Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP-42 Section Number: 9.10.1.2

Reference Number: 22

Title: Particulate Emission Study for Michigan Sugar Company, Caro, Michigan

Swanson Environmental, Inc.

Swanson Environmental, Inc.

December 1989

AP-42 Section 9.10.1.2
Reference 22
Report Sect. ____
Reference ____

PARTICULATE EMISSION STUDY
FOR
MICHIGAN SUGAR COMPANY
CARO, MICHIGAN

DATE OF TESTING:
December 14, 1989

Prepared For:

Michigan Sugar Company
P.O. Box 1348
Saginaw, Michigan 48605

Prepared By:

Swanson Environmental, Inc.
24156 Haggerty Road
Farmington Hills, Michigan 48024

MA-5491

SWANSON ENVIRONMENTAL INC.

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APPENDIX

SWANSON ENVIRONMENTAL INC.

EMISSION STUDY
PULP DRIER STACK
MICHIGAN SUGAR COMPANY
CARO, MICHIGAN
JANUARY 11, 1990
MA-5491

EXECUTIVE SUMMARY

Swanson Environmental, Inc., was retained by Michigan Sugar Company to conduct a study of the particulate emissions from the beet pulp drier at the Caro, Michigan facility.

The purpose of the study was to determine if the particulate emissions were in compliance with Michigan Sugar's Operations Permit (Number 566-89) Special Conditions requirements. The results of the study are as follows:

TABLE 1

TEST NO.	TEST DATE	STACK GAS FLOW RATE (DSCFM)	GRAIN PER DSCF	LBS/1000 LBS ACTUAL-GAS	LBS/1000 LBS DRY 50% EA*	LBS/ HOUR
P-1	12-14-89	41580	0.0595	0.089	0.202	21.22
P-2	12-14-89	35799	0.0669	0.089	0.230	20.52
P-4	12-14-89	31426	0.0727	0.092	0.247	19.58
P-5	12-14-89	31940	0.0676	0.085	0.229	18.49
AVERAGE (P2, P4, P5)		33055	0.0691	0.089	0.235	19.53

* EA = Excess Air

The average result of 0.089 pounds of total particulate per 1000 pounds of air meets the permit requirements of 0.10 pounds as established by the Michigan Department of Natural Resources (MDNR).

Note:

The average results were calclulated using only the results from tests P-2, P-4 and P-5. The data obtained in test P-1 was deemed invalid and test P-3 was discontinued during sampling (see Section 7.0).

EMISSION STUDY
PULP DRIER STACK
MICHIGAN SUGAR COMPANY
CARO, MICHIGAN
JANUARY 11, 1990
MA-5491

1.0 INTRODUCTION

Swanson Environmental, Inc., was retained by Michigan Sugar Company, of Saginaw, Michigan to conduct a particulate emission study on the beet pulp drier stack at their Caro, Michigan facility.

The purpose of the study was to determine if the particulate emissions were in compliance with Michigan Sugar's Operating Permit (Number 566-89) Special Conditions. The test was conducted in accordance with the procedures outlined in 40 CFR 60, Appendix A, for U.S. EPA Method 17.

The study was conducted on December 14, 1989, by Mr. Dan Larin, Mr. Andrew Secord, Mr. Mark Hook and Mr. Thomas Wilk of Swanson Environmental, Inc. Mr. Mark Suhr of Michigan Sugar assisted in the study. Mr. Fred Harris, the MDNR field representative, was present to monitor the study.

2.0 PROCESS DESCRIPTION

The pulp, after being extracted from the beets and discharged from the diffuser, is pressed to remove excess moisture. The pulp is then dried by feeding the material into large revolving drums through which hot air is blown.

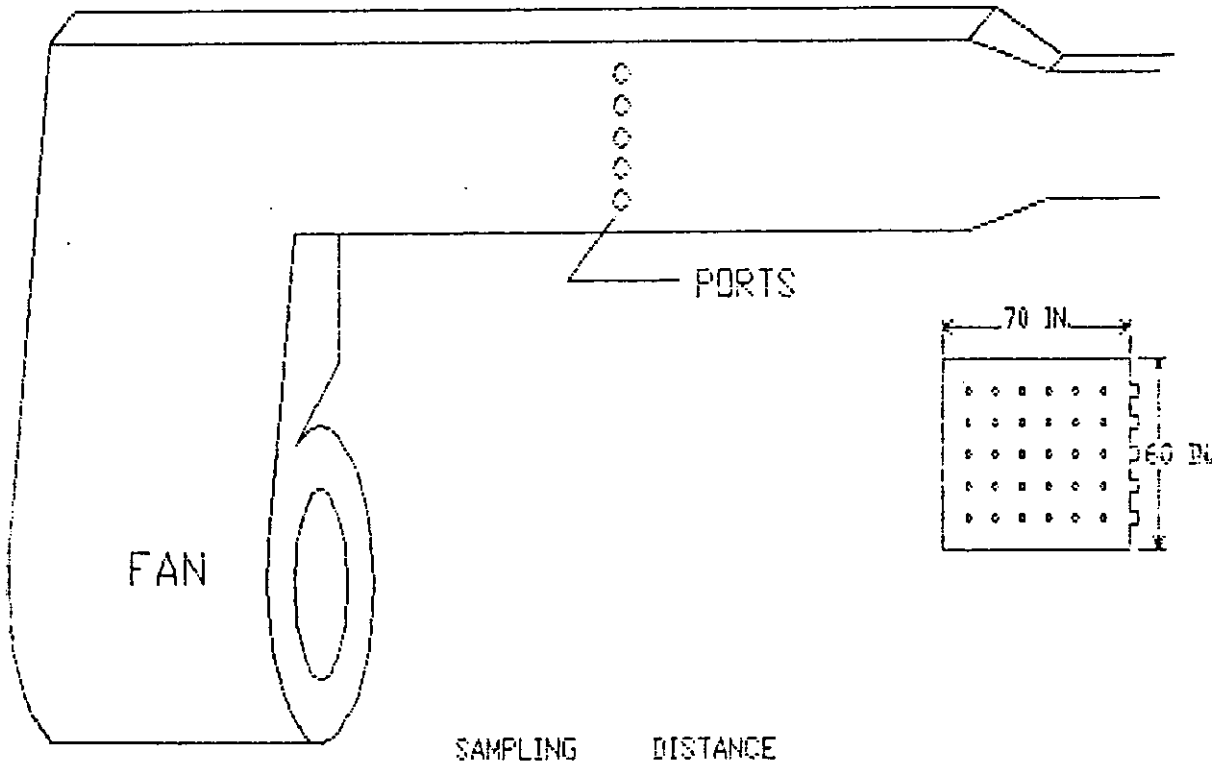
The drying reduces the pulp moisture to approximately 12% from a high of approximately 80%. The moist air leaves the drum and passes through a multiclone, which separates particulate from the air stream. The hopper of the multiclone is aspirated and the air flow is recirculated back to the combustion chamber of the drying furnace. The particulate suspended in the air flow is incinerated by the flame of the drying furnace. The moist air leaving the multiclone is discharged via a 60 x 70 inch rectangular duct inside the facility.

3.0 PRELIMINARY TESTS AND CALCULATIONS

Prior to the start of testing, the stack diameter was measured and a total of 30 traverse points were selected. Five 4-inch diameter sampling ports were previously installed on the retangular duct (see Figure 1). Preliminary velocity traverses (U.S. EPA Method 2) and wet bulb-dry bulb moisture determinations (U.S. EPA Method 4) were performed at the sampling location. All velocity measurements were determined by using a calibrated S-type pitot tube with an attached thermocouple probe.

Following the calculation of gas density and gas velocities, a sampling nozzle size was determined which would allow isokinetic sampling at all measured points.

FIGURE 1
BEET PULP DRIER STACK
MICHIGAN SUGAR COMPANY
CARO MICHIGAN



SAMPLING POINTS	DISTANCE FROM PORT
1	65 INCHES
2	53 INCHES
3	41 INCHES
4	29 INCHES
5	17 INCHES
6	5 INCHES

4.0 PARTICULATE SAMPLING EQUIPMENT/PROCEDURE

The apparatus used to sample the drier stack emissions, known as a sampling train, followed the provisions stipulated in 40 CFR 60, Appendix A, for U.S. EPA Method 17. This method is also approved by the Michigan Department of Natural Resources, as Method 5C. The sampling train components were:

1. An appropriately sized stainless steel sample nozzle;
2. One 47 mm A/E glass fiber filter backed up with a ceramic thimble and a holder;
3. A six-foot stainless steel sample probe;
4. A one-half inch diameter flexible sample line;
5. Four impingers placed in an insulated ice water bath in the following sequence:
   a) A modified impinger containing 100 ml of distilled water;
   b) A second modified impinger containing 100 ml of distilled water;
   c) An empty standard Greenburg-Smith impinger to act as a dry condensate trap; and
   d) A modified impinger containing approximately 300 grams of pre-dried silica gel.
6. Sample gas measuring train containing the following components in sequence:
   a) An umbilical sampling line;
   b) A vacuum gauge;
   c) A leakless, oil type pump;
   d) A calibrated dry test gas meter;
   e) A calibrated gas flow orifice; and
   f) An inclined water column manometer.

The observed velocity head readings were used in the isokinetic point sampling rate calculations. The sampling time for each of the 30 points was 2 minutes.

Prior to testing, the first and second impingers were filled with 100 ml of deionized water each. The third impinger remained empty and the fourth impinger was filled with approximately 300 grams of silica gel and weighed. After the sampling train was assembled, a pretest leak check was made under a vacuum of 15" Hg. During sampling, the sample gas flow conditions and rate were monitored, adjusted and recorded. A post-test leak check was made at a vacuum equal to or greater than the highest system vacuum incurred during the test period. After the test, the sampling train was disassembled for proper transfer of the collected materials to be analyzed.

5.0 ANALYTICAL PROCEDURES

The water filled impinger volumes were measured and recorded. The silica gel impinger was reweighed in order to determine the amount of moisture absorbed. The filters were placed in their sample containers for transporting and the filter holder and probe were brushed out, then flushed with acetone. The preweighed filters were oven dried for two hours, then placed in a desiccator for 24 hours, weighed, and then redesiccated for an additional 12 hours prior to final weighing. The initial and final weights were determined on the same analytical balance accurate to 0.1 milligram.

All acetone flushing solutions were placed in individual preweighed aluminum dishes and the acetone was evaporated at 70° F. The aluminum dishes were desiccated for 24 hours, weighed, and then redesiccated for an additional 12 hours. The initial and final weights were determined on the same analytical balance.

6.0 TESTING RESULTS

The results of the study conducted on December 14, 1989 are in Table 1 of the Executive Summary. All field sampling data, velocity traverse data, and calibration sheets are located in the Appendix.

7.0 PROBLEMS ENCOUNTERED

Upon completion of test P-1, the sampling system did not pass a post-test leak check. In accordance with U.S. EPA regulations, the data obtained in test P-1 is invalid and therefore was not used to determine average results.

Test P-3 was discontinued during the sampling period, due to furnace flame-out. Since final data was not obtained for this test run, no results were determined.

8.0 CONCLUSION

The Michigan Sugar pulp drier stack at the Caro, Michigan facility had an average emission rate of 0.089 pounds per 1000 pounds of actual stack gas. This value is below the maximum allowable emission standard (0.10 pounds total particulate per 1000 pounds of gas) as set forth by the

Michigan Department of Natural Resources in the Air Pollution Control Commission's particulate matter emission schedule, Chapter R336.1331, Subpart J entitled "Exhaust Systems serving material handling equipment not otherwise listed in Table 31". Therefore, the pulp drier stack emissions meet the compliance requirement guidelines.

Report Prepared By:

Paul G. Page

Paul G. Page
Staff Environmental Engineer

Report Reviewed By:

Michael W. Roth
Assistant Director
Air Quality Services

PGP:mag

MBM1:MA-5491.R01

A P P E N D I X

SWANSON ENVIRONMENTAL, INC.
PARTICULATE SAMPLING DATA AND CALCULATIONS

PLANT: MICH. SUGAR SOURCE: PULP DRIER
DATE: 12/14/89

	CLOCK TIME:	60.00	60.00	60.00	60.00
	1.00 NUMBER	P-1	P-2	P-4	P-5
B.	STACK DIAMETER, In	73.01	73.01	73.01	73.01
C.	STACK AREA, Sq.Ft	29.08	29.08	29.08	29.08
D.	No. SAMPLE POINTS	30.00	30.00	30.00	30.00
E.	TOTAL SAMPLE TIME, MIN.	60.00	60.00	60.00	60.00
F.	NOZZLE DIAMETER, In.	0.248	0.248	0.248	0.248
G.	NOZZLE AREA, Sq.Ft.	0.00034	0.00034	0.00034	0.00034
H.	CALIBRATION FACTORS:				
	PITOT TUBE, Cp	0.840	0.840	0.840	0.840
	GAS METER, y	1.005	1.005	1.005	1.005
I.	BAROMETRIC PRESSURE, In.Hg.	29.30	29.30	29.30	29.30
J.	STACK STATIC PRESSURE In.H20	1.30	1.30	1.30	1.30
K.	STACK GAS TEMP.	213.83	269.40	280.17	288.90
L.	AVG. Sq. Rt. VEL. HEAD	0.66	0.68	0.64	0.66
M.	AVG. METER TEMP.	89.37	92.27	88.13	86.53
N.	AVG. METER PRESS., H2O	0.40	0.67	0.39	0.39
O.	METER VOL., ACTUAL Cu. Ft.	27.86	24.13	21.13	20.91
P.	METER VOL., @STP	26.48	22.83	20.13	19.98
Q.	LIQUID VOL., H20 COND., Ml.	249.70	336.80	348.80	355.20
R.	VAPOR VOL., H20 COND., @STP, Cu.Ft.	11.84	15.96	16.53	16.84
S.	TOTAL GAS SAMPLED, @ STP, Cu.Ft.	38.32	38.79	36.66	36.81
T.	%MOISTURE IN EXHAUST GAS				
	1) AT TEST LOCATION	30.89	41.15	45.10	45.74
	2) BEFORE COLLECTOR	0.00	0.00	0.00	0.00
U.	DRY GAS COMP. %O2	13.6	13.7	13.6	13.6
	%CO2	2.4	1.9	1.6	2.0
	%CO	0.0	0.0	0.0	0.0
	%N2	84.0	84.4	84.8	84.4
V.	DENSITY & MOL. Wt. -STACK GAS				
	1)DRY, @ STP,Lbs/Cu.Ft.	0.0748	0.0746	0.0745	0.0746
	2)WET, @ STP,Lbs/Cu.Ft.	0.0661	0.0630	0.0619	0.0618
	3)WET @ STACK,Lbs/Cu.Ft.	0.0509	0.0449	0.0434	0.0428
	4)MOL.Wt., @ STP,Lb/MOLE	28.94	28.86	28.81	28.87

W. WEIGHT OF GAS SAMPLED:				
1)DRY GAS,Lbs	1.98	1.70	1.50	1.49
2)WET GAS,Lbs	2.53	2.45	2.27	2.27
X. TOTAL PARTICULATE COLLECTED (GRAMS)	0.1023	0.0990	0.0949	0.0875
Y. AVERAGE GAS VELOCITY, FPM	2686.50	2940.34	2807.53	2921.04
Z. STACK GAS FLOW RATE				
1)AT STACK, Qa, ACFM	78111	85492	81631	84931
2)AT Std.,Qstd, SCFM	60165	60833	57241	58860
3)Std. DRY,Qdg, SCFM	41580	35799	31426	31940
AA. PERCENT EXCESS AIR	158.58	159.64	154.77	156.65
BB. CONCENTRATION CONVERSION FACTORS:				
1)50% E.A.,AFTER COLLECTOR	1.52	1.45	1.40	1.40
2)50% E.A.,BEFORE COLLECTOR	2.27	2.58	2.68	2.71
3)MOISTURE BEFORE COLLECTOR	1.28	1.44	1.51	1.53
CC. PARTICULATE CONCENTRATION:				
1)Lbs/1000 Lbs., ACTUAL	0.089	0.089	0.092	0.085
2)Lbs/1000 Lbs., DRY	0.114	0.128	0.140	0.129
3)Lbs/1000 Lbs., WET @ 50%E.A	0.135	0.129	0.129	0.119
4)Lbs/1000 Lbs., DRY @ 50%E.A	0.202	0.230	0.247	0.229
5)GRAINS / DSCF	0.0595	0.0669	0.0727	0.0676
6)POUNDS / HOUR	21.22	20.52	19.58	18.49
DD. PERCENT ISOKINETIC	91.70	91.82	92.22	90.05

SHEET No. 3

Caro Factory — 78 Day Beginning 7 A.M. 12-14-89

Lime	Day	To Date	Lime Cake	Day	To Date	Molasses	Day	To Date	Dried Pulp	Day	To Date
Rock to Kiln, Tons			% CaO in Cake			Molasses Feed, Tons			Pulp Produced Tons		
Rock % as Basis			% CaO in Sewer			Molasses Feed, % on Basis			Pulp Produced % Basis		
Discard from Kiln, Tons			Sugar in Cake % on Basis			Sugar in Mol. Feed, Tons					
Discard from Slaker, Tons			Sugar in Lime Sewer Tons			Sugar in Mol. Feed, % on Basis					
Lime Bought or Sold, Tons			Sugar in Lime Sewer % on Basis								
CaO Introduced Tons											
CaO Introduced % on Basis											

Time	Lime Cake Wet Sugar	Lime Cake Dry Sugar	Lime Cake Sol. Sugar	Lime Cake Comp-cake	Lime Sewer % Sugar	Milk of Lime lbs	Milk of Lime % CaO	Lime Juice CaO gpl 200 ml	Kiln Gas % CO_2	Molasses Produced Brix	Pol.	App. Purity	Sucrose	Refl.	Tons Purity	SO_2	Inv. Sugar	Wet Wash %	Press Bagasse %	Dry Bagasse %	Dry Sugar %	Pulpers Bagasse %	Pulpers Sugar %	Condensed Water O-Effluent Boiler Feed	O-Effluent Home Sol.	L-Light Sugar %	H-Heavy Bail Tank	H-Heavy Sugar %
7			.2			19		225		86.7	50.4	58.0	70	B								10.29		0	0	0	VL	
8								260	26.0											13.05				0	0	0	VL	
9	.3					20		240										F 4	824			10.15		0	0	0	VL	
10								225												8.05	4.0			0	0	0	VL	
11			.3					240										TE	—			11.64		0	0	0	VL	
PM 12						21		215												8.90				0	0	0	VL	
1	.1							230														11.49		0	0	0	VL	
2						18		265		83.3	48.0	57.6	70	B						9.45				0	0	0	VL	
Avg.																												
3			.9			19		250		83.2	48.4	58.17	68	B								—		0	0	0	VL	
4								213												15.4				0	0	0	VL	
5		.2				20		200										#2	899			10.25		VL	VL	0	VL	
6								210												16.10				VL	VL	0	VL	
7			.1			22		255														11.99	5.6	VL	VL	0	VL	
8								230										#3	913	9.40				VL	VL	0	VL	
9	.1					23		215											71.3			10.15		0	0	0	VL	
10								200		82.0	48	58.4	65	B						16.85				0	0	0	VL	
Avg.																												
11		.1				24		200		80.4	47.2	58.70	68									10.84		0	0	0	VL	
AM 12								205												16.50				0	0	0	VL	
1	.6					20		230										#4	715			7.05		0	0	0	VL	
2								210												12.61	2.4			0	VL	0	VL	
3		.1				23		215														11.39		0	VL	0	VL	
4								200										#5	805	13.27				0	VL	0	VL	
5	.7					21		200		79.2	45.4	57.3	91									11.03		0	VL	0	VL	
6								250												13.56				0	VL	VL	VL	
Avg.																												
Sol for Avg.	.36	.13	.36			21.00		2.23	26.0	82.7	47.38	57.39	7.2						72.40	12.81		10.89	4.00					

FORM 320 (Rev. 4-62)
HERITAGE PRINTS 87-000

CARO FACTORY — **DIFFUSER DATA** — DATE 1/4/89 — No. Days Slicing 24 — Beginning 7:00 A.M.

