



KODGLER & ASSOCIATES

ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET

GAINESVILLE, FLORIDA 32609

904/377-5822 • FAX 377-7158

FAX TRANSMITTAL FORM

TO: Bruce Mitchell

FROM: John Keegler

PROJECT: 307-90-01

SENT BY: Megan

DATE: 11/18

FAX PHONE: 904-377-7158

The text being transmitted consists of 2 pages
PLUS this one.

REMARKS: _____



KOUGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 307-90-01

November 16, 1992

Mr. C. H. Fancy
Bureau of Air Regulation
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Florida Crushed Stone Company
Minor Modification to Permits AC27-118674
(PSD-FL-091A) and A027-183509

Dear Mr. Fancy:

The purpose of this letter is to request a minor modification to the referenced air construction and air operating permits issued to the Florida Crushed Stone Company for the operation of a dry process Portland cement plant and related equipment. The minor modification will allow Florida Crushed Stone to use whole tire derived fuel (WTDF) to provide up to 15 percent of the heat input to the cement plant and will account for possible increases in total hydrocarbon emissions associated with the utilization of WTDF.

The referenced air permits limit the heat input to the cement kiln to 248.0 MMBTU per hour through the firing of coal with a maximum sulfur content of 0.75 percent. Florida Crushed Stone requests authorization to supplement 15 percent of this heat input, or up to 37.2 MMBTU per hour, with WTDF. This will be equivalent to feeding up to 1.33 tons per hour of WTDF to the cement kiln. The conditions associated with the use of the WTDF that were proposed by Hernando County on November 10, 1992, are acceptable to Florida Crushed Stone.

The other matter that must be addressed by the minor modification is the possible increase in total hydrocarbon emissions as a result of using WTDF. Measurements made at Florida Crushed Stone in November 1991 with only the cement plant operating and with coal being used to provide 100 percent of the heat input to the cement plant, indicated that total hydrocarbon emissions from the plant, as measured by EPA Method 25A, averaged 3.6 pounds per hour with a standard deviation of 0.26 pounds per hour. The 95th percentile total hydrocarbon emissions rate during this period of time would have been 4.1 pounds per hour. During the same

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Mr. C. H. Fancy
Florida Department of
Environmental Regulation

November 16, 1992
Page 2

period of time (November 1991), total hydrocarbon emissions were measured using EPA Method 25A while the cement plant only was operating and with WTDF providing 15 percent of the heat input to the kiln. The results of these measurements indicated total hydrocarbon emissions in the range of 1.2 pounds per hour.

In July 1992, total hydrocarbon emissions were measured at the CPL plant using Method 25A with the cement plant, power plant and lime plant operating. When coal was used to provide 100 percent of the heat input to the cement plant, the total hydrocarbon emissions averaged 2.5 pounds per hour. When WTDF was used to provide approximately 15 percent of the heat input to the cement plant, total hydrocarbon emissions averaged 3.7 pounds per hour. The July 1992 tests indicated there could be a 1.2 pound per hour increase in total hydrocarbon emissions as a result of using WTDF in the cement plant.

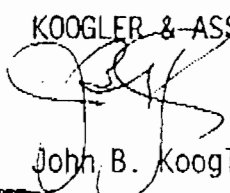
For purposes of this minor modification, Florida Crushed Stone proposes to establish baseline total hydrocarbon emissions from the cement plant only at 4.1 pounds per hour (the 95th percentile emission rate based on measurements made in November 1991) and 18.0 tons per year (based on 8,760 hours per year of operation as presently permitted). When WTDF is used to provide up to 15 percent of the heat input to the cement plant, the total hydrocarbon emissions from the cement plant only are proposed at 5.3 pounds per hour (baseline plus the possible 1.2 pound per hour increase measured in July 1992) and 22.9 tons per year (based on the cement plant operating 8,760 hours per year but only 8,300 hours per year with WTDF).

There are no other modifications or changes requested to the referenced air permits. Enclosed is a check in the amount of \$250.00 payable to the Florida Department of Environmental Regulation for processing the requested minor modification.

We appreciate your consideration of this matter. If there are further questions regarding this matter, please do not hesitate to contact me.

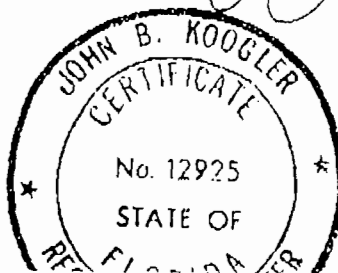
Very truly yours,

KOOGLER & ASSOCIATES


John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

c: Mr. Bruce Mitchell, FDER
Mr. Tom Mountain, FCS
Mr. Randy Thompson, FCS
Mr. Larry Sellers





ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 307-90-01

November 5, 1992

Mr. David Buff
KBN Engineering & Applied Science
1034 N.W. 57th Street
Gainesville, FL 32605

Subject: Florida Crushed Stone Company
Whole Tire Derived Fuel Test Critique

RECEIVED

NOV 10 1992

Division of Air
Resources Management

Dear Dave:

I have reviewed your critique of our test reports describing baseline (100 percent coal) and whole tire derived fuel (WTDF)/coal tests which were conducted at the Florida Crushed Stone Company in Hernando County, Florida, in June 1992. I am pleased that you concur with most of the conclusions that we reached, but would like to comment and/or provide you with additional information on three matters. These matters relate to total volatile organic compound (VOC) emissions, continuous stack gas flow measurements and kiln oxygen levels.

In your analysis of our reported VOC emission rates, you report baseline emission rates ranging from 4.1 pounds per hour (limit of detection) to 11.6 pounds per hour with an average of 2.5 pounds per hour. The average was calculated using one-half the limit of detection for emission rates reported at the limit of detection. For the WTDF/coal tests, you report our data as ranging from 4.0 pounds per hour (limit of detection) to 8.2 pounds per hour with an average of 3.7 pounds per hour. Again, the average was calculated by using one-half the reported emission rates for emissions reported below the limit of detection. Your analysis of data falling below the limit of detection follows one procedure that is commonly used, and I find no fault with this procedure. In our opinion, based on the July 1992 test data and other data supplied herein, the difference between the average emission rates (3.7 pounds per hour versus 2.5 pounds per hour) does not represent an increase in VOC emissions that would require an amendment to an air construction permit.

