69	258	260	51	94	91	12.0	1.204	

Forms: Fielddat.frm

Steiner Environmental, Inc.

PLANT Harris-Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-27-91 RUN NO. 1-A
TEST LOCATION Hulling-Shelling B-H OPERATOR SW

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
	09:30				Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
B- 1	60	0.79	5.12	751.809	78	249	260	48	91	90	7.5	0.889	
2	65	0.78	5.07	758.204	78	252	260	46	93	91	7.5	0.883	
3	70	0.80	5.21	764.645	79	259	253	48	95	92	8.0	0.894	
4	75	0.79	5.14	771.248	80	253	252	49	96	93	8.0	0.889	
5	80	0.81	5.28	777.867	80	251	254	50	97	94	8.0	0.900	
6	85	0.82	5.35	784.462	80	253	258	53	97	94	8.0	0.906	
7	90	0.96	6.27	791.146	80	255	253	53	98	95	9.5	0.980	
8	95	0.95	6.21	798.420	80	255	250	54	99	95	9.5	0.975	
9	100	0.96	6.28	805.771	80	255	250	54	99	96	9.5	0.980	
10	105	0.93	6.07	813.055	82	256	253	56	100	97	9.0	0.964	
11	110	0.94	6.14	820.281	82	257	252	56	100	97	9.0	0.970	
12	115	0.91	5.93	827.525	83	258	258	58	100	97	8.5	0.954	Pitot √ OK.
	120			834.734									
T/A	120 min		5.70	166.000	77.21				91.	00		0.9326	

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Forms 1B: Fielddat.frm 1/91

Steiner Environmental, Inc.

PLANT Hardi's - Woolf TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 Barometric Pressure 29.68
Test Location SHELLING BAGHOUSE Static in.wg. -7.4
Run Number 2-A Probe Type/Length GL/8'
Stack Diameter 60.0" Pitot Coefficient 0.84
Operator SW Meter Box No./Y 644/0.9812
Filter No. 498 Nozzle No./Size 1555/0.2792

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	531.8	539.3	-7.5				
DI	539.3	525.9	13.4				
dry	463.5	460.3	3.2				
				Leakrate	cfm		"Hg
s.g.	711.6	684.6	27	Initial	.002		15"
		TOTAL	36.1	Final	.005		4"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	11:20												
A-1	0	0.61	3.93	835.367	87	246	245	69	95	98	3.25	0.781	Pitot O.K.
2	5	0.63	4.06	840.995	89	257	251	63	100	96	3.25	0.794	30590 FHW 3-A
3	10	0.64	4.14	846.876	89	247	248	66	103	98	3.25	0.800	
4	15	0.62	4.01	852.788	90	260	257	60	104	99	3.0	0.787	30589 FHW 3-A
5	20	0.65	4.20	858.629	91	253	250	60	104	100	3.25	0.806	
6	25	0.75	4.87	864.635	91	260	250	60	106	102	3.50	0.866	30588 FHF 3-A
7	30	0.83	5.38	871.083	92	251	252	60	106	102	3.50	0.911	
8	35	0.82	5.32	877.747	92	253	253	62	107	102	3.50	0.906	
9	40	0.81	5.26	884.518	92	252	256	62	107	104	3.50	0.900	
10	45	0.80	5.22	891.197	90	255	253	63	108	104	3.50	0.894	
11	50	0.78	5.09	897.872	90	254	251	63	108	104	3.50	0.883	
12	55	0.91	5.98	904.455	86	241	254	64	108	104	4.0	0.954	

Forms: Fielddat.frm

Steiner Environmental, Inc.

PLANT Harris - Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-27-91 RUN NO. 2-A
TEST LOCATION Shelling Bag House OPERATOR SW

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	12:25												
B- 1	60	0.72	4.66	911.622	93	249	251	64	105	105	3.25	0.849	
2	65	0.69	4.48	917.928	94	249	255	59	109	105	3.25	0.831	
3	70	0.68	4.42	924.150	94	244	262	57	110	106	3.25	0.825	
4	75	0.66	4.29	930.272	94	244	264	58	110	107	3.25	0.812	
5	80	0.65	4.22	936.413	95	245	257	59	111	107	3.25	0.806	
6	85	0.80	5.20	942.421	95	242	257	61	111	107	3.25	0.894	
7	90	0.83	5.40	948.458	95	244	263	59	111	108	3.50	0.911	
8	95	0.79	5.14	955.479	95	247	261	60	111	108	3.25	0.889	
9	100	0.78	5.06	962.153	96	246	254	62	111	108	3.25	0.883	
10	105	0.82	5.32	968.848	96	248	260	60	111	108	3.50	0.906	
11	110	0.85	5.52	975.608	96	250	251	59	111	108	3.50	0.922	
12	115	0.86	5.58	982.513	97	248	254	61	112	108	3.50	0.927	
	120			989.497									Pitot ok.
T/A	120 min		4.86	154.130	92.46				105.	77		0.8641	

Forms 1B: Fielddat.frm 1/91

Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 (SHELLING) Barometric Pressure 29.54
Test Location BAGHOUSE Static in.wg. -7.3
Run Number 3-A Probe Type/Length GL/8'
Stack Diameter 60.0" Pitot Coefficient 0.84
Operator SW Meter Box No./γ 644/0.9812
Filter No. 513 Nozzle No./Size 1555/2792

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	526.2	538.5	-12.3				
DI	567.8	561.4	6.4				
DRY	436.6	432.3	4.3				
				Leakrate	cfm		"Hg
S.G.	728.3	701.0	27.3	Initial	.007		15"
		TOTAL	25.7	Final	.004		9"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	14:15												
A-1	0	0.57	3.64	991.282	100	241	257	65	104	105	7.0	0.755	Pitot O.K.
2	5	0.58	3.74	996.825	99	259	255	63	110	108	6.0	0.762	
3	10	0.63	4.07	1001.337	99	249	249	61	111	108	6.75	0.794	30584 DHW 3-A
4	15	0.60	3.88	1008.458	99	248	257	61	112	108	6.25	0.775	
5	20	0.67	4.33	1014.263	100	246	260	62	113	110	7.0	0.819	30583 PHW-3-A
6	25	0.62	4.02	1020.345	100	252	252	61	114	111	6.5	0.787	
7	30	0.81	5.25	1026.281	100	249	249	61	114	111	7.0	0.900	30582 MF-3 A
8	35	0.80	5.19	1032.995	100	243	259	60	115	112	7.0	0.894	
9	40	0.81	5.30	1039.676	96	249	258	63	115	112	7.0	0.900	
10	45	0.75	4.89	1046.444	98	240	259	61	116	112	7.0	0.866	
11	50	0.64	4.17	1052.958	98	242	251	61	115	112	6.5	0.800	
12	55	0.35	2.28	1058.995	98	244	257	62	116	112	5.0	0.592	

Forms: Fieldat.frm

Steiner Environmental, Inc.