	Temperature 1 Cold Jul.	2 Circ. Jul.	3 Mixer	4 C.T.	5 Fresh Water	6 Press Water	7 R.J.	Tower 8 Amp.	Level	Screen Pressure	PH C.T	Press Water	Fresh Water	Diffusion Juice Brix	Purity	pH	Sugar Press Water	Conc.	Weightometer Reading	Tons/Hr.	Knife Change Time	Slicer	Remarks
Am 7	59	69	61	71	59	81	47	74	58	20	5.7	5.6	6.3	15.1	88.74	6.0	1.66	17.4	233380	130			1.66 - Sod Water
8	60	69	61	71	59	81	46	76	40	20	5.5	5.6	5.8			5.8	1.18		232450	70			
9	63	68	62	71	58	77	54	100	60	20	5.6	6.0	6.1	15.1	89.41	5.9	1.66	18.0	232686	135			
10	57	68	58	70	59	80	45	78	58	20	5.6	6.4	6.0			5.9	.83		232780	135	10:25	I	
11	58	68	59	70	59	80	44	76	52	20	5.5	5.2	6.0	14.1	87.34	6.0	.88	17.8	232840	180			
12	57	68	58	71	58	80	45	74	52	20	5.4	4.8	5.8			5.9	1.33		232972	135			
1	59	69	60	70	59	80	47	74	56	20	5.4	5.9	5.6	15.8	87.34	5.8	1.64	17.6	233110	135			
2	58	68	59	71	59	80	46	76	48	20	5.4	5.8	5.6			5.8	1.92		233245	135			
3	59	67	59	71	57	76	47	78	48	20	5.6	5.8	6.0	15.2	88.88	5.9	2.13	17.6	233380	135			
4	58	69	59	71	58	80	48	80	48	20	5.7	5.9	5.6			5.9	1.99		233515	135			
5	58	69	59	71	59	80	45	80	46	20	5.7	6.0	5.9	15.9	90.56	5.9	1.78	7.4	233650	135			
6	62	68	62	70	59	66	49	80	46	20	56	56	59			59	179		233785	135			
7	60	68	60	70	59	76	50	84	40	20	58	59	58	159	89.95	59	1.80	18.2	233920	135			
8	59	67	60	70	60	70	46	90	50	20	56	60	59			59	120		234055	135			
9	59	68	60	70	60	80	47	80	50	20	56	57	59	146	90.41	59	179	18.0	234190	135			
10	58	66	59	71	58	80	45	76	48	20	5.6	5.9	5.8			5.8	1.19		234325	135			
11	57	66	57	70	59	79	43	76	46	20	5.5	5.9	5.8	149	90.86	5.8	1.35	17.8	234460	135			
12	58	66	59	70	58	77	45	76	48	20	5.8	6.1	5.8			5.9	1.35		234595	135			
Am 1	59	68	60	70	58	76	49	78	54	20	5.9	6.3	6.0	15.9	89.30	6.0	1.45	17.2	234730	135	3:00	II	
2	61	70	61	70	58	79	45	76	52	20	5.8	5.5	5.9			6.0	1.50		234865	135			
3	61	69	62	69	59	79	48	74	56	20	5.7	6.0	6.0	15.9	89.30	6.0	1.56	17.6	235000	135			
4	59	69	60	70	59	81	43	72	54	20	5.8	6.1	6.0			6.0	1.56		235135	135			
5	61	68	61	70	58	80	44	72	54	20	5.7	6.2	5.9	15.6	89.10	6.0	1.66	18.0	235270	135			
6	60	68	60	71	58	72	46	74	54	20	5.8	6.2	6.0			6.0	1.66		235405	135			

SHIFT I: TONS SLICED 995

DELAYS: 8:15 - 8:30 = Dryer Kick-out
11:45 - 11:55 = " " "

SHIFT II: TONS SLICED 1080

DELAYS: 6:00 Dryer Power
6:20 " "
7:50 " "

SHIFT III: TONS SLICED 1080 Total: 3155

DELAYS:

161-A (Rev. 8-87)

HERITAGE PRESS 07-1986

SWANSON ENVIRONMENTAL INC.

TEST No.: P-1

PLANT:	MICH. SUGAR	PITOT No:	4	CALIBRATION PITOT:	0.8400
DATE:	12/14/89	METER BOX:	NUTECH	NOZ. DIA. Inches :	0.248
LOCATION:	CARO	AMB TEMP F.	101.00	STACK DIA. Inches :	73.01
OPERATOR:	DJL/MH	B.P. In.Hg.	29.30	STACK PRESS In. H2O:	1.30
SOURCE:	PULP DRIER	ASSUMED %M:	40.0	H20 VOL. Ml. :	249.700
LEAK TST:	.005	METER DEL-H	1.78145	METER f:	1.677
Hg INT.:	15	Kiso:	1745.726	Yd:	1.005
LEAK TST:	.04	PROBE LEN:	120.00	SAMPLE PTS:	30.00
Hg FIN.:	15	W.B.TEMP F.	160	TOT.TIME:	60.00

****

SAMPLE POINTS	PITOT SQRT	ORIFICE No.	DRY GAS	METER TEMP F	STACK TEMP F	PITOT DELTA
1	0.41	0.17	698.68	89.00	239.00	0.17
2	0.59	0.18		91.00	258.00	0.35
3	0.60	0.15		90.00	268.00	0.36
4	0.52	0.12		88.00	272.00	0.27
5	0.42	0.11		87.00	274.00	0.18
6	0.66	0.45		87.00	281.00	0.43
7	0.71	0.25		88.00	184.00	0.51
8	0.68	0.12		89.00	182.00	0.46
9	0.35	0.07		87.00	181.00	0.12
10	0.26	0.08		86.00	182.00	0.07
11	0.36	0.20		87.00	175.00	0.13
12	0.92	1.00		90.00	174.00	0.85
13	0.82	0.29		89.00	178.00	0.68
14	0.67	0.11		90.00	188.00	0.45
15	0.42	0.09		88.00	199.00	0.18
16	0.40	0.05		88.00	178.00	0.16
17	0.57	0.30		88.00	175.00	0.33
18	1.10	1.95		89.00	180.00	1.20
19	0.81	0.35		89.00	175.00	0.65
20	0.69	0.24		90.00	172.00	0.48
21	0.45	0.17		89.00	183.00	0.20
22	0.52	0.19		89.00	168.00	0.27
23	0.79	0.61		90.00	169.00	0.62
24	1.14	1.00		90.00	168.00	1.30
25	0.62	0.35		91.00	266.00	0.38
26	0.65	0.41		93.00	268.00	0.42
27	0.75	0.62		93.00	270.00	0.57
28	0.88	0.81		92.00	270.00	0.78
29	1.05	0.86		92.00	269.00	1.10
30	0.92	0.86	602.77	92.00	269.00	0.85
AVERAGE	0.66	0.40	27.86	89.37	213.83	

SWANSON ENVIRONMENTAL, INC.

PLANT: MICH. SUGAR TEST DATE: 12/14/89 TEST No.:P-1
SOURCE: PULP DRIER WTS. DATE: 12-7-89

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FRACTION A ACETONE RINSES FRACTION A TOTAL WTS (mg) = 16.70

	ACE. RINSE	ACE BLANK	CONT. BLANK
LIQUID VL	180.00	180.00	
CONT. No.	92989-57	92989-66	92989-67
FIN. WTS.	1573.30	1555.50	1555.40
INT. WTS.	1555.30	1554.90	1554.10
NET WTS.	18.00	0.60	1.30 mg
CONT CORR	1.30	1.30	
NET WTS.	16.70	0.00 mg	
ACE CORR.	0.00		
FINAL WTS	16.70 mg		

FRACTION B FRONT FILTER FRACTION B TOTAL WTS (mg) = 89.66

	TEST FILTER	BLANK FILTER
FILTER No	91128-06	91128-14
FINAL WT.	42900.20	62053.10
INT. WT.	42810.40	62052.90
NET WT.	89.80	0.20 mg
BLK. CORR	0.14	
FINAL WT.	89.66 mg	

FRACTION C BACK UP FILTER FRACTION C TOTAL WTS (mg) = -4.10

FILTER No	91101-11	BLANK	0
FINAL WT.	115.80		129.20
INT. WT.	119.90		129.20
NET WT.	-4.10		0.00 mg
BLK. CORR	0.00		
FINAL WT.	-4.10 mg		

TOTAL WEIGHTS (mg) = 102.26
TOTAL WEIGHTS (g) = 0.10

(1) DO NOT APPLY ANY WEIGHT LOSS CORRECTION FOR LIQUID BLANKS.

*BLANK CORR. WT.= FINAL USED WT./INITIAL BLANK WT * NET CHANGE IN BLANK
*ACE. CORR. WT.= RINSE LIQ./BLANK LIQ. * BLANK LIQ. GAIN IN WT.

SWANSON ENVIRONMENTAL INC.

TEST No.: P-2

PLANT:	MICH. SUGAR	PITOT No:	4	CALIBRATION PITOT:	0.8400
DATE:	12/14/89	METER BOX:	NUTECH	NOZ. DIA. Inches :	0.2480
LOCATION:	CARO	AMB TEMP F.	101.00	STACK DIA. Inches :	73.0130
OPERATOR:	AS/TW	B.P. In.Hg.	29.30	STACK PRESS In. H2O:	1.3000
SOURCE:	PULP DRIER	ASSUMED %M:	40.0	H20 VOL. Ml. :	336.800
LEAK TST:	.004	METER DEL-H	1.78145	METER f:	1.677
Hg INT.:	15	Kiso:	1745.726	Yd:	1.005
LEAK TST:	.003	PROBE LEN:	120.00	SAMPLE PTS:	30.00
Hg FIN.:	16.1	W.B.TEMP F.	160	TOT. TIME:	60.00

****

SAMPLE POINTS	PITOT SQRT	ORIFICE No.	DRY GAS	METER TEMP	STACK TEMP	PITOT DELTA
1	0.65	0.54	729.18	94.00	265.00	0.42
2	0.68	0.59		93.00	266.00	0.46
3	0.77	0.76		92.00	266.00	0.60
4	0.91	1.08		91.00	268.00	0.83
5	1.07	1.46		89.00	271.00	1.15
6	1.20	1.89		89.00	269.00	1.45
7	0.75	0.72		89.00	268.00	0.57
8	0.70	0.52		90.00	268.00	0.49
9	0.53	0.35		91.00	270.00	0.28
10	0.60	0.46		91.00	268.00	0.36
11	0.68	0.58		90.00	270.00	0.46
12	1.14	2.65		90.00	270.00	1.30
13	0.85	0.99		90.00	269.00	0.72
14	0.61	0.47		90.00	270.00	0.37
15	0.39	0.19		90.00	270.00	0.15
16	0.33	0.14		91.00	270.00	0.11
17	0.52	0.34		92.00	269.00	0.27
18	1.18	1.39		93.00	271.00	1.39
19	0.74	0.70		93.00	270.00	0.55
20	0.70	0.62		93.00	271.00	0.49
21	0.39	0.19		93.00	270.00	0.15
22	0.35	0.15		93.00	271.00	0.12
23	0.40	0.20		93.00	271.00	0.16
24	0.79	0.80		94.00	270.00	0.63
25	0.40	0.20		95.00	269.00	0.16
26	0.56	0.39		95.00	270.00	0.31
27	0.61	0.47		96.00	272.00	0.37
28	0.55	0.38		96.00	270.00	0.30
29	0.51	0.33		96.00	270.00	0.26
30	0.73	0.69	753.31	96.00	270.00	0.54
AVERAGE	0.68	0.67	24.13	92.27	269.40	

SWANSON ENVIRONMENTAL, INC.

PLANT: MICH. SUGAR TEST DATE: 12/14/89 TEST No: P-2
SOURCE: PULP DRIER WTS. DATE: DATE

****

FRACTION A ACETONE RINSES FRACTION A TOTAL WTS (mg) = 46.8

	ACE. RINSE	ACE BLANK	CONT. BLANK
LIQUID VL	180.00	180.00	
CONT. No.	92989-58	92989-66	92989-67
FIN. WTS.	1666.30	1555.50	1555.40
INT. WTS.	1618.20	1554.90	1554.10
NET WTS.	48.10	0.60	1.30 mg
CONT CORR	1.30	1.30	
NET WTS.	46.80	0.00 mg	
ACE CORR.	0.00		
FINAL WTS	46.80 mg		

FRACTION B FRONT FILTER FRACTION B TOTAL WTS (mg) = 89.09

	TEST FILTER	BLANK FILTER
FILTER No	91128-08	91128-14
FINAL WT.	33709.30	62053.10
INT. WT.	33620.10	62052.90
NET WT.	89.20	0.20 mg
BLK. CORR	0.11	
FINAL WT.	89.09 mg	

FRACTION C BACK UP FILTER FRACTION C TOTAL WTS (mg) = -36.90

		BLANK
FILTER No	91101-12	0
FINAL WT.	82.40	129.20
INT. WT.	119.30	129.20
NET WT.	-36.90	0.00 mg
BLK. CORR	0.00	
FINAL WT.	-36.90 mg	

TOTAL WEIGHTS (mg) = 98.99
TOTAL WEIGHTS (g) = 0.10

(1) DO NOT APPLY ANY WEIGHT LOSS CORRECTION FOR LIQUID BLANKS.

*BLANK CORR. WT.= FINAL USED WT./INITIAL BLANK WT * NET CHANGE IN BLANK
*ACE. CORR. WT.= RINSE LIQ./BLANK LIQ. * BLANK LIQ. GAIN IN WT.

SWANSON ENVIRONMENTAL INC.

TEST No.: P-4

PLANT:	MICH. SUGAR	PITOT No:	4	CALIBRATION PITOT:	0.84
DATE:	12/14/89	METER BOX:	NUTECH	NOZ. DIA. Inches :	0.248
LOCATION:	CARO	AMB TEMP F.	96.00	STACK DIA. Inches :	73.01
OPERATOR:	ADS	B.P. In.Hg.	29.30	STACK PRESS In. H2O:	1.30
SOURCE:	PULP DRIER	ASSUMED %M:	40.00	H20 VOL. Ml. :	348.800
LEAK TST:	.004	METER DEL-H	1.78145	METER f:	1.677
Hg INT.:	15	Kiso:	1745.726	Yd:	1.005
LEAK TST:	.013	PROBE LEN:	120.00	SAMPLE PTS:	30
Hg FIN.:	10	W.B.TEMP F.	160	TOT. TIME:	60.00

****

SAMPLE POINTS	PITOT SQRT	ORIFICE No.	DRY GAS	METER TEMP	STACK TEMP	PITOT DELTA
1	0.61	0.32	771.18	95.00	275.00	0.37
2	0.51	0.22		94.00	281.00	0.26
3	0.54	0.24		93.00	284.00	0.29
4	0.65	0.35		92.00	293.00	0.42
5	1.14	1.10		89.00	274.00	1.30
6	1.26	1.30		87.00	269.00	1.60
7	0.74	0.45		86.00	289.00	0.55
8	0.69	0.39		86.00	279.00	0.47
9	0.49	0.20		86.00	282.00	0.24
10	0.58	0.28		86.00	282.00	0.34
11	0.71	0.43		86.00	277.00	0.51
12	1.10	1.00		87.00	273.00	1.20
13	0.63	0.40		87.00	284.00	0.40
14	0.53	0.28		87.00	290.00	0.28
15	0.40	0.16		87.00	290.00	0.16
16	0.41	0.17		87.00	280.00	0.17
17	0.62	0.38		87.00	279.00	0.38
18	0.91	0.83		87.00	275.00	0.83
19	0.53	0.23		87.00	279.00	0.28
20	0.47	0.18		87.00	284.00	0.22
21	0.37	0.12		87.00	282.00	0.14
22	0.35	0.10		87.00	278.00	0.12
23	0.52	0.23		87.00	278.00	0.27
24	0.87	0.64		87.00	278.00	0.76
25	0.52	0.23		89.00	281.00	0.27
26	0.57	0.27		88.00	280.00	0.32
27	0.60	0.30		89.00	280.00	0.36
28	0.53	0.24		89.00	278.00	0.28
29	0.50	0.21		89.00	277.00	0.25
30	0.71	0.42	729.31	89.00	274.00	0.50
AVERAGE	0.64	0.39	21.13	88.13	280.17	

SWANSON ENVIRONMENTAL, INC.

PLANT: MICH. SUGAR TEST DATE: 12/14/89 TEST No: P-4
SOURCE: PULP DRIER WTS. DATE: DATE

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FRACTION A ACETONE RINSES FRACTION A TOTAL WTS (mg) = 32.2

	ACE. RINSE	ACE BLANK	CONT. BLANK
LIQUID VL	180.00	180.00	
CONT. No.	92989-58	92989-66	92989-67
FIN. WTS.	1595.50	1555.50	1555.40
INT. WTS.	1562.00	1554.90	1554.10
NET WTS.	33.50	0.60	1.30 mg
CONT CORR	1.30	1.30	
NET WTS.	32.20	0.00 mg	
ACE CORR.	0.00		
FINAL WTS	32.20 mg		

FRACTION B FRONT FILTER FRACTION B TOTAL WTS (mg) = 79.40

	TEST FILTER	BLANK FILTER
FILTER No	91128-07	91128-14
FINAL WT.	29931.80	62053.10
INT. WT.	29852.30	62052.90
NET WT.	79.50	0.20 mg
BLK. CORR	0.10	
FINAL WT.	79.40 mg	

FRACTION C BACK UP FILTER FRACTION C TOTAL WTS (mg) = -16.70

FILTER No	91101-16	BLANK	0
FINAL WT.	102.20		129.20
INT. WT.	118.90		129.20
NET WT.	-16.70		0.00 mg
BLK. CORR	0.00		
FINAL WT.	-16.70 mg		

TOTAL WEIGHTS (mg) = 94.90
TOTAL WEIGHTS (g) = 0.09

(1) DO NOT APPLY ANY WEIGHT LOSS CORRECTION FOR LIQUID BLANKS.

