AP42 Section:	11.25
Background Chapter	4
Reference:	5
Title:	*Source Test Report, Plant B, Kiln Number 2 Outlet*, Technical Services, Inc., Jacksonville, FL, February, 1979.

Section 4 Reference 5
AP-42 Reference __

Emission Test Report Review Checklist--Short Form

Reviewer: Brian Shrager
Review Date: 4/20/93

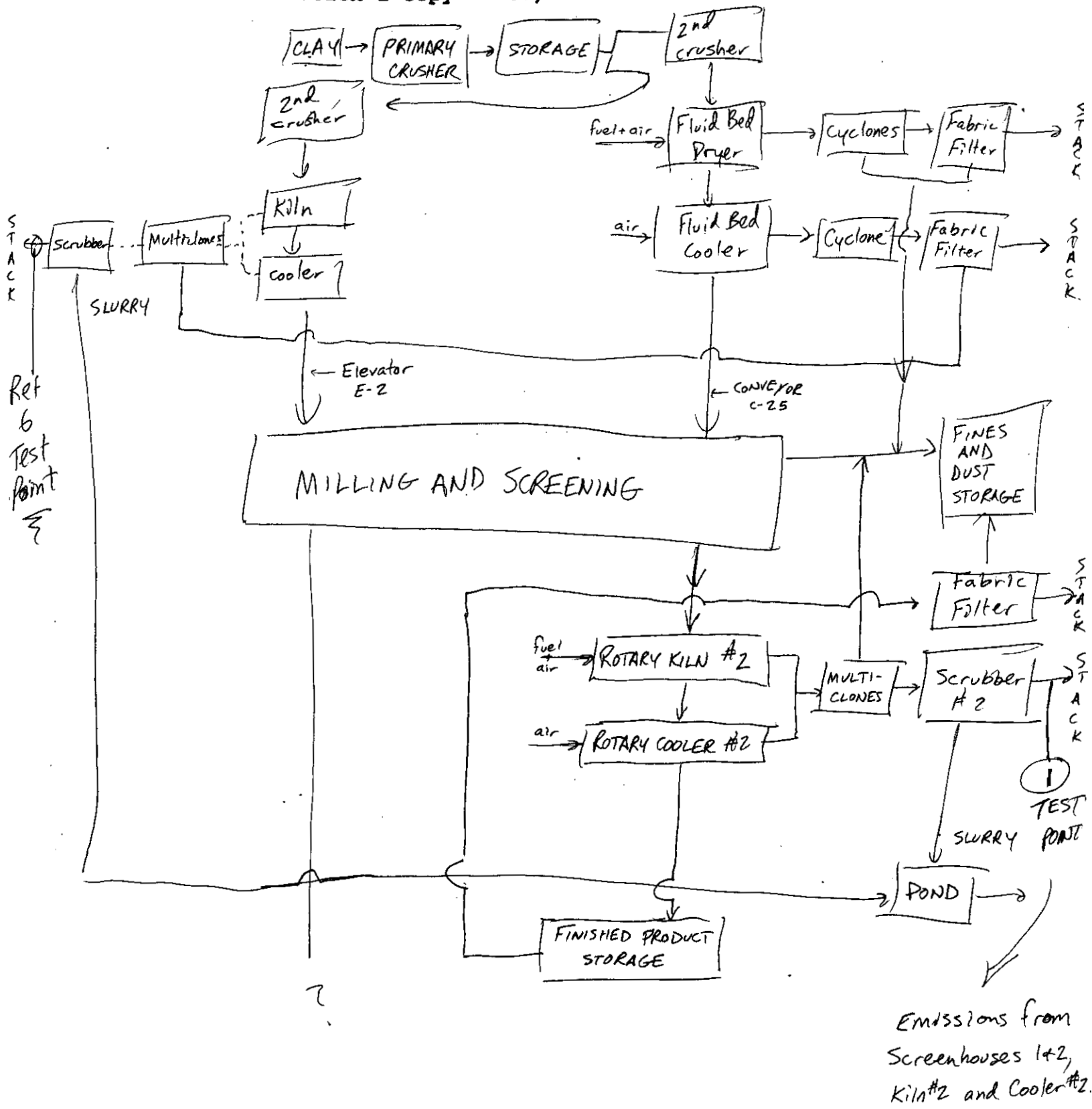
A. Background Information

1. Facility name: Waverly Min. Prod.
   Location: Meigs, Georgia
2. Source category: Fuller's Earth (labeled in Calc. + Dry. docket) not specified in report.
3. Test date: 2/1/79
4. Test sponsor: Industry
5. Testing contractor: Technical Services, Inc.
6. Purpose of test: To determine if wet scrubber system improvements were successful.
7. Pollutants measured (include test method and indicate if valid): Filterable PM - Method 5
   CO_2 - ORSAT
8. Process overview: Attach a process description and a block diagram. Identify processes tested with letters from the beginning of the alphabet (A, B, C, etc...) and APC systems with letters from the end of the alphabet (V, W, X, etc...). Also identify test locations with Arabic numerals (1,2,3, ...). Using the ID symbols from the diagram, complete the table below.

Test ID	Process	Process ID	Emissions tested		APCD (controlled emissions only)
			Uncontrolled	Controlled	
1	#2 Kiln, #2 cooler #1 & 2 Screenhouses	A		✓	ID: Type: Multicyclone and wet scrubber Model #:
					ID: Type: Model #:
					ID: Type: Model #:
					ID: Type: Model #:

B. **Process Information**

1. **Provide a brief narrative description of the process and attach process flow diagram. (Note: If the process description provided in the test report is adequate, attach a copy here.)**



C. 1. List any APCD parameters (supplied in the test report) below.

APCD ID	Parameter	Units	Readings			
			Run 1	Run 2	Run 3	Run 4
Z	ΔP	in. w.c.	15"			
Type of APCD: Scrubber	water feed	gal/min	300			
Type of APCD:						
Type of APCD:						

2. Include any additional information (such as capture techniques for fugitive systems) and descriptions of the air pollution control systems (use a separate page if necessary).

D. Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported Run 1	Run 2	Run 3	Avg. ~~Run 4~~
1	Stack temperature	°R	566.5	566	567	
	Moisture	%	10.2	10.0	10.4	
	Oxygen	%	21	21	21	
	Volumetric flow, actual	ACFM	31530	29682	31,247	
	Volumetric flow, standard	DSCFM	26554	25059	26,243	
	Percent isokinetic		106.7	107.2	105.7	
Circle: (Production) or feed rate Capacity:		TPH	19.76	19.76	19.76	
	Pollutant concentrations:					
	Filterable PM	Gr/DSCF	0.0566	0.0511	0.0607	
	CO_2	%	0	0	0	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	12.88	10.98	13.66	
	~~CO_2~~					
	Emission factors:	lb/ton				
	Filterable PM	~~lb/ton~~	0.652	0.556	0.691	0.63
	~~CO_2~~					

A-82-39
II-4-58

SOURCE TEST REPORT
WAVERLY MINERAL PRODUCTS
MEIGS, GEORGIA

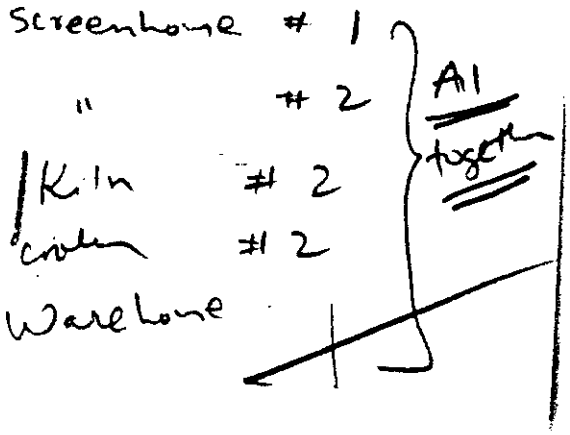
NUMBER 2 KILN OUTLET

FEBRUARY 1, 1979

(FULLER'S EARTH)

PREPARED BY:

STEPHEN L. NECK, B.S.M.E., P.E.



TECHNICAL SERVICES, INC.
103-7 STOCKTON STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

1

TABLE OF CONTENTS

2

I. INTRODUCTION

Particulate emission testing was performed on Scrubber #2 that receives particulate matter from the Screenhouses #1 and #2, Kiln #2, Cooler #2, and Warehouse at Waverly Mineral Products Company plant in Meigs, Georgia.

The wet scrubber system had been recently improved in hopes of reducing emission to within compliance limitations. This present testing was initiated to determine if the improvements were seccessful.

The testing was performed on February 1, 1979 by personnel of Technical Services, Inc. of Jacksonville, Florida.

II. SUMMARY AND DISCUSSION OF RESULTS

Results of the testing are included in Table 1. Complete emission data are included in appendix.

Based on the results of the tests, the recent modifications have resulted in a system that is operating well within compliance limitations.

During this test series the scrubber was operated at 15" of water pressure drop with a low pressure water feed of approximately 300 gallons per minute.

4

TABLE 1
EMISSION SUMMARY

ATE	RUN NUMBER	TIME	EMISSION/FLOW RATE				% H_2O	Ts	% ISOKINETIC
			ACTUAL LBS/HR	ALLOWABLE LBS/HR	ACFM	SCFMD			
/1/79	1	1033-1147	12.88	32.98	31530	26554	10.2	106.5	106.7
/1/79	2	1312-1424	10.98	28.59	29682	25059	10.0	106.0	107.2
/1/79	3	1533-1641	13.66	29.15	31247	26243	10.4	107.0	105.7
	MEAN		12.51	30.24	30820	25952	10.2	106.5	106.5

ALLOWABLE EMISSION E = $4.1\ (p)^{0.67}$

57

III. PROCESS DESCRIPTION AND OPERATION WITH FLOW DIAGRAM

The Waverly Mineral Products Company in Meigs, Georgia mines, dries, and processes clay for absorbent products.

Kiln #2 receives material from Screenhouses #1 and #2 that contains approximately 10% moisture. This material is further dried in Kiln #2 before it is bagged as cat litter or oil and grease absorbent.

The Screenhouses #1 and #2, Kiln #2, Cooler #2, and Warehouse vent gases pass through a multiclone dry collector and then the wet scrubber before being emitted into the atmosphere.