PLANT Harris-Woolf TEST TYPE M-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-27-91 RUN NO. 3-A
TEST LOCATION Shelling Bag House OPERATOR SW

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	15:20												
B - 1	60	0.62	4.03	1064.111	98	256	252	63	113	111	6.5	0.787	
2	65	0.66	4.29	1070.008	100	258	260	62	116	112	6.75	0.812	
3	70	0.63	4.09	1076.084	101	254	256	60	117	112	6.5	0.794	
4	75	0.62	4.03	1082.047	101	251	253	61	117	113	6.5	0.787	
5	80	0.70	4.56	1087.964	101	251	261	63	118	114	7.0	0.837	
6	85	0.68	4.43	1094.222	100	257	257	62	118	114	7.0	0.825	
7	90	0.85	5.53	1100.409	101	255	250	62	118	114	8.0	0.922	
8	95	0.82	5.35	1107.267	100	255	250	63	118	115	8.0	0.906	
9	100	0.88	5.73	1114.068	100	255	259	62	117	114	9.0	0.938	
10	105	0.84	5.48	1121.105	99	255	257	63	117	114	8.75	0.917	
11	110	0.87	5.66	1128.012	100	258	257	63	116	114	9.0	0933	
12	115	0.91	5.93	1135.018	99	25	252	64	116	114	9.0	0.954	
	120			1142.209									Pitot/O.K.
T/A	120 min		4.58	150.927	99.46				113.	29		0.8356	

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Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 Barometric Pressure 29.83
Test Location SHELLING ENGHOUSE Static in.wg. -6.9
Run Number 1-B OUT Probe Type/Length GC-6'
Stack Diameter 34" Pitot Coefficient 0.84
Operator SC Meter Box No./γ 279/1.0081
Filter No. 518 Nozzle No./Size #208/0.2637

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	549.2	552.3	-3.1		0	20.9	
DI	583.5	573.0	10.5				
Dry	465.8	463.4	2.4				
				Leakrate	cfm		"Hg
S.G.	618.4	599.0	19.4	Initial	.014		15
		TOTAL	29.2	Final	.008		9

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	0830												
A-1	0	0.34	1.83	265.837	74	250	251	63	74	75	2.0	0.583	PITOT OK
2	5	0.37	2.03	269.635	75	253	247	63	92	79	2.0	0.608	
3	10	0.36	1.98	273.652	75	256	249	63	95	81	2.5	0.600	30593 BHW 1-B
4	15	0.47	2.60	277.666	76	253	250	64	97	89	3.0	0.686	
5	20	0.44	2.44	282.168	76	251	258	63	100	89	2.5	0.663	30592 BHW-1-B
6	25	0.41	2.27	286.534	78	257	260	64	102	87	2.5	0.640	
7	30	0.87	4.82	290.828	77	248	265	64	101	88	4.0	0.933	30591 BHF-1-B
8	35	0.54	3.01	296.682	77	247	261	64	103	90	3.0	0.735	
9	40	0.43	2.40	301.503	78	249	258	63	104	92	3.0	0.656	
10	45	0.37	2.06	305.823	77	249	252	64	102	92	2.5	0.608	
11	50	0.38	2.11	309.840	79	251	256	64	104	92	3.0	0.616	
12	55	0.36	2.00	313.982	79	262	251	65	104	93	2.5	0.600	
	60			317.980									

Forms: Fielddat.frm

Steiner Environmental, Inc.

PLANT HARRIS-WOOLF TEST TYPE METHOD-5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-27-91 RUN NO. 1-B
TEST LOCATION SHELLING BAGHOUSE OPERATOR SC
DUCT - B

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	0935												
B-1	60	0.50	2.76	317.980	79	261	257	64	95	92	3.0	0.707	
2	65	0.50	2.77	322.464	80	265	259	64	102	93	3.0	0.707	
3	70	0.57	3.16	326.865	81	262	260	65	103	93	3.0	0.755	
4	75	0.65	3.60	331.470	81	261	258	65	104	93	3.0	0.806	
5	80	0.50	2.77	336.272	82	259	260	65	106	93	3.0	0.707	
6	85	0.90	4.99	340.660	82	261	259	66	106	94	4.0	0.949	
7	90	0.77	4.29	346.375	82	264	248	66	108	96	3.5	0.877	
8	95	0.50	2.78	351.675	83	258	250	67	109	97	3.0	0.707	
9	100	0.45	2.51	356.168	83	258	248	66	109	98	3.0	0.671	
10	105	0.40	2.23	360.432	83	253	251	66	109	98	2.5	0.632	
11	110	0.70	3.89	364.546	85	247	250	65	110	99	3.5	0.837	
12	115	0.76	4.24	370.197	85	250	252	66	111	100	4.0	0.872	
1035	120			375.472									PITOT OK
T/A			2.90	109.635	79.46				96.73			0.714	

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Stellner Environmental, Inc.

PLANT HARRIS WOOD TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 Barometric Pressure 29.68
Test Location SMELTING & H. Static in.wg. -6.5
Run Number 2-B-DUCT Probe Type/Length 6G- 6'
Stack Diameter 34" Pitot Coefficient 0.84
Operator SC Meter Box No./Y 729/1.0081
Filter No. 519 Nozzle No./Size 208/0.2637

IMPINGER VOLUMES/WEIGHTS			
Contents	final	initial	Net
DI	533.9	541.4	-7.50
DI	527.6	519.7	7.90
DRY	463.0	461.4	1.6
S.G.	650.1	629.8	20.3
		TOTAL	22.3