*BLANK CORR. WT.= FINAL USED WT./INITIAL BLANK WT * NET CHANGE IN BLANK
*ACE. CORR. WT.= RINSE LIQ./BLANK LIQ. * BLANK LIQ. GAIN IN WT.

SWANSON ENVIRONMENTAL INC.

TEST No.: P-5

PLANT:	MICH. SUGAR	PITOT No:	4	CALIBRATION PITOT:	0.84
DATE:	12/14/89	METER BOX:	NUTECH	NOZ. DIA. Inches :	0.248
LOCATION:	CARO	AMB TEMP F.	94.00	STACK DIA. Inches :	73.01
OPERATOR:	ADS	B.P. In.Hg.	29.30	STACK PRESS In. H2O:	1.30
SOURCE:	PULP DRIER	ASSUMED %M:	40.00	H20 VOL. Ml. :	355.200
LEAK TST:	0.00	METER DEL-H	1.78145	METER f:	1.677
Hg INT.:	15	Kiso:	1745.726	Yd:	1.005
LEAK TST:	0.00	PROBE LEN:	120.00	SAMPLE PTS:	30
Hg FIN.:	13	W.B.TEMP F.	160	TOT. TIME:	60.00

****

SAMPLE POINTS	PITOT SQRT	ORIFICE No.	DRY GAS	METER TEMP	STACK TEMP	PITOT DELTA
1	0.57	0.27	667.26	86.00	280.00	0.33
2	0.54	0.23		85.00	320.00	0.29
3	0.57	0.26		86.00	337.00	0.33
4	0.65	0.33		85.00	330.00	0.42
5	0.98	0.76		85.00	328.00	0.97
6	1.22	1.20		86.00	313.00	1.50
7	0.78	0.48		86.00	329.00	0.61
8	0.66	0.35		86.00	294.00	0.43
9	0.54	0.24		86.00	284.00	0.29
10	0.66	0.36		86.00	286.00	0.44
11	0.71	0.42		86.00	284.00	0.51
12	1.05	0.91		87.00	283.00	1.10
13	0.77	0.49		87.00	281.00	0.59
14	0.44	0.15		87.00	279.00	0.19
15	0.41	0.14		87.00	282.00	0.17
16	0.45	0.18		87.00	277.00	0.20
17	0.62	0.33		87.00	275.00	0.39
18	0.99	0.83		87.00	273.00	0.98
19	0.62	0.32		87.00	272.00	0.38
20	0.57	0.27		87.00	274.00	0.32
21	0.46	0.18		87.00	277.00	0.21
22	0.41	0.14		87.00	275.00	0.17
23	0.54	0.24		87.00	279.00	0.29
24	0.95	0.76		87.00	277.00	0.91
25	0.53	0.23		87.00	285.00	0.28
26	0.51	0.22		87.00	276.00	0.26
27	0.58	0.28		87.00	277.00	0.34
28	0.56	0.26		87.00	278.00	0.31
29	0.52	0.22		87.00	281.00	0.27
30	0.82	0.57	689.30	87.00	281.00	0.68
AVERAGE	0.66	0.39	20.91	86.53	288.90	

SWANSON ENVIRONEMNTAL, INC.

PLANT: MICH. SUGAR TEST DATE: 12/14/89 TEST No: P-5
SOURCE: PULP DRIER WTS. DATE: DATE

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FRACTION A ACETONE RINSES FRACTION A TOTAL WTS (mg) = 44.1

	ACE. RINSE	ACE BLANK	CONT. BLANK
LIQUID VL	180.00	180.00	
CONT. No.	92989-60	92989-66	92989-67
FIN. WTS.	1604.90	1555.50	1555.40
INT. WTS.	1559.50	1554.90	1554.10
NET WTS.	45.40	0.60	1.30 mg
CONT CORR	1.30	1.30	
NET WTS.	44.10	0.00 mg	
ACE CORR.	0.00		
FINAL WTS	44.10 mg		

FRACTION B FRONT FILTER FRACTION B TOTAL WTS (mg) = 81.12

	TEST FILTER	BLANK FILTER
FILTER No	91128-09	91128-14
FINAL WT.	56535.80	62053.10
INT. WT.	56454.50	62052.90
NET WT.	81.30	0.20 mg
BLK. CORR	0.18	
FINAL WT.	81.12 mg	

FRACTION C BACK UP FILTER FRACTION C TOTAL WTS (mg) = -37.70

		BLANK
FILTER No	91101-14	0
FINAL WT.	82.20	0.00
INT. WT.	119.90	129.20
NET WT.	-37.70	0.00 mg
BLK. CORR	0.00	
FINAL WT.	-37.70 mg	

TOTAL WEIGHTS (mg) = 87.52
TOTAL WEIGHTS (g) = 0.09

(1) DO NOT APPLY ANY WEIGHT LOSS CORRECTION FOR LIQUID BLANKS.

*BLANK CORR. WT.= FINAL USED WT./INITIAL BLANK WT * NET CHANGE IN BLANK
*ACE. CORR. WT.= RINSE LIQ./BLANK LIQ. * BLANK LIQ. GAIN IN WT.

SWANSON ENVIRONMENTAL, INC.

SAMPLING DATA CALCULATION EQUATIONS

A. Sample Number (Test)
B. Stack Dimensions - inches or feet, (In. or Ft.)
C. Area of Stack - square feet, (Sq. Ft.)
D. Number of Points Sample
E. Duration of Sample - time in minutes, (min.)
F. Nozzle Diameter - inches, (In.)
G. Nozzle Area - square feet, (Sq. Ft.)
H. Calibration Factors
   1) Pitot tube, (C_p)
   2) Gas Meter, (y)
I. Barometric Pressure - inches of mercury, (" Hg)
J. Static Pressure in Stack - inches of water, (" H_2O)
K. Stack Gas Temperature - ^oF
L. Average Square Root of Velocity Head of Points Sampled, ($\overline{\sqrt{\Delta P_s}}$)
M. Average Meter Temperature - ^oF
N. Average Meter Pressure - inches of water, (" H_2O)
O. Meter Volume, Actual Gas Meter Reading, cubic feet,(Cu. Ft.)
P. Meter Volume @ STP, Cu. Ft. = $H_2 \times O \times \left[\frac{530 \times [I+(0.07355 \times N)]}{(M+460) \times 29\ 92}\right]$
Q. Liquid Volume of Water Condensed, Ml.

R. Vapor Volume of Water Condensed, @ STP, Cu. Ft., = ($Q \times 0.0474$)

S. Total Gas Sampled, @ STP, Cu. Ft. = (R + P)

T. Percent Moisture in Exhaust Gas
   1) At Test Location = ($R/S \times 100$)
   2) Before Collector (when applicable)

U. Dry Gas Composition : % O_2
% CO_2
% CO
% N_2

V. Density and Molecular Weight of Stack Gas :

1) Dry, @ STP, Lbs./Cu. Ft. $= \frac{[(\%O_2 \times .0827)+(\%CO_2 \times .1137)+(\%CO+N_2) \times .0724]}{100}$

2)Moist, @ STP, Lbs./Cu. Ft. $= \left[\left(V_1 \times \frac{(100-T)}{100}\right)+\left(.0465 \times \frac{T}{100}\right)\right]$

3) Moist Gas, @ Stack Conditions, Lbs./Cu. Ft. =

$$= V_2 \times \left(\frac{530}{K+460}\right) \times \left(\frac{I+0.07355 \times J}{29.92}\right)$$

4) Molecular Weight, Dry, @STP, Lb./Mole = ($V_1 \times 386.9$ Cu. Ft./Mole)

NOTE: STP = 29.92 "Hg., 70^oF

SAMPLING DATA CALCULATION EQUATIONS

W. Weight of Gas Sampled:
1) Dry Gas, Lbs. $= (P \times V_1)$
2) Moist Gas, Lbs. $= (S \times V_2)$

X. Total Weight of Particulate Collected, Grams

Y. Average Gas Velocity, $\left(FPM \cdot \frac{1096}{\sqrt{V_3}} \times (L_{avg}) \times (H_1)\right)$

Z. Stack Gas Flow Rate :
1) Stack Conditions, $Q_a = ACFM\ (C \times Y)$
2) Standard Conditions, Q_{std}, SCFM $= \left(\left(Z_1 \cdot \left(\frac{530}{K \cdot 460}\right) \times \left(\frac{I + 0.07355 \times J}{29.92}\right)\right)\right)$
3) Standard Dry, $Q_{d.g.}$, SCFM $= Q_{std} \times \frac{100 - T}{100}$

AA. Percent Excess Air $= \frac{(\%O_2) - (0.5\ \%CO)}{(0.264\ \%N_2) - (\%O_2) + (0.5\%CO)} \times 100$

BB. Concentration Conversation Factors:
1)
1) 50% Excess Air , After Collector $= \frac{V_4 + 18\ T_1/(100-T_1)}{(0.1826\%N_2) - (2.0592\%O_2) + V_4 + \frac{18T}{(100-}}$

2) 50% Excess Air, Before Collector
$$= \frac{V_4 + 18T_1/(100-T_1)}{(0.1826\ \%N_2) - (2.0592\ \%O_2) + V_4 + \frac{18T2}{(100 - T_2)}}$$
3) Moisture Before Collector $+= \left(\frac{V_4 + 18T_1/(100 - T_1)}{V_4 + 18T_2/(100 - T_2)}\right)$

CC. Particulate Concentration :
1) Lbs./1000 Lbs., Actual $= \frac{(1000 \times X)}{(454 \times W_2)}$
2) Lbs./1000 Lbs., Dry* $= (CC_1 \times BB_3)$
3) Lbs./1000 Lbs., Wet ** @50% E. A. $= (CC_1 \times BB_1)$
4) Lbs./1000 Lbs., Dry @ 50% E. A. $= (CC_1 \times BB_2)$
5) Grains/1000DSCF*** $= \frac{(X \times 7000 \times 100)(1000)}{(454 \times S \times (100 - T))}$
6) Pounds / Hour $= \left(Z_2 \times V_2 \times \left(\frac{1000\ X\ \ X\ 006}{454 \times W_2}\right)\right)$

DD. Percent Isokinetic $= \frac{100 \times 29.92 \times (K + 460) \times S}{530 \times (I + 0.07355 \times J) \times E \times G \times Y}$

* Dry means process moisture included, moisture added by collector excluded (if applicable)

** Wet means actual moisture as measured after collector.

*** DSCF is under totally dry conditions - all moisture removed.

NOTE: STP = 29.92 " Hg., 70°F.

A

SHORT DATA SHEETS

LOCATION CARO

SEI JOB # MA 5492

DATE	TEST #	RUN #	CO2	O2	CO	RESULTS CO2	O2	N2
12/14	P-1		2.4 2.4 2.4	16.0 16.0 16.0	.1 .1	2.4	13.6	83.
	P-2		1.9 1.9 1.9	15.6 15.6 15.6	15.8 .2	1.9	13.7	84.
	P-3		1.6 1.6 1.6	15.0 15.2 15.2	15.3 .1	1.6	13.6	84

MI Sugar

ATE 12/14/89

OURCE

IMPINGER DATA

	INITIAL Vol(ml)	INITIAL WT(gm)	FINAL Vol(ml)	FINAL WT(gm)	Δ Vol(ml)	Δ WT(gm)
- 1						
#1	100 ml		258		158	
#2	100 ml		181		81	
#3	0		1		1	
#4	743.5		753.2		9.7	
#5						
					249.7	
- 2						
#1	100 ml		387 ml		287	
#2	100 ml		133 ml		33	
#3	0		2 ml		2	
#4	805g		819.8g		14.8	
#5					336.8	
- 3						
#1	100 ml		VOID			
#2	100 ml					
#3	0					
#4						
#5	792.1g					

OTES —

ATE 12/14/89

URCE

IMPINGER DATA

	INITIAL Vol(ml)	INITIAL WT(gm)	FINAL Vol(ml)	FINAL WT(gm)	Δ Vol(ml)	Δ WT(gm)
- 3	~~100 ml~~					
#1	100 ml		~~387~~ 387		~~287~~ 287	
#2	~~100~~ 100 ml		143		43	
#3	0		0		0	
#4	772.3		791.1		18.8	
#5						
					348.8	
- P-5						
#1	100 ml		407		307	
#2	100 ml		131		31	
#3	0		2		2	
#4	783.1		798.3		15.2	
#5						
					355.2	
#1						
#2						
#3						
#4						
#5						

ES -

PITOT TRAVERSE DATA

SOURCE: MI SUGAR CARD

DATE	TIME	PITOT NUMBER	STACK DIMENSION
12/14/89			

BAROMETRIC (P_b)	STATIC (P_g)	G_s	STACK TEMP. T_s	C_p	STACK AREA A_s	WB TEMP T_w	B_{wo}
29.30	1.30			.84	2896		

	SAMPLING POINT	PITOT (Δp)	STACK TEMP
TOP 1	1	.28	247
	2	.35	250
	3	.28	253
	4	.26	254
	5	.26	254
	6	.29	254
TOP 2	1	.49	256
	2	.43	256
	3	.19	257
	4	.13	256
	5	.18	257
	6	.48	257
MID	1	.47	256
	2	.46	256
	3	.26	256
	4	.20	257
	5	.27	257
	6	.89	257

	SAMPLING POINT	PITOT (Δp)	STACK TEMP
BOT 2	1	.42	256
	2	.44	258
	3	.33	258
	4	.34	259
	5	.46	258
	6	1.20	259
BOT 1	1	.42	258
	2	.43	258
	3	.53	259
	4	.77	258
	5	1.20	257
	6	1.50	257

$V_s = 2.9\, C_p\, 60 \sqrt{T_s \cdot \Delta p} \sqrt{\frac{29.92}{P_s} \cdot \frac{1}{G_s}}$ $\quad Q_s = V_s \cdot A_s$ $\quad Q_{scfm} = Q_s \cdot \frac{530}{T_s} \cdot \frac{P_s}{29.92}$

146.16

256.13

78,937

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant: MI SUGAR
Date: 12/14
Location: LARO
Operator: Andy
Stack No.: Horizont.
Run No.: PART. NO. 4
PITOT TUBE NO. ____ C_p 0.84
Meter Box No.: SGI - 5500 - N #1

Ambient Temperature: ~~86~~ 88
Barometric Pressure P_b "Hg
Assumed Moisture, % WV: 40
Probe Length, in.: 120
Nozzle Diameter, in. D: .249
Stack Diameter, in.: 60X69.5
Stack Pressure, in. H_2O P_g
Sampling train LEAK TEST: Initial 0.004 @ 15. Final 0.013 @ ~~8~~ 10

Meter $\Delta H_@$ ____ M_f 1.128564
K_{iso} 1745.726 Y_d 1.005
WET BULB TEMPERATURE ____

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight g
Final					
Initial					
Liquid Collected					

V_{lc} Total ____

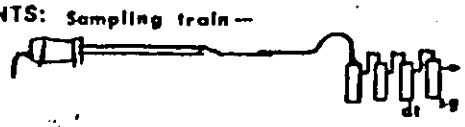
Start 7:35

	SAMPLING POINT	TIME ●	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP. T_m °F	VACUUM	STACK TEMP. T_s °F	FILTER TEMP.	IMPINGER TEMP.	
					77118						
	6		.37	.32	77186	95	60	275		74	
	5		.26	.22	77247	94	15	281		74	
	4		.29	.24	77303	93	15	284		74	Flame out
1	3		.42	.35	77373	92	35	293		74	8:15
	2		1.4	1.15		92		298			Restart
	2		1.3	1.10	77512	89	50	274		70	
	1		1.6	1.30	77632	87	60	269		67	
	6		.55	.45	77714	86	50	289		68	
	5		.47	.39	77789	86	55	279		67	
2	4		.24	.20	77842	86	25	282		67	
	3		.34	.28	77905	86	35	282		68	
	2		.51	.43	77981	86	50	277		68	
	1		1.2	1.00	78091	87	70	273		67	
					78091						
	6		.48	.40	78173	87	50	284		68	
	5		.34	.28	78237	87	45	290		69	
3	4		.20	.16	78288	87	30	290		69	
	3		.20	.17	78338	87	40	280		69	
	2		.45	.38	78407	87	50	279		70	
	1		.99	.83	78507	87	80	275		70	

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. F91128-1

COMMENTS: Sampling train —



Filter No. F91101-16

PITOT TUBE LEAK TEST: Initial 0. @ " Final 0. @ "

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC.

