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AP-42 Section Number: 1.8

Reference Number: 29

Title: Source Test Report for Particulate
Emissions Twin Impingement Wet
Scrubber Boiler Number 4: Talisman
Sugar Corporation

December 1991

11-11-91
5-245C4
OSW-P-245C4

**SOURCE TEST REPORT
for
PARTICULATE EMISSIONS
TWIN IMPINGEMENT WET SCRUBBER
BOILER NUMBER 4
TALISMAN SUGAR CORPORATION
SOUTH BAY, FLORIDA**

DECEMBER 9, 1991

Prepared for:

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REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.

Dagmar Neck
Dagmar Neck

1/15/1992
Date

1.0 INTRODUCTION

On December 9, 1991, Air Consulting and Engineering, Inc. (ACE), conducted particulate emission testing on the Wet Scrubber Outlet of Boiler 4 at Talisman Sugar Corporation located in South Bay, Florida.

Testing was performed to demonstrate compliance with the current Florida Department of Environmental Regulation (FDER) operating permit.

United States Environmental Protection Agency (EPA) Method 5 was utilized for the emission testing.

Mr. Kleeman of Kleeman Engineering, Inc. coordinated testing and provided production data.

2.0 SUMMARY AND DISCUSSION OF RESULTS

Boiler Number 4 demonstrated compliance with the permit conditions.

Table 1 is a summary of the emission results and flue gas parameters.

Particulate emissions averaged 59.53 pounds per hour (lbs/Hr) and 0.262 pounds per million BTU (lbs/MMBTU) which is within the allowable emissions of 68.22 lbs/Hr and 0.300 lbs/MMBTU.

Complete emission summaries, field data sheets and laboratory data are presented in Appendices A, B, and C, respectively.

Production rate summaries are provided in Appendix D. This data was obtained from control room recordings of steam flow, temperature, and pressure as well as feed water temperature and pressure. Residue integrator and oil meter readings were recorded at the beginning and end of each particulate run.

Table 1 Emission Summary
 Boiler Number 4
 Talisman Sugar Corporation
 South Bay, Florida
 December 9, 1991

Run Number	Flow Rate SCFMD	Stack Temp. °F	Stack Moisture %	<u>Particulate Emissions</u>		<u>Allowable Emissions</u>	
				lbs/Hr	lbs/MMBTU	lbs/Hr	lbs/MMBTU
1	63300	157	29.4	60.88	0.265	68.94	0.300
2	59677	159	31.6	57.38	0.253	68.01	0.300
3	61312	160	31.6	60.33	0.267	67.71	0.300
AVERAGE	61430	159	30.9	59.53	0.262	68.22	0.300

3.0 PROCESS DESCRIPTION AND OPERATION

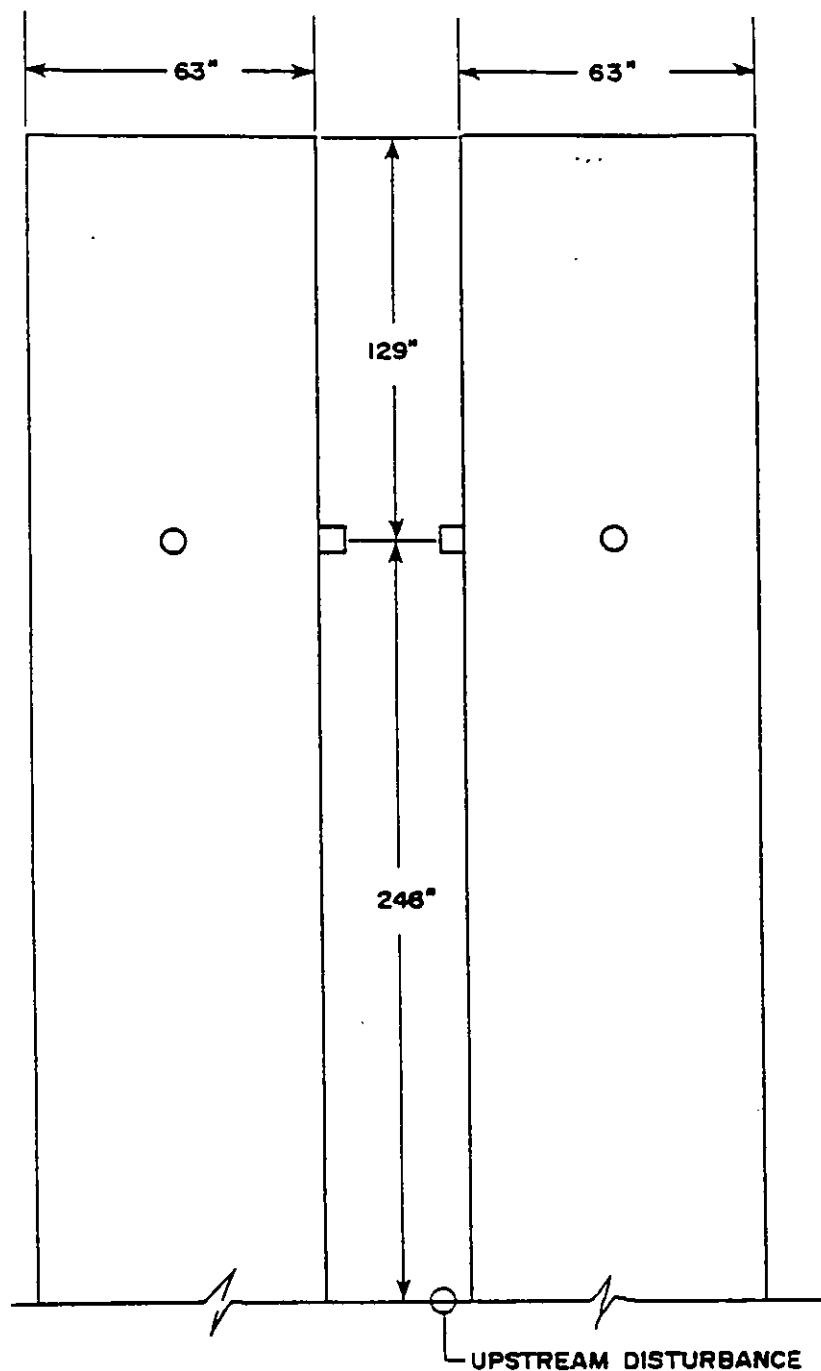
The Number 4 Boiler at Talisman Sugar Corporation is a traveling grate stoker design used primarily for bagasse fuel firing. Supplemental oil firing may also be utilized but was not used during the emission test series.

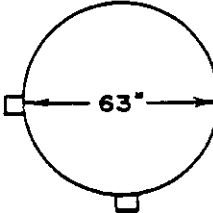
The Boiler averaged 114,950 pounds per hour (lbs/Hr) steam production over the test run period.

Oil meters, steam integrators, and other production monitoring devices were rigorously calibrated prior to the production season.

4.0 SAMPLING POINT LOCATION

The sampling point location and outlet duct schematic are provided in Figure 1.



	
TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	1.3
2	4.2
3	7.4
4	11.2
5	15.8
6	22.4
7	40.6
8	47.3
9	51.8
10	55.6
11	58.8
12	61.7

NOTE: NOT TO SCALE

**FIGURE I.
SAMPLING POINT LOCATION
BOILER NO. 4
TALISMAN SUGAR CORPORATION
SOUTH BAY, FLORIDA**

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5.0 FIELD AND ANALYTICAL PROCEDURES

5.1 *Particulate Matter Sampling and Analysis--EPA Method 5 (Glass Probe)*

Particulate matter samples were collected by the particulate matter emission measurement method specified by the United States Environmental Protection Agency. A schematic diagram of the sampling train used is shown in Figure 2. All particulate matter captured from the nozzle to, and including, the filter was included in the calculation of the emission rate of particulate matter.

PREPARATION OF EQUIPMENT

1. **FILTERS** - Gelman type "A" filters were placed in a drying oven for two hours at 105 degrees C, removed and placed in a standard desiccator containing indicating silica gel, allowed to cool for two hours, and weighed to the nearest 0.1 mg. The filters were then re-desiccated for a minimum of six hours and weighed to a constant weight (less than 0.5 mg change from previous weighing). The average of the two constant weights was used as the tare weight.
2. **NOZZLE, FILTER HOLDER, AND SAMPLING PROBE** - The nozzle, filter holder, and sampling probe were washed vigorously with soapy water and brushes, rinsed with distilled water and acetone, and dried prior to the test program. All openings on the sampling equipment were sealed while in transit to the test site.
3. **IMPINGERS** - The Greenburg-Smith impingers were cleaned with a warm soapy water solution and brushes, rinsed with distilled water and acetone, and dried. The impingers were sealed tightly during transit.