In reviewing the two data sets from the July 1992 tests, the upper range of VOC emissions was higher during baseline conditions (11.6 pounds per hour) than during WTDF/coal firing conditions (8.2 pounds per hour). The average emission rates of VOCs during the two 23-hour periods of monitoring show, based on your calculations, higher emissions during the WTDF/coal test (3.7 pounds per hour) than during the baseline test (2.5 pounds per hour). Considering the ranges of VOC emissions during the two test periods, the fact that a large number of the hourly average observations under both test conditions were below the limit of detection and the variability in emission rates of other constituents from cement plants and power plants, I question the necessity of interpreting the apparent change in VOC emissions as significant enough to require a permit amendment.

I would like to provide some additional information on VOC emissions from the Florida Crushed Stone facility that perhaps should have been provided earlier. The reason for not providing these data at an earlier time is that I anticipated no concern regarding the low levels of VOC measured during our July 1992 tests. In the attached table, I have summarized emission rate measurement made for volatile organic compounds at the Florida Crushed Stone facility during previous baseline and TDF tests. A review of these data show that volatile organic compounds from Florida Crushed Stone vary but generally fall in the range of less than five pounds per hour. The data also demonstrate that there is no correlation between the magnitude of the volatile organic compound emission rates and the fuel being fired in the cement plant. In my opinion, these data, coupled with the data from our July 1992 tests, support the fact that VOC emissions from the Florida Crushed Stone facility are variable and not correlated to fuel type. I have attached hereto the pages from our earlier reports in which these VOC emission rates were reported and will be more than happy to provide you with additional documentation if you require.

Regarding your recommendation that a continuous stack gas flow rate monitor be installed in the main CPL plant stack, Florida Crushed Stone has been looking at flow rate monitors for the past few months. The company is investigating instrumentation that is on the market with specifications and performance that will meet EPA and FDER certification. Once a monitor has been found that is EPA and FDER certifiable and compatible with conditions at Florida Crushed Stone, the company will proceed with installation.

Another matter I would like to comment on, as a matter of clarification, is your suggestion that TDF firing to the cement kiln not commence or continue unless the oxygen level, as measured at the base of the preheater, is three percent or greater. In reviewing your report and the data provided to us by Florida Crushed Stone, I presume the kiln inlet oxygen levels that you reported and refer to are the oxygen levels listed under the heading KILN INLET on the monitor screen printed by Florida Crushed Stone (see attached). The oxygen level reported under KILN INLET (4.05 percent on the attached sheet) is



actually measured at the inlet of the cement plant I.D. fan as shown on the attached sheet. The oxygen level measured at the base of the preheater is the oxygen concentration shown within the preheater on the screen (1.77 percent on the attached sheet).

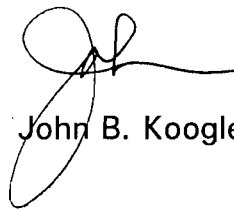
The oxygen concentration at the base of the preheater is measured in an environment that is approximately 1800°F and extremely dust laden. Maintaining an instrument in this environment is difficult and Florida Crushed Stone personnel have stated that the reliability of the instrument is questionable. As an example, I reviewed some of the printouts that were provided to us by Florida Crushed Stone and found reported oxygen levels ranging from less than one percent to over nine percent in a matter of a few hours.

To overcome the difficulties associated with measuring oxygen at the base of the preheater, Florida Crushed Stone installed a second oxygen monitor at the inlet to the cement plant I.D. fan. The oxygen level measured at this point is a surrogate to oxygen levels measured at the base of the preheater. With this understanding as to where the oxygen concentrations are measured, Florida Crushed Stone has no objection to the requirement of maintaining an oxygen level of at least three percent, one-hour average, at the cement plant I.D. fan while burning TDF.

I will contact you to discuss these matters further once you have had an opportunity to digest this information. If you have any questions in the meantime, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

c: Mr. Bruce Mitchell, FDER-Tallahassee
Mr. C. Hetrick, Hernando County
Mr. Tom Mountain, FCS
Mr. A. Cleveland, Oertel, Hoffman
Mr. Larry Sellers, Holland & Knight
Mr. Carl Lunderstadt, FCS, Leesburg



VOLATILE ORGANIC COMPOUND
EMISSION DATA

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

Date	Plants Operating	VOC Emissions (lb/hr)			
		Baseline (coal)		TDF/Coal	
9/18-24/90	CPL	<u>Volatile(1)</u>	<u>Semi-Volatile(2)</u>	<u>Volatile(1)</u>	<u>Semi-Volatile(2)</u>
		0.15			
		0.16			
		<u>0.13</u>			
		0.15	5.01	0.44	0.90
		5.16 Total		1.34 Total	
11/13-21/91	Cement	<u>VOC(3)</u>	<u>Benzene</u>	<u>VOC(3)</u>	<u>Benzene</u>
		3.5	(4)	1.2	0.00068
		3.4	(4)	1.3	0.00061
		<u>3.9</u>	<u>0.00131</u>	<u>1.2</u>	<u>0.00050</u>
		3.6	0.00131	1.2	0.00060
7/21-29/92	CPL	<u>VOC (5)</u>		<u>VOC (5)</u>	
		< 4.1 - 11.6		< 4.0 - 8.2	
		Avg = 2.5		Avg = 3.7	

- (1) Sum of specific volatile organic compounds measured with VOST system.
- (2) Sum of specific semi-volatile organic compounds measured with MM5 system.
- (3) Total VOCs measured by EPA 25A; one-hour averages.
- (4) No data.
- (5) Range and average of 23 hours of data measured by EPA 25A.