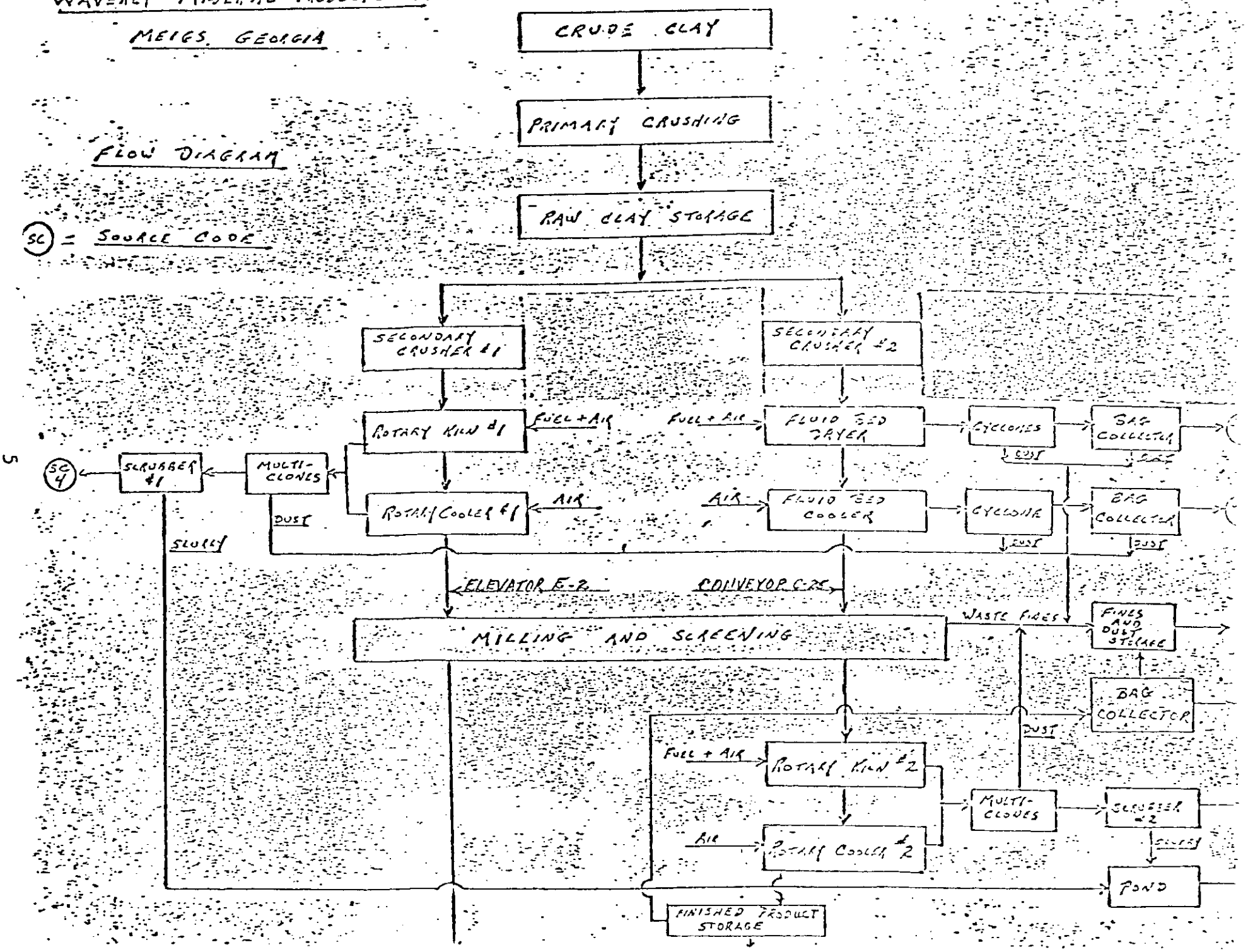
BAGGING OPERATION

WAVERLY MINERAL PRODUCTS CO.

MEIGS, GEORGIA

FLOW DIAGRAM

(SC) = SOURCE CODE



IV. SAMPLING POINT LOCATION

The sampling point location and outlet duct schematic are included in Figure 2.

8

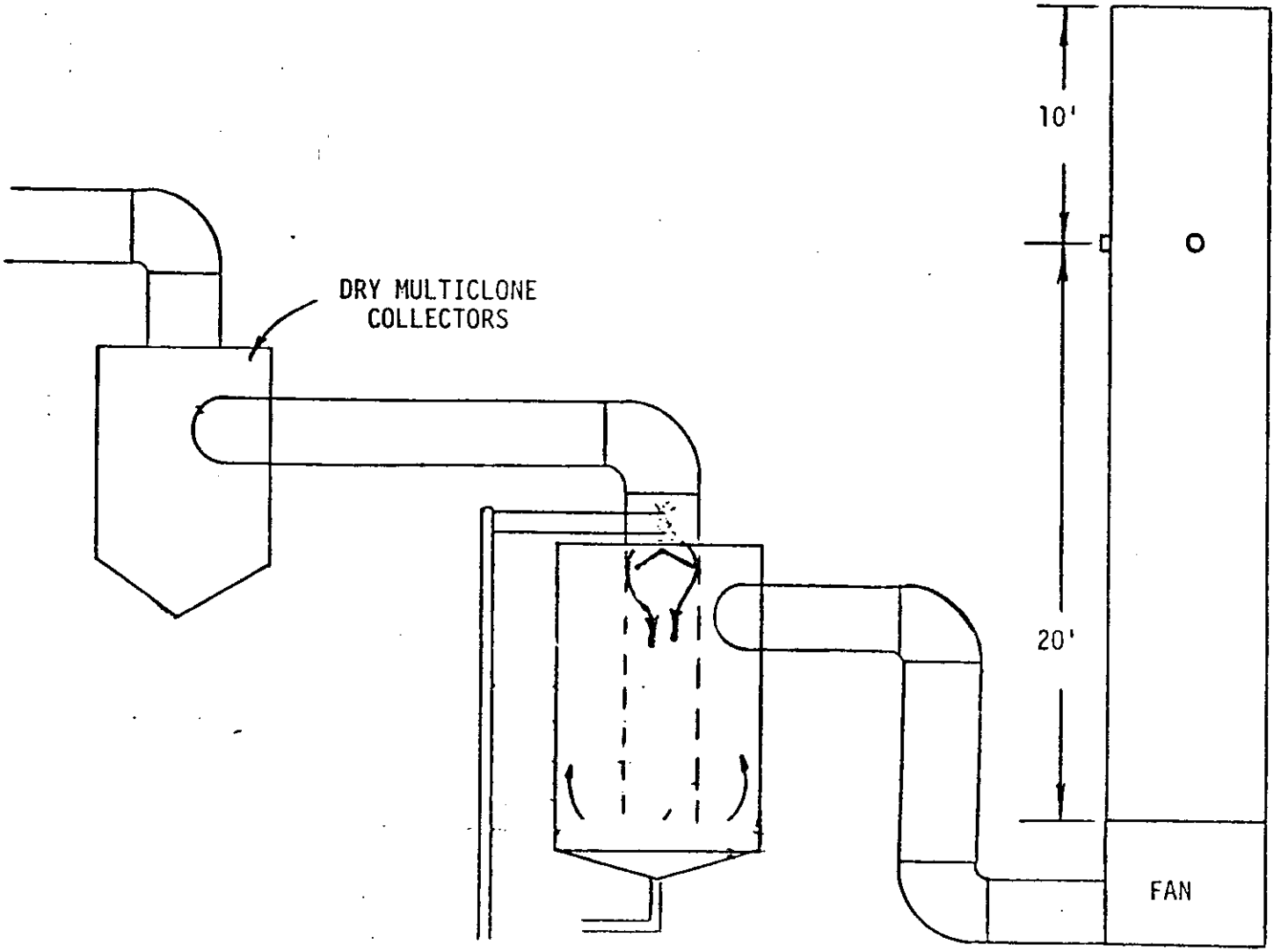


FIGURE 2. No. 2 KILN OUTLET

APPENDIX A

COMPLETE EMISSION DATA

SOURCE SAMPLING NOMENCLATURE SHEET

PB - Barometric pressure, inches Hg
PS - Stack pressure, inches Hg
AS - Effective area of positive stack gas flow, sq.ft.
As - Stack area, sq. ft.
NPTS - Number of traverse points where the pitot velocity head was greater than zero.
TS - Stack temperature, ^{o}R
TM - Meter temperature, ^{o}R
$\overline{H}$ - Average velocity head, inches H_2O
$\Delta\overline{H}$ - Average meter orifice pressure differential, inches H_2O
AN - Sampling nozzle area, square feet
CP - S-type pitot tube correction factor
VM - Recorded meter volume sample, cubic feet (meter conditions)
VC - Condensate and silica gel increase in impingers, milliliters
Po - Pressure at the dry test meter orifice, $\left[PB + \frac{\overline{H}}{13.6}\right]$ inches Hg.
STP - Standard conditions, dry, $68^{o}F$, 29.92 inches Hg.