TEST PROCEDURE

Prior to performing the actual particulate matter sample runs, certain stack and stack gas parameters were measured. These preliminary measurements

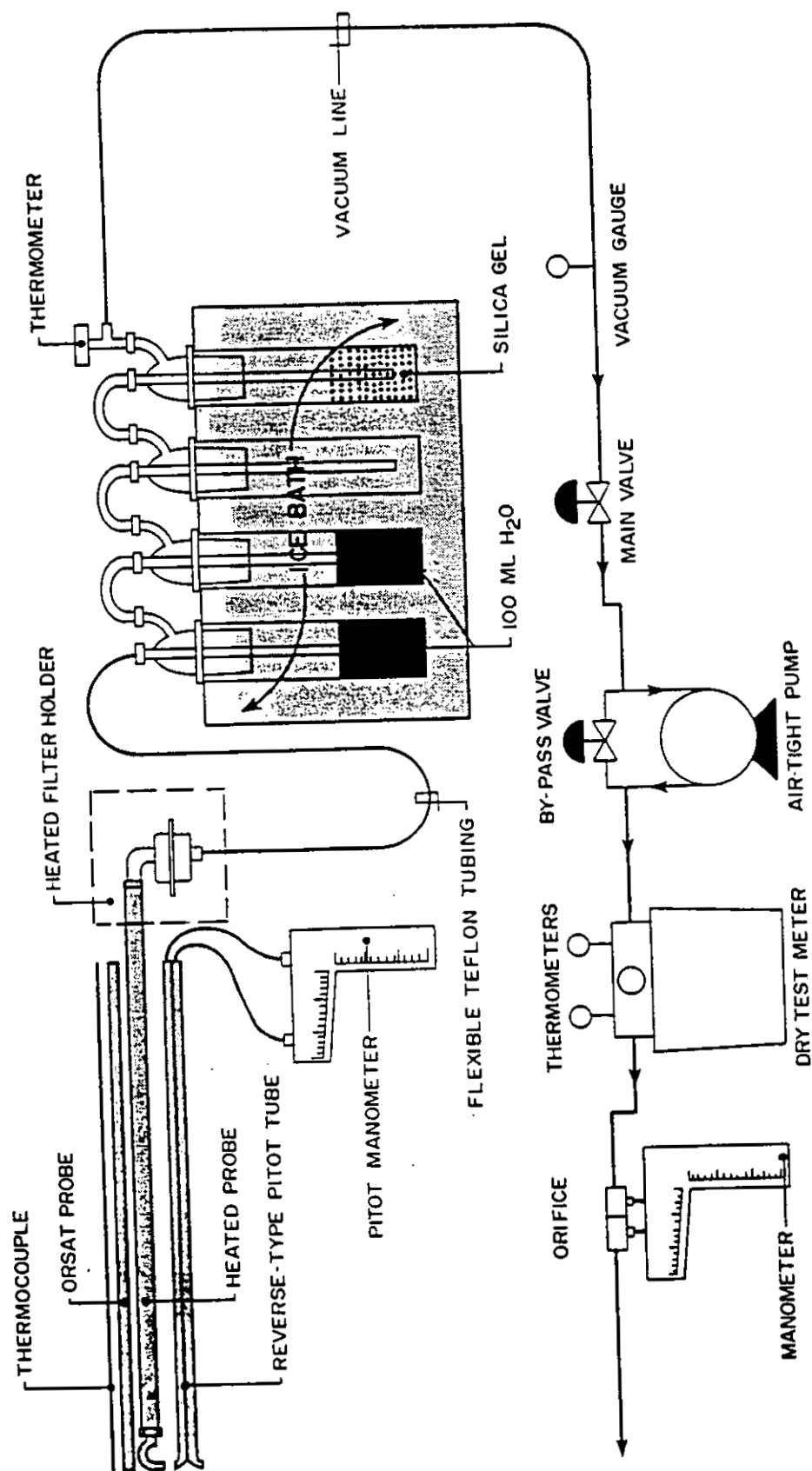


FIGURE 2
EPA METHOD 5 SAMPLING TRAIN

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included the average gas temperature, the stack gas velocity head, the stack gas moisture content, and the stack dimensions at the point where the tests were being performed. The stack gas temperature was determined by using a bi-metallic thermocouple and calibrated pyrometer. Velocity head measurements were made with calibrated type "S" pitot tube and an inclined manometer. Velocity head measurements of 0.05 inches H₂O or less were measured utilizing a micromanometer.

The sampling traverse points were selected so that a representative sample could be extracted from the gas stream. The traverse points were located in the center of equal areas, the number of which were dependent upon the distance upstream and downstream from flow disturbances.

Each particulate matter test run consisted of sampling for a specific amount of time at each traverse point. The type "S" pitot tube was connected to the sampling probe so that an instantaneous velocity head measurement could be made at each traverse point while making the test run. The stack gas temperature was also measured at each traverse point. Nomographs were used to calculate the isokinetic sampling rate at each traverse point during each test run.

The gases sampled passed through the following components: a stainless steel nozzle and glass probe; a glass fiber filter; two impingers each with 100 ml

of distilled deionized water; one impinger dry; one impinger with 200 grams of silica gel; a flexible sample line; an air-tight pump; a dry test meter; and a calibrated orifice. The second impinger had a standard tip, while the first, third, and fourth impingers had modified tips with a 0.5 inch I.D. opening.

Sample recovery was accomplished by the following procedures:

1. The pre-tared filter was removed from its holder and placed in Container 1 and sealed. (This is usually performed in the lab.)
2. All sample-exposed surfaces prior to the filter were washed with acetone and placed in Container 2, sealed and the liquid level marked.
3. The volume of water from the first three impingers was measured for the purpose of calculating the moisture in the stack gas and then discarded.
4. The used silica gel from the fourth impinger was transferred to the original tared container and sealed.

LABORATORY ANALYSIS

The three sample containers from each sample run were analyzed according to the following procedures:

1. The filter was dried at 105 degrees C for three hours, desiccated for a minimum of one hour, and weighed to the nearest 0.1 mg. A minimum of two such weighings six hours apart was made to determine constant weight.
2. The acetone from Container 2 was transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure, desiccated for 24 hours, and weighed to the nearest 0.1 mg. A minimum of two such weighings six hours apart were made to determine constant weight.
3. The used silica gel in its tared container was weighed to the nearest 0.1 gram.

The total sample weight included the weight of material collected on the filter plus the weight of material collected in the nozzle, sampling probe, and front half of the filter holder.

DATA

The field data sheets, calculation sheets, and nomenclature definitions are included in the appendices of this report.

**APPENDIX A
COMPLETE EMISSION DATA
AND
SAMPLE CALCULATIONS**

AIR MONITORING and ENGINEERING
COMPLETE EMISSION DATA

PLANT: TALISMAN SUGAR CORPORATION
SOURCE: NUMBER 4 BOILER
DATE: 12-09-91

RUN NO.:	1	IMPINGER ml	343
BEGIN TIME:	908	SILICA GEL cwt.	3.7
END TIME:	1048	PERCENT O2	13.00
TOTAL RUN TIME:	96.00 min.	PERCENT CO2	13.00
BAROMETRIC PRESSURE:	30.16 "Hg	"P" FACTOR	0
STACK PRESSURE:	30.16 "Hg.		
NOZZLE DIAMETER:	.227 inches	PARTICULATE	
METER CORR. FACTOR:	1.009	-----	
FINAL METER:	950.561 cubic ft.	FILTER mg.	279.1
INITIAL METER:	920.477 cubic ft.	WASH mg.	13.6
STACK AREA:	43.296 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	GAUF. DIFF.	STACK TEMP.	METER TEMP.
1-1	.350	0.532	.530	157	56
1-2	.350	0.532	.530	158	56
1-3	.300	0.548	.450	158	56
1-4	.300	0.548	.450	158	56
1-5	.270	0.520	.410	158	57
1-6	.330	0.742	.830	158	57
1-7	.650	0.806	.950	158	56
1-8	.580	0.825	1.020	158	56
1-9	.810	0.900	1.220	158	56
1-10	.750	0.866	1.150	158	58
1-11	.600	0.775	.900	158	58
1-12	.570	0.733	.860	158	73
2-1	.330	0.574	.500	158	71
2-2	.300	0.548	.450	158	71
2-3	.330	0.574	.500	158	72
2-4	.370	0.606	.560	158	72
2-5	.480	0.696	.720	158	72
2-6	.500	0.707	.750	158	74
2-7	.380	0.592	.530	157	74
2-8	.320	0.536	.480	158	73
2-9	.380	0.518	.570	158	73
2-10	.470	0.586	.710	158	73
2-11	.410	0.540	.620	157	73
2-12	.430	0.566	.650	157	73
AVERAGES	0.452	0.664	0.661	158	71

EMISSION RESULTS

NOZZLE AREA(FT2)	10.0002514		
AVG. VELOCITY HEAD	0.40 "H2O	VOL. FLOW ACFM	109937
AVG. STACK TEMP.:	157 F	VOL. FLOW SCFMD	63300
AVG. METER TEMP.:	77 F		
AVG. ORIFICE DIFFERENTIAL:	0.62 "H2O	PARTICULATE DATA	
METER STANDARD CUBIC FEET:	40.256	-----	
% H2O VAPOR:	25.4	POUNDS PER HOUR:	60.380
GAS MOL. WT. DRY:	30.24	POUNDS PER SCF	0.0000150
GAS MOL. WT. WET:	26.64	GRAINS/SCF:	0.112
% EXCESS AIR:	50.38	GRAINS/SCF @ 8% O2	0.112
AVG. STACK VEL. (FPS)	40.01	GRAINS/SCF @50% EA	0.120
MMBTU INPUT	125.61	POUNDS PER MMBTU	0.263
PERCENT ISO-KINETIC	101.61		

292.7

STACK 2 DATA INPUT

PORT-POINT	VELOCITY HEAD	SQUARE RT. ORIFICE VEL. HEAD	ORIFICE DIFF.	STACK TEMP.	METER TEMP.
1-1	.200	0.447	.300	156	73
1-2	.180	0.424	.270	156	73
1-3	.210	0.468	.320	156	73
1-4	.220	0.465	.330	156	73
1-5	.240	0.490	.360	156	80
1-6	.240	0.490	.360	157	80
1-7	.250	0.510	.390	157	81
1-8	.380	0.615	.570	156	81
1-9	.410	0.640	.620	156	81
1-10	.470	0.686	.630	156	83
1-11	.510	0.714	.670	156	83
1-12	.560	0.592	.470	156	83
2-1	.750	0.866	1.130	156	84
2-2	.860	0.812	.990	156	84
2-3	.820	0.787	.930	157	84
2-4	.490	0.700	.740	157	84
2-5	.370	0.608	.640	157	86
2-6	.180	0.424	.270	157	86
2-7	.380	0.615	.570	157	86
2-8	.350	0.600	.640	157	86
2-9	.340	0.563	.510	157	85
2-10	.470	0.686	.710	157	86
2-11	.500	0.707	.750	156	86
2-12	.440	0.663	.660	153	83
AVERAGES	0.385	0.608	0.552	157	83