GAS COMPOSITION			
Time	CO_2	O_2	CO
	0	20.9	

Leakrate	cfm	"Hg
Initial	.012	15
Final	.010	12

Sample Point	Time 11:20	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in.Hg	√ΔP	Comments
A-1	0	0.33	1.78	376.875	89	249	257	63	93	92	7.0	0.574	PITOT OK
2	5	0.40	2.16	380.568	89	251	260	63	95	90	7.0	0.632	
3	10	0.45	2.43	384.600	90	253	255	63	99	91	8.0	0.671	30587 BHW-2-B
4	15	0.45	2.46	388.832	90	252	252	64	104	94	8.5	0.671	
5	20	0.49	2.66	393.098	93	248	251	64	105	95	9.0	0.700	30586 FHW-2-B
6	25	0.42	2.30	397.542	92	254	249	64	108	97	8.0	0.648	
7	30	0.93	5.10	401.734	92	250	251	64	110	98	12.0	0.968	30585 MF-2-B
8	35	0.65	3.56	407.125	93	255	248	64	108	101	10.0	0.806	
9	40	0.50	2.74	412.330	93	255	256	64	108	102	8.5	0.707	
10	45	0.45	2.48	416.795	93	248	254	64	112	103	8.5	0.671	
11	50	0.39	2.15	420.999	94	248	256	65	113	104	7.5	0.624	
12	55	0.40	2.20	424.965	95	250	257	65	114	105	7.0	0.632	
	60			428.865									

Forms: Fielddat.frm

Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 2 of 2)
DATE 9-27-91 RUN NO. 2-B
TEST LOCATION SHELLING - BRIGHOUSE OPERATOR SC
DUCT - B

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	12:25												
B-1	60	0.52	2.84	428.865	96	260	248	62	107	104	8.5	0.721	
2	65	0.47	2.58	432.136	95	259	252	63	111	104	8.0	0.686	
3	70	0.59	3.25	437.474	95	263	254	63	113	105	8.5	0.768	
4	75	0.67	3.68	441.985	96	251	247	63	113	105	10.0	0.819	
5	80	0.50	2.75	446.796	95	256	249	63	113	105	9.5	0.707	
6	85	0.89	4.91	451.055	96	248	256	64	115	107	12.0	0.943	
7	90	0.76	4.18	456.171	96	248	251	64	113	107	12.0	0.872	
8	95	0.55	3.03	461.375	96	252	257	64	113	107	9.5	0.742	
9	100	0.39	2.15	466.325	96	251	256	64	114	108	7.0	0.624	
10	105	0.42	2.32	470.225	97	247	248	64	117	108	7.5	0.648	
11	110	0.73	4.04	474.392	98	247	250	65	120	110	12.0	0.854	
12	115	0.80	4.42	479.564	98	254	251	65	117	110	12.0	0.894	
1325	120			484.947									PITOT OK
			3.007	108.072	94.04				105.97			0.7324	

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Steiner Environmental, Inc.

PLANT HARRIS - WOOLF TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)

Date 9-27-91 Barometric Pressure 29.54
Test Location SHELVING B.H. REF Static in.wg. -5.6
Run Number 3-B Probe Type/Length 6C-6'
Stack Diameter 24" Pitot Coefficient 0.84
Operator SC Meter Box No./γ 779/1.0081
Filter No. 520 Nozzle No./Size 208/0.2637

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	535.7	547.2	-11.5				
DI	545.2	536.7	8.5				
DRY	447.9	445.4	2.5				
				Leakrate	cfm		"Hg
S.G.	649.4	627.4	22.0	Initial	.009		15
		TOTAL	21.5	Final	.009		12

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	14:15												
A-1	0	0.35	1.90	485.697	97	248	265	64	102	102	5.0	0.592	PITOT OK
2	5	0.35	1.89	489.084	100	251	263	63	105	100	5.0	0592	
3	10	0.40	2.18	492.838	100	250	261	63	112	102	5.5	0.632	30585 RHW 3-B
4	15	0.47	2.57	496.761	100	256	258	63	115	106	7.0	0.686	
5	20	0.45	2.45	500.871	105	249	255	63	117	107	7.0	0.671	30580 PHW-3B
6	25	0.45	2.47	505.130	99	249	251	63	118	106	7.0	0.671	
7	30	0.93	5.13	509.352	100	257	249	63	122	109	12.0	0.964	
8	35	0.50	2.75	514.970	101	251	254	63	118	110	7.0	0.707	30579 PHP-3-B
9	40	0.45	2.49	519.348	101	256	250	64	122	113	6.0	0.671	
10	45	0.40	2.21	523.395	100	252	259	64	120	112	5.5	0.632	
11	50	0.40	2.21	527.308	102	256	260	64	122	113	5.5	0.632	
12	55	0.38	2.10	531.125	101	251	262	64	122	113	5.5	0.616	
	60			534.964									

Forms: Fielddat.frm

Steiner Environmental, Inc.

PLANT HARRIS - HOUSE TEST TYPE METHOD 5 FIELD TEST DATA SHEET (Page 1 of 2)
DATE 9-27-91 RUN NO. 3-B DUCT
TEST LOCATION BAGHOUSE OUT DUCT - B OPERATOR SC

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	TEMPERATURE °F						Pump Vacuum in.Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
	1520												
B-1	60	.0.5	2.75	534.964	101	247	257	63	115	112	6.5	0.707	
2	65	.50	2.75	539.200	102	250	254	63	121	112	6.5	0.707	
3	70	0.60	3.31	543.400	102	251	257	64	122	113	8.0	0.775	70 MIN. GAS METER STOPPED
4	75	0.60	3.31	548.165	103	249	254	64	123	113	8.0	0.775	RUNNING FOR 5 SECS.
5	80	0.52	2.88	552.485	102	250	251	64	123	115	7.0	0.721	
6	85	0.78	4.31	556.880	103	248	253	64	123	115	10.0	0.883	QC30 STICKING
7	90	0.61	3.37	561.754	103	250	251	64	124	115	8.0	0.781	QS IT TURNS
8	95	0.40	2.21	566.571	103	256	250	64	123	115	6.0	0.632	87.4 MIN
9	100	0.40	2.21	570.457	103	256	253	65	124	115	6.0	0.632	METER STOPS AGAIN
10	105	0.42	2.32	574.363	103	254	252	65	125	115	6.5	0.648	
11	110	0.65	3.60	578.440	103	253	251	65	125	115	8.0	0.806	
12	115	0.70	3.89	583.265	101	256	251	65	125	116	8.0	0.837	
1620	120			589.044									PITOT OK
			2.80	103.347	101.46				115.25			0.7071	

Steiner Environmental, Inc.