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter ΔH@ _____ M_f

Date _____ Barometric Pressure P_b "Hg _____ K iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. _____ Nozzle Diameter, in. D _____

Run No. PART. NO. 4 (B) Stack Diameter, in. _____

PITOT TUBE NO. ____ C_p O_2 Stack Pressure, in. H_2O P_g _____

Meter Box No. SGI – 5500 – Sampling Train LEAK TEST Initial O_2 @ " Final O_2 @ "

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight 5
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

port	SAMPLING POINT	TIME @	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP. T_s °F	FILTER TEMP.	IMPINGER TEMP
					785.07					
	6		28	23	785.95	87	45	279	70	79
(4)	5		22	18	786.16	87	40	284	70	79
	4		14	12	786.61	87	30	282		71
	3		12	10	787.04	87	30	278		71
	2		27	23	787.61	89	40	278		72
	1		26	69	788.52	87	65	278		72
					788.52					
	6		27	23	789.14	89	50	281		72
(5)	5		32	27	789.76	88	50	280		73
	4		36	30	790.40	89	45	280		73
	3		28	24	790.98	89	40	278		73
	2		25	21	791.55	89	50	279		73
	1		50	42	792.31	89	55	274		73
	9:25 PM									

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. _____

Filter No. _____

PITOT TUBE LEAK TEST Initial O_2 @ " Final O_2 @ "

COMMENTS: Sampling train –

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

CTHS#

Plant: MI SUGAR
Date: 12/14/89
Location: CARO
Operator: Andy
Stack No.: Drier
Run No. PART. NO: P-5
PITOT TUBE NO. ____ C_p 0.84
Meter Box No. SGI-5500-N#1

Ambient Temperature ____
Barometric Pressure P_b "Hg ____
Assumed Moisture, % wv 40
Probe Length, in. 120
Nozzle Diameter, in. D .249
Stack Diameter, in. 60x69.5
Stack Pressure, in. H_2O ____
Sampling train LEAK TEST: Initial O_2 0 @15"; Final O_2 0 @10"

Meter ΔH@ ____ M_1 1.677...
K iso ____ Y_d ____
WET BULB TEMPERATURE ____

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight g
Final					
Initial					
Liquid Collected					

V_{lc} Total ____

P-1 ✓
P-2 Good
P-3 Void
P-4 Good
P-5

Port	SAMPLING POINT	TIME θ	PITOT ΔPs	ORIFICE ΔH	DRY GAS METER Vm	METER TEMP Tm °F	VACUUM	STACK TEMP. Ts °F	FILTER TEMP.	IMPINGER TEMP.
		0:00			79278					
	6		.33	.27	79342	86	50	280		74
	5		.29	.23	79409	85	40	326		72
1	4		.33	.26	79463	86	50	337		72
	3		.42	.33	79532	85	50	330		72
	2		.97	.76	79627	85	10	328		72
	1		1.5	1.20	79741	86	13	313		71
	OFF				79741					
	6		.61	.48	79827	86	60	329		70
	5		.43	.35	79898	86	50	294		71
	4		.29	.24	79956	86	45	284		72
2	3		.44	.36	80025	86	50	286		72
	2		.51	.42	80101	86	55	284		72
	1		1.1	.91	80205	87	10	283		72
	OFF				80205					
	6		.59	.49	80285	87	60	281		73
	5		.18	.15	80341	87	40	279		72
3	4		.17	.14	80388	87	30	282		71
	3		.26	.18	80439	87	35	277		71
	2		.39	.33	80504	87	50	275		70
	1		.98	.83	80604	87	10	273		70

ΔP 750
0 = 760
310 = 770
320 = 780
330 = 790
340 = 750

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. T 91128 #9
Filter No. F 91101-14

COMMENTS: Sampling train —

PITOT TUBE LEAK TEST: Initial O_2 @ "; Final O_2 @ "

$$\Delta H = K_{iso} C_p^2 D^4 \left[1 - \frac{WV}{100}\right]^2 \frac{C_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter $\Delta H_@$ _____ M_f

Date _____ Barometric Pressure P_b "Hg _____ K iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. _____ Nozzle Diameter, in. D _____

Run No. PART. NO. 5 (B) Stack Diameter, in. _____

PITOT TUBE NO. ____ C_p O_2 Stack Pressure, in. H_2O P_g _____

Meter Box No. SGI - 5500 - Sampling train LEAK TEST Initial O_2 @ " Final O_2 .001 @ 13 "

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica G Weight g
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

page 2

pA	SAMPLING POINT	TIME θ	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP T_s °F	FILTER TEMP	IMPINGER TEMP
					806.04					
	6		.38	.32	806.75	87	50	272		70
	5		.32	.27	807.35	87	50	274		70
4	4		.21	.18	807.87	87	40	277		70
	3		.17	.14	808.32	87	35	275		70
	2		.29	.24	808.91	87	50	279		70
	1		.91	.76	809.90	87	10	277		70
	OFF				809.90					
	6		.28	.23	810.46	87	50	285		71
	5		.26	.22	811.03	87	50	276		70
5	4		.34	.28	811.66	87	50	277		70
	3		.31	.26	812.28	87	50	278		70
	2		.27	.22	812.82	87	50	281		70
	1		.68	.57	813.69	87	80	281		70

11:10 END

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. 1 #9 9 1128

Filter No. F #14 9 1101

PITOT TUBE LEAK TEST Initial O_2 @ " Final O_2 @ "

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

F91101-12
T91128-8

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant M1 - Sugar
Date 12/14
Location CARO
Operator Andy
Stack No. 1
Run No. PART. NO 2
PITOT TUBE NO. ___ C_p 0.84
Meter Box No. SGI - 5500 - N 1

Ambient Temperature 88
Barometric Pressure P_b Hg
Assumed Moisture, % WV 40
Probe Length, in. 120
Nozzle Diameter, in. D .249
Stack Diameter, in. 60 x 69.5
Stack Pressure, in. H_2O Pg
Sampling train LEAK TEST Initial 0.00425 Final 0.0032158

Meter ΔH@ M_1 1128564358
K_{iso} 1745.726 Y_d 1.005
WET BULB TEMPERATURE

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight 5
Final					
Initial					
Liquid Collected					

V_{lc} Total

	SAMPLING POINT	TIME θ	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP. T_m °F	VACUUM	STACK TEMP. T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6	1513	.42	.537	72918	94	6	265		87
	5		.46	.587	73018	93	65	266		84
	4		.60	.764	73104	92	86	266		81
	3		.83	1.078	73102	91	152	268		79
	2		1.15	1.46	73313	89	156	271		76
	1		1.45	1.89	73435	89	159	269		74
			[illegible]	[illegible]	73536					
	6		.51	.72	73536	89	110	268		74
	5		.49	.82	73573	90	102	268		76
	4		.28	.35	73664	91	90	270		75
	3		.36	.46	73741	91	91	268		75
	2		.46	.58	73815	90	107	270		76
	1		1.3	2.65	73905	90	[illegible]	270		77
					73997		162			7
	6		.72	.99	73997	90	158	269		79
	5		.37	.47	74099	90	105	270		78
	4		.15	.19	74181	90	53	270		80
	3		.11	.14	74231	91	48	270		83
	2		.27	.34	74278	92	72	269		85
	1		1.10	1.39	74340	93	161	271		86
					74436					

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

~~Filter~~ T No. 91128-8

COMMENTS: Sampling train —

Filter No. 91101-12

PITOT TUBE LEAK TEST Initial 0. 2 " Final 0. 2 "

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter ΔH@ _____ M_f

Date _____ Barometric Pressure P_b "Hg _____ K iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. _____ Nozzle Diameter, in. D _____

Run No. PART. NO. 2 Stack Diameter, in. _____

PITOT TUBE NO. ____ C_p O_2 _____ Stack Pressure, in. H_2O "Hg _____

Meter Box No. SGI - 5500 - Sampling train LEAK TEST Initial O_2 @ " Final O_2 @ "

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight 5
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6		.35	.70	144.56	93	110	270		87
	5		.40	.82	145.51	93	104	271		88
	4		.15	.19	146.43	93	51	270		88
	3		.12	.15	147.16	93	42	271		88
	2		.16	.20	147.56	93	49	271		88
	1		.63	.80	148.17	94	119	270		89
					148.92					
	6		.16	.20	148.94	95	52	269		90
	5		.31	.39	149.54	95	69	270		90
	4		.37	.47	150.25	96	79	272		90
	3		.30	.38	151.30	96	73	270		90
	2		.26	.33	151.76	96	69	270		90
	1		.54	.69	152.44	96	157	270		90
					153.31					

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. _____

Filter No. _____

PITOT TUBE LEAK TEST Initial O_2 @ Final O_2 @

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{C_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

$\frac{\cancel{B}S}{\cancel{S}W} \times M_f \times \frac{\Delta P}{\cancel{1.677408}}$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

1,677

Plant _____

Date _____

Location _____

Operator _____

Stack No. _____

Run No. PART. NO. P-1

PITOT TUBE NO. ____ C_p 0.84

Meter Box No. SGI-5500-

Ambient Temperature _____

Barometric Pressure P_b Hg _____

Assumed Moisture, % WV 40

Probe Length, in. _____

Nozzle Diameter, in. D .248

Stack Diameter, in. _____

Stack Pressure, in. H_2O $\frac{B}{2}$

Sampling train LEAK TEST Initial 0.805 @ 15" Final 0.44 @ 15"

Meter $\Delta H_@$ 17 M_f ~~1.7382~~

K iso 1745.726491 Y_d _____

WET BULB TEMPERATURE _____

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica C Weigh 9
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME θ	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP T_s °F	FILTER TEMP.	IMPINGER TEMP.
T	6	1248	17	363	69868	89	20	239		86
	5	50	35	765	69943	91	40	258		84
	4	52	36	800	70038	90	45	268		82
	3	54	27	605	70134	88	45	272		80
	2	56	18	405	70215	87	45	274		79
	1	58	43	43	70295	87	7	281		78
					70391					
	6		51	100	70391	88	7	189		82
	5		46	903	70491	89	95	182		78
	4		12	236	70620	87	6	181		78
	3		07	082	70687	86	3	182		81
	2		13	150	70712	87	4	175		
	1		85	16	70756	90	14	174		84
					70853					
	6		68	132	70853	89	14	178		84
	5		45	089	70943	90	14	188		82
	4		18	363	71088	88	8	199		87
	3		16	312	71302	88	7	178		88
	2		33	382	71340	88	8	175		90
	1		12	235	71405	89	14	180		94
					71503					

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

T Filter No. ~~91128-4~~ 91128-06

F Filter No. ~~91101-10~~ 91101-11

PITOT TUBE LEAK TEST Initial 0. @ " Final 0. @ "

COMMENTS: Sampling train —

.7056

.0039663 .0037

.36

$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$

ABORTED

SWANSON ENVIRONMENTAL INC.

FIELD DATA SHEET

P1

Plant _____ Ambient Temperature _____ Meter $\Delta H@$ M_f

Date _____ Barometric Pressure P_b "Hg _____ K iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. _____ Nozzle Diameter, in. D _____

Run No. PART. NO. _____ Stack Diameter, in. _____

PITOT TUBE NO. _____ C_p O_2 _____ Stack Pressure, in. H_2O P_g _____

P1 Meter Box No. SGI-5500- _____ Sampling train LEAK TEST Initial Q_r @ _____ Final Q_r @ _____

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica G Weigh 9
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME θ	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6		.65	1.76	715.03	89	1.45	175		98
	5		.48	1.29	716.4	90	1.45	172		101
	4		.20	.55	717.32	89	1.2	183		105
	3		.27	.72	718.35	89		168		108
	2		.62	.709	719.18	90		169		110
	1		1.3	1.48	720.16	90		168		113
					721.21					
	6		.38	.83	721.21	91	1.2	266		104
	5		.42	.925	722.24	93	1.3	268		110
	4		.57	1.25	723.33	93	1.4	270		111
	3		.78	1.72	724.50	92	1.4	270		112
	2	200	1.1	2.43	726.54	92		269		112
	1									

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. _____

Filter No. _____

PITOT TUBE LEAK TEST Initial Q_r @ _____ Final Q_r @ _____

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant: MI Sugar
Date: 12/14/89
Location: CARO
Operator: DJL/MA
Stack No.: Dryer
Run No. PART. NO.: P-1
PITOT TUBE NO. ____ C_p 0.84
Meter Box No.: SGI-5500-

Ambient Temperature ____
Barometric Pressure P_b ____ "Hg
Assumed Moisture, % WV: 40
Probe Length, in.: 120."
Nozzle Diameter, in. D: .248
Stack Diameter, in.: 60x69.5
Stack Pressure, in. H_2O: 5
Sampling Train LEAK TEST: Initial 0.005 @ 15"; Final 0.010 @ 14"

Meter ΔH@: M_d 1.67 M_{OSE}
K Iso: 1745.7264 M_d 1.005
WET BULB TEMPERATURE ____

Volume of Liquid Water Collected	Impinger Volume, ml 1	2	3	4	Silica Gel Weight 5
Final					
Initial					
Liquid Collected					

V_{lc} Total ____

	SAMPLING POINT	TIME	PITOT ΔPs	ORIFICE ΔH	DRY GAS METER Vm	Tm °F	VACUUM	STACK TEMP. Ts °F	FILTER TEMP.	IMPINGER TEMP.
				224						
T	6	1248	.17	~~.223~~	69868	89	20	239		86
	5		.35	.449	69943	91	40	258		84
	4		.36	.456	70038	90	45	268		82
	3		.27	.343	70134	88	45	272		80
	2		.18	.228	70215	87	45	274		79
	1		.43	.532	70295	87	70	281		78
					70391					
	6		.51	.728	70391	88	70	184		82
	5		.46	.660	70491	89	95	182		78
	4		.12	.172	70620	87	60	181		78
	3		.07	.100	70687	86	30	182		81
	2		.13	.188	70712	87	40	175		81
	1		.85	1.230	70856	90	140	174		84
					70855					
	6		.68	.966	70853	87	40	178		84
	5		.45	.641	70985	90	140	188		82
	4		.18	.251	71302	88	80	199		87
	3		.16	.230	71302	88	70	178		88
	2		.33	.477	71346	88	80	175		90
	1		.12	.172	71405	87	140	180		92
					71503					

Qrsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

T 91128-06
Filter No. ~~91128-9~~

F 91101-11
Filter No. ~~91101-10~~

PITOT TUBE LEAK TEST: Initial 0. @ "; Final 0. @ "

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{\sigma_m}{\sigma_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter $\Delta H_@$ _____ M_f

Date _____ Barometric Pressure P_b "Hg _____ K Iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. _____ Nozzle Diameter, in. D _____

Run No. PART. NO. _____ Stack Diameter, in. _____

PITOT TUBE NO. ____ C_p Q_2 ____ Stack Pressure, in. H_2O _____

Meter Box No. 501-3500- _____ Sampling train LEAK TEST Initial Q_2 0 " Final Q_2 0 "

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Sac. Wr
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP. T_m °F	VACUUM	STACK TEMP. T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6		.65	.970	715.08	89		175		98
	5		.48	.721	716.14	90		172		101
	4		.20	.295	717.32	89		183		105
	3		.27	.408	718.35	89		168		108
	2		.62	.936	719.18	90		169		110
	1		.13	.193	720.16	90		168		113
					721.21					
	6		.38	.292	722.21	91		266		101
	5		.42	.551	723.04	93		268		110
	4		.57	.756	723.03	93		270		110
	3		.78	1.03	723.50	92		270		112
	2		1.1	1.46	724.10	92		269		112
	1		.85	1.12	724.54	92		269		112
		200			726.54					

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. _____

Filter No. _____

PITOT TUBE LEAK TEST Initial Q_2 0 " Final Q_2 0 "

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left[1 - \frac{WV}{100}\right]^2 \frac{Q_m}{Q_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter ΔH@ _____ M_f 1.6774

Date 12/14/89 Barometric Pressure P_b Hg _____ K_{iso} 1745.72649 Y_d _____

Location MT SUGAR CARO Assumed Moisture, % WV 40 WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. P-3 Nozzle Diameter, in. D .248

Run No. PART. NO. Stack Diameter, in. _____

PITOT TUBE NO. ____ C_p 0.84 Stack Pressure, in. H_2O P_g _____

Meter Box No. SGI-5500- Sampling train LEAK TEST Initial O_2 .004 @ 15 Final O_2 @

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Weig g
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME @	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	METER TEMP T_m °F	VACUUM	STACK TEMP T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6	523	.69	.869	75403	97	9	280		84
	5		.74	.91	75515	96	10	291		84
	4		.68	.84	75621	95	14	292		81
	3		.80	.979	75728	95	14	289		79
	2		.83	1.05	75825	96	16	284		78
	1		.84	1.05	75938	98	16	283		77
					76040		-			
	6		.37	.466	76040	98	8	292		82
	5		.50	.61	76127	99	11	298		81
	4		.25	.18	76118	99	1	298		80
	3		.28	.205	76258	99	9	296		80
	2		.53	.38	76325	99	90	295		80
	1		1.1	1.368	76397	98		291		
					76501	~~89~~		~~285~~		
	6		.24	.37	76501	98	11	29[illegible]		82
	5		.15	.18	76572	98	5	290		82
	4		.09	.11	76628	99		286		82
	3		.09	.11	76677	99	4	284		83
	2		.28	.35	76728	99	65	280		84
	1		.89	1.12	76780	99	16	278		83

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

T Filter No. 91128-4

F Filter No. 91101-10

COMMENTS: Sampling train —

VOID

PITOT TUBE LEAK TEST Initial O_2 @ Final O_2 @

$$\Delta H = K_{iso} C_p^2 D^4 \left[1 - \frac{WV}{100}\right]^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

ABORTED

SWANSON ENVIRONMENTAL INC

FIELD DATA SHEET

Plant _____ Ambient Temperature _____ Meter $\Delta H_@$ _____ M_f

Date _____ Barometric Pressure P_b "Hg _____ K iso _____ Y_d _____

Location _____ Assumed Moisture, % WV _____ WET BULB TEMPERATURE _____

Operator _____ Probe Length, in. _____

Stack No. P-3 Nozzle Diameter, in. D _____

Run No. PART. NO. Stack Diameter, in. _____

PITOT TUBE NO. _____ C_p 0. Stack Pressure, in. H_2O P_s _____

Meter Box No. 501-5500- Sampling train LEAK TEST Initial O_2 @ Final O_2 @

Volume of Liquid Water Collected	Impinger Volume ml 1	2	3	4	Silica Gel Weight g
Final					
Initial					
Liquid Collected					

V_{lc} Total _____

	SAMPLING POINT	TIME	PITOT ΔP_s	ORIFICE ΔH	DRY GAS METER V_m	T_m	METER TEMP °F	VACUUM	STACK TEMP. T_s °F	FILTER TEMP.	IMPINGER TEMP.
	6		.10	.086	768	76	97		263		84
	5		.19	.175	768		97		229		84
	4		.20	.185	769	73	98		221		84
	3		.10	.09	770	78	99	4	231		84
	2		.10	.08			99		242		85
	1										
	6										
	5										
	4										
	3										
	2										
	1										

Orsat Measurement					
Test	Time	CO_2	O_2	CO	N_2
1					
2					
3					
4					

Filter No. _____

Filter No. _____

PITOT TUBE LEAK TEST Initial O_2 @ Final O_2 @

COMMENTS: Sampling train —

$$\Delta H = K_{iso} C_p^2 D^4 \left(1 - \frac{WV}{100}\right)^2 \frac{G_m}{G_s} \frac{P_s}{P_m} \frac{T_m}{T_s} \Delta P_s$$