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COMPLETE EMISSION DATA

PLANT: TALISMAN SUGAR CORPORATION
SOURCE: NUMBER 4 BOILER
DATE: 12-09-91

RUN NO.:	1	EXPINGER ml	375
BEGIN TIME:	1:50	SILICA GEL gms	8.8
END TIME:	1:17	PERCENT O2	8.00
TOTAL RUN TIME:	56.00 min.	PERCENT CO2	12.00
BAROMETRIC PRESSURE:	30.15 "Hg	"F" FACTOR	0
STACK PRESSURE:	30.15 "Hg		
NOZZLE DIAMETER:	.237 inches	PARTICULATE	
METER CORR. FACTOR:	1.005	-----	
FINAL METER:	1001.282 cubic ft.	FILTER mg.	279.1
INITIAL METER:	951.100 cubic ft.	ASH mg.	7.8
STACK AREA:	43.255 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIF. DIFF.	STACK TEMP.	METER TEMP.
1-1	.600	0.775	.900	155	88
1-2	.730	0.854	1.100	155	88
1-3	.650	0.782	.870	157	88
1-4	.430	0.593	.720	157	88
1-5	.480	0.593	.720	157	88
1-6	.330	0.574	.600	158	88
1-7	.180	0.424	.270	157	88
1-8	.210	0.455	.320	156	88
1-9	.320	0.566	.480	157	88
1-10	.450	0.571	.530	157	88
1-11	.450	0.571	.530	157	88
1-12	.450	0.571	.530	157	88
2-1	.150	0.424	.270	157	88
2-2	.120	0.345	.120	158	88
2-3	.220	0.469	.330	158	88
2-4	.220	0.469	.330	157	88
2-5	.250	0.500	.380	157	88
2-6	.240	0.490	.350	156	88
2-7	.250	0.510	.390	157	88
2-8	.250	0.510	.390	158	88
2-9	.250	0.535	.440	159	88
2-10	.350	0.500	.540	151	88
2-11	.420	0.548	.630	159	88
2-12	.420	0.548	.630	158	88
AVERAGES	0.354	0.582	0.530	157	88

EMISSION RESULTS

NOZZLE AREA(FT2)	10.0002814		
AVG. VELOCITY HEAD	0.38 "H2O	VOL. FLOW ACFM	101385
AVG. STACK TEMP.:	155 F	VOL. FLOW SCFMD	59677
AVG. METER TEMP.:	88 F		
AVG. ORIFICE DIFFERENTIAL	0.59 "H2O	PARTICULATE DATA	
METER STANDARD CUBIC FEET	39.457		
% H2O VAPOR	31.8	POUNDS PER HOUR	57.383
GAS MOL. WT. DRY	30.14	POUNDS PER SCF	0.0000150
GAS MOL. WT. WET	28.37	GRAINS/SCF	0.112
% EXCESS AIR	60.95	GRAINS/SCF @ 8% O2	0.112
AVG. STACK VEL. (FPM)	19.03	GRAINS/SCF @50% EA	0.120
METER CORR. F.	1.005	POUNDS PER "METER"	0.353
PERCENT STACK METAL	35.97		

STACK 2 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE AT. ORIFICE VEL. HEAD	DIFF.	STACK TEMP.	THERMISTOR TEMP.
1-1	.300	0.548	.450	150	87
1-2	.300	0.548	.450	150	87
1-3	.280	0.529	.420	151	88
1-4	.380	0.515	.550	150	88
1-5	.480	0.533	.720	150	88
1-6	.380	0.500	.540	153	88
1-7	.380	0.532	.530	153	88
1-8	.380	0.515	.530	151	88
1-9	.370	0.508	.560	150	88
1-10	.410	0.540	.620	150	88
1-11	.400	0.532	.510	155	88
1-12	.420	0.548	.470	158	90
2-1	.350	0.532	.530	152	90
2-2	.320	0.565	.480	152	90
2-3	.300	0.543	.450	151	90
2-4	.280	0.529	.420	150	90
2-5	.280	0.529	.420	150	90
2-6	.320	0.565	.450	150	90
2-7	.570	0.513	1.010	150	91
2-8	.500	0.354	1.200	155	91
2-9	.540	0.517	1.250	150	91
2-10	.750	0.565	1.130	150	91
2-11	.500	0.773	.500	150	91
2-12	.550	0.746	.540	150	91
AVERAGES	0.438	0.551	0.545	150	89

AIR CONVECTIVE and SMOKE-TESTING
COMPLETE EMISSION DATA

Aug 02 = 8.1

PLANT: TALISMAN SUGAR CORPORATION
SOURCE: NUMBER 4 BOILER
DATE: 12-09-91

RUN NO.:	3	IMFINGER W1	355
BEGIN TIME:	1520	SILICA GEL gms.	3.2
END TIME:	1701	PERCENT O2	7.00
TOTAL RUN TIME:	55.00 min.	PERCENT CO2	11.00
BAROMETRIC PRESSURE:	30.16 "Hg	CFI FACTOR	0
STACK PRESSURE:	30.16 "Hg.	PARTICULATE	-
NOZZLE DIAMETER:	.227 inches	-----	-----
METER CORR. FACTOR:	1.005	FILTER mg.	280.4
FINAL METER:	1041.273 cubic ft.	WASH mg.	5.6
INITIAL METER:	1002.000 cubic ft.		
STACK AREA:	43.295 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIF. DIFF.	STACK TEMP.	METER TEMP.
1-1	.410	0.640	.615	155	57
1-2	.330	0.574	.300	155	57
1-3	.310	0.557	.470	155	57
1-4	.270	0.520	.410	155	57
1-5	.270	0.520	.410	155	57
1-6	.290	0.529	.420	155	57
1-7	.330	0.574	.500	152	57
1-8	.500	0.707	.630	151	57
1-9	.890	0.943	1.150	151	57
1-10	.780	0.883	1.010	151	57
1-11	.630	0.754	.820	151	57
1-12	.630	0.754	.820	151	57
2-1	.300	0.548	.350	150	55
2-2	.300	0.548	.350	150	55
2-3	.300	0.548	.350	150	55
2-4	.330	0.574	.430	151	55
2-5	.420	0.645	.550	151	55
2-6	.500	0.707	.630	151	55
2-7	.500	0.707	.630	150	55
2-8	.330	0.574	.430	150	55
2-9	.340	0.583	.440	155	55
2-10	.370	0.608	.480	155	55
2-11	.370	0.608	.480	155	55
2-12	.370	0.608	.480	155	55
AVERAGES	0.419	0.537	0.554	150	55

EMISSION RESULTS

NOZZLE AREA(FT2)	10.0002814		
AVG. VELOCITY HEAD	0.40 "H2O	VOL. FLOW ACFM	104438
AVG. STACK TEMP.:	150 F	VOL. FLOW SCFM	61312
AVG. METER TEMP.:	55 F		
AVG. ORIFICE DIFFERENTIAL:	0.55 "H2O	PARTICULATE DATA:	
METER STANDARD CUBIC FEET:	38.445		
% H2O VAPOR:	31.5	POUNDS PER HOUR:	50.332
GAS MOL. WT. DRY:	30.20	POUNDS PER SCF:	0.0000124
GAS MOL. WT. WET:	26.34	GRAINS/SCF:	0.115
% EXCESS AIR:	45.57	GRAINS/SCF @ 3% O2	0.107
AVG. STACK VEL. (FPS)	40.20	GRAINS/SCF @50% EA	0.114
MMBTU INPUT:	225.71	POUNDS PER MMBTU:	0.257
PERCENT ISCHINETIC	100.45		

Aug = 227.7

STACK 1 DATA INPUT

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIFICE DIFF.	STACK TEMP.	METER TEMP.
1-1	.200	0.447	.280	180	89
1-2	.200	0.447	.280	180	90
1-3	.200	0.447	.280	180	90
1-4	.230	0.480	.300	180	90
1-5	.260	0.510	.340	180	90
1-6	.220	0.469	.290	181	90
1-7	.230	0.480	.300	181	90
1-8	.260	0.510	.340	180	91
1-9	.300	0.643	.390	181	91
1-10	.300	0.643	.390	181	91
1-11	.380	0.613	.490	180	91
1-12	.450	0.656	.680	180	91
2-1	.750	0.854	.380	189	92
2-2	.650	0.611	1.080	180	92
2-3	.300	0.894	1.040	180	92
2-4	.650	0.812	.680	180	94
2-5	.440	0.653	.570	180	93
2-6	.250	0.636	.680	180	93
2-7	.400	0.632	.620	180	93
2-8	.620	0.721	.680	180	93
2-9	.600	0.773	.790	180	93
2-10	.620	0.721	.680	180	93
2-11	.620	0.721	.680	180	93
2-12	.620	0.721	.680	180	93
					78
AVERAGES	0.418	0.630	0.643	180	91

APPENDIX B
FIELD DATA SHEETS

STACK SAMPLING FIELD DATA SHEET



2106 N. W. 67th PLACE, SUITES 9 & 10
GAINESVILLE, FLORIDA 32606

PLANT Talisman Sugar Corp.
SOURCE Boiler #4
PLANT LOCATION South Bay, Florida
TYPE OF SAMPLING TRAIN EPA-5
TYPE OF SAMPLES P.M.
DATE 12-09-91 RUN NO. 1
TIME START 0905 TIME END 1046
SAMPLE TIME 2:48 (min/pt) = 96 Total min
ASSUMED MOISTURE 30 % FDA 70
NOMOGRAPH C₁ 1.50 PITOT CORR. .84
P_b 30.16 "Hg P_s 30.16 "Hg
WEATHER PHY cldy TEMP 70 °F
METER BOX NO. 6 H 1.91 Y 1.009
NOZZLE CAL. .227 .227 .228 = .227
STACK DIMENSIONS 63" X 2
STACK AREA 43.295 ft² EFFECTIVE ft²
STACK HEIGHT ft
STACK DIAMETER: UPSTRM. DNSTRM.
PORT SIZE 4 1/2 in. NIPPLE LENGTH 6 in.
U CORD LENGTH 200'
REMARKS:

TEST ID IS4C1AS
PAGE 1 OF 3

MAT'L PROCESSING RATE
GAS METER READINGS: FINAL 960.661 ft³
INITIAL 920.477 ft³
NET 40.184 ft³
FILTER NO. 3487 IMP. VOL. GAIN 343 ml.
SIL GEL NO. 133 WT. GAIN 9.7 ml.
TOTAL CONDENSATE 352.1 ml.