Cement Plant
Only

TABLE 3

BASELINE
NOVEMBER 13, 1991

Run	Flow (dscfm)	NOx (ppm)	NOx (lb/hr) (1)	CO (ppm)	CO (lb/hr)	VOC (ppm)	VOC (lb/hr) (2)	PM (lb/hr)
1	491,906	123	434	29.6	63.5	1.04	3.5	25.14
2	441,021	76	240	28.6	55.0	1.14	3.4	10.75
3	462,192	116	384	28.2	56.9	1.22	3.9	11.96
Avg	465,039	105	353	28.8	58.6	1.13	3.6	11.36(3)

TDF
NOVEMBER 21, 1991

Run	Flow (dscfm)	NOx (ppm)	NOx (lb/hr) (1)	CO (ppm)	CO (lb/hr)	VOC (ppm)	VOC (lb/hr) (2)	PM (lb/hr)
1	330,016	89	210.6	51.5	74.2	0.51	1.15	10.00
2	324,764	75	174.6	63.8	90.4	0.59	1.31	9.07
3	328,980	90	212.3	52.4	75.2	0.53	1.20	0.76
Avg	327,920	85	199.1	55.9	79.9	0.54	1.22	9.61

- (1) As NO₂
- (2) As propane
- (3) Runs 2 and 3

$$\text{Emissions: NOx} = (\text{ft}^3/\text{min})(60 \text{ min/hr})(10^{-6})(\text{Conc-ppm})(46/385)$$

$$\text{CO} = (\text{ft}^3/\text{min})(60 \text{ min/hr})(10^{-6})(\text{Conc-ppm})(28/385)$$

$$\text{VOC} = (\text{ft}^3/\text{min})(60 \text{ min/hr})(10^{-6})(\text{Conc-ppm})(44/385)$$

Cement Plant
Only

TABLE 4

SUMMARY OF BENZENE
BASELINE AND TDF EMISSION RATES

CPL, BROOKSVILLE, FLORIDA
NOVEMBER 13 - 21, 1991

Run	Benzene Emission Rate	
	Baseline (lbs/hr)	TDF (lbs/hr)
Run 1	(1)	0.675×10^{-3}
Run 2	(1)	0.614×10^{-3}
Run 3	1.31×10^{-3}	0.497×10^{-3}
Average	$1.31 \times 10^{-3}(1)$	0.595×10^{-3}

(1) Runs 1 and 2 could not be analyzed due to high CO₂ concentrations;
CO₂ released during calcining of raw feed.

Calculations:

$$\begin{aligned} \text{Emissions (lb/hr)} &= \frac{\text{ng}}{20 \text{ l}} \times 28.32 \frac{\text{l}}{\text{ft}^3} \times Q \frac{\text{ft}^3}{\text{min}} \times 60 \frac{\text{min}}{\text{hr}} \times \frac{1}{453.6 \times 10^9} \frac{\text{lb}}{\text{ng}} \\ &= (\text{ng})(Q \text{ ft}^3/\text{min}) \times 1.873 \times 10^{-6} \end{aligned}$$

Baseline Q = 465,039 dscfm

TDF Q = 327,920 dscfm



TABLE 3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS EMISSION RATES

CENTRAL POWER AND LIME, INC.
BROOKSVILLE, FLORIDA
SEPTEMBER 18-24, 1960
9

Compound	(Mol. Wt.)	(lb/hr)		
		1	2	3
Acetone	58.08	0.01	0.01	0.03
Benzene	78.11	0.09	0.10	0.05
Toluene	92.13	0.01	0.01	0.01
Chloromethane	84.90	<0.01	<0.01	<0.01
Other		<0.03	<0.03	<0.03
TOTAL		0.15	0.16	0.13

Baseline / CPL Plants

TABLE 4
SUMMARY OF SEMI-VOLATILE ORGANIC COMPOUNDS EMISSION RATES

CENTRAL POWER AND LIME, INC.
BROOKSVILLE, FLORIDA
SEPTEMBER 18-24, 1990

Compound	Average Emission Rate (lb/hr)
Mostly C ₁₆ - C ₁₈ Aliphatic Compounds	5.01

See laboratory report for individual compounds.

Baseline / CPL Plants

TABLE 3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS EMISSION RATES

CENTRAL POWER AND LIME, INC.
CEMENT/POWER/LIME PLANTS
SEPTEMBER 18-24, 1990

Compound	Average of 3 Runs (lb/hr)
Acetone	0.02
Benzene	0.15
Toluene	0.20
Chloromethane	0.03
Others	0.04
Total	0.44

TDF / CPL Plants

TABLE 4
SUMMARY OF SEMI-VOLATILE ORGANIC COMPOUNDS EMISSION RATES

CENTRAL POWER AND LIME, INC.
BROOKSVILLE, FLORIDA
SEPTEMBER 18-24, 1990

Compound	Emission Rate (Average of 3 runs) (lb/hr)
Mostly C ₁₆ - C ₁₈ Aliphatic Compounds	0.90

See laboratory report for individual compounds.

TDF / CPL Plants

Best Available Copy

07:53:59 21-JUL-92 TUESDAY

KILN PREHEATER

25 31 32 34 35 36 37 40 41 42 43 44

2 START-UP
HORNS

KILN ID FAN
3 START 4 STOP

9 BAGHOUSE

SPEED DEMAND/ INLET TEMP.
70.0 % 399.6 DEG F
143
ACTUAL SPEED INLET PRESS
71.6 % -3.2 "WG
HD 43
FAN AMPS DELT.F
H 0 1014. H 7.3 "WG
FLC 3390 H143

TO BAGHOUSE GRAPH
753 DEGF
-3.10 "WG
120.2 AMPS
K13

STACK
OPACITY 3.4 %
NOX 135.6PPM (53)
SOX 167.1PPM (53)
FAN DMPR 5 PPS DND: 0.0 %
ACT POS: 53.1 %

E4837 SUREN
4-17-91

KILN EXHAUST
DMPR 6

25.0 %

758 DEGF
19.66 "WG

KILN INLET
TEMP 1755 DEGF
DRAFT: 0.70 "WG
O2: 4.05 %
CO: 0.58 %
CO: 904.7 PPM

measured
at cement
plant I.D.
fan

12.30 "WG 7.74 "WG
792 DEGF
820 DEGF SW 802 DEGF NW 792 DEGF NE 871 DEGF SE
7.7

1370 DEGF
MEAL TEMP

GAS TEMP
1376 DEGF

SIL0 G07 DISCH
1A 1B 2A 2B
8 18 12 11

7 PREHEATER FEED
DEMAND 130.0 %
ACTUP 130.6

8 KILN SPEED
DEMAND 92.0 %
ACT 137.

K1H04
KILN EXHAUST
DAMPER

0.00- 7.1
25.0% LOCK

10-10-91

H03
26.4
AMPS

KILN
FEED
BIN

DEMAND
15.4
1P DIS

Oxygen measured at base
of Preheater is not reliable
Example:

Date	Time	Oz(%)
7/21/92	07:53:59	1.77
	09:57:58	0.79
	10:56:45	8.67
	11:49:46	9.15
	12:45:29	9.14
	13:44:03	9.13
7/22/92	02:57:30	9.12
	04:52:48	0.10



4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 307-90-01

November 2, 1992

Mr. Tom Mountain
Florida Crushed Stone Company
P.O. Box 1508
Brooksville, FL 34605-1508

Subject: Air Quality Impact Analysis
Coal and Coal/TDF Emission Test Data
July 21-29, 1992

Dear Mr. Mountain:

In my letter to you dated October 13, 1992, I provided the results of SCREEN modeling to demonstrate that the ambient air concentrations of various constituents measured during the baseline and whole tire derived fuel (WTDF) tests in July 1992 did not exceed FDER guideline No Threat Levels (NTLs). This demonstration was in accordance with the test protocol that had been reviewed and approved prior to the test period. The protocol required that an impact analysis be conducted for the measured metals, volatile organic compounds and hydrogen chloride. It has come to my attention that you have now been requested to demonstrate that the particulate matter, nitrogen oxides and carbon monoxide emission rates measured during the July 1992 test periods do not result in ambient levels that exceed NTLs or ambient air quality standards.

In the attached table, I have listed the maximum emission rate of particulate matter, nitrogen oxides, and carbon monoxide measured during either the baseline test period or the WTDF test period; both of which were conducted during the period July 21-29, 1992. I determined the estimated ambient air concentrations of these emissions at the Florida Crushed Stone property line nearest the CPL plant using the same SCREEN modeling procedures as described in my letter of October 13, 1992. The results are summarized in the attached table.

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NOV 04 1992

Division of Air
Resources Management

Mr. Tom Mountain
Florida Crushed Stone Company

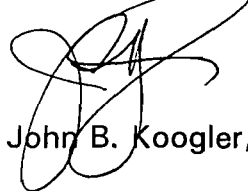
November 2, 1992
Page 2

As in the previous impact analysis, the SCREEN model was used. This model calculates only a maximum expected 1-hour impact. For the three constituents modeled, the maximum predicted 1-hour impacts are less than all NTLs or ambient air quality standards; whether the NTL or air quality standard is for an hourly period or for a longer averaging time. As the maximum expected impact will decrease as the duration of the averaging time increases, it is apparent that the maximum impacts of particulate matter, nitrogen oxides and carbon monoxide emissions from the CPL plant during the burning of coal or coal/WTDF will not exceed any air quality standard or NTL.

If there are any questions regarding this analysis, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

c: Mr. Bruce Mitchell, FDER-Tallahassee ✓
Mr. C. Hetrick, Hernando County
Mr. David Buff, KBN
Mr. A. Cleveland, Oertel, Hoffman
Mr. Larry Sellers, Holland & Knight
Mr. Carl Lunderstadt, FCS, Leesburg
Mr. Brian Beals, EPA Region IV, Atlanta
Mr. Brian Mitchell, National Park Service



SCREEN MODEL ANALYSIS OF
CONSTITUENTS FROM CPL PLANT

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

Constituent	Max Measured Emission Rate (1) (lb/hr)	Dilution Factor (2) ($\mu\text{g}/\text{m}^3$ / lb/hr)	Max Expected 1-hr Impact (3) ($\mu\text{g}/\text{m}^3$)	NTL or AAQS ($\mu\text{g}/\text{m}^3$)		
				8-hr	24-hr	Annual
P.M.	62.66	0.063	3.9	NA	150	50
NOx	762.2	0.063	47.9	310	74.4	100
CO	671.3	0.063	42.2	10,000 (5)	NA	NA

- (1) Maximum average emission rate measured during baseline or WTDF tests; 7/21-29/92.
- (2) Dilution factor = Max one-hour impact from SCREEN model ($4.99 \mu\text{g}/\text{m}^3$)
+ SCREEN modeled emissions rate (79.4 lbs/hr)
- (3) Max one-hour impact = Measured Emissions (lb/hr) x Dilution Factor
- (4) FDER Guideline NTLs, Version 3.0 or FDER AAQS
- (5) One-hour CO AAQS is $40,000 \mu\text{g}/\text{m}^3$



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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KA 307-90-01

October 29, 1992

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OCT 30 1992

Division of Air
Resources Management

Mr. David A. Buff, M.E., P.E.
KBN Engineering and Applied
Sciences, Inc.
1034 N.W. 57th Street
Gainesville, FL 32605

Subject: Florida Crushed Stone Company
Baseline and Whole Tire Derived Fuel Tests

NPS Data
3
EPA
file *OK*

Dear Mr. Buff:

This letter is a follow-up of my letter of October 23, 1992, to you and provides additional information in response to your letter of October 15, 1992.

1. In your letter of October 15, 1992, you questioned differences in kiln feed rate and clinker production reported in the Summary Report for 7/22/92 cement plant operation and the data for these same parameters reported in our baseline test report. As I stated in my letter to you of October 23, 1992, the data in our final report were provided to us by Mr. Charles Allen of Florida Crushed Stone. These data were based upon empirical factors that Florida Crushed Stone uses to arrive at kiln feed and clinker production. Following is a description of how these factors are applied.

The data recorded by Florida Crushed Stone is the preheater feed rate. Within the preheater there is an 8-10 percent loss in feed (material that is subsequently collected in the baghouse). In addition, there is a 35 percent loss in weight of feed material as carbonates are calcined in the cement kiln. The preheater feed rate is adjusted for these losses to calculate the clinker production and the kiln feed (tph) is calculated by dividing the calculated clinker production rate (tph) by 0.65. As stated in my letter of October 23, 1992, the calculated kiln feed rates and clinker production rates were reported in our final report as these are the rates typically used by FCS.