12 PAGE LAB REPORT MICHIGAN SUGAR COMPANY PLANT: CARO

DATE	DAYS	DIFFUSER #1 SHIFTS 1ST	2ND	3RD	DIFFUSER #2 SHIFTS 1ST	2ND	3RD	BEETS SLICED TOTAL DAY	TONS SLICED TODATE	AVE.	SUGAR IN COSSETES % SUGAR DAY	% SUGAR TODATE	TONS SUGAR DAY	TONS SUGAR TODATE	STEAM ON BEETS TEMP C BTS	TEMP C COSS	% STEAM DAY	% STEAM TD	PRODUCT DAY	PRODUCT TD
11/24	58.00	1120	1010	1125				3255	181916	3136	16.78	17.20	546.19	31287.44	11	18	1.19	.58	38.7	1063.2
11/25	59.00	1145	880	1040				3065	184981	3135	16.77	17.19	514.00	31801.44	12	17	.85	.59	26.1	1089.3
11/26	60.00	990	1095	970				3055	188036	3134	17.55	17.20	536.15	32337.59	11	16	.85	.59	26.0	1115.3
11/27	61.00	695	850	740				2285	190321	3120	17.07	17.20	390.05	32727.64	12	17	.85	.60	19.4	1134.7
11/28	62.00	675	745	990				2410	192731	3109	17.87	17.20	430.67	33158.31	13	17	.68	.60	16.4	1151.1
11/29	63.00	1120	805	900				2825	195556	3104	18.00	17.22	508.50	33666.81	9	15	1.02	.60	28.8	1179.9
11/30	64.00	545	1025	1070				2640	198196	3097	17.39	17.22	459.10	34125.91	13	16	.51	.60	13.5	1193.4
WK 9								19535		2791	17.33		3384.66					.60		1193.4
TD									198196	3097		17.22		34125.91						
12/01	65.00	905	940	1050				2895	201091	3094	16.77	17.21	485.49	34611.40	8	16	1.36	.61	39.4	1232.8
12/02	66.00	350	300	755				1405	202496	3068	17.26	17.21	242.50	34853.90		15	2.56	.63	36.0	1268.8
12/03	67.00	725	570	770				2065	204561	3053	16.95	17.21	350.02	35203.92	4	15	1.88	.64	38.8	1307.6
12/04	68.00	730	605	810				2145	206706	3040	17.38	17.21	372.80	35576.72	15	7	1.36	.62	29.2	1278.4
12/05	69.00	990	985	1005				2980	209686	3039	16.94	17.21	504.81	36081.53	7	15	1.36	.63	40.5	1318.9
12/06	70.00	940	875	945				2760	212446	3035	17.30	17.21	477.48	36559.01	9	15	1.02	.63	28.2	1347.1
12/07	71.00	850	1125	910				2885	215331	3033	17.30	17.21	499.11	37058.12	8	16	1.36	.64	39.2	1386.3
WK 10								17135		2448	17.11		2932.21					.64		1386.3
TD									215331	3033		17.21		37058.12						
12/08	72.00	995	1100	1085				3180	218511	3035	17.02	17.21	541.24	37599.36	9	16	1.19	.65	37.8	1424.1
12/09	73.00	810	1110	1090				3010	221521	3035	17.38	17.21	523.14	38122.50	6	14	1.36	.66	40.9	1465.0
12/10	74.00	1135	1050	1120				3305	224826	3038	17.47	17.21	577.38	38699.88	9	15	1.02	.67	33.7	1498.7
12/11	75.00	1085	1105	965				3155	227981	3040	17.92	17.22	565.38	39265.26	7	15	1.36	.68	42.9	1541.6
12/12	76.00	935		305				1240	229221	3016	17.65	17.23	218.86	39484.12	5	14	1.54	.68	19.1	1560.7
12/13	77.00	860	1080	1080				3020	232241	3016	17.53	17.23	529.41	40013.53	5	12	1.19	.69	35.9	1596.6
12/14	78.00	995	1080	1080				3155	235396	3018	17.72	17.24	559.07	40572.60	5	13	1.36	.70	42.9	1639.5
WK 11								20065		2866	17.52		3514.48					.70		1639.5
TD									235396	3018		17.24		40572.60						
12/15	79.00	1050	1120	1120				3290	238686	3021	17.78	17.24	584.96	41157.56	4	12	1.36	.71	44.7	1684.2
12/16	80.00	1150	1150	1150				3450	242136	3027	18.31	17.26	631.70	41789.26	4	12	1.36	.71	46.9	1731.1
12/17	81.00	1115	1130	1140				3385	245521	3031	17.90	17.27	605.92	42395.18	3	10	1.19	.72	40.3	1771.4
12/18	82.00	1150	905	1060				3115	248636	3032	17.57	17.27	547.31	42942.49	2	11	1.54	.73	48.0	1819.4
12/19	83.00	1160	1040	1115				3315	251951	3036	17.85	17.28	591.73	43534.22	2	11	1.54	.74	51.1	1870.5
12/20	84.00	580	1160	1090				2830	254781	3033	17.79	17.28	503.46	44037.68	3	7	.68	.74	19.2	1889.7
12/21	85.00	955	1110	905				2970	257751	3032	17.50	17.29	519.75	44557.43		11	1.88	.75	55.8	1945.5
WK 12								22355		3194	17.83		3984.83					.75		1945.5
TD									257751	3032		17.29		44557.43						

6 9 1990

		DIFFUSION JUICE						DRAFT BY		THICK JUICE						THIN JUICE		
		BRIX			PURITY			SUGAR CONTENT		BRIX			PURITY			BRIX		
DATE	DAYS	DAY	TOTAL	TODATE	DAY	TOTAL	TODATE	DAY	TODATE	DAY	TOTAL	TODATE	DAY	TOTAL	TODATE	DAY	TOTAL	TODATE
11/24	58.00	14.12	859.96	15.09	91.01	5129.69	89.99	128.24	124.60	66.1	3697.3	66.0	90.36	5095.30	90.99	13.8	820.1	14.4
11/25	59.00	14.33	874.29	15.07	90.07	5219.76	90.00	128.07	124.68	67.2	3764.5	66.0	89.57	5184.87	90.96	13.4	833.5	14.4
11/26	60.00	14.79	889.08	15.07	90.74	5310.50	90.01	128.76	124.74	64.8	3829.3	66.0	90.02	5274.89	90.95	14.1	847.6	14.4
11/27	61.00	14.33	903.41	15.06	89.93	5400.43	90.01	130.36	124.82	65.8	3895.1	66.0	89.74	5364.63	90.93	12.9	860.5	14.3
11/28	62.00	15.05	918.46	15.06	90.71	5491.14	90.02	128.85	124.81	63.8	3958.9	66.0	90.98	5455.61	90.93	12.7	873.2	14.3
11/29	63.00	15.32	933.78	15.06	90.66	5581.80	90.03	127.80	124.94	66.4	4025.3	66.0	90.23	5545.84	90.92	14.3	887.5	14.3
11/30	64.00	14.90	948.68	15.06	89.59	5671.39	90.02	128.70	124.95	65.7	4091.0	66.0	89.83	5635.67	90.90	12.6	900.1	14.3
WK 9		14.69			90.39			128.56		65.6			90.10			13.4		
TD				15.06			90.02		124.95			66.0			90.90			14.3
12/01	65.00	15.44	964.12	15.06	89.59	5760.98	90.02	119.35	124.88	64.4	4155.4	66.0	90.81	5726.48	90.90	14.2	914.3	14.3
12/02	66.00	14.24	978.36	15.05	88.91	5849.89	90.00	134.67	124.99	54.4	4209.8	65.8	90.58	5817.06	90.89	11.2	925.5	14.2
12/03	67.00	14.69	993.05	15.05	87.03	5936.92	89.95	130.08	125.06	64.6	4274.4	65.8	87.76	5904.82	90.84	13.7	939.2	14.2
12/04	68.00	14.53	1007.58	15.04	88.73	6025.65	89.94	132.95	125.16	64.0	4338.4	65.7	88.75	5993.57	90.81	12.6	951.8	14.2
12/05	69.00	15.03	1022.61	15.04	89.45	6115.10	89.93	123.99	125.17	65.1	4403.5	65.7	89.76	6083.33	90.80	13.0	964.8	14.2
12/06	70.00	15.01	1037.62	15.04	90.33	6205.43	89.93	126.05	125.17	65.4	4468.9	65.7	90.10	6173.43	90.79	13.7	978.5	14.2
12/07	71.00	15.47	1053.09	15.04	90.04	6295.47	89.94	121.83	125.16	61.3	4530.2	65.7	90.84	6264.27	90.79	14.8	993.3	14.2
WK 10		14.92			89.15			126.61		62.7			89.80			13.3		
TD				15.04			89.94		125.16			65.7			90.79			14.2
12/08	72.00	15.22	1068.31	15.05	89.22	6384.69	89.93	122.98	125.09	65.1	4595.3	65.6	90.51	6354.78	90.78	14.9	1008.2	14.2
12/09	73.00	15.28	1083.59	15.05	89.53	6474.22	89.92	124.85	125.10	62.7	4658.0	65.6	89.82	6444.60	90.77	14.8	1023.0	14.2
12/10	74.00	15.76	1099.35	15.06	89.53	6563.75	89.91	121.62	125.03	67.2	4725.2	65.6	89.68	6534.28	90.75	15.1	1038.1	14.2
12/11	75.00	15.46	1114.81	15.07	89.98	6653.73	89.92	126.88	125.01	64.2	4789.4	65.6	90.53	6624.81	90.75	15.1	1053.2	14.2
12/12	76.00	14.72	1129.53	15.06	90.14	6743.87	89.92	131.36	125.17	59.9	4849.3	65.5	90.63	6715.44	90.75	12.0	1065.2	14.2
12/13	77.00	14.85	1144.38	15.06	89.61	6833.48	89.91	130.01	125.18	65.6	4914.9	65.5	89.85	6805.29	90.74	12.0	1077.2	14.2
12/14	78.00	15.33	1159.71	15.06	89.14	6922.62	89.90	127.55	125.27	67.7	4982.6	65.6	89.58	6894.87	90.72	14.7	1091.9	14.2
WK 11		15.23			89.59			126.35		64.6			90.09			14.1		
TD				15.06			89.90		125.27			65.6			90.72			14.2
12/15	79.00	15.56	1175.27	15.07	89.98	7012.60	89.91	125.28	125.17	65.1	5047.7	65.6	90.90	6985.77	90.72	14.7	1106.6	14.2
12/16	80.00	15.43	1190.70	15.07	90.43	7103.03	89.91	129.29	125.32	65.9	5113.6	65.6	91.32	7077.09	90.73	15.0	1121.6	14.2
12/17	81.00	15.37	1206.07	15.08	90.39	7193.42	89.92	126.83	125.30	67.0	5180.6	65.6	90.60	7167.69	90.73	14.8	1136.4	14.2
12/18	82.00	15.12	1221.19	15.08	90.08	7283.50	89.92	126.58	125.30	67.1	5247.7	65.6	90.91	7258.60	90.73	14.2	1150.6	14.2
12/19	83.00	15.27	1236.46	15.08	90.53	7374.03	89.93	127.24	125.36	66.5	5314.2	65.6	90.26	7348.86	90.73	14.6	1165.2	14.2
12/20	84.00	15.01	1251.47	15.08	89.26	7463.29	89.92	130.99	125.37	65.4	5379.6	65.6	90.20	7439.06	90.72	13.3	1178.5	14.2
12/21	85.00	14.55	1266.02	15.07	89.03	7552.32	89.91	133.47	125.54	64.1	5443.7	65.6	89.99	7529.05	90.71	13.6	1192.1	14.2
WK 12		15.19			89.96			128.58		65.8			90.60			14.3		
TD				15.07			89.91		125.54			65.6			90.71			14.2

8 9 1990

		LIME ROCK BURNED				COKE BURNED				CAO INTRODUCED				LIME CAKE		SUGAR LOST IN CAKE				SUGAR LOST, SEWER				CO2
		==TONS==		ZON BEETS		==TON==		ZON ROCKS		===TONS===		ZON BEETS		====TONS====		==TONS==		ZON BTS		==TONS=		ZON BEETS		%
DATE	DAY	DAY	TD	DAY	TD	DAY	TD	DAY	TD	DAY	TD	DAY	TD	DAY	TODATE	DAY	TD	DAY	TD	DAY	TD	DAY	TD	GAS
11/24	58	146	7958	4.49	4.37	15	796	10.27	10.00	73.0	3939.0	2.24	2.17	299.2	18143.8	2.24	111.33	.07	.06					27
11/25	59	151	8109	4.93	4.38	15	811	9.93	10.00	75.5	4014.5	2.46	2.17	322.6	18466.4	1.29	112.62	.04	.06					27
11/26	60	135	8244	4.42	4.38	13	824	9.63	10.00	67.5	4082.0	2.21	2.17	298.7	18765.1	1.31	113.93	.04	.06					32
11/27	61	119	8363	5.21	4.39	12	836	10.08	10.00	59.5	4141.5	2.60	2.18	253.2	19018.3	1.11	115.04	.05	.06					28
11/28	62	116	8479	4.81	4.40	12	848	10.34	10.00	58.0	4199.5	2.41	2.18	241.7	19260.0	1.28	116.32	.05	.06					30
11/29	63	155	8634	5.49	4.42	15	863	9.68	10.00	77.5	4277.0	2.74	2.19	329.8	19589.8	1.91	118.23	.07	.06					27
11/30	64	175	8809	6.63	4.44	17	880	9.71	9.99	87.5	4364.5	3.31	2.20	370.8	19960.6	2.37	120.60	.09	.06					28
WK 9		997		5.10		99		9.93								11.51		.06						28
TD			8809		4.44		880		9.99								120.60		.06					
12/01	65	172	8981	5.94	4.47	17	897	9.88	9.99	86.0	4450.5	2.97	2.21	413.5	20374.1	2.48	123.08	.09	.06					
12/02	66	98	9079	6.98	4.48	10	907	10.20	9.99	49.0	4499.5	3.49	2.22	227.9	20602.0	.50	123.58	.04	.06					24
12/03	67	144	9223	6.97	4.51	14	921	9.72	9.99	72.0	4571.5	3.49	2.23	300.0	20902.0	2.46	126.04	.12	.06					27
12/04	68	167	9390	7.79	4.54	17	938	10.18	9.99	83.5	4655.0	3.89	2.25	342.2	21244.2	1.92	127.96	.09	.06					29
12/05	69	167	9557	5.60	4.56	17	955	10.18	9.99	83.5	4738.5	2.80	2.26	366.2	21610.4	2.09	130.05	.07	.06					27
12/06	70	170	9727	6.16	4.58	17	972	10.00	9.99	85.0	4823.5	3.08	2.27	345.5	21955.9	1.14	131.19	.04	.06					25
12/07	71	166	9893	5.75	4.59	17	989	10.24	10.00	83.0	4906.5	2.88	2.28	347.3	22303.2	1.49	132.68	.05	.06					29
WK 10		1084		6.33		109		10.06								12.08		.07						27
TD			9893		4.59		989		10.00								132.68		.06					
12/08	72	169	10062	5.31	4.60	17	1006	10.06	10.00	84.5	4991.0	2.66	2.28	367.4	22670.6	1.73	134.41	.05	.06					26
12/09	73	171	10233	5.68	4.62	17	1023	9.94	10.00	85.5	5076.5	2.84	2.29	368.5	23039.1	2.98	137.39	.10	.06					27
12/10	74	175	10408	5.30	4.63	17	1040	9.71	9.99	87.5	5164.0	2.65	2.30	367.6	23406.7	1.03	138.42	.03	.06					27
12/11	75	177	10585	5.61	4.64	18	1058	10.17	10.00	88.5	5252.5	2.81	2.30	368.8	23775.5	1.81	140.23	.06	.06					29
12/12	76	85	10670	6.85	4.65	9	1067	10.59	10.00	42.5	5295.0	3.43	2.31	174.2	23949.7	.84	141.07	.07	.06					26
12/13	77	142	10812	4.70	4.66	14	1081	9.86	10.00	71.0	5366.0	2.35	2.31	300.8	24250.5	1.32	142.39	.04	.06					30
12/14	78	184	10996	5.83	4.67	18	1099	9.78	9.99	92.0	5458.0	2.92	2.32	383.3	24633.8	1.11	143.50	.04	.06					26
WK 11		1103		5.50		110		9.97								10.82		.05						27
TD			10996		4.67		1099		9.99								143.50		.06					
12/15	79	154	11150	4.68	4.67	15	1114	9.74	9.99	77.0	5535.0	2.34	2.32	327.7	24961.5	2.13	145.63	.06	.06					
12/16	80	171	11321	4.96	4.68	17	1131	9.94	9.99	85.5	5620.5	2.48	2.32	365.4	25326.9	4.17	149.80	.12	.06					26
12/17	81	171	11492	5.05	4.68	17	1148	9.94	9.99	85.5	5706.0	2.53	2.32	351.9	25678.8	1.72	151.52	.05	.06					28
12/18	82	162	11654	5.20	4.69	16	1164	9.88	9.99	81.0	5787.0	2.60	2.33	326.6	26005.4	2.48	154.00	.08	.06					26
12/19	83	152	11806	4.59	4.69	15	1179	9.87	9.99	76.0	5863.0	2.29	2.33	324.8	26330.2	1.66	155.66	.05	.06					26
12/20	84	132	11938	4.66	4.69	13	1192	9.85	9.98	66.0	5929.0	2.33	2.33	280.9	26611.1	.62	156.28	.02	.06					27
12/21	85	155	12093	5.22	4.69	16	1208	10.32	9.99	77.5	6006.5	2.61	2.33	328.4	26939.5	1.15	157.43	.04	.06					26
WK 12		1097		4.91		109		9.94								13.93		.06						27
TD			12093		4.69		1208		9.99								157.43		.06					

DATE	DAY	ALKALINITY 1ST CARB	ALKALINITY 2ND CARB	LIME SALTS THIN JUICE	LIME SALTS STND LIQU	PH PRE. LIME	PH 2ND CARB	PH THIN JUICE	PH THICK JUICE	PH STND LIQU	SULPHUR POUNDS DAY	SULPHUR POUNDS TD	SULPHUR #/TON DAY	SULPHUR BTS TD	SODA ASH POUNDS DAY	SODA ASH POUNDS TD	SODA ASH #/TON DAY	SODA ASH BTS TD	FILTER AIDS POUNDS DAY	FILTER AIDS POUNDS TD	FILTER AIDS #/TON DAY	FILTER AIDS BTS TD	PH DIFF # 1	PH JUICE # 2
11/24	58	.080	.030	.336	.229	11.3	9.5	9.3	9.0	8.9		56000				57822	5.9							
11/25	59	.090	.026	.335	.263	11.4	9.6	9.2	8.6	8.6		56000				57822	6.0							
11/26	60	.084	.022	.239	.180	11.5	9.3	9.0	8.4	8.2		56000				57822	5.9							
11/27	61	.084	.022	.244	.206	11.8	9.4	9.3	8.6	8.4		56000				57822	5.9							
11/28	62	.088	.022	.211	.161	11.8	9.4	9.3	8.7	8.6		56000				57822	6.0							
11/29	63	.084	.028	.236	.172	11.6	9.8	9.7	9.1	8.9		56000				57822	6.1							
11/30	64	.081	.027	.250	.181	11.5	9.9	9.6	9.1	9.0	6000	62000			8556	66378	6.2							
WK 9		.084	.025	.264	.199	11.6	9.6	9.3	8.8	8.7	6000		.31						8556		.44		6.0	
TD		.089	.026	.164	.136	11.0	9.3	9.1	8.6	8.5		62000		.31						66378		.33		
12/01	65	.084	.034	.321	.226	11.4	10.0	9.7	9.4	9.3		62000								66378			6.0	
12/02	66	.075	.024	.339	.277	11.5	9.6	9.2	9.2	9.1		62000								66378			6.1	
12/03	67	.079	.027	.358	.282	11.0	9.9	9.4	9.1	9.1		62000								66378			6.1	
12/04	68	.090	.021	.379	.263	11.5	9.6	9.4	8.9	8.8		62000								66378			6.0	
12/05	69	.092	.027	.294	.234	11.2	9.7	9.4	8.8	8.7		62000								66378			6.0	12.0
12/06	70	.082	.022	.259	.195	10.9	9.4	9.1	8.6	8.4		62000								66378			6.0	
12/07	71	.086	.022	.204	.176	10.9	9.3	9.1	8.9	8.8	7000	69000							11661	78039			5.9	
WK 10		.084	.025	.308	.236	11.2	9.6	9.3	9.0	8.9	7000		.41						11661		.68		6.0	12.0
TD		.089	.026	.178	.146	11.0	9.4	9.2	8.6	8.5		69000		.32						78039		.36		
12/08	72	.095	.026	.236	.155	11.1	9.5	9.2	8.6	8.5		69000								78039			5.9	
12/09	73	.092	.023	.281	.220	11.4	9.3	9.1	8.5	8.3		69000								78039			5.9	
12/10	74	.091	.021	.233	.154	11.3	9.4	9.1	8.1	8.0		69000								78039			5.9	
12/11	75	.082	.020	.207	.146	11.3	9.1	9.0	8.2	7.9		69000								78039			5.9	
12/12	76	.062	.012	.222	.133	11.3	9.1	8.8	8.6	8.2		69000								78039			6.0	
12/13	77	.088	.027	.201	.193	11.4	9.7	9.5	8.8	8.5		69000							7176	85215			5.9	
12/14	78	.089	.026	.218	.174	11.4	9.3	9.2	8.6	8.6	9000	78000												
WK 11		.086	.022	.228	.168	11.3	9.3	9.1	8.5	8.3	9000		.45						7176		.36		5.9	
TD		.088	.026	.183	.148	11.1	9.4	9.2	8.6	8.5		78000		.33						85215		.36		
12/15	79	.092	.025	.186	.141	11.3	9.4	9.2	8.7	8.5		78000								85215			5.9	
12/16	80	.089	.024	.211	.165	11.3	9.4	9.1	8.6	8.5		78000								85215			5.9	
12/17	81	.087	.021	.241	.174	11.4	9.6	9.3	8.6	8.4		78000								85215			6.0	
12/18	82	.082	.020	.243	.153	11.4	9.4	9.1	8.4			78000								85215			5.9	
12/19	83	.082	.019	.215	.168	11.4	9.3	9.2	8.5	8.4		78000								85215			5.9	
12/20	84	.074	.021	.239	.185	11.5	9.3	9.1	8.4	8.3		78000								85215			5.9	
12/21	85	.081	.021	.247	.188	11.2	9.4	9.2	8.7	8.5	5000	83000							5106	90321			6.0	
WK 12		.084	.022	.226	.168	11.4	9.4	9.2	8.6	8.4	5000		.22						5106		.23		5.9	
TD		.088	.025	.186	.150	11.1	9.4	9.2	8.6	8.5		83000		.32						90321		.35		