Date: 9-27-91

Test Location: SHELLING BAGHOUSE HARRIS - WOLF

SAMPLE HANDLING/LOG-IN

NO	SAMPLE TYPE	VOLUME	COMMENTS
1	30596 5 Meth BHW Sample 1 Test		
2	30595 5 Meth FHW Sample 1 Test		
3	30594 5 Meth MF Sample 1 Test		
4	30593 5 Meth BHW Sample 1 Test		
5	30592 5 Meth FHW Sample 1 Test		
6	30591 5 Meth MF Sample 1 Test		
7	30590 5 Meth BHW Sample 2 Test		
8	30589 5 Meth FHW Sample 2 Test		
9	30588 5 Meth MF Sample 2 Test		
10	30587 5 Meth BHW Sample 2 Test		
11	30586 5 Meth FHW Sample 2 Test		
12	30585 5 Meth MF Sample 2 Test		

CHAIN-OF-CUSTODY

Signature	Date/Time	Signature	Date/Time
S. Cochran	2240 / 9-27-91		
M. Cabrera	10.3-91		

Steiner Environmental, Inc.

Date: 9-27-91

Test Location: SHELLING BAGHOUSE HARRIS-WOOLF

SAMPLE HANDLING/LOG-IN

NO	SAMPLE TYPE	VOLUME	COMMENTS
1	30584 5 Meth BHW Sample 3 Test		
2	30583 5 Meth FHW Sample 3 Test		
3	30582 5 Meth MF Sample 3 Test		
4	30581 5 Meth BHW Sample 3 Test		
5	30580 5 Meth FHW Sample 3 Test		
6	30579 5 Meth MF Sample 3 Test		
7			
8			
9			
10			
11			
12			

CHAIN-OF-CUSTODY

Signature	Date/Time	Signature	Date/Time
S. Coghan	2235 / 9-27-91		
M. Carnasco	10-3-91		

Steiner Environmental, Inc.

Date: 9-23-91

Test Location: HARRIS- HOOKF

SAMPLE HANDLING/LOG-IN

NO	SAMPLE TYPE	VOLUME	COMMENTS
1	30608 S Meth BLK Sample AL Test		
2	30607 S Meth BLK Sample AL Test		
3	30606 S Meth BLK Sample AL Test		
4	30605 S Meth BHW Sample 1 Test		
5	30604 S Meth FHW Sample 1 Test		
6	30603 S Meth MF Sample 1 Test		
7	30602 S Meth BHW Sample 2 Test		
8	30601 S Meth FHW Sample 2 Test		
9	30600 S Meth MF Sample 2 Test		
10	30599 S Meth BHW Sample 3 Test		
11	30598 S Meth FHW Sample 3 Test		
12	30597 S Meth MF Sample 3 Test		

CHAIN-OF-CUSTODY

Signature	Date/Time	Signature	Date/Time
S. Coghlan	9-23-91 1540		
M. Carnaster	10-3-91		

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FHW ANALYSIS (g) DATE : 09-24-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :Acetone ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Pre-cleaning Baghouse,
ANALYTICAL METHOD :GRAVIMETRIC

	Test No.	Sample Volume (ml)		Analytical Result (total sample) Uncorrected	Blank Corr. (g)
	1	105		0.02507	0.02498
	2	150		0.04336	0.04322
	3	160		0.04175	0.04161
	Blank	100		0.00009	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FILTERABLE PARTICULATE DATE : 09-24-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :100 mm FILTER ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Pre-cleaning Baghouse,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Filter No.	Analytical Result (total sample) Uncorrected	Blank Corr. (g)
1	457	0.00632	0.00618
2	484	0.00481	0.00467
3	490	0.00548	0.00534
Blank		0.00014	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :CONDENSIBLE PARTICULATE DATE : 09-24-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :DiH2O ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Pre-cleaning Baghouse,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Sample Volume	Analytical Result (total sample) grams Uncorrected	Blank Corrected
1	325	0.00183	0.00154
2	365	0.00172	0.00139
3	395	0.00166	0.00130
Blank	100	0.00009	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FHW ANALYSIS (g) DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :Acetone ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct A,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Sample Volume (ml)	Analytical Result (total sample) Uncorrected	Blank Corr. (g)
1	95	0.01757	0.01748
2	100	0.01198	0.01189
3	105	0.01070	0.01061
Blank	100	0.00009	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FILTERABLE PARTICULATE DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :100 mm FILTER ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct A,
ANALYTICAL METHOD :GRAVIMETRIC

	Test No.	Filter No.		Analytical Result (total sample) Uncorrected	Blank Corr. (g)
	1	485		0.00053	0.00039
	2	492		0.00106	0.00092
	3	513		0.00014	0.00000
	Blank			0.00014	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :CONDENSIBLE PARTICULATE DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :DiH2O ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct A,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Sample Volume	Analytical Result (total sample) grams Uncorrected	Blank Corrected
1	330	0.00242	0.00212
2	345	0.00233	0.00202
3	330	0.00788	0.00758
Blank	100	0.00009	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FHW ANALYSIS (g) DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :Acetone ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct B,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Sample Volume (ml)	Analytical Result (total sample) Uncorrected	Blank Corr. (g)
1	110	0.01230	0.01220
2	130	0.00991	0.00979
3	120	0.01052	0.01041
Blank	100	0.00009	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :FILTERABLE PARTICULATE DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :100 mm FILTER ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct B,
ANALYTICAL METHOD :GRAVIMETRIC

Test No.	Filter No.	Analytical Result (total sample) Uncorrected	Blank Corr. (g)
1	518	0.00145	0.00131
2	519	0.00020	0.00006
3	520	-0.00089	-0.00103
Blank		0.00014	

A N A L Y T I C A L R E P O R T

SAMPLE TYPE :CONDENSIBLE PARTICULATE DATE : 09-27-91
SAMPLING METHOD :M5
SAMPLE COMPONENT :DiH2O ANALYST : MC & KG
REQUESTED BY :Harris-Woolf, Shelling Baghouse Duct B,
ANALYTICAL METHOD :GRAVIMETRIC

	Test No.	Sample Volume	Analytical Result (total sample) grams Uncorrected	Blank Corrected
	1	350	0.00229	0.00198
	2	390	0.00475	0.00440
	3	340	0.00241	0.00210
	Blank	100	0.00009	

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 1
DATE : SEPT 23,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 114.75 DEG. F		STATIC PRESS.	= -5.50	in. H2O
STACK TEMP.	= 93.29 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.9310 in. H2O		STACK I.D.	= 43.00	inch
METER ORIFICE	= 2.99 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 111.376 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 1.0081		STACK AREA	= 10.085	Sq.Ft.
BAR. PRESSURE	= 29.15 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 25.1 ml		NOZZLE DIA.	= 0.2333	inch