VWV - Conversion of condensate in milliliters to water vapor in cubic feet (STP)
VSTPD - Volume sampled, cubic feet (STP)
VT - Total water vapor volume and dry gas volume sampled, cubic feet (STP)
W - Moisture fraction of stack gas
FDA - Dry gas fraction
MD - Molecular weight of stack gas, lbs/lb-mole (dry conditions)
MS - Molecular weight of stack gas, lbs/lb-mole (Stack conditions)
GS - Specific gravity of stack gas, referred to air
EA - Excess air, %
$\sqrt{H \times TS}$ - Average square root of velocity head times stack temperature
U - Stack gas velocity, feet per minute
QS - Stack gas flow rate, cubic feet per minute (stack conditions)
QD - Stack gas flow rate, cubic feet per minute (dry conditions)
QSTPD - Stack gas flow rate, cubic feet per minute (STP)
PISO - Percent isokinetic volume sampled (method described in Federal Register)
ESTP - Particulate concentration at standard and dry conditions, grains/scf
E_{12} - ESTP corrected to 12% CO_2, grains/scf
E_{50} - ESTP corrected to 50% excess air, grains/scf
EM - Mass emission rate, lbs/hr

EQUATIONS FOR CALCULATING PARTICULATE EMISSIONS

$$VWV = (0.0472) \times (VC)$$

$$VSTPD = (17.65) \times (VM) \times \left(PB + \frac{\Delta H}{13.6}\right) \div TM$$

$$VT = (VWV) + (VSTPD)$$

$$W = (VWV) \div (VT)$$

$$FDA = (1.0) - (W)$$

FMOIST = Assumed moisture fraction

$$MD = (0.44 \times \%\ CO_2) + (0.32 \times \%\ O_2) + (0.28 \times \%\ N_2) + (0.28 \times \%\ CO)$$

$$MS = (MD \times FDA) + (18 \times W)$$

$$GS = (MS) \div (28.99)$$

$$EA = \left[(100) \times \left(\%\ O_2 - \frac{\%\ CO}{2}\right)\right] \div \left[(0.266 \times \%\ N_2) - \left(O_2 - \frac{\%\ CO}{2}\right)\right]$$

$$\underline{U} = (174)\ X\ (CP) \times \sqrt{(\underline{H})} \times \sqrt{(TS \times 29.92) \div (GS \times PS)}$$

$$QS = (\underline{U}) \times (AS)$$

$$QD = (QS) \times (FDA)$$

$$QSTPD = (528) \times (QD) \times (PS) \div TS \div 29.92$$

$$PISO = \left[(0.00267 \times VC \times TS) + (P_o \times TS \times VM \div TM)\right] \div \left[(Time \times \underline{U} \times PS \times AN)\right]$$

$$ESTP = \frac{\left(\frac{15.43\ grains}{gram}\right)(y)}{VSTPD}$$

$$E_{12} = \frac{(ESTP)\ (12)}{(CO_2\ \%)}$$

$$E50 = \frac{(ESTP)\ (100 + EA)}{150}$$

$$EM = (ESTP)\ (QSTPD)\ \left(60\ \frac{min}{hr}\right)\ \left(\frac{lb}{7000\ grains}\right)$$

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

1037 STOCKTON STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT- WAVERLY MINERAL PRODUCTS - MEIGS, GEORGIA DATE- 2/1/79
STACK- NO. 2 KILN OUTLET RUN 1 FROM 1033-1147
WEATHER CONDITIONS- CLEAR, COLD PB- 30.10 IN HG PS- 30.10 IN H
AS'- 16.499 SQ. FEET TS- 566.5 °R TM- 505.9 °R
H- 0.291 IN H_2O ΔH- 0.97 IN H_2O AN- .000345 SQ.FT. CP- 0.84
VM-36.030 CF VC- 91.1 ML TOTAL TIME- 64 MIN NPTS- 32
ORSAT: CO_2- 0 % O_2- 21% CO- 0 % N_2- 79 %

1.	Volume Water Vapor	1. 4.299	SCF
2.	Gas Volume Sampled - STPD	2. 37.926	SCFD
3.	Total Volume	3. 42.226	SCF
4.	Moisture in Stack Gas - Volume Fraction	4. 0.1018	
5.	Dry Stack Gas - Volume Fraction	5. 0.8982	
6.	Assumed Moisture in Stack Gas - Volume Fraction	6. 0.0800	
7.	Molecular Weight of Stack Gas - Dry Basis	7. 28.84	
8.	Molecular Weight of Stack Gas - Stack Conditions	8. 27.74	
9.	Specific Gravity of Stack Gas Relative to Air	9. 0.9568	
10.	Excess Air - Percent	10. ---	%
11.	Average of Factor ($\sqrt{H}$ x TS)	11. ---	
12.	Average Stack Velocity	12. 1911	FPM
13.	Actual Stack Gas Flow Rate	13. 31530	ACFM
14.	Actual Stack Gas Flow Rate Dry	14. 28320	CFMD
15.	Stack Gas Flow Rate - STPD	15. 26554	SCFM
16.	Percent Ioskinetic	16. 106.7	%

	MG	GR/SCF	GR/ACF	LBS/HR
Prefilter	90.7	0.0369	0.0311	8.40
Filter	48.5	0.0197	0.0166	4.48
Totals	139.2	0.0566	0.0477	12.88

Comments: _____

Tests Conducted by: _____

Tel. (904) 353-5761

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Analytical Services

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P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT-WAVERLY MINERAL PRODUCTS - MEIGS, GA. DATE- 2/1/79
STACK-NO. 2 KILN OUTLET RUN 2 FROM 1312-1424
WEATHER CONDITIONS- CLEAR, COLD PB- 30.10 IN HG PS- 30.10 IN HG
AS'- 16.499SQ. FEET TS- 566 °R TM- 513.2 °R
H- .258 IN H_2O ΔH- .88 IN H_2O AN- .000345 SQ.FT. CP-0.84
VM- 34.662 CF VC- 85 ML TOTAL TIME- 64 MIN NPTS- 32
ORSAT: CO_2- 0 % O_2- 21 % CO- 0 % N_2- 79 %