		PULP PRODUCED					PRESSED PULP			DRY PULP			PELLET PULP			% SUGAR IN PRESSED PULP			
		===TONS===		% ON BEETS			=====% MOISTURE=====			=====% MOISTURE=====			=====% MOISTURE=====			=% SUGAR=		===TONS===	
DATE	DAY	DAY	TODATE	DAY	TD	AVE	DAY	TOTAL	TODATE	DAY	TOTAL	TODATE	DAY	TOTAL	TODATE	DAY	TD	DAY	TD
11/24	58	179	9995	5.50	5.49	172	73.18	4116.37	74.84	11.15	673.31	12.02	11.15	595.72	10.64	.30	.28	9.77	512.[illegible]
11/25	59	169	10164	5.51	5.49	172	66.82	4183.19	74.70	10.38	683.69	11.99	10.34	606.06	10.63	.24	.28	7.36	519.8[illegible]
11/26	60	168	10332	5.50	5.49	172	66.55	4249.74	74.56	10.24	693.93	11.96	10.73	616.79	10.63	.27	.28	8.25	528.[illegible]
11/27	61	126	10458	5.51	5.49	171	67.53	4317.27	74.44	11.99	705.92	11.96	11.44	628.23	10.65	.27	.28	6.17	534.28
11/28	62	133	10591	5.52	5.50	171	69.52	4386.79	74.35	11.20	717.12	11.95	11.14	639.37	10.66	.28	.28	6.75	541.03
11/29	63	155	10746	5.49	5.50	171	66.10	4452.89	74.21	14.71	731.83	12.00	11.41	650.78	10.67	.25	.28	7.06	548.09
11/30	64	145	10891	5.49	5.50	170	67.03	4519.92	74.10	13.14	744.97	12.02	10.61	661.39	10.67	.21	.28	5.54	553.63
WK 9		1075		5.50			68.10			11.83			10.97			.26		50.90	
TD			10891		5.50				74.10			12.02			10.67		.28		553.63
12/01	65	159	11050	5.49	5.50	170	70.62	4590.54	74.04	10.09	755.06	11.99	11.04	672.43	10.67	.26	.28	7.53	561.16
12/02	66	77	11127	5.48	5.49	169	70.03	4660.57	73.98	8.46	763.52	11.93	10.52	682.95	10.67	.21	.28	2.95	564.11
12/03	67	114	11241	5.52	5.50	168	75.85	4736.42	74.01	8.21	771.73	11.87	10.32	693.27	10.67	.32	.28	6.61	570.72
12/04	68	118	11359	5.50	5.50	167	73.43	4809.85	74.00	9.53	781.26	11.84	10.74	704.01	10.67	.24	.28	5.15	575.87
12/05	69	164	11523	5.50	5.50	167	71.08	4880.93	73.95	12.68	793.94	11.85	11.72	715.73	10.68	.27	.28	8.05	583.92
12/06	70	152	11675	5.51	5.50	167	71.72	4952.65	73.92	9.71	803.65	11.82	10.53	726.26	10.68	.21	.28	5.80	589.72
12/07	71	159	11834	5.51	5.50	167	74.96	5027.61	73.94	9.22	812.87	11.78	10.31	736.57	10.67	.33	.28	9.52	599.24
WK 10		943		5.50			72.53			9.70			10.74			.27		45.61	
TD			11834		5.50				73.94			11.78			10.67		.28		599.24
12/08	72	175	12009	5.50	5.50	167	77.03	5104.64	73.98	9.59	822.46	11.75	10.72	747.29	10.68	.32	.28	10.18	609.42
12/09	73	166	12175	5.51	5.50	167	73.98	5178.62	73.98	11.28	833.74	11.74	10.07	757.36	10.67	.30	.28	9.03	618.45
12/10	74	182	12357	5.51	5.50	167	75.23	5253.85	74.00	11.05	844.79	11.73	10.23	767.59	10.66	.31	.28	10.25	628.70
12/11	75	174	12531	5.52	5.50	167	74.55	5328.40	74.01	10.80	855.59	11.72	10.68	778.27	10.66	.27	.28	8.52	637.22
12/12	76	68	12599	5.48	5.50	166	75.95	5404.35	74.03	10.26	865.85	11.70	10.33	788.60	10.66	.22	.28	2.73	639.95
12/13	77	166	12765	5.50	5.50	166	73.08	5477.43	74.02	11.75	877.60	11.70	11.17	799.77	10.66	.23	.28	6.95	646.90
12/14	78	174	12939	5.52	5.50	166	77.16	5554.59	74.06	12.81	890.41	11.72	10.89	810.66	10.67	.29	.28	9.15	656.05
WK 11		1105		5.51			75.28			11.08			10.58			.28		56.81	
TD			12939		5.50				74.06			11.72			10.67		.28		656.05
12/15	79	181	13120	5.50	5.50	166	73.38	5627.97	74.05	12.10	902.51	11.72	10.77	821.43	10.67	.24	.28	7.90	663.95
12/16	80	190	13310	5.51	5.50	166	71.88	5699.85	74.02	12.00	914.51	11.72	10.84	832.27	10.67	.27	.28	9.32	673.27
12/17	81	186	13496	5.49	5.50	167	73.00	5772.85	74.01	11.97	926.48	11.73	10.87	843.14	10.67	.28	.28	9.48	682.75
12/18	82	171	13667	5.49	5.50	167	77.87	5850.72	74.06	10.81	937.29	11.72	10.66	853.80	10.67	.33	.28	10.28	693.03
12/19	83	182	13849	5.49	5.50	167	73.93	5924.65	74.06	12.31	949.60	11.72	10.95	864.75	10.68	.26	.28	8.62	701.65
12/20	84	156	14705	5.51	5.77	175	71.58	5996.23	74.03	11.09	960.69	11.72	10.46	875.21	10.67	.24	.28	6.79	708.44
12/21	85	163	14868	5.49	5.77	175	71.62	6067.85	74.00	10.06	970.75	11.70	11.07	886.28	10.68	.21	.28	6.24	714.68
WK 12		1229		5.50			73.32			11.48			10.80			.26		58.63	
TD			14868		5.77				74.00			11.70			10.68		.28		714.68

MOLASSES PRODUCED

DATE	DAY	TONS DAY	TONS TODATE	% ON BEETS DAY	% ON BEETS TD	% SUGAR DAY	% SUGAR TD	TONS SUGAR DAY	TONS SUGAR TODATE	SUGAR % BEETS DAY	SUGAR % BEETS TD	BRIX DAY	BRIX TOTAL	BRIX TD	PURITY DAY	PURITY TOTAL	PURITY TODATE	PH
11/24	58	133	7154	4.09	3.93	50.53	50.06	67.20	3581.34	2.06	1.97	84.0	4430.1	83.6	60.20	3179.63	59.99	7.5
11/25	59	126	7280	4.11	3.94	47.83	50.02	60.27	3641.61	1.97	1.97	79.9	4510.0	83.5	59.96	3239.59	59.99	7.7
11/26	60	125	7405	4.09	3.94	47.10	49.97	58.88	3700.49	1.93	1.97	79.5	4589.5	83.4	59.22	3298.81	59.98	7.5
11/27	61	94	7499	4.11	3.94	48.23	49.95	45.34	3745.83	1.98	1.97	83.4	4672.9	83.4	57.85	3356.66	59.94	7.8
11/28	62	99	7598	4.11	3.94	47.60	49.92	47.12	3792.95	1.96	1.97	80.8	4753.7	83.4	58.95	3415.61	59.92	7.8
11/29	63	116	7714	4.11	3.94	47.07	49.88	54.60	3847.55	1.93	1.97	83.6	4837.3	83.4	56.35	3471.96	59.86	8.0
11/30	64	108	8172	4.09	4.12	46.10	49.83	49.79	4071.91	1.89	2.05	83.1	4920.4	83.4	55.46	3527.42	59.79	7.9
WK 9		801		4.10				383.20				82.0			58.28			7.7
TD			8172		4.12				4071.91					83.4			59.79	7.3
12/01	65	124	8296	4.28	4.13	46.70	49.78	57.91	4129.82	2.00	2.05	83.1	5003.5	83.4	56.21	3583.63	59.73	7.7
12/02	66	60	8356	4.27	4.13	48.47	49.77	29.08	4158.90	2.07	2.05	83.6	5087.1	83.4	57.81	3641.44	59.70	8.1
12/03	67	89	8445	4.31	4.13	48.37	49.76	43.05	4201.95	2.08	2.05	85.6	5172.7	83.4	56.51	3697.95	59.64	8.9
12/04	68	92	8537	4.29	4.13	48.97	49.75	45.05	4247.00	2.10	2.05	86.2	5258.9	83.5	56.84	3754.79	59.60	8.7
12/05	69	128	8665	4.30	4.13	49.03	49.74	62.76	4309.76	2.11	2.06	84.8	5343.7	83.5	57.82	3812.61	59.57	8.6
12/06	70	119	8784	4.31	4.13	48.90	49.73	58.19	4367.95	2.11	2.06	82.1	5425.8	83.5	59.60	3872.21	59.57	8.5
12/07	71	174	8958	6.03	4.16	48.80	49.71	84.91	4452.86	2.94	2.07	83.0	5508.8	83.5	58.82	3931.03	59.56	7.7
WK 10		786		4.59				380.95				84.1			57.66			8.3
TD			8958		4.16				4452.86					83.5			59.56	7.4
12/08	72	137	9095	4.31	4.16	49.70	49.71	68.09	4520.95	2.14	2.07	84.7	5593.5	83.5	58.68	3989.71	59.55	7.0
12/09	73	129	9224	4.29	4.16	50.72	49.72	65.43	4586.38	2.17	2.07	82.6	5676.1	83.5	61.38	4051.09	59.57	7.2
12/10	74	142	9366	4.30	4.17	51.97	49.76	73.80	4660.18	2.23	2.07	84.5	5760.6	83.5	61.51	4112.60	59.60	7.2
12/11	75	136	9502	4.31	4.17	50.07	49.76	68.10	4728.28	2.16	2.07	85.0	5845.6	83.5	58.93	4171.53	59.59	7.3
12/12	76	53	9555	4.27	4.17	49.18	49.76	26.07	4754.35	2.10	2.07	82.3	5927.9	83.5	59.84	4231.37	59.60	7.0
12/13	77	130	9685	4.30	4.17	48.24	49.74	62.71	4817.06	2.08	2.07	83.8	6011.7	83.5	57.56	4288.93	59.57	7.1
12/14	78	136	9821	4.31	4.17	47.37	49.70	64.42	4881.48	2.04	2.07	82.7	6094.4	83.5	57.30	4346.23	59.54	7.2
WK 11		863		4.30				428.62				83.7			59.31			7.1
TD			9821		4.17				4881.48					83.5			59.54	7.4
12/15	79	141	10162	4.29	4.26	49.30	49.70	69.51	5050.40	2.11	2.12	82.3	6176.7	83.5	59.93	4406.16	59.54	7.8
12/16	80	148	10310	4.29	4.26	52.67	49.74	77.95	5128.35	2.26	2.12	84.1	6260.8	83.5	62.86	4469.02	59.59	7.4
12/17	81	146	10456	4.31	4.26	52.47	49.78	76.61	5204.96	2.26	2.12	84.7	6345.5	83.5	61.91	4530.93	59.62	8.3
12/18	82	134	10590	4.30	4.26	52.07	49.81	69.77	5274.73	2.24	2.12	85.8	6431.3	83.5	60.70	4591.63	59.63	7.7
12/19	83	143	10733	4.31	4.26	49.30	49.80	70.50	5345.23	2.13	2.12	83.8	6515.1	83.5	58.85	4650.48	59.62	7.1
12/20	84	122	10855	4.31	4.26	49.53	49.80	60.43	5405.66	2.14	2.12	83.5	6598.6	83.5	59.37	4709.85	59.62	7.8
12/21	85	128	10983	4.31	4.26	50.33	49.80	64.42	5470.08	2.17	2.12	84.0	6682.6	83.5	59.91	4769.76	59.62	7.4
WK 12		962		4.30				489.19				84.0			60.50			7.6
TD			10983		4.26				5470.08					83.5			59.62	7.4

TEMPERATURES

DATE	DAY	DIFF FEED WATER DAY	DIFF FEED WATER TOTAL	DIFF FEED WATER TD	PRESS WATER DAY	PRESS WATER TOTAL	PRESS WATER TD	RAW JUICE IN DAY	RAW JUICE IN TOTAL	RAW JUICE IN TD	RJ AFTER SPIRAL DAY	RJ AFTER SPIRAL TOTAL	RJ AFTER SPIRAL TD	TO 1ST CARB DAY	TO 1ST CARB TOTAL	TO 1ST CARB TD	TO 2ND CARB DAY	TO 2ND CARB TOTAL	TO 2ND CARB TD	TO EVAPORATOR DAY	TO EVAPORATOR TOTAL	TO EVAPORATOR TD	STANDARD LIQUOR DAY	STANDARD LIQUOR TOTAL	STANDARD LIQUOR TD
11/24	58	62	3507	63	87	4354	78	48	2831	51	80	4404	80	86	4882	87	97	4552	95	90	4918	102	94	4140	92
11/25	59	62	3569	63	81	4435	78	47	2878	50	80	4484	80	86	4968	87	96	4648	95	90	5008	102	92	4232	92
11/26	60	65	3634	63	86	4521	78	55	2933	51	80	4564	80	89	5057	87	97	4745	95	90	5098	102	90	4322	92
11/27	61	61	3695	63	88	4609	78	50	2983	51	80	4644	80	88	5145	87	96	4841	95	90	5188	102	88	4410	92
11/28	62	63	3758	63	76	4685	78	49	3032	51	80	4724	80	90	5235	87	94	4935	95	90	5278	102	89	4499	92
11/29	63	68	3826	63	68	4753	78	62	3094	51	80	4804	80	85	5320	87	95	5030	95	90	5368	101	90	4589	92
11/30	64	62	3888	63	80	4833	78	48	3142	51	80	4884	80	88	5408	87	94	5124	95	90	5458	101	88	4677	92
WK 9		63			81			51			80			87			96			90			90		
TD				63			78			51			80			87			95			101			92
12/01	65	62	3950	63	81	4914	78	47	3189	51	80	4964	80	85	5493	87	102	5226	95	95	5553	101	89	4766	92
12/02	66	65	4015	63	90	5004	78	54	3243	51	80	5044	80	89	5582	87	104	5330	95	96	5649	101	84	4850	92
12/03	67	62	4077	63	88	5092	78	51	3294	51	81	5125	80	85	5667	87	105	5435	95	92	5741	101	82	4932	91
12/04	68	61	4138	63	84	5176	78	45	3339	51	80	5205	80	87	5754	87	105	5540	96	92	5833	101	80	5012	91
12/05	69	61	4199	63	83	5259	78	51	3390	51	80	5285	80	87	5841	87	107	5647	96	95	5928	100	90	5102	91
12/06	70	60	4259	63	83	5342	79	46	3436	51	81	5366	80	86	5927	87	105	5752	96	93	6021	100	90	5192	91
12/07	71	63	4322	63	62	5404	78	48	3484	50	80	5446	80	87	6014	87	106	5858	96	95	6116	100	91	5283	91
WK 10		62			82			49			80			87			105			94			87		
TD				63			78			50			80			87			96			100			91
12/08	72	61	4383	63	83	5487	78	48	3532	50	80	5526	80	86	6100	87	102	5960	96	95	6211	100	94	5377	91
12/09	73	61	4444	63	84	5571	78	46	3578	50	80	5606	80	88	6188	87	107	6067	96	95	6306	100	94	5471	91
12/10	74	60	4504	63	82	5653	79	47	3625	50	80	5686	80	84	6272	87	104	6171	96	95	6401	100	96	5567	91
12/11	75	59	4563	63	82	5735	79	44	3669	50	80	5766	80	86	6358	87	102	6273	97	95	6496	100	92	5659	91
12/12	76	64	4627	63	82	5817	79	45	3714	50	80	5846	80	89	6447	87	108	6381	97	95	6591	100	89	5748	91
12/13	77	61	4688	63	83	5900	79	46	3760	50	80	5926	80	85	6532	87	103	6484	97	95	6686	100	94	5842	91
12/14	78	60	4748	62	77	5977	79	45	3805	50	80	6006	80	87	6619	87	105	6589	97	95	6781	100	92	5934	91
WK 11		61			82			46			80			86			104			95			93		
TD				62			79			50			80			87			97			100			91
12/15	79	59	4807	62	79	6056	79	44	3849	50	80	6086	80	84	6703	87	104	6693	97	96	6877	100	94	6028	91
12/16	80	56	4863	62	86	6142	79	45	3894	50	80	6166	80	87	6790	87	108	6801	97	94	6971	100	99	6127	91
12/17	81	56	4919	62	82	6224	79	44	3938	50	80	6246	80	86	6876	87	107	6908	97	96	7067	100	100	6227	92
12/18	82	58	4977	62	83	6307	79	46	3984	50	80	6326	80	87	6963	87	108	7016	97	95	7162	99	90	6317	92
12/19	83	61	5038	62	92	6399	79	52	4036	50	80	6406	80	86	7049	87	105	7121	98	94	7256	99	94	6411	92
12/20	84	59	5097	62	67	6466	79	44	4080	50	80	6486	80	86	7135	87	107	7228	98	95	7351	99	96	6507	92
12/21	85	56	5153	62	67	6533	79	44	4124	50	80	6566	80	87	7222	87	105	7333	98	96	7447	99	100	6607	92
WK 12		58			79			46			80			86			106			95			96		
TD				62			79			50			80			87			98			99			92