GAS ANALYSIS = 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 99.715 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 1.164 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.012 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.054

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.71

P(stack) = Pbar + [Pstatic / 13.6] ..... = 28.75 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 54.74 ft/sec

Qs = vs x As x 60 ..... = 33,123 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 29,563 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 95.49 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 2
DATE : SEPT 23,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 118.1 DEG. F		STATIC PRESS.	= -5.43	in. H2O
STACK TEMP.	= 100.17 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.9098 in. H2O		STACK I.D.	= 43.00	inch
METER ORIFICE	= 2.83 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 107.662 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 1.0081		STACK AREA	= 10.085	Sq.Ft.
BAR. PRESSURE	= 29.58 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 18.0 ml		NOZZLE DIA.	= 0.2333	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 97.196 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 0.834 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.009 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.066

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.74

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.18 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 53.39 ft/sec

Qs = vs x As x 60 ..... = 32,307 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 29,000 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 94.88 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 3
DATE : SEPT 23,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 119.29 DEG. F	STATIC PRESS.	=	-5.40	in. H2O
STACK TEMP.	= 101.08 DEG. F	Cp	=	0.840	
SQ.RT. dP	= 0.8511 in. H2O	STACK I.D.	=	43.00	inch
METER ORIFICE	= 2.55 in. H2O	DUCT LENGTH	=		inch
METER VOLUME	= 105.539 Cu.Ft.	DUCT WIDTH	=		inch
METER Y	= 1.0081	STACK AREA	=	10.085	Sq.Ft.
BAR. PRESSURE	= 29.52 in.Hg	TEST TIME	=	120.00	min.
COND.(Vlc)	= 17.2 ml	NOZZLE DIA.	=	0.2333	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460).....	=	94.826	dscf
Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic	=	0.797	scf
Bws = Vw(std) / (Vm(std) + Vw(std)).....	=	0.008	Lower Bws value used.
Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.)	=	0.068	
%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100	=	**********	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	28.84	
Ms = (Md x (1-Bws)) + (18.0 x Bws).....	=	28.75	
P(stack) = Pbar + [Pstatic / 13.6]	=	29.12	in. Hg
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)]	=	50.04	ft/sec
Qs = vs x As x 60	=	30,276	acf/min
Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92)	=	27,084	dscf/min
I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60)	=	99.12	%

SOURCE TEST CALCULATIONS

PLANT : HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 1
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 91 DEG. F		STATIC PRESS.	= -7.40	in. H2O
STACK TEMP.	= 77.21 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.9326 in. H2O		STACK I.D.	= 60.00	inch
METER ORIFICE	= 5.70 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 166.000 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 0.9812		STACK AREA	= 19.635	Sq.Ft.
BAR. PRESSURE	= 29.83 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 38.4 ml		NOZZLE DIA.	= 0.2792	inch

GAS ANALYSIS = 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 155.406 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 1.780 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.011 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.032

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.71

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.29 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 53.53 ft/sec

Qs = vs x As x 60 ..... = 63,063 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 59,072 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 101.25 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 2
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 105.77 DEG. F		STATIC PRESS.	= -7.40	in. H2O
STACK TEMP.	= 92.46 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.8641 in. H2O		STACK I.D.	= 60.00	inch
METER ORIFICE	= 4.86 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 154.130 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 0.9812		STACK AREA	= 19.635	Sq.Ft.
BAR. PRESSURE	= 29.68 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 36.1 ml		NOZZLE DIA.	= 0.2792	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 139.543 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 1.673 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.012 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.052

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.71

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.14 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 50.43 ft/sec

Qs = vs x As x 60 ..... = 59,412 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 53,811 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 99.80 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 3
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 113.29 DEG. F		STATIC PRESS.	= -7.30	in. H2O
STACK TEMP.	= 99.46 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.8356 in. H2O		STACK I.D.	= 60.00	inch
METER ORIFICE	= 4.58 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 150.927 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 0.9812		STACK AREA	= 19.635	Sq.Ft.
BAR. PRESSURE	= 29.54 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 25.7 ml		NOZZLE DIA.	= 0.2792	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 134.130 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 1.191 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.009 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.065

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.74

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.00 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 49.16 ft/sec

Qs = vs x As x 60 ..... = 57,915 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 51,721 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 99.80 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 1
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 93.73 DEG. F		STATIC PRESS.	= -6.90	in. H2O
STACK TEMP.	= 79.46 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.7148 in. H2O		STACK I.D.	= 34.00	inch
METER ORIFICE	= 2.90 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 109.635 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 1.0081		STACK AREA	= 6.305	Sq.Ft.
BAR. PRESSURE	= 29.83 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 29.2 ml		NOZZLE DIA.	= 0.2637	inch

GAS ANALYSIS	= 20.90	% O2	0.00	% CO	
	0.00	% CO2	79.10	% N2	

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 104.218 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 1.354 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.013 | Lower Bws

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 0.034 | value used.

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = **********

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.70

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.32 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 41.10 ft/sec

Qs = vs x As x 60 ..... = 15,548 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 14,500 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = 99.57 %

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 2
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 105.97 DEG. F		STATIC PRESS.	= -6.50	in. H2O
STACK TEMP.	= 94.04 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.7324 in. H2O		STACK I.D.	= 34.00	inch
METER ORIFICE	= 3.01 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 108.072 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 1.0081		STACK AREA	= 6.305	Sq.Ft.
BAR. PRESSURE	= 29.68 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 22.3 ml		NOZZLE DIA.	= 0.2637	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460).....	=	100.036	dscf
Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic	=	1.034	scf
Bws = Vw(std) / (Vm(std) + Vw(std)).....	=	0.010	Lower Bws value used.
Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.)	=	0.055	
%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100	=	**********	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	28.84	
Ms = (Md x (1-Bws)) + (18.0 x Bws).....	=	28.73	
P(stack) = Pbar + [Pstatic / 13.6]	=	29.20	in. Hg
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)]	=	42.74	ft/sec
Qs = vs x As x 60	=	16,170	acf/min
Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92)	=	14,661	dscf/min
I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60)	=	94.53	%

SOURCE TEST CALCULATIONS

PLANT : HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 3
DATE : SEPT 27,1991