1.	Volume Water Vapor	1. 4.012	SCF
2.	Gas Volume Sampled - STPD	2. 35.9593	SCFD
3.	Total Volume	3. 39.9713	SCF
4.	Moisture in Stack Gas - Volume Fraction	4. 0.1004	
5.	Dry Stack Gas - Volume Fraction	5. 0.8996	
6.	Assumed Moisture in Stack Gas - Volume Fraction	6. 0.0800	
7.	Molecular Weight of Stack Gas - Dry Basis	7. 28.84	
8.	Molecular Weight of Stack Gas - Stack Conditions	8. 27.79	
9.	Specific Gravity of Stack Gas Relative to Air	9. 0.9586	
10.	Excess Air - Percent	10. ---	%
11.	Average of Factor ($\sqrt{H} \times TS$)	11. ---	
12.	Average Stack Velocity	12. 1799	FPM
13.	Actual Stack Gas Flow Rate	13. 29682	ACFM
14.	Actual Stack Gas Flow Rate Dry	14. 26702	CFMD
15.	Stack Gas Flow Rate - STPD	15. 25059	SCFM
16.	Percent Ioskinetic	16. 107.2	%

	MG	GR/SCF	GR/ACF	LBS/HR
Prefilter	73.5	0.0315	0.0266	6.76
Filter	45.7	0.0196	0.0166	4.22
Totals	119.2	0.0511	0.0432	10.98

Comments: _____

Tests Conducted by: _____

Tel. (904) 353 5761

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Analytical Services

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P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT- WAVERLY MINERAL PRODUCTS - MEIGS, GA. DATE- 2/1/79
STACK- NO. 2 KILN OUTLET RUN 3 FROM 1533-1641
WEATHER CONDITIONS- CLEAR, COLD PB- 30.10 IN HG PS- 10.10 IN HG
AS- 16.499 SQ. FEET TS- 567 ^{o}R TM- 517.1 ^{o}R
H- .286 IN H_2O ΔH-.98 IN H_2O AN-.000345 SQ.FT. CP- 0.84
VM- 36.050 CF VC- 90.8 ML TOTAL TIME- 64 MIN NPTS- 32
ORSAT: CO_2- 0 % O_2- 21 % CO- 0 % N_2- 79 %

1.	Volume Water Vapor	1. 4.286	SCF
2.	Gas Volume Sampled - STPD	2. 37.126	SCFD
3.	Total Volume	3. 41.412	SCF
4.	Moisture in Stack Gas - Volume Fraction	4. 0.1035	
5.	Dry Stack Gas - Volume Fraction	5. 0.8965	
6.	Assumed Moisture in Stack Gas - Volume Fraction	6. 0.0800	
7.	Molecular Weight of Stack Gas - Dry Basis	7. 28.84	
8.	Molecular Weight of Stack Gas - Stack Conditions	8. 27.85	
9.	Specific Gravity of Stack Gas Relative to Air	9. 0.9608	
10.	Excess Air - Percent	10. ---	%
11.	Average of Factor ($\sqrt{H} \times TS$)	11. ---	
12.	Average Stack Velocity	12. 1894	FPM
13.	Actual Stack Gas Flow Rate	13. 31247	ACFM
14.	Actual Stack Gas Flow Rate Dry	14. 28013	CFMD
15.	Stack Gas Flow Rate - STPD	15. 26243	SCFM
16.	Percent Ioskinetic	16. 105.7	%

	MG	GR/SCF	GR/ACF	LBS/HR
Prefilter	98.6	0.0410	0.0344	9.22
Filter	47.5	0.0197	0.0166	4.44
Total	146.1	0.0607	0.0510	13.66

Comments: _____

Tests Conducted by: _____

APPENDIX B

FIELD DATA SHEETS

SOURCE SAMPLING FIELD DATA SHEET

TSI

Plant WAVERLY
MEXICO CO.
Sample Location No. 1
KILN
Control Device WET
SCRUBBER
Type of Samples PARTICULATE
Date 2-1-79 Run No. 1
Moisture 8 %, FDA ____, Gas Density Factor ____
Barometric Press 30.10 "Hg, Stack Press ____ "Hg
Weather CLEAR
Temp. ____ °F, W/D ____, W/S ____
Sample Box No. ____ Meter Box No. 1
Meter ΔH@ 1.71 Pitot Corr. Factor .84
Nozzle Dia. .251 in., Probe Length 7 ft
Probe Heater Setting ____
Stack Dimensions: Inside Diameter 55 in
Inside Area ____ ft²
Height ____ ft

21

Effective Stack Area 16.499 ft² 32 pts. @ 2 min/pt= 64 min.

Time Start 1033
Time End 1147

Mat'l Processing Rate ____
Final Gas Meter Reading 549.97
Initial Gas Meter Reading 513.94
Total Condensate in Impingers 32
Moisture in Silica Gel 9.1
Silica Gel Container No. ____ Filter No. ____
Orsat: CO_2 ____
O_2 ____
CO ____
N_2 ____
Excess Air ____
Test Conducted by: NECK
KIMBALL
Leak Rate 0.01 START CFM @ 15"
.005 END @ 15" Hg
Remarks: RUN MOTHER
.252 .249 .252 .251

Vm = 36.03 H = .539 ΔH = .97 Ts = 566.5 Tm = 505.9

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VA(
1-1	1.0	1035	514.93	.20	.66	.66	106	36	36	275	34	/
2	2.7		515.85	.21	.68	.68	106	38	37	275	34	/
3	4.7		516.79	.21	.68	.68	106	39	37	275	34	/
4	6.9		517.74	.22	.70	.70	106	42	37	275	34	/
5	9.3		518.75	.22	.70	.70	106	44	38	225	34	/
6	12.1	1045	519.73	.24	.72	.72	106	45	38	250	34	/
7	15.6		520.76	.25	.80	.80	106	47	38	250	34	/
8	20.5		521.93	.31	1.0	1.0	106	50	39	252	34	/
9	34.4		523.15	.34	1.1	1.1	106	51	39	252	34	/
10	39.4		524.4[illegible]	.37	1.2	1.2	106	52	40	252	34	/