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FEDERAL EXPRESS		QUESTIONS? CALL 800-238-5355 TOLL FREE.		AIRBILL PACKAGE TRACKING NUMBER 6081756015			
1300M 6081756015		Date <u>11/29/92</u> RECIPIENT'S COPY					
From (Your Name) Please Print John B Koogler		Your Phone Number (Very Important) 904-537-5822		To (Recipient's Name) Please Print Bruce Mitchell			
Company KOOGLER & ASSOC		Department/Floor No.		Company FEDEX TOWN TOWERS OFFICE			
Street Address 014 NW 13TH ST		Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.) 2600 Blair Stone Rd					
City AINSVILLE		State FL		City Tallahassee			
ZIP Required 32809		State FL		ZIP Required 32309			
YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.) 307-90-01							
IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required							
PAYMENT 1 <input checked="" type="checkbox"/> Bill Sender 2 <input type="checkbox"/> Bill Recipient's FedEx Acct. No. 3 <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. 4 <input type="checkbox"/> Bill Credit Card 5 <input type="checkbox"/> Cash/Check							
4 SERVICES (Check only one box) Priority Overnight (Delivery by next business morning) 11 <input type="checkbox"/> OTHER PACKAGING 16 <input checked="" type="checkbox"/> FEDEX LETTER* 12 <input type="checkbox"/> FEDEX PAK* 13 <input type="checkbox"/> FEDEX BOX 14 <input type="checkbox"/> FEDEX TUBE Economy Two-Day (Delivery by second business day) 30 <input type="checkbox"/> ECONOMY Standard Overnight (Delivery by next business afternoon, no Saturday delivery) 51 <input type="checkbox"/> OTHER PACKAGING 56 <input type="checkbox"/> FEDEX LETTER* 52 <input type="checkbox"/> FEDEX PAK* 53 <input type="checkbox"/> FEDEX BOX 54 <input type="checkbox"/> FEDEX TUBE Government Overnight (Restricted for authorized users only) 46 <input type="checkbox"/> GOVT LETTER 41 <input type="checkbox"/> GOVT PACKAGE Freight Service (For packages over 150 lbs.) 70 <input type="checkbox"/> OVERNIGHT FREIGHT** (Confirmed reservation required) 80 <input type="checkbox"/> TWO-DAY FREIGHT** (Confirmed reservation required)		5 DELIVERY AND SPECIAL HANDLING (Check services required) HOLD FOR PICK-UP (Fill in Box H) { 1 <input type="checkbox"/> WEEKDAY or 31 <input type="checkbox"/> SATURDAY DELIVER { 2 <input checked="" type="checkbox"/> WEEKDAY or 3 <input type="checkbox"/> SATURDAY (Extra charge) (Not available to all locations) 4 <input type="checkbox"/> DANGEROUS GOODS (Extra charge) 5 <input type="checkbox"/> 6 <input type="checkbox"/> DRY ICE (Dangerous Goods Shipper's Declaration not required) Dry Ice, LUN 1995, X kg. III 7 <input type="checkbox"/> OTHER SPECIAL SERVICE 9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge) 12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		6 PACKAGES WEIGHT in Pounds Only YOUR DECLARED VALUE (See right) DIM SHIPMENT (Chargeable Weight) L x W x H 1 <input type="checkbox"/> Regular Stop 3 <input type="checkbox"/> Drop Box 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station 2 <input type="checkbox"/> On-Call Stop		Emp. No. Date <input type="checkbox"/> Cash Received <input type="checkbox"/> Return Shipment <input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold Street Address City State Zip Received By: X Date/Time Received FedEx Employee Number Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 6/92 PART #137204 FXEM 10/92 FORMAT #138 136 © 1991-92 FEDEX PRINTED IN U.S.A.	

6. Subsequent to my letter of October 23, 1992, I retrieved the Florida Crushed Stone plant operating records from your office and further analyzed the nitrogen oxides data for the periods July 21-31 (July) and August 8-31, 1992 (August). The data are presented graphically and in tabular form in attachments hereto. The graphical presentation of the data is similar to the graphical presentation of NO_x data that you supplied to this office. In general, the NO_x concentrations measured by the Florida Crushed Stone CEM in the CPL stack show higher NO_x levels during the August period. Based on my calculations, the average NO_x concentration for the July period was 166 parts per million while the average concentration for the August period (through August 27, 1992, with one spiked concentration removed) was 227 parts per million. This difference is significant at the 95 percent confidence level.

I spoke with Mr. Charles Allen of Florida Crushed Stone regarding this difference and there was no difference in cement plant operations during the two periods that he was aware of that would explain this difference. I might point out that the NO_x concentration in the CPL plant stack also represents NO_x from the power plant and lime plant. Operational differences in these plants could have been a contributing factor to the difference noted in the stack gas NO_x concentration.

Another factor that I looked into was the carbon monoxide concentration measured by FCS instrumentation at the cement plant preheater exit. These data were examined for the same two periods and are presented graphically and in tabular form in attachments hereto. The data show that the carbon monoxide levels at the preheater exit averaged 273 parts per million for the July period and 239 parts per million for the August period (through August 27, 1992, with spiked data removed from both data sets). These data indicate that the carbon monoxide concentration at the cement plant exit was higher during the July period than during the August period (significantly higher). This is inverse to the nitrogen oxides concentration; an inverse relationship that is expected based on cement plant operation.

In conclusion, we have no ready answer as to why NO_x concentrations in the CPL stack were higher during the August period. This could have been due to the possibility that the cement

plant operated at slightly higher oxygen levels (as reflected by lower carbon monoxide levels in August) or it could have been due to operational differences in the power plant and lime plant.

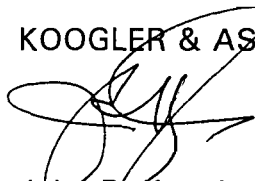
In analyzing the data for the August period, I excluded data for August 28-31 as the carbon monoxide levels reported at the preheater exit were significantly higher than during the July and early August periods. There is no immediate explanation for the higher reported carbon monoxide levels during this late August period.