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 115.25 DEG. F		STATIC PRESS.	= -5.60	in. H2O
STACK TEMP.	= 101.46 DEG. F		Cp	= 0.840	
SQ.RT. dP	= 0.7071 in. H2O		STACK I.D.	= 34.00	inch
METER ORIFICE	= 2.80 in. H2O		DUCT LENGTH	=	inch
METER VOLUME	= 103.347 Cu.Ft.		DUCT WIDTH	=	inch
METER Y	= 1.0081		STACK AREA	= 6.305	Sq.Ft.
BAR. PRESSURE	= 29.54 in.Hg		TEST TIME	= 120.00	min.
COND.(Vlc)	= 21.5 ml		NOZZLE DIA.	= 0.2637	inch

GAS ANALYSIS : 20.90 % O2 0.00 % CO
0.00 % CO2 79.10 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460).....	=	93.630	dscf
Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic	=	0.997	scf
Bws = Vw(std) / (Vm(std) + Vw(std)).....	=	0.011	Lower Bws value used.
Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.)	=	0.068	
%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 =		**********	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	28.84	
Ms = (Md x (1-Bws)) + (18.0 x Bws).....	=	28.72	
P(stack) = Pbar + [Pstatic / 13.6]	=	29.13	in. Hg
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)]	=	41.60	ft/sec
Qs = vs x As x 60	=	15,736	acf/min
Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92)	=	14,039	dscf/min
I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) =		92.39	%

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 1
DATE : SEPT 23,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.02498 grams	Vm(std)	99.715	ft3
Mass Filter (MF)	0.00618 grams	Vw(std)	1.164	ft3
Back Half Wash (BHW)	0.00154 grams	Qs(std)	29,563	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.012	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0048	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0048	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.22	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0050	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0051	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.28	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 2
DATE : SEPT 23,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.04322 grams	Vm(std)	97.196	ft3
Mass Filter (MF)	0.00467 grams	Vw(std)	0.834	ft3
Back Half Wash (BHW)	0.00139 grams	Qs(std)	29,000	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.009	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0075	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0076	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.89	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0078	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0078	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.94	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
PRE-CLEANING BAGHOUSE

RUN NO.: 3
DATE : SEPT 23,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.04161 grams	Vm(std)	94.826	ft3
Mass Filter (MF)	0.00534 grams	Vw(std)	0.797	ft3
Back Half Wash (BHW)	0.00130 grams	Qs(std)	27,084	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.008	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0076	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0076	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.77	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0078	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0079	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.82	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 1
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.01748 grams	Vm(std)	155.406	ft3
Mass Filter (MF)	0.00039 grams	Vw(std)	1.780	ft3
Back Half Wash (BHW)	0.00212 grams	Qs(std)	59,072	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.011	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0018	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0018	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.90	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0020	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0020	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	1.00	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 2
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.01189 grams	Vm(std)	139.543 ft3
Mass Filter (MF)	0.00092 grams	Vw(std)	1.673 ft3
Back Half Wash (BHW)	0.00202 grams	Qs(std)	53,811 dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.012
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00 %
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90 %

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0014	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0014	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.65	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0016	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0016	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.76	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS MOOLF
HULL/SHELL-A

RUN NO.: 3
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.01061	grams	Vm(std)	134.130	ft3
Mass Filter (MF)	0.00000	grams	Vw(std)	1.191	ft3
Back Half Wash (BHW)	0.00758	grams	Qs(std)	51,721	dscfm
Front Half Sulfate (FHS)	0.00	mg H2SO4	Bws	0.009	
Back Half Sulfate (BHS)	0.00	mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00	mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0012	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0012	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.54	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0021	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0021	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.93	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 1
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.01220 grams	Vm(std)	104.218	ft3
Mass Filter (MF)	0.00131 grams	Vw(std)	1.354	ft3
Back Half Wash (BHW)	0.00198 grams	Qs(std)	14,500	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.013	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0020	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0020	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.25	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0023	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0023	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.29	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 2
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.00979 grams	Vm(std)	100.036	ft3
Mass Filter (MF)	0.00006 grams	Vw(std)	1.034	ft3
Back Half Wash (BHW)	0.00440 grams	Qs(std)	14,661	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.010	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0015	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0015	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.19	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0022	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0022	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.28	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

EMISSION RATE CALCULATIONS

PLANT :HARRIS WOOLF
HULL/SHELL-B

RUN NO.: 3
DATE : SEPT 27,1991
O2 CORR.: 3.0 %

STANDARD TEMP. : 60 DEG. F

Front Half Wash (FHW)	0.01041 grams	Vm(std)	93.630	ft3
Mass Filter (MF)	0.00000 grams	Vw(std)	0.997	ft3
Back Half Wash (BHW)	0.00210 grams	Qs(std)	14,039	dscfm
Front Half Sulfate (FHS)	0.00 mg H2SO4	Bws	0.011	
Back Half Sulfate (BHS)	0.00 mg H2SO4	CO2	0.00	%
H2O2 Catch (SO2)	0.00 mg H2SO4	O2	20.90	%

F-FACTOR

10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460)/528] ..... dscf/MMBtu

FILTERABLE PARTICULATE

15.432 x (FHW + MF) / [Vm(std) + Vw(std)]	0.0017	gr/scf
15.432 x (FHW + MF) / Vm(std)	0.0017	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.21	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0020	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0021	gr/dscf
gr/dscf x (12 / %CO2)		@ 12% CO2
0.00857 x Qs(std) x gr/dscf	0.25	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu

TOTAL SULFATE

0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)]	gr/scf
0.015432 x (FHS + BHS) / Vm(std)	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
0.00857 x Qs(std) x gr/dscf	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..	lb/MMBtu

SULFUR DIOXIDE (SO2)

1.60982 x [T(std) + 460] x (mg H2SO4) / [98.076 x Vm(std)]	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460]..	lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

SULFUR (S)

(lb/MMBtu SO2) / 2	lb/MMBtu
(lb/MMBtu Total Sulfate) x (32 / 98.076)	lb/MMBtu
Total Sulfur	lb/MMBtu

DRY GAS METER / ORIFICE METER CALIBRATION DATA

Date .....07/22/91 | Dry Gas Meter No. ... 658977
Bar. Press, in.Hg 29.72 | Standard Test Meter # 69279
Meter Box No. ... 779 | Operator ..... DM