17

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC.	("H2O) ORIFICE PRESS. DROP ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	METER TEMPERATURE OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VAC. ("Hg)
1-11		1055	525.60	.37	1.2	1.2	106	53	40	252	34	15
12			526.83	.36	1.15	1.15	106	54	40	252	34	15
13			528.09	.36	1.15	1.15	106	55	41	252	34	15
14			529.37	.36	1.15	1.15	106	56	41	252	34	15
15			530.64	.36	1.15	1.15	106	56	42	252	34	15
16		1105	531.89	.36	1.15	1.15	106	57	42	252	34	15
2-1		1111	533 —	.19	.63	.63	107	51	43	230	34	7.
2			533.75	.19	.63	.63	107	51	43	252	34	7.
3			534.67	.19	.63	.63	107	51	43	252	34	6
4			535 —	.22	.72	.72	107	51	43	252	34	6
5		1125	536.66	.25	.82	.82	107	46	44	252	34	6
6			537.72	.25	.82	.82	107	48	44	252	34	6
7			538.79	.27	.90	.90	107	49	44	252	34	6
8			539.87	.27	.90	.90	107	52	44	252	34	7.
9			541.05	.31	1.05	1.05	107	53	43	252	34	7.
10		1135	542.27	.32	1.10	1.10	107	54	44	252	34	8.
11			543.52	.37	1.25	1.25	107	55	44	252	34	8.
12			544.81	.37	1.25	1.25	107	56	44	252	34	9.
13			546.11	.35	1.3	1.3	107	56	44	252	34	8.
14			547.39	.37	1.25	1.25	107	57	44	252	34	8.
15			548.68	.37	1.25	1.25	107	57	45	252	34	8.
16		1147	549.97	.37	1.25	1.25	107	53	45	252	34	8.
								[illegible]	947			
							$\sqrt{\Delta h}$ = .5197					
										1875 FPM		
							16.56 A_s					
										30532 ACFM		
										26523 SCFMD		
								A_n = .000344				

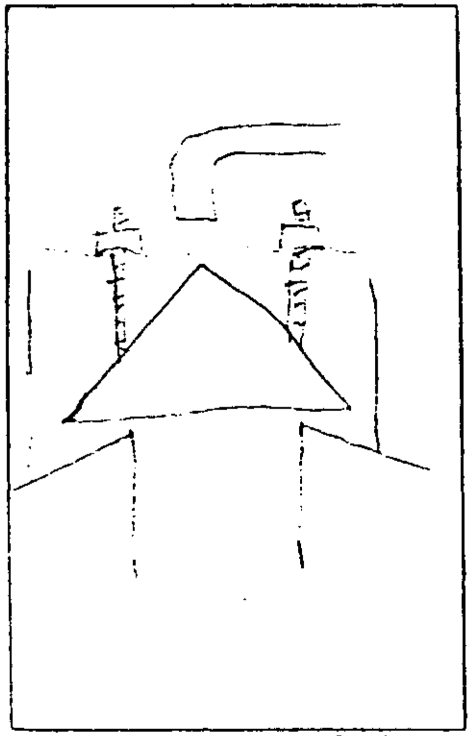
18

SOURCE SAMPLING FIELD DATA SHEET

Plant Waverly Minerals [illegible]
Sample Location No. 2 Kiln Outlet
Control Device Wet Scrubber
Type of Samples particulate
Date 2-1-79 Run No. 2
Moisture 8 %, FDA ____, Gas Density Factor ____
Barometric Press 30.10 "Hg, Stack Press ____ "Hg
Weather clear cold
Temp. ____ °F, W/D ____, W/S ____
Sample Box No. ____ Meter Box No. 1
Meter ΔH@ 1.71 Pitot Corr. Factor .84
Nozzle Dia. .251 in., Probe Length 7 ft
Probe Heater Setting 250 °F
Stack Dimensions: Inside Diameter 55 in
Inside Area ____ ft²
Height ____ ft

23

Effective Stack Area ____ ft² 32 pts. @ 2 min/pt= 64 min.



Time Start 1:12 PM
Time End 2:24 pm

Mat'l Processing Rate ____
Final Gas Meter Reading 591.827 ft
Initial Gas Meter Reading 550.185 ft
Total Condensate in Impingers [illegible] ml
Moisture in Silica Gel 7.0 g
Silica Gel Container No. ____ Filter No. ____
Orsat: CO_2 ____
O_2 ____
CO ____
N_2 ____
Excess Air ____
Test Conducted by: Neck Kimball
Leak Rate Init. 0.00, Final 0.004 CFM @ 15" Hg
Remarks: 15" LF 300 GPM [illegible]
4.5" CLEARANCE [illegible] 50" [illegible]
[illegible]" DISC OVERHANG

Vm = 34.662 H = .508 Cp = .84 Ts = 566 Tm = 512.2

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC.	("H2O) ORIFICE PRESS. DROP ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	METER TEMPERATURE OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VAC. ("Hg)
1-1		1:12 PM	551.1	.21	.70		106	43	44	256	36	1
2			552.1	.21	.70		106	44	44	256	36	1
3			553.0	.21	.70		104	45	44	259	36	1
4			554.1	.25	.83		100	47	44	260	37	1
5			555.1	.24	.81		106	49	44	260	38	1
6			556.2	.24	.81		106	51	45	265	38	1
7			557.3	.26	.89		106	53	45	265	35	1
8			558.7	.26	.89		106	55	45	260	38	1
9			559.6	.32	1.10		106	56	46	260	38	1