- 7B. After retrieving the Florida Crushed Stone records from your office, we had the opportunity to review clinker quality for the period July 21-August 31, 1992, and to compare the clinker quality with target values established by Florida Crushed Stone. The target values are daily average limits established by FCS for each of the parameters. The attached figures show the target limits for each parameter and the 24-hour values of each parameter for the July-August period. The data demonstrate that clinker quality fell within acceptable limits during the period of record.

If there are further questions regarding these data, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

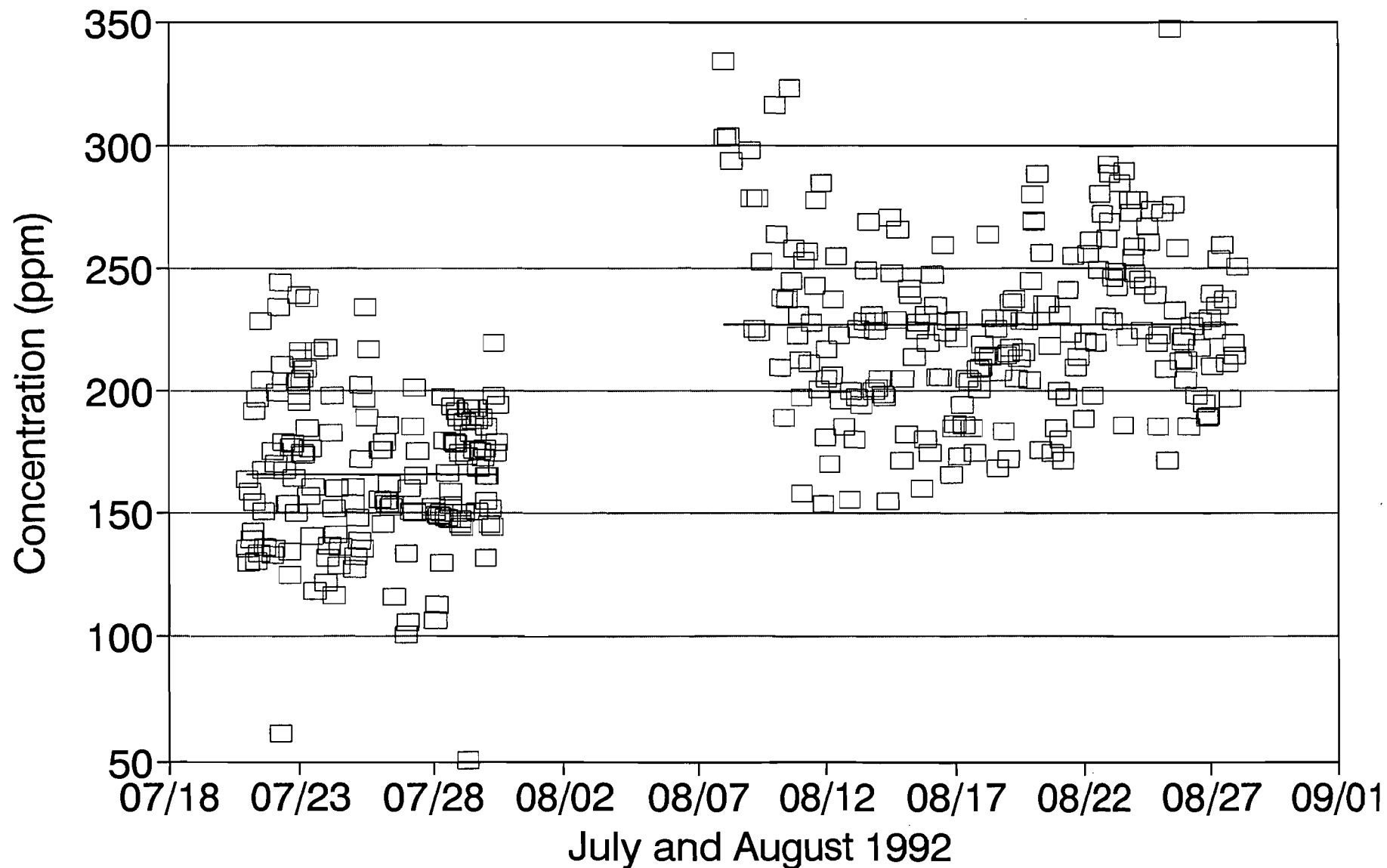
JBK:wa
Enc.

c:✓ Mr. Bruce Mitchell, FDER, Tallahassee
Mr. Tom Mountain, FCS
Mr. Larry Sellers, Holland & Knight
Mr. Segundo Fernandez, Oertel & Hoffman
Mr. Charles Hetrick, Hernando County Commission
Mr. Kathy Liles, Hernando County Commission
Mr. Larry Jennings, Hernando County Commission