STANDARD TEST METER			DRY TEST METER				
Press. dHs (in. H2O)	Temp. Ts (dF)	Volume Vs (ft3)	Press. dH (in. H2O)	Temp. Tdi (dF)	Temp. Tdo (dF)	Volume Vd (ft3)	Time t (min)
	70.0	279.390		96	93	207.738	
-1.0	69.0	260.522	0.5	94	89	187.938	49.0
Avg/Net :	69.5	18.868			93	19.800	
	72.0	341.427		109	98	271.362	
-1.5	71.0	321.939	1.0	100	95	251.184	36.0
Avg/Net :	71.5	19.488			101	20.178	
	68.0	259.770		100	88	187.152	
-1.8	68.0	239.616	1.5	76	77	166.532	31.0
Avg/Net :	68.0	20.154			85	20.620	
	71.0	321.256		103	95	250.486	
-2.3	70.0	300.894	2.0	100	95	229.639	27.0
Avg/Net :	70.5	20.362			98	20.847	
	70.0	300.258		105	95	228.980	
-3.0	70.0	280.112	3.0	97	93	208.485	22.0
Avg/Net :	70.0	20.146			98	20.495	

y = Vs x (Pbar + (dHs / 13.6)) x (Avg. Td + 460) / [Vd x (Pbar + (dH / 13.6)) x (Ts + 460)]

Ko = [(Vs/t) x [(Tdo + 460) / (Ts + 460)] x [(Pbar + (dHs/13.6) / (Pbar + (dH/13.6)] / [((Tdo + 460) x dH) / (Pbar + (dH/13.6)) x (Ms)]^0.5

dH :	0.5	1.0	1.5	2.0	3.0	Avg.	Std.Dev.
y :	0.9915	1.0122	1.0011	1.0169	1.0187	1.0081	0.0103
Ko :	0.706	0.7014	0.6827	0.6891	0.6812	0.6921	0.0100

y : 1.02 % Relative Std. Dev.

Ko : 1.44 % Relative Std. Dev.

DRY GAS METER / ORIFICE METER CALIBRATION DATA

Date .....SEPT 21,1991 — Dry Gas Meter No. ... 1008455
Bar. Press, in.Hg 29.57 — Standard Test Meter # 69279
Meter Box No. ... 644 — Operator ..... JS

STANDARD TEST METER			DRY TEST METER				
Press. dHs (in. H2O)	Temp. Ts (dF)	Volume Vs (ft3)	Press. dH (in. H2O)	Temp. Tdi (dF)	Temp. Tdo (dF)	Volume Vd (ft3)	Time t (min)
	80.0	717.379		108	106	571.366	
-1.0	75.0	697.129	0.5	97	92	550.107	50.0
Avg/Net :	77.5	20.250			101	21.259	
	82.0	740.078		113	110	595.624	
-1.6	80.0	719.864	1.0	110	107	574.012	36.0
Avg/Net :	81.0	20.214			110	21.612	
	83.0	762.838		116	113	620.017	
-2.0	82.0	742.021	1.5	114	110	597.714	31.0
Avg/Net :	82.5	20.817			113	22.303	
	84.0	784.980		117	114	643.633	
-2.5	83.0	765.340	2.0	116	113	622.711	25.0
Avg/Net :	83.5	19.640			115	20.922	
	85.0	808.084		120	117	668.286	
-3.5	85.0	787.858	3.0	118	114	646.712	21.0
Avg/Net :	85.0	20.226			117	21.574	

$$y = Vs \times (Pbar + (dHs / 13.6)) \times (Avg.\ Td + 460) / [\ Vd \times (Pbar + (dH / 13.6)) \times (\ Ts + 460)]$$

$$Ko = [(Vs/t) \times [(Tdo + 460) / (Ts + 460)] \times [(Pbar + (dHs/13.6) / (Pbar + (dH/13.6)] / [((Tdo + 460) \times dH) / (Pbar + (dH/13.6)) \times (Mm)]^{0.5}$$

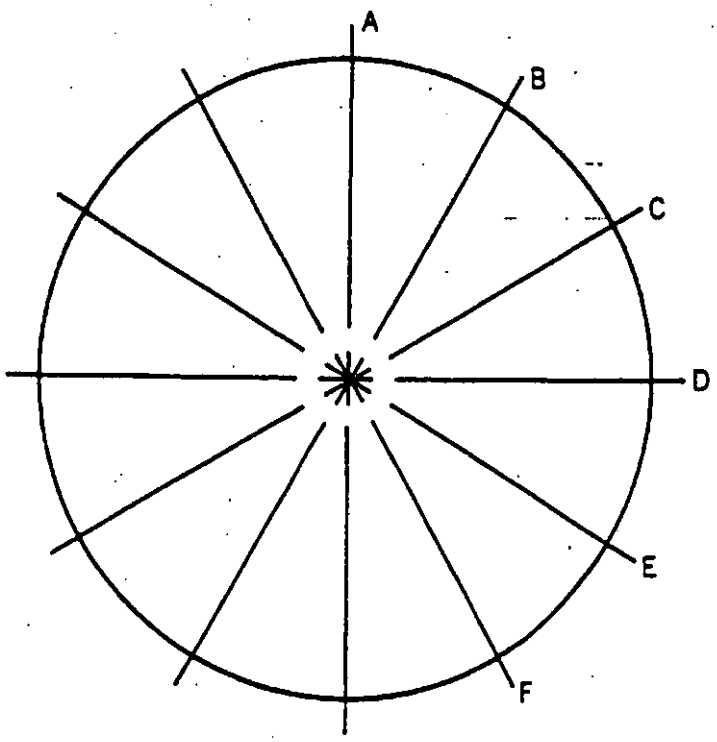
dH :	0.5	1.0	1.5	2.0	3.0	Avg.	Std.Dev.
y :	0.9902	0.9791	0.9777	0.9821	0.9771	0.9812	0.0048
Ko :	0.7351	0.7204	0.7022	0.7101	0.7074	0.7150	0.0116

y : 0.49 % Relative Std. Dev.

Ko : 1.63 % Relative Std. Dev.

Steiner Environmental, Inc.

NOZZLE CALIBRATION



DIAMETER (in.)