ORSAT

	1	2	3	4	AVG.
% CO ₂	12.0	12.0			
% O ₂	8.0	8.0			
% CO					
% N ₂					

F₀ = F₀ RANGE =
ORSAT ANALYZER

LEAK CHECKS

PRE 0.015 cfm 15 "Hg POST 0.015 cfm 15 "Hg
METER BOX/PUMP GAS SAMPLE SYST.
ORSAT BAG
PITOT TUBE NO. PRE-TEST OK
POST-TEST (+) 0.00 / 15 H₂O/Sec
POST-TEST (-) 0.00 / 15 H₂O/Sec
PYROMETER NO. 3
BOX OPERATOR South Bay, Florida PROBE HOLDER MacFarland

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL / COMMENTS	CLOCK TIME	GAS METER READING (FT ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O)		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP °F	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
1-1		0907	921.01	.35	.53	.53	157	275	57	66	2.0
2		0909	921.53	.35	.53	.53	158	270	57	66	2.0
3		0911	922.85	.30	.45	.45	158	270	57	66	2.1
4		0913	923.63	.30	.45	.45	158	270	56	66	2.7
5		0915	925.33	.27	.41	.41	158	261	56	67	5.0
6		0917	925.81	.55	.83	.83	158	266	56	67	5.0

PORT AND TRAVERSE NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft. ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O)		STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN (in. Hg)
					CALC.	ACTUAL					
1-7		0919	926.92	.65	.98	.98	158	265	56	68	5.0
8		0921	927.51	.68	1.02	1.02	158	263	56	68	5.0
9		0923	927.95	.81	1.22	1.22	158	257	56	68	5.0
10		0925	929.10	.75	1.13	1.13	158	257	56	68	5.0
11		0927	930.13	.60	.90	.90	156	246	56	68	5.0
12		0929	931.20	.57	.86	.86	158	254	59	70	5.0
2-1		0933	932.07	.33	.50	.50	158	254	60	71	5.0
2		0935	932.63	.30	.45	.45	158	254	61	71	5.0
3		0937	933.34	.33	.50	.50	158	241	61	72	5.0
4		0939	934.21	.37	.56	.56	158	247	62	72	5.0
5		0941	934.98	.48	.72	.72	158	247	63	72	6.0
6		0943	935.93	.50	.75	.75	158	252	63	74	6.0
7		0945	936.78	.35	.53	.53	157	252	62	74	6.0
8		0947	937.50	.32	.48	.48	158	255	62	75	5.0
9		0949	938.35	.38	.57	.57	158	255	62	75	5.0
10		0951	939.13	.47	.71	.71	158	255	62	76	6.0
11		0953	940.10	.41	.62	.62	157	255	62	76	6.0
12		0955	941.01	.43	.65	.65	157	255	62	76	6.0
North											
1-1		0958	941.63	.20	.30	.30	156	256	63	78	4.0
2		1000	942.21	.18	.27	.27	156	264	65	78	4.0
3		1002	942.84	.21	.32	.32	156	274	64	78	4.0
4		1004	943.41	.22	.33	.33	156	274	64	78	4.0
5		1006	944.05	.24	.36	.36	156	264	64	80	5.0
6		1008	944.70	.24	.36	.36	157	264	64	80	5.0
7		1010	945.40	.26	.39	.39	157	264	65	81	6.0

[illegible]

STACK SAMPLING FIELD DATA SHEET



2106 N. W. 67th PLACE, Suite 9810
GAINESVILLE, FLORIDA 32606

PLANT Talisman Sugar Corp.
SOURCE Boiler #4
PLANT LOCATION South Bay, Florida
TYPE OF SAMPLING TRAIN F-PA-S
TYPE OF SAMPLES P.M
DATE 12-09-91 RUN NO. 2
TIME START 1150 TIME END 1417
SAMPLE TIME 2148 (min/pt) = 96 Total min
ASSUMED MOISTURE 30 % FDA 70
NOMOGRAPH C₁ 1.5 PITOT CORR. .84
P_b 30.16 "Hg P_s 30.16 "Hg
WEATHER Ptly cldy TEMP 70 °F
METER BOX NO. 6 H 1.91 Y 1.009
NOZZLE CAL. .227 .227 .228 = .227
STACK DIMENSIONS 63" X 2
STACK AREA 43.295 ft² EFFECTIVE 112
STACK HEIGHT ft
STACK DIAMETER: UPSTRM. DNSTRM.
PORT SIZE 4" in. NIPPLE LENGTH 6 " in.
U CORD LENGTH 200 '
REMARKS:

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (FT ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O)		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP F	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN (°Hg)
					CALC.	ACTUAL					
1-1		1152	962.43	.60	.90	.90	156	235	64	88	3.0
2		1154	963.50	.73	1.10	1.10	155	235	60	88	4.0
3		1156	964.21	.58	.87	.87	157	235	56	88	4.0
4	* Stopped sampling For 34 minutes after 7 minutes into the run to fit heater box.	1200	965.41	.48	.72	.72	157	270	63	86	4.0
5		1204	966.62	.48	.72	.72	157	270	62	86	4.0
6		1206	967.13	.33	.50	.50	158	273	62	86	4.0

TEST ID TS402AS
PAGE 1 OF 3

MAT'L PROCESSING RATE
GAS METER READINGS: FINAL 1001.282 ft³
INITIAL 961.100 ft³
NET 40.182 ft³
FILTER NO. 3488 IMP. VOL. GAIN 375 ml.
SIL GEL NO. 25 WT. GAIN 8.8 ml.
TOTAL CONDENSATE 383.8 ml.

ORSAT

	1	2	3	4	AVG.
% CO ₂	12.0	12.0			12.0
% O ₂	8.0	8.0			8.0
% CO					
% N ₂					

F₀ = FO RANGE =

ORSAT ANALYZER

LEAK CHECKS

PRE 0.00 cfm 15 "Hg POST 0.00 cfm 15 "Hg
METER BOX/PUMP GAS SAMPLE SYST.

ORSAT BAG

PITOT TUBE NO. PRE-TEST OK

POST-TEST (+) 0.00 / 15 H₂O/Sec

POST-TEST (-) 0.01 / 15 H₂O/Sec

PYROMETER NO. 3

BOX OPERATOR Gauthreaux PROBE HOLDER McFarland

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL / COMMENTS	CLOCK TIME	GAS METER READING (ft. ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O")		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
1-7		1238	967.83	.18	.27	.27	157	265	63	86	2.0
8		1240	968.32	.21	.32	.32	156	250	63	86	2.0
9		1242	969.20	.32	.48	.48	157	235	63	86	2.0
10		1244	970.08	.45	.68	.68	157	229	63	86	2.0
11		1246	971.02	.45	.68	.68	157	231	63	86	2.0
12		1248	971.78	.45	.68	.68	157	231	63	86	2.0
2-1		1303	972.91	.18	.27	.27	157	270	67	86	3.0
2		1305	972.31	.12	.12	.12	158	275	62	86	3.0
3		1307	974.00	.22	.33	.33	158	275	62	86	3.0
4		1309	974.37	.22	.33	.33	157	275	62	86	3.0
5		1311	975.00	.25	.38	.38	157	275	62	86	3.0
6		1313	975.46	.24	.36	.36	156	275	62	86	3.0
7		1315	976.14	.26	.39	.39	157	275	61	86	3.0
8		1317	976.81	.26	.39	.39	158	275	61	86	3.0
9		1319	977.56	.29	.44	.44	159	268	61	86	4.0
10		1321	978.35	.36	.54	.54	161	257	60	86	4.0
11		1323	979.22	.42	.63	.63	159	251	60	86	4.0
12		1325	980.17	.42	.63	.63	158	251	60	86	4.0
South											
1-1		1329	980.85	.30	.45	.45	160	267	60	87	4.0
2		1331	981.58	.30	.45	.45	160	267	60	87	4.0
3		1333	982.30	.28	.42	.42	161	272	60	88	5.0
4		1335	983.21	.38	.59	.59	160	275	60	88	5.0
5		1337	984.05	.48	.72	.72	160	275	59	88	6.0
6		1339	984.85	.36	.54	.54	159	258	59	88	6.0
7		1341	985.67	.35	.53	.53	159	245	60	88	6.0

[illegible]

STACK SAMPLING FIELD DATA SHEET



2106 N. W. 67th PLACE - Suites 9 & 10
GAINESVILLE, FLORIDA 32606

TEST ID TS4C34S
PAGE 1 OF 3

PLANT Talisman Sugar Corporation
SOURCE Boiler #4
PLANT LOCATION South Bay, Florida
TYPE OF SAMPLING TRAIN EPA-5
TYPE OF SAMPLES P.M.
DATE 12-09-91 RUN NO. 3
TIME START 1520 TIME END 1701
SAMPLE TIME 2148 (min/pt) = 96 Total min
ASSUMED MOISTURE 31 % FDA 69
NOMOGRAPH C, 1.50/1.90 PITOT CORR. .84
 P_b 30.16 "Hg P_s 30.16 "Hg
WEATHER Phy cldy TEMP 75 °F
METER BOX NO. 6 H 1.91 Y 1.009
NOZZLE CAL. .227 .227 .228 = .227
STACK DIMENSIONS 63x2
STACK AREA 43.295 ft² EFFECTIVE 112
STACK HEIGHT 11 ft
STACK DIAMETER: UPSTRM. DNSTRM.
PORT SIZE 4 in. NIPPLE LENGTH 6 in.
U CORD LENGTH 200
REMARKS:

MAT'L PROCESSING RATE
GAS METER READINGS: FINAL 041.278 ft³
INITIAL 1002.000 ft³
NET 39.278 ft³
FILTER NO. 3489 IMP. VOL. GAIN 366 ml.
SIL GEL NO. 28 WT. GAIN 8.2 ml.
TOTAL CONDENSATE 374.2 ml.