19

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H20)	("H20) ORIFICE PRESS. DROP		STACK GAS TEMP. (°F)	METER TEMPERATURE		FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VA. (
					CALC	ACTUAL		IN	OUT			
11	[illegible]		561.7	.20	.65		106	55	47	265	39	2
12	[illegible]		562.9	.35	1.30		106	59	47	265	39	4
13	[illegible]		564.2	.32	1.10		106	61	48	265	39	4
14	50.2		565.5	.41	1.40		106	62	48	270	38	5
15	[illegible]		566.6	.26	.87		106	63	48	265	38	
16	[illegible]		567.6	.23	.78		106	63	49	265	38	
2-1		1:51 pm	568.6	.20	.68		106	58	50	260	40	
2			569.6	.26	.85		106	58	50	265	40	2
3			570.7	.27	.90		106	58	50	270	40	2
4			571.9	.28	.92		106	59	50	270	40	3
5			573.0	.32	1.10		106	60	51	265	40	4
6			574.1	.23	.78		106	61	51	270	40	3
7			575.2	.23	.78		106	61	51	270	40	
8			576.3	.23	.72		106	62	51	265	40	3
9			577.3	.26	.85		106	62	51	265	40	3
10			578.5	.28	.92		106	63	52	265	40	2
11			579.7	.34	1.20		106	63	52	270	40	3
12			581.3	.24	.80		106	64	52	265	40	3
13			582.9	.23	.75		106	64	52	265	40	3
14			584.4	.23	.78		106	63	52	270	40	3
15			585.5	.19	.64		106	63	52	270	40	2
16			586.577	.23	.78		106	63	52	265	40	3
								1548	1106			

02

SOURCE SAMPLING FIELD DATA SHEET

Plant WAVERLY
MEIGS GA
Sample Location No 2
KILN
Control Device WET
SCRUBBER
Type of Samples PARTICULATE
Date 2-1-79 Run No. 3
Moisture 8 %, FDA ____, Gas Density Factor ____
Barometric Press 30.10 "Hg, Stack Press ____ "Hg
Weather CLEAR
Temp. 40 °F, W/D ____, W/S ____
Sample Box No. ____ Meter Box No. 1
Meter ΔH@ 1.71 Pitot Corr. Factor .84
Nozzle Dia. .251 in., Probe Length 7 ft
Probe Heater Setting ____
Stack Dimensions: Inside Diameter 55 in
Inside Area ____ ft²
Height ____ ft

25

Time Start 1533
Time End [illegible]

Effective Stack Area ____ ft² 32 pts. @ 2 min/pt= 64 min.

Mat'l Processing Rate ____
Final Gas Meter Reading 621.17 ft
Initial Gas Meter Reading 585.12 ft
Total Condensate in Impingers 98 ml
Moisture in Silica Gel 10.8 g
Silica Gel Container No. ____ Filter No. ____
Orsat: CO_2 0
O_2 21
CO 0
N_2 79
Excess Air ____
Test Conducted by: NICK
KIMBALL
Leak Rate 0.005 START / 0.000 END @ 10" Hg CFM @ 15" Hg
Remarks: ____

Vm = 36.05 √ΔP = .555 ΔH = .93 Ts = 567 Tm = 517.1

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VAC. ("Hg)
1-1		1535	586.03	.20	.67	.67	107	47	47	225	45	2.0
2			587.00	.21	.70	.70	107	48	48	240	40	2.5
3			587.96	.22	.72	.72	107	50	49	252	38	2.5
4			588.95	.23	.76	.76	107	53	49	252	38	2.
5			5 —	.23	.76	.76	107	54	49	252	38	2.
6		1545	591.00	.27	.90	.90	107	56	49	252	38	3.
7			592.08	.27	.90	.90	107	57	52	252	38	3.
8			593.15	.27	.90	.90	107	59	52	252	38	3.
9			594.32	.31	1.05	1.05	107	60	53	252	39	3.
10			595.55	.36	1.2	1.2	107	61	52	252	38	4

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H20)	("H20) ORIFICE PRESS. DROP		STACK GAS TEMP. (°F)	METER TEMPERATURE		FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VAC (";
					CALC	ACTUAL		IN	OUT			
1-11		1555	596.82	.36	1.2	1.2	107	63	51	250	38	4
12			598.08	.38	1.3	1.3	107	64	51	250	38	4.
13			599.35	.36	1.2	1.2	107	65	51	250	38	4.
14			600.61	.36	1.2	1.2	107	65	52	250	38	4.
15			601.88	.36	1.2	1.2	107	66	52	250	38	4.
16		1605	603.14	.34	1.18	1.18	107	66	52	250	38	4
2-1		1611	604.69	.19	.63	.63	107	61	53	260	38	3
2			605.00	.19	.63	.63	107	61	53	260	38	3
3			605.96	.21	.72	.72	107	61	53	260	38	3.
4			606.94	.21	.70	.70	107	62	54	250	38	3
5			607.95	.23	.76	.76	107	62	54	250	38	4
6		1621	608.96	.25	.84	.84	107	63	54	250	38	
7			610.07	.27	.90	.90	107	64	54	250	38	
8			611.17	.27	.90	.90	107	65	54	250	38	4
9			612.32	.30	1.00	1.00	107	65	54	250	38	5
10			613.56	.31	1.05	1.05	107	67	55	250	38	5
11		1631	614.79	.38	1.3	1.3	107	67	55	250	38	5.
12			616.10	.36	1.25	1.25	107	68	55	250	38	5.
13			617.46	.34	1.18	1.18	107	69	55	250	38	5
14			618.66	.34	1.18	1.18	107	69	55	250	38	5
15			619.92	.34	1.18	1.18	107	69	55	250	38	5.
16		1641	621.17	.34	1.18	1.18	107	70	56	252	38	5.
								1432	1179			

26

122

APPENDIX C

PROCESS WEIGHT DETERMINATION

PROCESS INPUT WEIGHT RATE

FOR

SCRUBBER #2 SYSTEM

PROCEDURE:

The Process Input Weight Rate was obtained through measuring the tons of material fed into the Scrubber #2 System by Conveyor C-25 and Elevator E-2, minus the weight of the free moisture contained in the material.

We obtained the tons per hour on Conveyor C-25 and Elevator E-2 by directing its' entire feed into the body of a large dump truck for a timed interval. The truck and material were weighed to obtain the gross weight, then the truck less the material was weighed to obtain the tare weight. By subtracting the tare weight from the gross weight and multiplying the resultant net weight of each tonnage check by 6(10 minute time interval), we established the tons per hour being fed into Screenhouses #1 and #2, Kiln #2, Cooler #2, Warehouse, and/or Scrubber #2 system. The tonnage checks were made at such times as to prevent any upsetting influence during the duration of all three (3) source emission test runs.