A 0.2332

B 0.2342

C 0.2325

D 0.2331

E _____

F _____

AVG. 0.2333

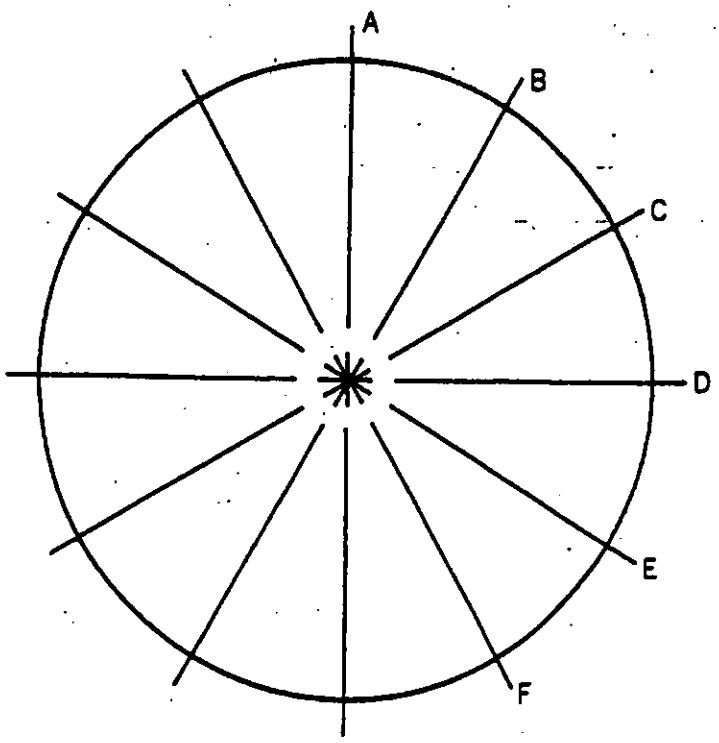
DATE 7-18-91

NOZZLE NO. 1458

OPERATOR SW

Steiner Environmental, Inc.

NOZZLE CALIBRATION



DIAMETER (in.)

A .2781

B .2815

C .2790

D .2782

E _____

F _____

AVG. .2792

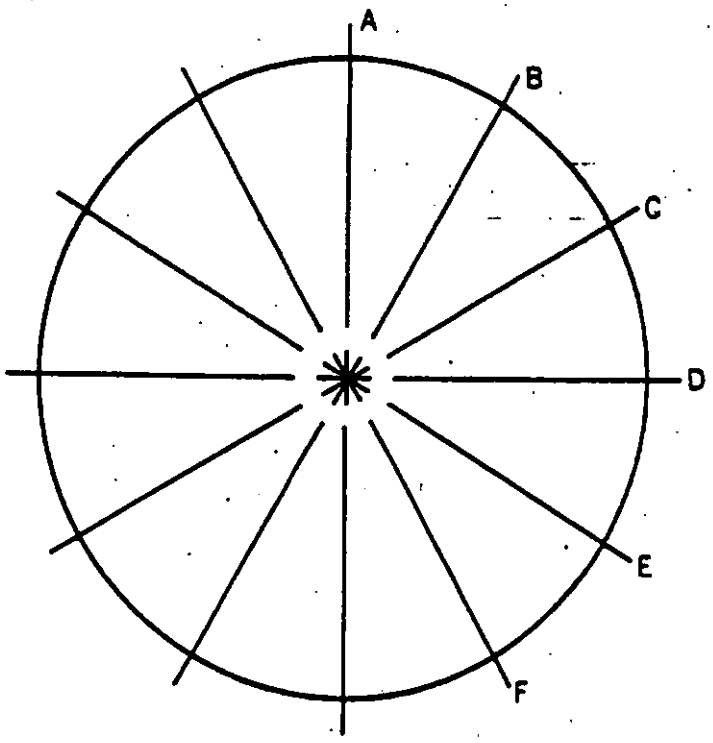
DATE 7-18-91

NOZZLE NO. 1555

OPERATOR SW

Steiner Environmental, Inc.

NOZZLE CALIBRATION



DIAMETER (in.)

A 0.2619

B 0.2625

C 0.2645

D 0.2660

E _____

F _____

AVG. 0.2637

DATE 7-18-91

NOZZLE NO. 208

OPERATOR SW

APPENDIX B

HARRIS WOOLF OPERATING DATA

000542

HARRIS - WOOLF
CALIFORNIA ALMONDS

RECEIVED
OCT - 8 1991
Ans'd............

HULLER LOG

DATE. 9-27-91

	TIME	SCALETICKET NUMBER	GROWER	FIELD	TANK NUMBER	INCOMING FIELDRUN LBS	Comments
Am 1	7:35	1916	CVLC	Sec 8 Blok 4	5	54 560	}
Am 2	9:20	1943	CVLC	Sec 8 Blok 4	3	16 490	} Test 1
Am 3	10:40	1941	Harris Farms	16-15-16	2	43440	}
Pm 4	12:45	1944	Harris Farms	NW 1/4 26-18-16	1	43 820	← Test 2
Pm 5	2:35	1947	Harris Farms	SE 16	3	24 330	}
Pm 6	3:35	1946	Harris Farms	NW 24	5	18 660	} Test 3
Pm 7	4:35	1949	Harris Farms	NW 1/4 26-18-16	2	42,790	Total Fieldrun
8	Stop	600 pm					200,650
9		Shear	Rollers	}			
10		Air	legs	}	BAge	house	Test
11		Run	on	Friday	By		
12							
13							
14							
15						Today	
16							
TOTAL TODAY		XXXXXXXXXXX	XXXXXXXXX	XXXXXXXXX	XXXXXXXXX	200650	XXXXXXXXXXXXXXX

OPERATOR..........................

HULLER LOG

HARRIS - WOOLF
CALIFORNIA ALMONDS

PRECLEANER LOG

DATE 23-9-91

	TIME START	TIME STOP	SCALE TICKET NUMBER	GROWER	FIELD	TANK NUMBER	INCOMING FIELDRUN LBS	COMMENTS
1	9:40	10:55	1886	Salyer America	SW 4	5	48,220	
2	11:00	12:40	1903	CVLC	5-8 BH1	2	67,440	Test 1
3	1245	2:15	1904	Harris Farms	NW 14	5	49 800	
4	2:20	3:35	1905	Sutfolk	Hwy 48	7	45,280	Test 2
5	3:35	5:10	1906	Harris Farms	Hwy	2	50,280	
6	6:25		1907	Moulding	26-1	5	50,900	Test 3
7	8:20		1909	Harris Farms	NW 14-W 18-16	2	48,970	
8	11:35		1890	CVLC	Sec 8 BK	2	52,010	
9	1'45		1892	CVLC	Sec 8 Blk	5	54,850	
10	3:20		1871	CVLC	Sec 8 Blk	2	53,770	
11	4:20		"	"	"	"	"	
12	630		"	"	"	"	"	Start new shift
13								
14			Pre Cleaner		Field runs	log	Ends	
15			Test on	23	1991			
16								
TOTAL TODAY							514,170	

OPERATOR Carlos Contreras