ORSAT

	1	2	3	4	AVG.
% CO ₂	12.0	12.0			
% O ₂	7.0	7.0			
% CO					
% N ₂					

F₀ = F₀ RANGE =

ORSAT ANALYZER

LEAK CHECKS

PRE 0.01 cfm 15 "Hg POST 0.004 cfm 15 "Hg
METER BOX/PUMP GAS SAMPLE SYST.
ORSAT BAG
PITOT TUBE NO. PRE-TEST OK
POST-TEST (+) 0.00 / 15 H₂O/Sec
POST-TEST (-) 0.00 / 15 H₂O/Sec
PYROMETER NO. 3

BOX OPERATOR Samuel S. Sauer PROBE HOLDER McFarland

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL / COMMENTS	CLOCK TIME	GAS METER READING (FT. ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O)		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP. °F	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
1-1		1522	003.31	.41	.615	.615	158	254	65	87	2.0
2		1524	003.82	.33	.500	.500	158	251	64	87	2.0
3		1526	004.54	.31	.47	.47	158	246	65	87	2.0
4		1528	005.21	.27	.41	.41	160	246	65	87	2.0
5		1530	005.91	.27	.41	.41	159	247	67	87	2.0
6		1532	006.62	.28	.42	.42	159	247	65	87	3.0

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL / COMMENTS	CLOCK TIME	GAS METER READING (ft ³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H ₂ O)		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN (in Hg)
					CALC.	ACTUAL					
1-7	Changed Nom. fac for to 1.3	1534	007.56	.33	.50	.50	162	258	65	87	4.0
8		1536	008.42	.50	.65	.65	161	259	63	87	4.0
9		1538	009.45	.89	1.16	1.16	161	259	63	87	4.0
10		1540	010.63	.78	1.01	1.01	161	259	63	87	4.0
11		1542	011.61	.63	.82	.82	161	266	63	87	5.0
12		1544	012.73	.63	.82	.82	161	265	63	87	5.0
2-1		1548	013.34	.30	.39	.39	160	265	64	88	4.0
2		1550	014.00	.30	.39	.39	160	265	64	88	4.0
3		1552	014.23	.30	.39	.39	160	265	64	88	4.0
4		1554	015.32	.33	.43	.43	161	265	64	88	4.0
5		1556	016.52	.42	.55	.55	161	261	64	89	4.0
6		1558	016.52	.50	.65	.65	161	255	64	89	4.0
7		1400	017.53	.50	.65	.65	160	250	64	89	4.0
8		1402	018.21	.33	.43	.43	160	252	64	89	4.0
9		1404	018.92	.34	.44	.44	158	258	66	89	4.0
10		1406	019.63	.37	.48	.48	159	259	66	89	5.0
11		1408	020.30	.37	.48	.48	159	259	66	89	5.0
12		1410	021.21	.37	.48	.48	159	259	66	89	6.0
North											
1-1		1613	022.54	.20	.26	.26	160	258	66	89	4.0
2		1615	023.31	.20	.26	.26	160	258	66	90	4.0
3		1617	023.63	.20	.26	.26	160	258	66	90	4.0
4		1619	024.20	.23	.30	.30	160	260	65	90	4.0
5		1621	024.91	.26	.34	.34	160	260	65	90	5.0
6		1623	025.51	.22	.29	.29	161	260	66	90	5.0
7		1625	026.14	.23	.30	.30	161	260	60	90	5.0

[illegible]

APPENDIX C
LABORATORY ANALYSIS

AIR CONSULTING & ENGINEERING, inc.

PARTICULATE LAB DATA

SOURCE _____

PROBE RINSE	RUN 1	RUN 2	RUN 3	BLANK	LIQUID LEVEL
CONTAINER NUMBER	149		5-31	100	✓
TOTAL VOLUME (ml)		115	160		
1st GROSS WEIGHT (g)	106.3678	103.5679	103.6894	110.6871	DATE & TIME: 12-12-91 11:57
2nd GROSS WEIGHT (g)	106.3678	103.5679	103.6894	110.6871	DATE & TIME: 12-13-91 10:24
AVERAGE GROSS WEIGHT (g)	106.3678	103.5679	103.6894	110.6871	
TARE WEIGHT (g)	106.3543	103.5601	103.6840	110.6271	
SUB NET WEIGHT (g)	0.0135	0.0078	0.0054	0.0600	
ACETONE BLANK (g)					
TOTAL NET WEIGHT (mg)	13.5	7.8	5.4	6.0	

NOTE: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

FILTER	RUN 1	RUN 2	RUN 3	BLANK
FILTER NUMBER	3487	3488	3489	3490
1st GROSS WEIGHT (g)	0.6799	0.7030	0.7021	0.4015
2nd GROSS WEIGHT (g)	0.6799	0.7030	0.7019	0.4015
AVERAGE GROSS WEIGHT (g)	0.6799	0.7030	0.7020	0.4015
TARE WEIGHT (g)	0.6799	0.7030	0.7020	0.4015
SUB NET WEIGHT (g)	0.02791	0.02791	0.02804	0.0000
TOTAL NET WEIGHT (mg)	27.91	27.91	28.04	0.0

TARE
BALANCE CHECK

SEE LAB BOOK

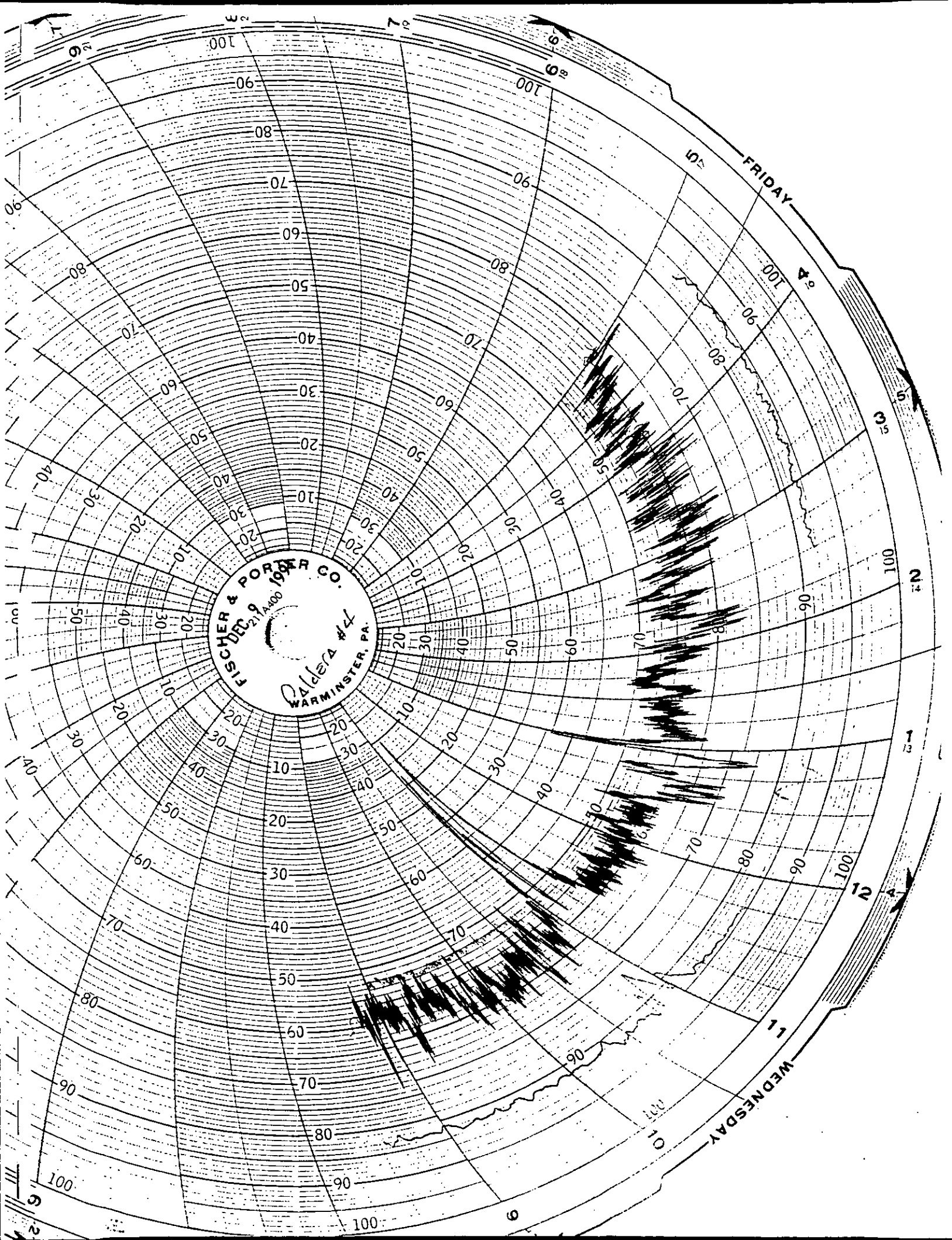
1st GROSS WEIGHT
BALANCE CHECK

0 ☒ 10.0g ☒
0.5g ☒ 100.0g ☒
%RH 75 DATE 12-12-91
Signature Christy L. Neek

2nd GROSS WEIGHT
BALANCE CHECK

0 ☒ 10.0g ☒
0.5g ☒ 100.0g ☒
%RH 64 DATE 12-13-91
Signature Christy L. Neek

APPENDIX D
PRODUCTION RATE
CERTIFICATION



PROCESS DATA

INSTALLATION

Boiler #4

COMPANY TALISMAN SUGAR CORP.