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		====STANDARD LIQUOR=====					= = = = = = WHITE PAN = = = = = =							= = = HIGH GREEN = = =				= = = HIGH WASH = = =			
		======BRIX======			PURITY	NO.	======BRIX======			=====PURITY=====				BRIX	=====PURITY=====			BRIX	=====PURITY=====		
DATE	DAY	DAY	TOTAL	TD		DAYS	DAY	TOTAL	TD	DAY	TOTAL	TD	PH	DAY	DAY	TOTAL	TD	DAY	DAY	TOTAL	TD
11/24	58	69.0	3656.7	67.7	92.4	56	93.1	5193.1	92.7	92.1	5138.1	91.8	8.5	82.8	81.7	4621.0	82.5	76.7	93.6	4978.2	90.5
11/25	59	65.6	3722.3	67.6	91.5	57	93.0	5286.1	92.7	90.1	5228.2	91.7	8.1	80.9	80.3	4701.3	82.5	77.9	91.0	5069.2	90.5
11/26	60	67.5	3789.8	67.6	91.4	58	92.6	5378.7	92.7	91.0	5319.2	91.7	7.7	80.6	82.1	4783.4	82.5	77.2	93.5	5162.7	90.6
11/27	61	68.7	3858.5	67.6	92.3	59	92.0	5470.7	92.7	92.3	5411.5	91.7	8.0	80.7	82.3	4865.7	82.5	76.2	93.4	5256.1	90.6
11/28	62	64.2	3922.7	67.6	92.8	60	92.7	5563.4	92.7	91.8	5503.3	91.7	8.1	79.5	83.5	4949.2	82.5	76.7	92.7	5348.8	90.7
11/29	63	68.0	3990.7	67.6	92.3	61	92.1	5655.5	92.7	91.9	5595.2	91.7	8.4	81.4	82.4	5031.6	82.5	78.2	91.7	5440.5	90.7
11/30	64	66.4	4057.1	67.6	92.0	62	92.4	5747.9	92.7	91.4	5686.6	91.7	8.7	80.5	84.2	5115.8	82.5	77.3	91.2	5531.7	90.7
WK 9		67.1			92.1		92.6			91.5			8.2	80.9	82.4			77.2	92.4		
TD				67.6					92.7			91.7					82.5				90.7
12/01	65	66.4	4123.5	67.6	92.4	63	92.3	5840.2	92.7	91.6	5778.2	91.7	9.1	81.5	83.0	5198.8	82.5	77.8	89.7	5621.4	90.7
12/02	66	53.9	4177.4	67.3	90.5	64	93.9	5934.1	92.7	85.3	5863.5	91.6	9.0	79.3	78.3	5277.1	82.5	78.0	83.4	5704.8	90.6
12/03	67	63.4	4240.8	67.3	89.6	65	94.9	6029.0	92.8	88.8	5952.3	91.6	8.7	83.1	79.1	5356.2	82.4	78.8	89.4	5794.2	90.5
12/04	68	65.1	4305.9	67.2	91.3	66	93.4	6122.4	92.8	90.9	6043.2	91.6	8.4	81.4	82.2	5438.4	82.4	78.6	91.9	5886.1	90.6
12/05	69	66.3	4372.2	67.2	91.6	67	93.4	6215.8	92.8	91.2	6134.4	91.6	8.3	81.9	81.8	5520.2	82.4	78.3	91.9	5978.0	90.6
12/06	70	63.9	4436.1	67.2	92.2	68	93.1	6308.9	92.8	91.4	6225.8	91.6	8.1	80.5	81.4	5601.6	82.4	75.7	92.1	6070.1	90.6
12/07	71	63.6	4499.7	67.1	92.5	69	93.1	6402.0	92.8	91.4	6317.2	91.6	8.3	80.3	83.0	5684.6	82.4	78.5	90.5	6160.6	90.6
WK 10		63.2			91.4		93.4			90.1			8.6	81.1	81.3			78.0	89.8		
TD				67.1					92.8			91.6					82.4				90.6
12/08	72	65.3	4565.0	67.1	92.0	70	93.6	6495.6	92.8	90.5	6407.7	91.5	8.0	81.1	83.1	5767.7	82.4	76.8	92.0	6252.6	90.6
12/09	73	65.0	4630.0	67.1	91.7	71	92.8	6588.4	92.8	91.4	6499.1	91.5	7.6	80.8	82.1	5849.8	82.4	77.1	92.6	6345.2	90.6
12/10	74	69.1	4699.1	67.1	91.2	72	93.6	6682.0	92.8	90.9	6590.0	91.5	7.5	81.7	81.3	5931.1	82.4	77.5	92.7	6437.9	90.7
12/11	75	68.6	4767.7	67.1	92.1	73	92.1	6774.1	92.8	92.2	6682.2	91.5	7.2	79.3	84.8	6015.9	82.4	77.1	93.1	6531.0	90.7
12/12	76	67.9	4835.6	67.1	94.3	74	92.2	6866.3	92.8	93.0	6775.2	91.6	7.3	79.8	85.9	6101.8	82.5	76.4	94.0	6625.0	90.8
12/13	77	61.3	4896.9	67.0	92.0	75	93.5	6959.8	92.8	91.7	6866.9	91.6	8.2	81.5	81.4	6183.2	82.4	77.0	93.5	6718.5	90.8
12/14	78	70.3	4967.2	67.1	91.8	76	93.9	7053.7	92.8	91.4	6958.3	91.6	8.1	81.8	83.3	6266.5	82.5	77.4	92.7	6811.2	90.8
WK 11		66.8			92.2		93.1			91.6			7.7	80.9	83.1			77.0	92.9		
TD				67.1					92.8			91.6					82.5				90.8
12/15	79	68.5	5035.7	67.1	93.4	77	92.8	7146.5	92.8	92.1	7050.4	91.6	8.1	79.2	85.2	6351.7	82.5	77.3	93.6	6904.8	90.9
12/16	80	68.4	5104.1	67.1	92.8	78	92.5	7239.0	92.8	92.5	7142.9	91.6	8.1	79.9	84.7	6436.4	82.5	76.9	93.0	6997.8	90.9
12/17	81	70.0	5174.1	67.2	92.7	79	93.0	7332.0	92.8	91.5	7234.4	91.6	7.8	81.0	83.7	6520.1	82.5	77.8	93.7	7091.5	90.9
12/18	82	69.6	5243.7	67.2	92.8	80	93.1	7425.1	92.8	92.4	7326.8	91.6	7.7	80.5	84.0	6604.1	82.6	77.1	91.9	7183.4	90.9
12/19	83	69.5	5313.2	67.2	92.3	81	92.8	7517.9	92.8	92.0	7418.8	91.6	7.8	81.1	84.1	6688.2	82.6	77.8	91.7	7275.1	90.9
12/20	84	69.2	5382.4	67.2	91.8	82	93.4	7611.3	92.8	91.0	7509.8	91.6	7.8	81.0	83.2	6771.4	82.6	77.4	91.4	7366.5	90.9
12/21	85	68.5	5450.9	67.3	91.4	83	92.9	7704.2	92.8	91.7	7601.5	91.6	8.0	80.7	82.3	6853.7	82.6	78.7	91.4	7457.9	91.0
WK 12		69.1			92.5		92.9			91.9			7.9	80.5	83.9			77.6	92.4		
TD				67.3					92.8			91.6					82.6				91.0

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		INTERMEDIATE (HIGH RAW) PAN							INTERMEDIATE SYRUP					LOW RAW PAN						
		BRIX			PURITY				BRIX	PURITY			NO.	BRIX			PURITY			
DATE	DAY	DAY	TOTAL	TD	DAY	TOTAL	TD	PH	DAY	DAY	TOTAL	TD	DAYS	DAY	TOTAL	TD	DAY	TOTAL	TD	PH
11/24	56	94.4	5231.9	93.4	81.3	4506.9	80.5	8.2	87.0	69.5	3815.5	69.4	55	96.1	5271.8	95.9	69.43	3823.35	69.52	7.9
11/25	57	94.2	5326.1	93.4	79.3	4586.2	80.5	8.0	84.1	68.4	3883.9	69.4	56	96.8	5368.6	95.9	71.30	3894.65	69.55	8.0
11/26	58	95.0	5421.1	93.5	79.4	4665.6	80.4	7.6	87.2	67.9	3951.8	69.3	57	96.5	5465.1	95.9	67.23	3961.88	69.51	7.3
11/27	59	95.1	5516.2	93.5	78.9	4744.5	80.4	7.8	85.6	67.8	4019.6	69.3	58	96.1	5561.2	95.9	67.85	4029.73	69.48	7.7
11/28	60	94.5	5610.7	93.5	80.8	4825.3	80.4	7.6	86.9	68.0	4087.6	69.3	59	94.6	5655.8	95.9	67.40	4097.13	69.44	7.5
11/29	61	94.5	5705.2	93.5	80.3	4905.6	80.4	8.1	86.5	69.1	4156.7	69.3	60	96.9	5752.7	95.9	66.80	4163.93	69.40	7.5
11/30	62	94.7	5799.9	93.5	79.3	4984.9	80.4	8.3	87.3	66.5	4223.2	69.2	61	96.8	5849.5	95.9	67.35	4231.28	69.37	7.9
WK 9		94.6			79.9			7.9	86.4	68.2				96.3			68.19			7.7
TD				93.5			80.4					69.2				95.9			69.37	
12/01	63	94.6	5894.5	93.6	80.1	5065.0	80.4	9.0	86.0	68.5	4291.7	69.2	62	98.0	5947.5	95.9	67.00	4298.28	69.33	8.8
12/02	64	95.2	5989.7	93.6	75.9	5140.9	80.3	9.0	87.3	67.8	4359.5	69.2	63	97.2	6044.7	95.9	68.50	4366.78	69.31	9.1
12/03	65	96.1	6085.8	93.6	77.5	5218.4	80.3	8.7	88.0	65.1	4424.6	69.1	64	94.6	6139.3	95.9	67.80	4434.58	69.29	8.3
12/04	66	95.8	6181.6	93.7	79.5	5297.9	80.3	8.4	86.5	66.0	4490.6	69.1	65	97.0	6236.3	95.9	66.70	4501.28	69.25	8.5
12/05	67	94.8	6276.4	93.7	80.2	5378.1	80.3	8.4	87.2	68.9	4559.5	69.1	66	96.2	6332.5	95.9	68.50	4569.78	69.24	8.1
12/06	68	95.1	6371.5	93.7	79.1	5457.2	80.3	7.8	85.3	70.0	4629.5	69.1	67	96.6	6429.1	96.0	67.70	4637.48	69.22	7.8
12/07	69	95.4	6466.9	93.7	78.5	5535.7	80.2	7.8	86.1	68.5	4698.0	69.1	68	96.2	6525.3	96.0	67.10	4704.58	69.19	7.1
WK 10		95.3			78.7			8.4	86.6	67.8				96.5			67.61			8.2
TD				93.7			80.2					69.1				96.0			69.19	
12/08	70	95.5	6562.4	93.7	79.9	5615.6	80.2	7.9	85.3	68.4	4766.4	69.1	69	97.1	6622.4	96.0	65.67	4770.25	69.13	7.6
12/09	71	95.3	6657.7	93.8	79.3	5694.9	80.2	7.1	86.5	67.2	4833.6	69.1	70	96.8	6719.2	96.0	68.35	4838.60	69.12	7.1
12/10	72	95.3	6753.0	93.8	80.0	5774.9	80.2	7.2	86.0	68.4	4902.0	69.0	71	97.1	6816.3	96.0	67.70	4906.30	69.10	7.0
12/11	73	95.0	6848.0	93.8	80.5	5855.4	80.2	7.3	87.2	68.8	4970.8	69.0	72	95.0	6911.3	96.0	69.20	4975.50	69.10	6.9
12/12	74	93.7	6941.7	93.8	82.8	5938.2	80.2	7.0	86.0	70.2	5041.0	69.1	73	95.5	7006.8	96.0	71.00	5046.50	69.13	6.8
12/13	75	95.9	7037.6	93.8	78.8	6017.0	80.2	7.5	85.6	68.3	5109.3	69.0	74	98.7	7105.5	96.0	69.30	5115.80	69.13	6.8
12/14	76	95.5	7133.1	93.9	80.0	6097.0	80.2	7.8	87.5	69.2	5178.5	69.0	75	96.8	7202.3	96.0	71.05	5186.85	69.16	7.3
WK 11		95.2			80.2			7.4	86.3	68.6				96.7			68.90			7.1
TD				93.9			80.2					69.0				96.0			69.16	
12/15	77	95.3	7228.4	93.9	80.7	6177.7	80.2	7.5	86.5	70.4	5248.9	69.1	76	95.6	7297.9	96.0	70.50	5257.35	69.18	7.3
12/16	78	94.7	7323.1	93.9	81.4	6259.1	80.2	7.9	86.9	69.7	5318.6	69.1	77	96.0	7393.9	96.0	71.00	5328.35	69.20	7.3
12/17	79	95.5	7418.6	93.9	81.0	6340.1	80.3	7.4	86.4	70.0	5388.6	69.1	78	97.5	7491.4	96.0	70.53	5398.88	69.22	7.5
12/18	80	95.1	7513.7	93.9	82.0	6422.1	80.3	7.8	87.0	70.1	5458.7	69.1	79	96.8	7588.2	96.1	70.60	5469.48	69.23	7.2
12/19	81	95.1	7608.8	93.9	81.1	6503.2	80.3	7.7	84.9	69.3	5528.0	69.1	80	95.3	7683.5	96.0	71.23	5540.71	69.26	7.7
12/20	82	95.5	7704.3	94.0	80.2	6583.4	80.3	7.8	85.6	70.0	5598.0	69.1	81	97.2	7780.7	96.1	67.75	5608.46	69.24	7.5
12/21	83	95.5	7799.8	94.0	78.9	6662.3	80.3	7.8	87.0	67.0	5665.0	69.1	82	97.4	7878.1	96.1	67.50	5675.96	69.22	7.3
WK 12		95.2			80.8			7.7	86.3	69.5				96.5			69.87			7.4
TD				94.0			80.3					69.1				96.1			69.22	

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	WHITE PANS								INTERMEDIATE PANS						LOW RAW PANS					
DATE	NO PANS DAY	NO PANS TD	C/F MASSECUITE DAY	C/F MASSECUITE TODATE	BAGS DAY	C/F TD	C/F DAY	T.B. TD	NO PANS DAY	NO PANS TD	C/F MASSECUITE DAY	C/F MASSECUITE TODATE	C/F DAY	T.B. TD	NO PANS DAY	NO PANS TD	C/F MASSECUITE DAY	C/F MASSECUITE TODATE	C/F DAY	T.B. TODATE
11/24	14	757	20000	1123050	45.0	46.1	6.1	6.2	6	324	8600	477750	2.6	2.6	4	142	5700	208550	1.8	1.1
11/25	14	771	21000	1144050	37.3	45.9	6.9	6.2	6	330	9000	486750	2.9	2.6	1	143	1500	210050	.5	1.1
11/26	12	783	18000	1162050	43.5	45.9	5.9	6.2	6	336	9000	495750	2.9	2.6	3	146	4500	214550	1.5	1.1
11/27	12	795	18000	1180050	45.6	45.8	7.9	6.2	6	342	9000	504750	3.9	2.7	4	150	6000	220550	2.6	1.2
11/28	10	805	16500	1196550	39.6	45.8	6.8	6.2	4	346	6000	510750	2.5	2.7	1	151	1500	222050	.6	1.2
11/29	13	818	19500	1216050	42.1	45.7	6.9	6.2	6	352	9000	519750	3.2	2.7	3	154	4500	226550	1.6	1.2
11/30	11	829	16500	1232550	46.0	45.7	6.3	6.2	4	356	6000	525750	2.3	2.7	2	156	3000	229550	1.1	1.2
WK 9	86		129500		42.6		6.6		38		56600		2.9		2		26700		1.4	
TD		829		1232550		45.7		6.2		356		525750		2.7		156		229550		1.2
12/01	12	841	18000	1250550	64.3	46.0	6.2	6.2	5	361	7500	533250	2.6	2.7	2	158	3000	232550	1.0	1.2
12/02	6	847	8900	1259450	20.5	45.8	6.3	6.2	4	365	6000	539250	4.3	2.7	2	160	3000	235550	2.1	1.2
12/03	9	856	13500	1272950	34.5	45.7	6.5	6.2	3	368	4500	543750	2.2	2.7	1	161	1500	237050	.7	1.2
12/04	10	866	15000	1287950	39.1	45.6	7.0	6.2	5	373	7500	551250	3.5	2.7	2	163	3000	240050	1.4	1.2
12/05	12	878	18000	1305950	44.8	45.6	6.0	6.2	5	378	7500	558750	2.5	2.7	2	165	3000	243050	1.0	1.2
12/06	12	890	17800	1323750	43.5	45.6	6.4	6.2	5	383	7500	566250	2.7	2.7	2	167	3000	246050	1.1	1.2
12/07	12	902	18000	1341750	42.9	45.5	6.2	6.2	6	389	9000	575250	3.1	2.7	3	170	4500	250550	1.6	1.2
WK 10	73		109200		43.5		6.4		33		49500		2.9		3		21000		1.2	
TD		902		1341750		45.5		6.2		389		575250		2.7		170		250550		1.2
12/08	14	916	19500	1361250	46.3	45.5	6.1	6.2	6	395	9000	584250	2.8	2.7	3	173	4500	255050	1.4	1.2
12/09	12	928	18000	1379250	50.2	45.6	6.0	6.2	5	400	7500	591750	2.5	2.7	2	175	3000	258050	1.0	1.2
12/10	14	942	21000	1400250	41.0	45.5	6.4	6.2	7	407	10500	602250	3.2	2.7	3	178	4500	262550	1.4	1.2
12/11	14	956	21000	1421250	39.1	45.4	6.7	6.2	6	413	9000	611250	2.9	2.7	3	181	4500	267050	1.4	1.2
12/12	10	966	15000	1436250	47.1	45.4	12.1	6.3	5	418	7500	618750	6.0	2.7	2	183	3000	270050	2.4	1.2
12/13	9	975	13500	1449750	39.8	45.4	4.5	6.2	5	423	7500	626250	2.5	2.7	2	185	3000	273050	1.0	1.2
12/14	16	991	24000	1473750	37.8	45.3	7.6	6.3	6	429	9000	635250	2.9	2.7	2	187	3000	276050	1.0	1.2
WK 11	89		132000		42.7		6.6		40		60000		3.0		3		25500		1.3	
TD		991		1473750		45.3		6.3		429		635250		2.7		187		276050		1.2
12/15	14	1005	21000	1494750	47.3	45.3	6.4	6.3	6	435	9000	644250	2.7	2.7	3	190	4500	280550	1.4	1.2
12/16	16	1021	24000	1518750	42.6	45.3	7.0	6.3	6	441	9000	653250	2.6	2.7	3	193	4500	285050	1.3	1.2
12/17	14	1035	21000	1539750	46.9	45.3	6.2	6.3	7	448	10500	663750	3.1	2.7	3	196	4500	289550	1.3	1.2
12/18	14	1049	21000	1560750	38.2	45.2	6.7	6.3	6	454	9000	672750	2.9	2.7	3	199	4500	294050	1.4	1.2
12/19	15	1064	22500	1583250	42.8	45.2	6.8	6.3	7	461	10500	683250	3.2	2.7	3	202	4500	298550	1.4	1.2
12/20	12	1076	18000	1601250	46.4	45.2	6.4	6.3	5	466	7500	690750	2.7	2.7	2	204	3000	301550	1.1	1.2
12/21	14	1090	21000	1622250	44.1	45.2	7.1	6.3	6	472	9000	699750	3.0	2.7	3	207	4500	306050	1.5	1.2
WK 12	99		148500		44.0		6.6		43		64500		2.9		3		30000		1.3	
TD		1090		1622250		45.2		6.3		472		699750		2.7		207		306050		1.2