The tonnage check truck/material weights were as follows:

First Tonnage Check:

Gross weight	-	32,220 pounds
Tare weight	-	24,250 pounds
Net material weight	-	7,970 pounds
Net weight in tons	-	3.99 tons

Tonnage check in tons/hour 6 x 3.99 = 23.94 tons/hour

Second Tonnage Check:

Gross weight	-	30,000 pounds
Tare weight	-	23,570 pounds
Net material weight	-	6,430 pounds
Net weight in tons	-	3.22 tons

Tonnage check in tons/hour x 3.22 = 19.32 tons/hour

24

Third Tonnage Check:

Gross weight	-	28,870 pounds
Tare weight	-	22,220 pounds
Net weight material	-	6,650 pounds
Net weight in tons	-	3.33 tons

Tonnage check in tons/hour 6 x 3.33 = 19.98 tons/hour

Samples of material were collected from Conveyor C-25 and Elevator E-2 to correlate with tonnage checks taken from Conveyor C-25 and Elevator E-2. Each of these samples were analyzed by the lab to determine its' free moisture.

A 50 gram sample of material from Conveyor C-25 and a 50 gram sample of material from Elevator E-2 was balanced on an Ohaus, Harvard Trip, Double Beam Balance. A 250 watt Heat Ray infrared heat lamp was placed directly above the 50 gram sample. The drying process was maintained on a continuous basis with periodic rebalancing of the scale beam until the lowest constant weight was achieved.

The free moisture laboratory results were as follows:

First samples:	6.2%
Second samples:	6.0%
Third samples:	6.5%

To establish the Process Input Weight Rate of Scrubber #2 System, we multiplied the average tons per hour from Conveyor C-25 and Elevator E-2 by the average percent of free moisture for that sample and subtracted the resultant weight of the free moisture from the average tons per hour from Conveyor C-25 and Elevator E-2, the final sums being averaged for our Process Input Weight Rate:

First tonnage check:

23.94 tons/hour - (23.94 x .062) = 22.46 tons/hour

Second tonnage check:

19.32 tons/hour - (19.32 x .06) = 18.15 tons/hour

Third tonnage check:

19.98 tons/hour - (19.98 x .065) = 18.68 tons/hour

PROCESS INPUT WEIGHT RATE:

$$\frac{22.46 + 18.15 + 18.68}{3} = 19.76 \text{ tons/hour}$$

Allowable Rate of Emission

$$E = 4.1P^{0.67}$$

E = Allowable Emission Rate in pounds per hour

P = Process Input Weight Rate in tons per hour

$$E = 4.1\ (19.76)^{0.67} = 30.27 \text{ pounds/hour allowable}$$

APPENDIX D

LABORATORY ANALYSIS

PLANT WAVERLY MINERALS

LOCATION MEIGS, GA.

STACK NO. 2 DRYER

DATE SAMPLED 2-1-79

LAB. NUMBER	SAMPLE IDENTIFICATION	TEST	METHOD	RESULTS (GRAINS)
28584	RUN 1 FILTER			.0465
	RUN 1 PREFILTER			.0907
	RUN 2 FILTER			.0457
	RUN 2 PREFILTER			.0735
	RUN 3 FILTER			.0475
	RUN 3 PREFILTER			.0986
	3 SILICA GELS			

28

PLANT AND LOCATION Waverly Minerals, Meigs, OH.

STACK No. 2 Dryer

DATE _____ ANALYST D. Williams LAB. NO. 2858/4

	RUN 1	RUN 2	RUN 3
FILTERS			
Sample No.	R1 FILTER	R2 FILTER	R3 FILTER
Filter No.	55212	55284	55263
Beaker & Filter Wt.	67.7945	80.7232	80.6004
Beaker Tare Wt.	67.3413	80.3960	80.1511
Gross Gain	.7532	.4272	.4493
Filter Tare Weight	.4047	.3815	.4018
Net Gain (grams)	.0485	.0457	.0475
SAMPLE ID			
Sample No.	R1 PREF	R2 PREF	R3 PREF
Sample Volume	225	225	325
Aliquot	225	225	325
Factor	1	1	1
Final Weight	150.9500	140.9727	153.3489
Tare Weight	150.7593	140.9092	153.2903
Net Gain	.0907	.0735	.0486
Net Gain x factor = Total (grams)	.0907	.0735	.0486
SAMPLE ID			
Sample No.			
Sample Volume			
Aliquot			
Factor			
Final Weight			
Tare Weight			
Net Gain			
Net gain x factor = Total (grams)			
FOR INSOLUBLE-SOLUBLE MATERIAL			
Solvent			
Sample No.			
Sample Volume			
Aliquot			
Factor			
Filter Final			
Filter Tare			
Net Gain			
Net Gain x Factor - Total Insoluble			
Beaker Final			
Beaker Tare			
Net Gain			
Net Gain x Factor = Total Soluble			

PLANT AND LOCATION Waverly Minerals, Meigs, OH.

STACK No. 2 Dryer

DATE _____ ANALYST D. Dillon LAB. NO. 2858Y

	RUN 1	RUN 2	RUN 3
FILTERS			
Sample No.	R1 FILTER	R2 FILTER	R3 FILTER
Filter No.	55212	55284	55263
Beaker & Filter Wt.	67.7445	80.7232	80.6007
Beaker Tare Wt.	67.3413	80.2960	80.1511
Gross Gain	.4032	.4272	.4496
Filter Tare Weight	.4047	.3815	.4021
Net Gain (grams)	.0485	.0457	.0475
SAMPLE ID			
Sample No.	R1 PREF	R2 PREF	R3 PREF
Sample Volume	225	225	325
Aliquot	225	225	325
Factor	1	1	1
Final Weight	150.9500	140.4727	153.3489
Tare Weight	150.8593	140.4092	153.2903
Net Gain	.0907	.0735	.0486
Net Gain x factor = Total (grams)	.0907	.0735	.0486
SAMPLE ID			
Sample No.			
Sample Volume			
Aliquot			
Factor			
Final Weight			
Tare Weight			
Net Gain			
Net gain x factor = Total (grams)			
FOR INSOLUBLE-SOLUBLE MATERIAL			
Solvent			
Sample No.			
Sample Volume			
Aliquot			
Factor			
Filter Final			
Filter Tare			
Net Gain			
Net Gain x Factor - Total Insoluble			
Beaker Final			
Beaker Tare			
Net Gain			
Net Gain x Factor = Total Soluble			