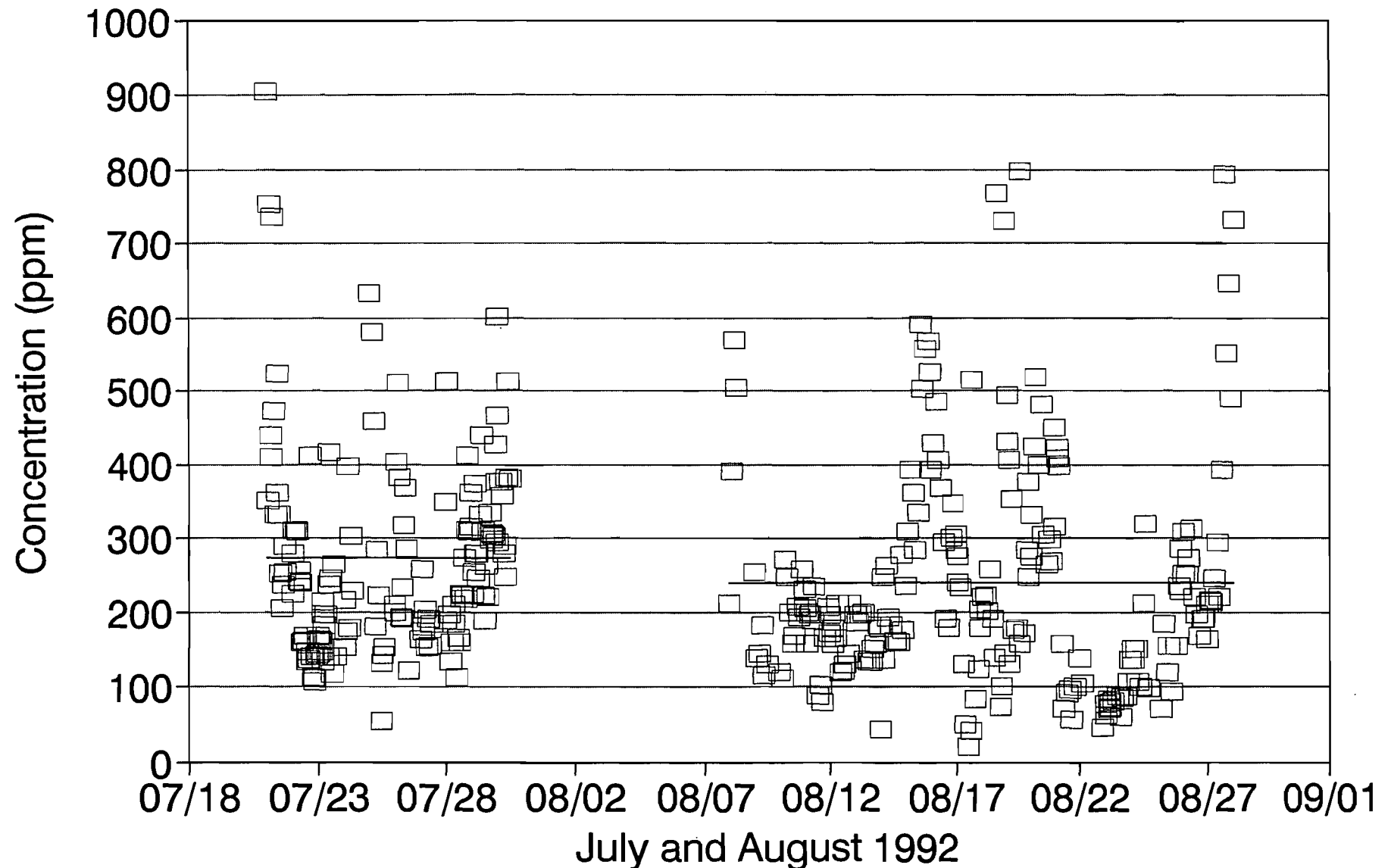
Stack Gas NO_x Concentration

Florida Crushed Stone, Brooksville, FL



CO At Preheater Exit

Florida Crushed Stone, Brooksville, FL



Florida Crushed Stone
Brooksville, Florida

July 1992

		WITH SPIKES				WITHOUT SPIKES	
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
July	21	904.7	135.6	July	21	904.7	135.6
		351.1	164.3			351.1	164.3
		752	130.2			752	130.2
		410.3	158.9			410.3	158.9
		438	139.5			438	139.5
		736.3	142.7			736.3	142.7
		472.3	192.1			472.3	192.1
		332.5	154.4			332.5	154.4
		522.8	130.5			522.8	130.5
		362.1	196.7			362.1	196.7
		331.4	133.9			331.4	133.9
		252.1	228.7			252.1	228.7
		205.8	204.6			205.8	204.6
		236.7	167.7			236.7	167.7
		253.2	150.6			253.2	150.6
		289.5	136.4			289.5	136.4
July	22	223.5	133	July	22	223.5	133
		278.5	175.3			278.5	175.3
		310.4	135.3			310.4	135.3
		310.4	170.6			310.4	170.6
		308.2	199.6			308.2	199.6
		256.5	234.4			256.5	234.4
		241.1	60.96			241.1	60.96
		240	243.9			240	243.9
		159.6	210.6			159.6	210.6
		161.8	179.4			161.8	179.4
		167.3	167.9			167.3	167.9
		146.4	154			146.4	154
		133.1	154			133.1	154
		135.4	134.4			135.4	134.4
		410.6	124.6			410.6	124.6
		139.8	177.5			139.8	177.5
		113.4	178.4			113.4	178.4
		111.2	164.7			111.2	164.7
		106.8	150.3			106.8	150.3
		142	204.1			142	204.1
		144.2	204.1			144.2	204.1
		146.4	198.2			146.4	198.2
		146.4	216.2			146.4	216.2
		133.2	174.8			133.2	174.8
July	23	167.3	239	July	23	167.3	239
		164	195.3			164	195.3
		161	213.4			161	213.4
		195.9	205			195.9	205
		214.7	174			214.7	174
		181.6	209			181.6	209

Florida Crushed Stone
Brooksville, Florida

July 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
July	24	197	237.8	July	24	197	237.8
		140.9	185			140.9	185
		236.6	157.1			236.6	157.1
		416.1	176.9			416.1	176.9
		245.5	140.7			245.5	140.7
		116.7	160.6			116.7	160.6
		264.2	118.5			264.2	118.5
		140.9	216.3			140.9	216.3
		153	217.5			153	217.5
		215.7	121.5			215.7	121.5
		172.8	131.7			172.8	131.7
		396.3	136.8			396.3	136.8
		178.3	183			178.3	183
		301.5	197.9			301.5	197.9
		229	151.8			229	151.8
July	25	2203	116.4	July	25		116.4
		1046	141.3				141.3
		2304	160.1				160.1
		1160	128.8				128.8
		2371	135.9				135.9
		631.9	161			631.9	161
		1618	153.9				153.9
		580.2	127.6			580.2	127.6
		4138	132.7				132.7
		458	148.3			458	148.3
		180.5	138.8			180.5	138.8
		282.9	202.6			282.9	202.6
		221.2	172.5			221.2	172.5
		3689	135.6				135.6
		131	196.7			131	196.7
July	26	53.95	234.4		26	53.95	234.4
		141.9	189.4			141.9	189.4
		151.9	216.8			151.9	216.8
		198.1	155.9			198.1	155.9
		210.2	175.7			210.2	175.7
		403.9	175.7			403.9	175.7
		509.6	145.9			509.6	145.9
		383	179.4			383	179.4
		192.6	154.9			192.6	154.9
		190.4	186.4			190.4	186.4
		233.4	154.2			233.4	154.2
		315.8	161.8			315.8	161.8
		367.7	152.5			367.7	152.5
		285.1	153.2			285.1	153.2
		121.1	116			121.1	116
July	27	4072	100.6	July	27		100.6