DATE DECEMBER 9, 1991

TYPE OF INSTALLATION BAGASSE BOILER

TYPE OF MATERIAL PROCESSED STEAM

TYPE OF FUEL USED BAGASSE

TYPE OF POLLUTION CONTROL SYSTEM VENTURI DUAL WET SCRUBBER PLUS DRY COLLECTOR

	NORMAL	RUN 1	RUN 2	RUN 3
SCRUBBER WATER FLOW (GPM)	<u>1200</u>	<u>1200</u>	<u>1200</u>	<u>1200</u>
PRESSURE DROP (INCHES)	<u>12</u>	<u>12.0</u>	<u>12.1</u>	<u>11.9</u>

REPORTED BY FRANK KLEEMAN

BOILER DATA SHEET

COMPANY TALISMAN SUGAR CORP. REPORTED BY FRANK KLEEMAN

DATE Dec. 9, 1991

INTEGRATOR FACTOR X 100 BOILER NO. 4

FUEL OIL USED No Oil

FUEL OIL USED			STEAM		FEED WATER	
TIME	INTEGRATOR $\times 100$	FLOW $\times 100$	PRESSURE	TEMP.	TEMP.	PRESSURE
9 05	275828	78	290	590	257	380
9 30	6312	79	295	592	257	380
10 00	6890	80	290	591	257	380
10 41	7695	78	280	582	258	385
	<u>1867</u>		<u>289</u>	<u>589</u>	<u>257</u>	<u>381</u> AVG.
96 MIN = 1.6 HRS.						
	$1867 \times 100 =$	186700				
	$\frac{186700}{1.6 \text{ HRS.}} =$	116700	LOSS/HK.			
11 50	278905	78	290	593	253	390
12 30	9660	78	290	594	253	390
13 20	280620	78	287	592	253	390
14 00	1362	77	288	595	253	390
14 50	2311	76	290	595	256	390
	<u>3406</u>		<u>289</u>	<u>594</u>	<u>254</u>	<u>390</u> AVG.
180 MINUTES	3406×100					
	<u>3.6</u>	$= 113500$	LOSS/HK.			
15 20	282887	80	280	592	258	385
15 50	3465	80	275	593	256	390
		78	278	593	255	390

AIR CONSULTING & ENGINEERING, INC.
Complete Emission Data

PLANT: TALISMAN SUGAR CORPORATION	DATE: 12-03-81	
LOCATION: SOUTH BAY, FLORIDA	RUN NUMBER: 1	
SOURCE: NUMBER 1 BOILER, SCRUBBER OUTLET	TIME: 0903-1041	

TIME INTERVAL----- 96 MINUTES

OIL:

FINAL OIL-----	N/A
BEGIN OIL-----	N/A
FACTOR-----	.

STEAM:

FINAL STEAM-----	277636
BEGIN STEAM-----	275828
FACTOR-----	100
TEMPERATURE-----	389 DEGREES F
PRESSURE-----	293 PSIG
	104 PSIA

FEEDWATER:

TEMPERATURE-----	267 DEGREES F
PRESSURE-----	361 PSIG
	396 PSIA

HEAT INPUT:

STEAM-----	1306.2 BTU/LB
FEEDWATER-----	225.0 BTU/LB
NET STEAM-----	1081.2 BTU/LB
STEAM RATE-----	116626 LB/HR
BOILER EFFICIENCY-----	85.0 %
TOTAL FUEL HEAT INPUT-----	229.3 MMBTU/HR
STEAM CALIBRATION FACTOR-----	1.00

OIL-----	0.00 GPH
OIL-----	160000 BTU/GAL

TOTAL HEAT INPUT (OIL)-----	0.00 MMBTU/HR
TOTAL HEAT INPUT (NON-OIL)-----	229.31 MMBTU/HR

ALLOWABLES:

ALLOWABLE EMISSION (OIL)-----	.10 LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)-----	.30 LB/MMBTU
TOTAL ALLOWABLE EMISSION-----	63.94 LB/HR
TOTAL ACTUAL EMISSION-----	60.88 LB/HR
TOTAL ALLOWABLE EMISSION-----	0.300 LB/MMBTU
TOTAL ACTUAL EMISSION-----	0.265 LB/MMBTU

4

BOILER NUMBER 4

OIL METER FACTOR No Oil used

SCRUBBER(S) PRESS. DROP 20, 8

SCRUBBER(S) GPM _____, _____

Ph(if applicable) _____, _____

FINAL INTEGRATOR 277695

TIME	GAUGE METER READING	STEAM			FEEDWATER	
		LBS. FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE
905	275828	78	590	290	257	380
930	6312	79	592	295	257	380
1000	6890	80	591	290	257	380
1041	7695	78	582	280	258	385
	<u>1867</u>		<u>589</u>	<u>289</u>	<u>257</u>	<u>381</u>
96 Min.	1867	$\times 100 = 186,700$				
	<u>186,700</u>					
	1.6	$= 116,700 \text{ LBS/Hr}$				

AIR CONSULTING & ENGINEERING, INC.
Complete Emission Data

PLANT:	TALISMAN SUGAR CORPORATION	DATE:	12-09-91
LOCATION:	SOUTH BAY, FLORIDA	RUN NUMBER	2
SOURCE:	NUMBER 1 BOILER, SCRUBBER OUTLET	TIME:	1150-1450

TIME INTERVAL----- 180 MINUTES

OIL:

FINAL OIL-----	N/A
BEGIN OIL-----	N/A
FACTOR-----	1

STEAM:

FINAL STEAM-----	282311
BEGIN STEAM-----	278908
FACTOR-----	100
TEMPERATURE-----	394 DEGREES F
PRESSURE-----	329 PSIG
	304 PSIA

FEEDWATER:

TEMPERATURE-----	233 DEGREES F
PRESSURE-----	350 PSIG
	405 PSIA

HEAT INPUT:

STEAM-----	1310.3 BTU/LB
FEEDWATER-----	222.0 BTU/LB
NET STEAM-----	1088.3 BTU/LB
STEAM RATE-----	11.8533 LB/HR
BOILER EFFICIENCY-----	88.0 %
TOTAL FUEL HEAT INPUT-----	226.72 MMBTUH
STEAM CALIBRATION FACTOR-----	1.00
OIL-----	0.00 GPH
OIL-----	150000 BTU/GAL

TOTAL HEAT INPUT (OIL)-----	0.00 MMBTUH
TOTAL HEAT INPUT (NON-OIL)-----	226.72 MMBTUH

ALLOWABLES:

ALLOWABLE EMISSION (OIL)-----	.10 LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)-----	.30 LB/MMBTU
TOTAL ALLOWABLE EMISSION-----	68.01 LB/HR
TOTAL ACTUAL EMISSION-----	57.68 LB/HR
TOTAL ALLOWABLE EMISSION-----	0.300 LB/MMBTU
TOTAL ACTUAL EMISSION-----	0.253 LB/MMBTU

22

BOILER NUMBER 4

OIL METER FACTOR No Oil

SCRUBBER(S) PRESS.DROP____,____

SCRUBBER(S) GPM _____, _____

SCRUBBER(S) H2O LEVEL _____,

Ph(if applicable) _____, _____

FINAL INTEGRATOR 282311

[illegible]

AIF CONSULTING & ENGINEERING, INC
Complete Emission Data

PLANT: TALLISMAN SUGAR CORPORATION	DATE: 12-09-91
LOCATION: SOUTH BAY, FLORIDA	RUN NUMBER: 3
SOURCE: NUMBER 1 BOILER SCRUBBER OUTLET	TIME: 1830-1705

TIME INTERVAL----- 105 MINUTES

OIL:

FINAL OIL-----	N/A
BEGIN OIL-----	N/A
FACTOR-----	1

STEAM:

FINAL STEAM-----	284893
BEGIN STEAM-----	282887
FACTOR-----	100
TEMPERATURE-----	553 DEGREES F
PRESSURE-----	178 PSIG
	193 PSIA

FEEDWATER:

TEMPERATURE-----	267 DEGREES F
PRESSURE-----	388 PSIG
	408 PSIA

HEAT INPUT:

STEAM-----	1310.3 BTU/LB
FEEDWATER-----	225.0 BTU/LB
NET STEAM-----	1085.3 BTU/LB
STEAM RATE-----	114529 LB/HR
BOILER EFFICIENCY-----	88.0 %
TOTAL FUEL HEAT INPUT-----	228.71 MMBTU/H
STEAM CALIBRATION FACTOR-----	1.00

OIL-----	0.00 GPH
OIL-----	180000 BTU/GAL

TOTAL HEAT INPUT (OIL)-----	0.00 MMBTU/H
TOTAL HEAT INPUT (NON-OIL)-----	228.71 MMBTU/H

ALLOWABLES:

ALLOWABLE EMISSION (OIL)-----	.10 LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)-----	.30 LB/MMBTU

TOTAL ALLOWABLE EMISSION-----	87.71 LB/HR
TOTAL ACTUAL EMISSION-----	80.33 LB/HR

TOTAL ALLOWABLE EMISSION-----	0.300 LB/MMBTU
TOTAL ACTUAL EMISSION-----	0.267 LB/MMBTU

12

BOILER NUMBER 4OIL METER FACTOR No Oil

SCRUBBER(S) PRESS.DROP____/____

SCRUBBER(S) GPM _____, _____

SCRUBBER(S) H2O LEVEL _____, _____

Ph(if applicable) _____, _____

FINAL INTEGRATOR 284893

[illegible]