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DATE	DAY	SUGAR SACKED CWTS. DAY	SUGAR SACKED CWTS. TODATE	GROSS EXTRACTION % ON BEETS DAY	GROSS EXTRACTION % ON BEETS TODATE	GROSS EXTRACTION % ON SUGAR DAY	GROSS EXTRACTION % ON SUGAR TODATE	POUNDS DAY	POUNDS TODATE	LAST YEARS SUGAR INTRODUCED % ON BEETS DAY	% ON BEETS TD	% ON SUGAR DAY	% ON SUGAR TD	NET EXTRACTION % ON BEETS DAY	% ON BEETS TD	% ON SUGAR DAY	% ON SUGAR TD
11/24	58	8995	517169	13.82	14.21	82.34	82.64		110221	.00	.03	.00	.18	13.82	14.18	82.34	82.4
11/25	59	7830	524999	12.77	14.19	76.17	82.55		110221	.00	.03	.00	.17	12.77	14.16	76.17	82.[illegible]
11/26	60	7830	532829	12.82	14.17	73.02	82.37		110221	.00	.03	.00	.17	12.82	14.14	73.02	82.20
11/27	61	8216	541045	17.98	14.21	105.32	82.64		110221	.00	.03	.00	.17	17.98	14.19	105.32	82.47
11/28	62	6526	547571	13.54	14.21	75.77	82.59		110221	.00	.03	.00	.17	13.54	14.18	75.77	82.42
11/29	63	8211	555782	14.53	14.21	80.74	82.52		110221	.00	.03	.00	.16	14.53	14.18	80.74	82.36
11/30	64	7583	563365	14.36	14.21	82.59	82.53	60	110281	.00	.03	.01	.16	14.36	14.18	82.58	82.37
WK 9		55191						60									
TD			563365						110281								
12/01	65	11581	574946	20.00	14.30	119.27	83.07		110281	.00	.03	.00	.16	20.00	14.27	119.27	82.91
12/02	66	1825	576771	6.49	14.24	37.63	82.75		110281	.00	.03	.00	.16	6.49	14.21	37.63	82.59
12/03	67	4653	581424	11.27	14.21	66.47	82.58		110281	.00	.03	.00	.16	11.27	14.18	66.47	82.42
12/04	68	5860	587284	13.66	14.21	78.59	82.54		110281	.00	.03	.00	.16	13.66	14.18	78.59	82.39
12/05	69	8056	595340	13.52	14.20	79.79	82.49		110281	.00	.03	.00	.15	13.52	14.17	79.79	82.33
12/06	70	7750	603090	14.04	14.19	81.16	82.48		110281	.00	.03	.00	.15	14.04	14.17	81.16	82.32
12/07	71	7730	610820	13.40	14.18	77.44	82.41		110281	.00	.03	.00	.15	13.40	14.16	77.44	82.26
WK 10		47455															
TD			610820						110281								
12/08	72	9037	619857	14.21	14.18	83.48	82.42		110281	.00	.03	.00	.15	14.21	14.16	83.48	82.27
12/09	73	9028	628885	15.00	14.19	86.29	82.48		110281	.00	.02	.00	.14	15.00	14.17	86.29	82.33
12/10	74	8604	637489	13.02	14.18	74.51	82.38		110281	.00	.02	.00	.14	13.02	14.15	74.51	82.24
12/11	75	8207	645696	13.01	14.16	72.58	82.24		110281	.00	.02	.00	.14	13.01	14.14	72.58	82.10
12/12	76	7072	652768	28.52	14.24	161.56	82.64		110281	.00	.02	.00	.14	28.52	14.21	161.56	82.50
12/13	77	5378	658146	8.90	14.17	50.79	82.24	24000	134281	.40	.03	2.27	.17	8.51	14.14	48.53	82.07
12/14	78	9065	667211	14.37	14.17	81.07	82.20		134281	.00	.03	.00	.17	14.37	14.14	81.07	82.04
WK 11		56391						24000									
TD			667211						134281								
12/15	79	9938	677149	15.10	14.18	84.95	82.28		134281	.00	.03	.00	.16	15.10	14.16	84.95	82.12
12/16	80	10221	687370	14.81	14.19	80.90	82.24		134281	.00	.03	.00	.16	14.81	14.17	80.90	82.08
12/17	81	9846	697216	14.54	14.20	81.25	82.22		134281	.00	.03	.00	.16	14.54	14.17	81.25	82.06
12/18	82	8031	705247	12.89	14.18	73.37	82.12		134281	.00	.03	.00	.16	12.89	14.16	73.37	81.96
12/19	83	9630	714877	14.52	14.19	81.37	82.10		134281	.00	.03	.00	.15	14.52	14.16	81.37	81.95
12/20	84	8360	723237	14.77	14.19	83.03	82.14	390	134671	.01	.03	.04	.15	14.76	14.17	82.99	81.98
12/21	85	9264	732501	15.60	14.21	89.12	82.18	20000	154671	.34	.03	1.92	.17	15.26	14.18	87.20	82.01
WK 12		65290						20390									
TD			732501						154671								

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		PULP DRIER GAS				PULP DRIER OIL				GAS + OIL			
		===CUBIC FEET==		====TONS 10K====		====GALLONS====		=====TONS 10K====		====TONS 10K====		==% ON BEETS==	
DATE	DAY	TODAY	TODATE	TODAY	TODATE	TODAY	TODATE	TODAY	TODATE	TODAY	TODATE	TODAY	TODATE
11/24	58	1467.8	85131.4	73.39	4256.59	0	0	.00	.00	73.39	4256.59	2.25	2.34
11/25	59	1289.0	86420.4	64.45	4321.04	0	0	.00	.00	64.45	4321.04	2.10	2.34
11/26	60	1238.2	87658.6	61.91	4382.95	0	0	.00	.00	61.91	4382.95	2.03	2.33
11/27	61	942.6	88601.2	47.12	4430.07	0	0	.00	.00	47.12	4430.07	2.06	2.33
11/28	62	1137.7	89738.9	56.88	4486.95	0	0	.00	.00	56.88	4486.95	2.36	2.33
11/29	63	1382.4	91121.3	69.12	4556.07	0	0	.00	.00	69.12	4556.07	2.45	2.33
11/30	64	1092.4	92213.7	54.62	4610.69	0	0	.00	.00	54.62	4610.69	2.07	2.33
WK 9		8550.1		427.49		0		.00		427.49		2.19	
TD			92213.7		4610.69		0		.00		4610.69		2.33
12/01	65	1191.3	93405.0	59.57	4670.26	0	0	.00	.00	59.57	4670.26	2.06	2.32
12/02	66	533.5	93938.5	26.67	4696.93	0	0	.00	.00	26.67	4696.93	1.90	2.32
12/03	67	1132.0	95070.5	56.60	4753.53	0	0	.00	.00	56.60	4753.53	2.74	2.32
12/04	68	816.2	95886.7	40.81	4794.34	0	0	.00	.00	40.81	4794.34	1.90	2.32
12/05	69	1374.3	97261.0	68.72	4863.06	0	0	.00	.00	68.72	4863.06	2.31	2.32
12/06	70	1160.5	98421.5	58.03	4921.09	0	0	.00	.00	58.03	4921.09	2.10	2.32
12/07	71	1300.8	99722.3	65.04	4986.13	0	0	.00	.00	65.04	4986.13	2.25	2.32
WK 10		7508.6		375.44		0		.00		375.44		2.19	
TD			99722.3		4986.13		0		.00		4986.13		2.32
12/08	72	1296.8	101019.1	64.84	5050.97	0	0	.00	.00	64.84	5050.97	2.04	2.31
12/09	73	1279.9	102299.0	63.99	5114.96	0	0	.00	.00	63.99	5114.96	2.13	2.31
12/10	74	1442.7	103741.7	72.13	5187.09	0	0	.00	.00	72.13	5187.09	2.18	2.31
12/11	75	1460.9	105202.6	73.04	5260.13	0	0	.00	.00	73.04	5260.13	2.32	2.31
12/12	76	437.6	105640.2	21.87	5282.00	0	0	.00	.00	21.87	5282.00	1.76	2.30
12/13	77	1452.1	107092.3	72.61	5354.61	0	0	.00	.00	72.61	5354.61	2.40	2.31
12/14	78	1575.0	108667.3	78.75	5433.36	0	0	.00	.00	78.75	5433.36	2.50	2.31
WK 11		8945.0		447.23		0		.00		447.23		2.23	
TD			108667.3		5433.36		0		.00		5433.36		2.31
12/15	79	1715.6	110382.9	85.78	5519.14	0	0	.00	.00	85.78	5519.14	2.61	2.31
12/16	80	1607.1	111990.0	80.35	5599.49	0	0	.00	.00	80.35	5599.49	2.33	2.31
12/17	81	1490.4	113480.4	74.52	5674.01	0	0	.00	.00	74.52	5674.01	2.20	2.31
12/18	82	1462.6	114943.0	73.13	5747.14	0	0	.00	.00	73.13	5747.14	2.35	2.31
12/19	83	1790.7	116733.7	89.53	5836.67	0	0	.00	.00	89.53	5836.67	2.70	2.32
12/20	84	1572.5	118306.2	78.63	5915.30	0	0	.00	.00	78.63	5915.30	2.78	2.32
12/21	85	1325.9	119632.1	66.29	5981.59	0	0	.00	.00	66.29	5981.59	2.23	2.32
WK 12		10964.8		548.23		0		.00		548.23		2.45	
TD			119632.1		5981.59		0		.00		5981.59		2.32

[redacted] 8 9 1990

		BOILER OIL				BOILER GAS				BOILER COAL				ALL BOILERS			
		GALLONS		--TONS 10K--		CUBIC FEET		--TONS 10K---		-----TONS-----		--TONS 10K--		----TONS 10K---		% ON BEETS	
DATE	DAY	DAY	TODATE	DAY	TODATE	DAY	TODATE	DAY	TODATE	DAY	TODATE	DAY	TODATE	DAY	TODATE	DAY	TD
11/24	58	0	6000	.00	.00	890.0	49618.3	44.50	2483.91	118.6	7072.3	156.55	9335.48	201.05	11819.39	6.18	6.50
11/25	59	0	6000	.00	.00	881.0	50499.3	44.05	2527.96	119.5	7191.8	157.74	9493.22	201.79	12021.18	6.58	6.50
11/26	60	0	6000	.00	.00	781.0	51280.3	39.05	2567.01	126.9	7318.7	167.51	9660.73	206.56	12227.74	6.76	6.50
11/27	61	0	6000	.00	.00	701.0	51981.3	35.05	2602.06	112.5	7431.2	148.50	9809.23	183.55	12411.29	8.03	6.52
11/28	62	0	6000	.00	.00	762.0	52743.3	38.10	2640.16	117.2	7548.4	154.70	9963.93	192.80	12604.09	8.00	6.54
11/29	63	0	6000	.00	.00	871.0	53614.3	43.55	2683.71	121.2	7669.6	159.98	10123.91	203.53	12807.62	7.20	6.55
11/30	64	0	6000	.00	.00	825.0	54439.3	41.25	2724.96	118.3	7787.9	156.16	10280.07	197.41	13005.03	7.48	6.56
WK 9				.00				285.55				1101.14		1386.69		7.10	
TD					.00				2724.96				10280.07		13005.03		6.56
12/01	65	0	6000	.00	.00	797.0	55236.3	39.85	2764.81	120.5	7908.4	159.06	10439.13	198.91	13203.94	6.87	6.57
12/02	66	0	6000	.00	.00	692.0	55928.3	34.60	2799.41	43.0	7951.4	56.76	10495.89	91.36	13295.30	6.50	6.57
12/03	67	0	6000	.00	.00	1261.0	57189.3	63.05	2862.46	53.9	8005.3	71.15	10567.04	134.20	13429.50	6.50	6.57
12/04	68	0	6000	.00	.00	773.0	57962.3	38.65	2901.11	76.3	8081.6	100.75	10667.79	139.40	13568.90	6.50	6.56
12/05	69	0	6000	.00	.00	882.0	58844.3	44.10	2945.21	115.6	8197.2	152.62	10820.41	196.72	13765.62	6.60	6.56
12/06	70	0	6000	.00	.00	842.0	59686.3	42.10	2987.31	124.3	8321.5	164.08	10984.49	206.18	13971.80	7.47	6.58
12/07	71	0	6000	.00	.00	990.0	60676.3	49.50	3036.81	120.7	8442.2	159.32	11143.81	208.82	14180.62	7.24	6.59
WK 10				.00				311.85				863.74		1175.59		6.86	
TD					.00				3036.81				11143.81		14180.62		6.59
12/08	72	0	6000	.00	.00	984.0	61660.3	49.20	3086.01	119.9	8562.1	158.27	11302.08	207.47	14388.09	6.52	6.58
12/09	73	0	6000	.00	.00	925.0	62585.3	46.25	3132.26	116.6	8678.7	153.91	11455.99	200.16	14588.25	6.65	6.59
12/10	74	0	6000	.00	.00	897.0	63482.3	44.85	3177.11	127.9	8806.6	168.83	11624.82	213.68	14801.93	6.47	6.58
12/11	75	0	6000	.00	.00	983.0	64465.3	49.15	3226.26	127.7	8934.3	168.57	11793.39	217.72	15019.65	6.90	6.59
12/12	76	0	6000	.00	.00	824.0	65289.3	41.20	3267.46	110.5	9044.8	145.91	11939.30	187.11	15206.76	15.09	6.63
12/13	77	0	6000	.00	.00	888.0	66177.3	44.40	3311.86	120.8	9165.6	159.46	12098.76	203.86	15410.62	6.75	6.64
12/14	78	0	6000	.00	.00	967.0	67144.3	48.35	3360.21	122.3	9287.9	161.44	12260.20	209.79	15620.41	6.65	6.64
WK 11				.00				323.40				1116.39		1439.79		7.18	
TD					.00				3360.21				12260.20		15620.41		6.64
12/15	79	0	6000	.00	.00	988.0	68132.3	49.40	3409.61	120.0	9407.9	158.40	12418.60	207.80	15828.21	6.32	6.63
12/16	80	0	6000	.00	.00	1093.0	69225.3	54.65	3464.26	125.4	9533.3	165.53	12584.13	220.18	16048.39	6.38	6.63
12/17	81	0	6000	.00	.00	1017.0	70242.3	50.85	3515.11	123.0	9656.3	162.36	12746.49	213.21	16261.60	6.30	6.62
12/18	82	0	6000	.00	.00	1024.0	71266.3	51.20	3566.31	121.6	9777.9	160.56	12907.05	211.76	16473.36	6.80	6.63
12/19	83	0	6000	.00	.00	1086.0	72352.3	54.30	3620.61	122.1	9900.0	161.17	13068.22	215.47	16688.83	6.50	6.62
12/20	84	0	6000	.00	.00	1017.0	73369.3	50.85	3671.46	100.8	10000.8	133.10	13201.32	183.95	16872.78	6.50	6.62
12/21	85	0	6000	.00	.00	1074.0	74443.3	53.70	3725.16	116.0	10116.8	153.12	13354.44	206.82	17079.60	6.96	6.63
WK 12				.00				364.95				1094.24		1459.19		6.53	
TD					.00				3725.16				13354.44		17079.60		6.63

MIDWEST RESEARCH INSTITUTE

Project/Acct. No. 4602-03 Date/Time 12/9/94

Project Title Sugar Beet Processing AP-42

Signature [illegible] Verified by _____ (signature/date)

Phone Contact ☐
Meeting Notes ☐
Work Sheet ☒

Caro, Michigan Facility

Test Date: 12/14/89

Test No.	Time Duration
P-2	3:13 - 4:23 PM
P-4	7:35 - 9:25 AM
P-5	10:00 - 11:10 PM

Total Dry Pulp Produced on 12/14/89 = 174 tons = 7.25 tons/hr. Average

Average over Test Run

Test No.	Slice Rate (tons/hr)	Pressed Pulp Moisture (%)	Dried Pulp Moisture (%)
P-2	135	82.6	15.0
P-4	135	71.3	9.4
P-5	135	71.3	16.45

$$\% \text{ Solids} = \frac{\text{Dry Pulp Produced} - \text{Dry Pulp Moisture} * \text{Pulp Produced}}{\text{Beets Sliced}}$$

P-2: $\% \text{ Solids} = \frac{7.25 - (0.15 * 7.25)}{135} = \frac{6.16}{135} \times 100 = 4.6\%$

P-4: $\% \text{ Solids} = \frac{7.25 - (0.094 * 7.25)}{135} = \frac{6.57}{135} \times 100 = 4.9\%$

P-5: $\% \text{ Solids} = \frac{7.25 - (0.1645 * 7.25)}{135} = \frac{6.06}{135} \times 100 = 4.5\%$

MRI

MIDWEST RESEARCH INSTITUTE

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Meeting Notes ☐
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$$\text{Process Rate (tons/hr.)} = \frac{\text{Beets Sliced} * \%\ \text{Solids}}{1 - \left(\frac{\text{Wet Pulp Moisture (\%)}}{100}\right)}$$

P-2: $\text{Rate} = \frac{135 * 0.046}{1 - \left(\frac{82.6}{100}\right)} = \frac{6.21}{0.174} = 35.7$ tons/hr.

P-4: $\text{Rate} = \frac{135 * 0.049}{1 - \left(\frac{71.3}{100}\right)} = \frac{6.62}{0.287} = 23.1$ tons/hr.

P-5: $\text{Rate} = \frac{135 * 0.045}{1 - \left(\frac{71.3}{100}\right)} = \frac{6.08}{0.287} = 21.2$ tons/hr.

MRI