APPENDIX E
QUALITY ASSURANCE
AND
CHAIN OF CUSTODY

STANDARD METER CALIBRATION
Meter Number 1040616

Air Consulting and Engineering, Inc. (ACE) uses a dry gas meter for the calibration standard. This meter has been calibrated against a wet test meter in triplicate. This data was used to generate a standard meter calibration curve (see next page). Field meter calibrations are corrected to this curve using the following formula:

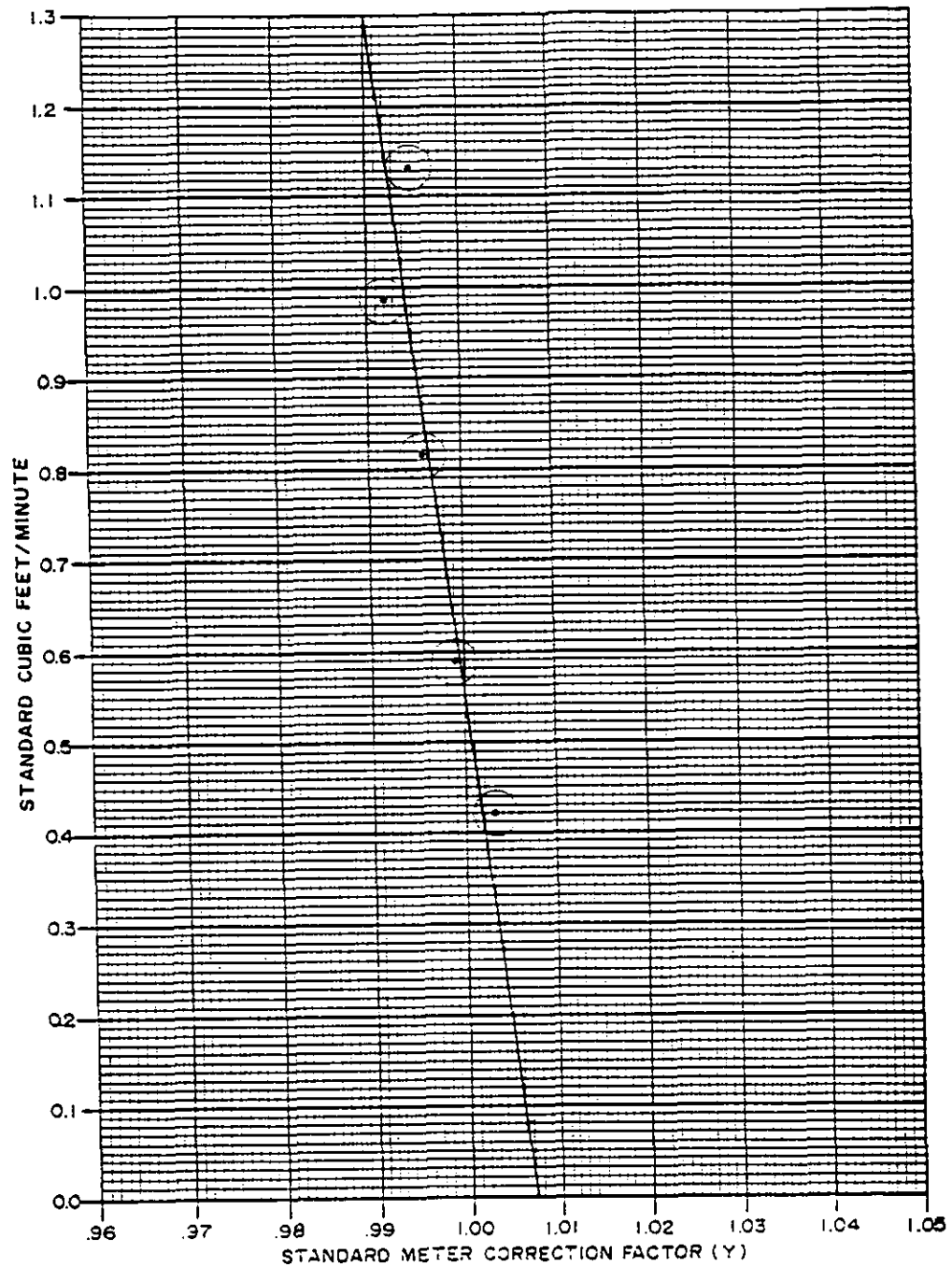
$$Y_a \times Y_s = Y$$

Y_a = actual ratio of field meter to standard meter

Y_s = ratio of standard meter to wet test meter at a given
flow rate (from Calibration Curve)

Y = corrected ratio of field meter

The dry standard meter was calibrated on June 11, 1991, and is checked and/or recalibrated at least annually.



STANDARD METER CALIBRATION
CURVE

JUNE 11, 1991

AIR CONSULTING
and
ENGINEERING

AIR CONSULTING & ENGINEERING STANDARD METER CALIBRATION

DATE 6-13-91 LEAK CHECK 0.000 CFM at 12 In. Hg.

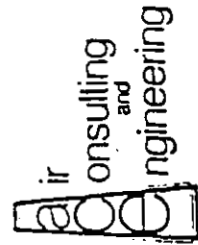
METER SERIAL NUMBER 1010616 BAROMETRIC PRESSURE 30.12 In. Hg.

STD GAS METER TEMPERATURE 74 °F / ASTM GLASS THERMOMETER TEMPERATURE 74 °F

WET ΔH	STD ΔH	GAS VOLUME, WET TEST METER			GAS VOLUME, STD GAS METER			TEMP WET TEST METER (°F)	TEMP OF STD METER (°F)	TIME (Minutes)
		INITIAL	FINAL	ACTUAL ft ³	INITIAL	FINAL	ACTUAL ft ³			
-3	-60	6.012	11.553	5.511	0.003	5.500	5.497	74	74	13
-3	-60	1.553	7.030	5.479	5.500	10.979	5.479	75	75	13
-3	-60	1.030	10.509	5.477	10.979	16.450	5.477	75	75	13
-3	-60	0.863	8.143	5.290	16.804	22.127	5.323	75	76	9
-3	-60	0.143	13.930	5.287	22.127	27.442	5.315	75	76	9
-3	-60	3.430	8.703	5.273	27.442	32.753	5.311	75	77	9
-4	-1.6	9.252	14.995	5.743	33.311	39.123	5.812	76	78	7
-4	-1.6	4.995	10.713	5.718	39.123	44.909	5.786	76	78	7
-4	-1.6	0.713	6.445	5.732	44.909	50.701	5.798	76	78	7
-5	-2.1	6.941	12.917	5.976	51.217	57.292	6.078	76	78	6
-5	-2.1	2.917	8.898	5.981	57.292	63.375	6.083	76	78	6
-5	-2.1	8.898	14.813	5.975	63.375	69.452	6.077	76	78	6
-7	-2.7	5.278	10.988	5.710	69.452	75.663	5.797	76	78	5
-7	-2.7	0.988	6.708	5.720	75.663	81.474	5.811	76	78	5
-7	-2.7	6.708	12.386	5.678	81.474	87.247	5.773	76	78	5

CALIBRATED BY: A. F. Labadie

Run	Y	SCFM	Y	SCFM	Y	SCFM	Y	SCFM
Run 1	1.004	0.422	0.998	0.584	0.996	0.814	0.992	0.985
Run 2	1.001	0.419	0.999	0.584	0.996	0.810	0.992	0.985
Run 3	1.003	0.419	0.999	0.582	0.996	0.812	0.992	0.988
Average	1.003	0.420	0.999	0.583	0.996	0.812	0.992	0.988
								1.131



AIR CONSULTING & ENGINEERING

ANNUAL METER CALIBRATION

DATE 10-3-91 LEAK CHECK 0.500 CFM at 15 in. Hg.

METER BOX NUMBER 60 BAROMETRIC PRESSURE 29.94 in. Hg.

DRY GAS METER TEMPERATURE 82 °F/ASTM GLASS THERMOMETER TEMPERATURE 82 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER		GAS VOLUME, DRY GAS METER			TEMP STD METER	TEMP OF DRY METER	TIME (Minutes)	TIMER
		INITIAL	FINAL	ACTUAL ft ³	INITIAL	FINAL				
-08	0.5	65.936	72.128	6.192	550.574	556.690	81	82	16	16
-13	1.0	72.551	78.148	5.597	557.102	562.651	81	82	10	
-18	1.5	78.417	84.504	6.087	562.914	568.942	81	83	9	
-24	2.0	84.709	90.083	5.374	568.145	574.456	81	83	7	
-35	3.0	90.361	96.607	5.646	574.724	580.290	81	84	6	
-46	4.0	96.243	101.631	5.388	580.521	585.818	81	85	5	

DELTA H	Y _a	SCFM	Y _S	Y
1.909	1.003	0.378	1.004	1.007
1.825	1.008	0.547	1.001	1.009
1.871	1.010	0.661	1.000	1.009
1.937	1.011	0.750	0.998	1.009
1.930	1.013	0.919	0.996	1.008
1.959	1.015	1.052	0.994	1.008

CALIBRATED BY: A. F. Gabriel

MEAN:

1.905

0.999

1.009

AIR CONSULTING & ENGINEERING, inc.

POST TEST CALIBRATION

DATE 12-20-91 METER BOX NUMBER 6 LEAK CHECK 0.00 CFM at 12 In. Hg.
 CLIENT TALISMAN SUGAR SOURCE ALL THERMOCOUPLE NUMBER _____ PYROMETER NUMBER _____
 FLIGHT SERVICE Pb 30.48 In. Hg. ACE BAROMETER Pb 30.48 In. Hg.
 ASTM GLASS THERMOMETER 150 °F / THERMOCOUPLE 150 °F ASTM GLASS THERMOMETER 68 °F / METER TEMP 68 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP STANDARD METER	TEMP OF DRY METER	TIME (Minutes)	MAX. VACUUM In. Hg
		INITIAL	FINAL	ACTUAL ft ³	INITIAL	FINAL	ACTUAL ft ³				
.56	.55	554.039	559.628	5.589	843.390	849.146	5.756	75 74	81 83	14	12
.51	.47	559.628	565.175	5.547	849.146	854.877	5.731	74 73	83 84	15	12
.67	.74	565.175	570.712	5.537	854.877	860.615	5.738	73 73	84 85	12	12

CALIBRATED BY: Carolyn Mitchell

DELTA H
 1.885
 1.867
 1.935

Y_a
 0.986
 0.987
 0.985

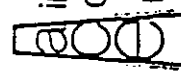
SCFM
 0.402
 0.373
 0.466

Y_s
 1.000
 1.000
 0.999

Y
 0.986
 0.987
 0.984

MEAN: 1.896 0.986

1.000 0.986

 air consulting and engineering

AIR CONSULTING & ENGINEERING, INC. PYROMETER CALIBRATION

DATE 9-4-90 PYROMETER NUMBER #3

SOURCE (SPECIFY)	GLASS THERMOMETER WITH NBS MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	<u>32</u>	<u>34</u>	<u>2</u>	<u>0.4</u>
AMBIENT	<u>80</u>	<u>81</u>	<u>1</u>	<u>0.2</u>
HOT OVEN	<u>268</u>	<u>264</u>	<u>4</u>	<u>0.6</u>

FDER - MAXIMUM 5° DIFFERENCE

$$\text{EPA} \left[\frac{(\text{REF. TEMP } ^\circ\text{F} + 460^\circ) - (\text{PYROMETER TEMP } ^\circ\text{F} + 460^\circ)}{\text{REF. TEMP } ^\circ\text{F} + 460^\circ} \right] 100 \leq 1.5\%$$

CALIBRATED BY: Greg R. Brown

AIR CONSULTING & ENGINEERING, INC.

PITOT TUBE CALIBRATION

DATE CALIBRATED 10-7-91

PITOT TUBE 59

IS PITOT TUBE ASSEMBLY LEVEL YES

ARE PITOT TUBE OPENINGS DAMAGED NO

$\alpha_1 = 0^\circ (<10^\circ)$, $\alpha_2 = 1^\circ (<10^\circ)$, $\beta_1 = 2^\circ (<5^\circ)$, $\beta_2 = 1^\circ (<5^\circ)$

$\gamma = 1^\circ$, $\theta = 1^\circ$, $A = 1.165 \text{ in.} = (P_a + P_b)$

$z = A \sin \gamma = 0.017 \text{ in.} < 0.32 / < 1/8 \text{ in.}$

$w = A \sin \theta = 0.017 \text{ in.} < 0.08 / < 1/32 \text{ in.}$

P_a 0.583 in. P_b 0.582 in. P_t 0.375

WAS CALIBRATION REQUIRED NO

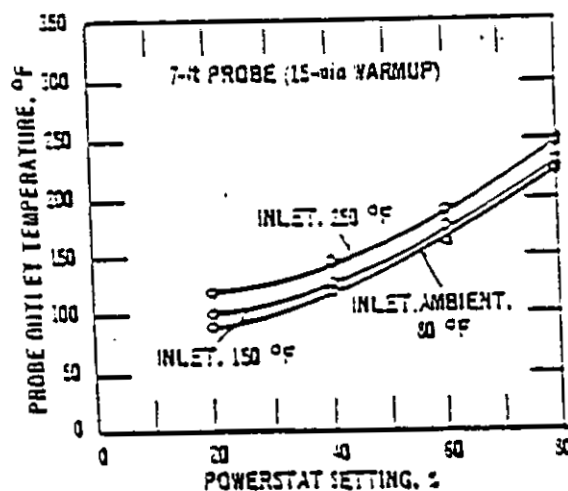
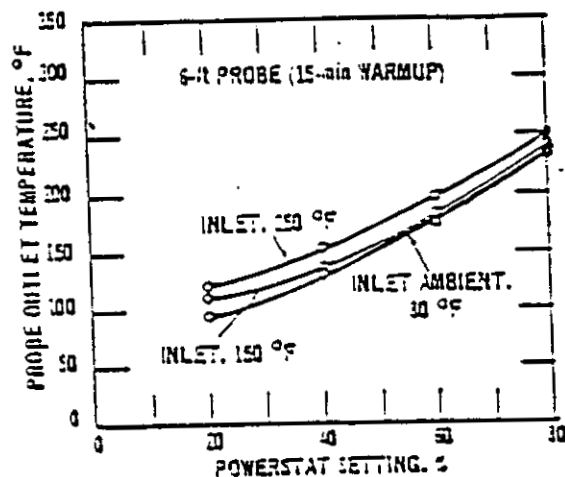
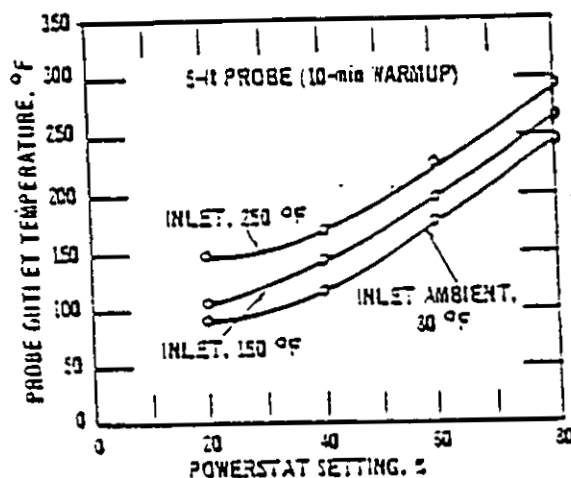
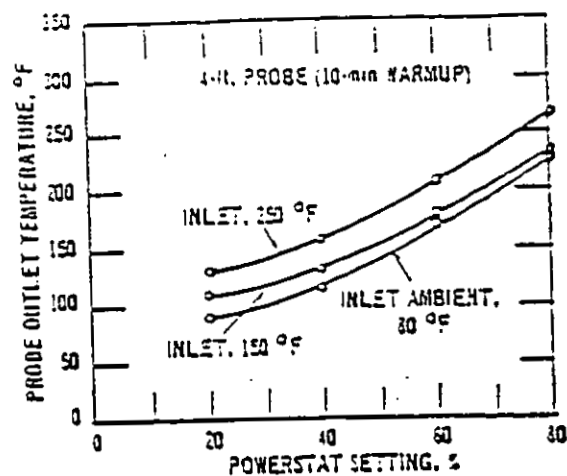
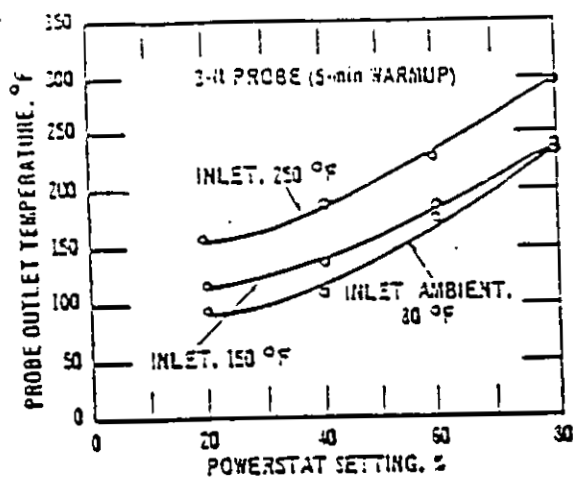
THERMOCOUPLE CALIBRATION

SOURCE (SPECIFY)	ASTM GLASS THERMOMETER WITH MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	<u>42</u>	<u>42</u>	<u>0</u>	<u>0</u>
AMBIENT	<u>78</u>	<u>78</u>	<u>0</u>	<u>0</u>
HOT OVEN	<u>402</u>	<u>400</u>	<u>2</u>	<u>0.38</u>

CALIBRATED BY: Sid Carter

FOUR - MAXIMUM 5° DIFFERENCE

EPA $\left[\frac{(\text{REF. TEMP } ^\circ\text{F} + 460^\circ) - (\text{PYROMETER TEMP } ^\circ\text{F} + 460^\circ)}{\text{REF. TEMP } ^\circ\text{F} + 460^\circ} \right] 100 \leq 1.5\%$



NOTE: Flow rate held constant at 0.75; 50% change in flow rate has little effect on probe temperature.

Probe temperatures.

AIR CONSULTING AND ENGINEERING, Inc.

SAMPLE RECOVERY AND CHAIN OF CUSTODY

PLANT NAME Talisman Sugar TEST DATE 12-09-91
SOURCE NAME Boiler #4 SAMPLE RECOVERED BY G Gauthreaux
TYPE OF SAMPLE pm PARTICULATE ANALYSES BY Chrissy

SAMPLE RECOVERY

RUN NO.	CONTAINER NO.	LIQUID LEVEL MARKED	COLOR	COMMENTS
1	3487	-	Dk. gray	
1		-	clear	
2	3488	-	Dk. Gray	
2		-	clear	
3	3489	-	Med Gray	
3		-	clear	
ACETONE/ WATER BLANK (CIRCLE)	5-44A	✓	clear	
FILTER BLANK				

SILICA GEL

RUN NO.	CONTAINER NO.	FINAL WT. (g)	INIT. WT. (g)	NET WT. (g)	COLOR
1	133	209.7	200.0	9.7	Pink
2	25	208.8	200.0	8.8	Pink
3	28	208.2	200.0	8.2	Pink
			200.0		
			200.0		
			200.0		
			200.0		
			200.0		

APPENDIX F
PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck, P.E.
Project Manager

Early McFarland
Field Participant

Gerard Gauthreaux
Field Participant

Christy Neck
Laboratory Analysis

Dagmar Neck
Report Preparation

Candace V. Taylor
Document Production

KLEEMAN ENGINEERING

Frank Kleeman
Coordinator

TALISMAN SUGAR CORPORATION

Angelo Archbold
Test Coordinator

FDER

Ken Tucker
Test Observer

Sherrel Culifer
Test Observer