**Florida Crushed Stone
Brooksville, Florida**

July 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
July	28	164	133.6	July	28	164	133.6
		258.7	105.8			258.7	105.8
		173.9	160.1			173.9	160.1
		179.4	150.8			179.4	150.8
		203.6	185.3			203.6	185.3
		151.9	201.1			151.9	201.1
		191.5	149.8			191.5	149.8
		155.2	165.2			155.2	165.2
		184.9	175.3			184.9	175.3
		188.2	152.7			188.2	152.7
		347.9	150.8			347.9	150.8
		511.9	106.8			511.9	106.8
		195.9	113.1			195.9	113.1
		134.3	149.3			134.3	149.3
		159.6	148.8			159.6	148.8
		209.1	129.6			209.1	129.6
		184.9	150.3			184.9	150.3
			197.5				197.5
		112.3	179.6			112.3	179.6
		166.2	148.4			166.2	148.4
		159.6	166.7			159.6	166.7
		216.9	147.3			216.9	147.3
		224.6	159.1			224.6	159.1
		221.3	153.3			221.3	153.3
		273	193.6			273	193.6
		217.9	179.2			217.9	179.2
		411.7	178.8			411.7	178.8
		311.5	191.6			311.5	191.6
July	29	308.2	189.4	July	29	308.2	189.4
		361.1	174.7			361.1	174.7
		313.8	147.8			313.8	147.8
		223.5	145.7			223.5	145.7
		253.2	144.5			253.2	144.5
		279.6	150.3			279.6	150.3
		373.2	187.4			373.2	187.4
		278.5	173.2			278.5	173.2
		245.5	50.49			245.5	50.49
		332.4	193.3			332.4	193.3
		439.1	193			439.1	193
		310.4	183.1			310.4	183.1
		222.4	187.9			222.4	187.9
		189.3	176.1			189.3	176.1
		263	192.8			263	192.8
		219	150.5			219	150.5
		334.7	188			334.7	188
		298.2	168.6			298.2	168.6

**Florida Crushed Stone
Brooksville, Florida**

July 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
July	30	306	175.5	July	30	306	175.5
		303.8	189.1			303.8	189.1
		301.6	172.8			301.6	172.8
		426	176.7			426	176.7
		465.7	155.4			465.7	155.4
		601.1	131.7			601.1	131.7
		292.8	185.2			292.8	185.2
		375.4	165.5			375.4	165.5
		1103	165.5				165.5
		375.4	145.9			375.4	145.9
		356.7	152.3			356.7	152.3
		279.6	144.2			279.6	144.2
		289.5	219.7			289.5	219.7
		247	198.1			247	198.1
		381.9	174.7			381.9	174.7
		513	179.4			513	179.4
		379.7	194.1			379.7	194.1
Mean		409.1205	166.019	Mean		272.9205	166.019
sd		608.2963	32.05729	sd		136.01	32.05729
n		154	155	n		144	155
Max		4138	243.9	Max		904.7	243.9
Min		53.95	50.49	Min		53.95	50.49

Note: Missing Data Indicate Outlyers

**Florida Crushed Stone
Brooksville, Florida**

August, 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
August	8	212.4	333.8	August	8	212.4	333.8
		390.8	303			390.8	303
		570.3	303.3			570.3	303.3
		504.2	293.3			504.2	293.3
August	9	253.2	298.1	August	9	253.2	298.1
		138.7	278.4			138.7	278.4
		144.2	225.5			144.2	225.5
		181.6	278.1			181.6	278.1
		115.6	223.9			115.6	223.9
		128.8	252.2			128.8	252.2
August	10	120	316	August	10	120	316
		111.2	263.5			111.2	263.5
		270.8	209.5			270.8	209.5
		247.7	237.6			247.7	237.6
		199.2	189.2			199.2	189.2
		156.3	237.1			156.3	237.1
		168.4	323			168.4	323
		208	244.9			208	244.9
		192.6	258			192.6	258
		258.7	222.6			258.7	222.6
		205.8	231.2			205.8	231.2
		199.2	197.5			199.2	197.5
August	11	230.1	212.8	August	11	230.1	212.8
		156.3	158.3			156.3	158.3
		197	253.2			197	253.2
		188.2	256.9			188.2	256.9
		235.5	211.1			235.5	211.1
		88.08	227.8			88.08	227.8
		101.2	242.9			101.2	242.9
		78.16	277.6			78.16	277.6
		165.1	200.7			165.1	200.7
		206.9	284.4			206.9	284.4
		170.6	153.7			170.6	153.7
		178.3	217.2			178.3	217.2
August	12	197	181.3	August	12	197	181.3
		157.4	205			157.4	205
		166.2	170.6			166.2	170.6
		211.3	206.5			211.3	206.5
		120	237.1			120	237.1
		122.1	254.7			122.1	254.7
		129.8	222.7			129.8	222.7
		145.2	196.3			145.2	196.3
		212.4	185.5			212.4	185.5
August	13	197	156	August	13	197	156
		186	199.9			186	199.9

**Florida Crushed Stone
Brooksville, Florida**

August, 1992

August, 2022

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
August	14	195.9	180.4	August	14	195.9	180.4
		198.1	197.7			198.1	197.7
		135.3	225.3			135.3	225.3
		133.1	194.2			133.1	194.2
		133.1	228.3			133.1	228.3
		149.7	249.5			149.7	249.5
		156.3	269.1			156.3	269.1
		182.7	230.7			182.7	230.7
		44.04	200.1			44.04	200.1
		135.3	228.7			135.3	228.7
		177.2	224.6			177.2	224.6
		247.7	201.3			247.7	201.3
		263.1	205			263.1	205
		192.6	198.5			192.6	198.5
August	15	182.7	197.2	August	15	182.7	197.2
			154.9				154.9
		160.7	271			160.7	271
		159.6	248			159.6	248
		276.2	229.3			276.2	229.3
		176.1	265.4			176.1	265.4
		235.5	171.3			235.5	171.3
		309.3	205			309.3	205
		391.9	182.6			391.9	182.6
		361.1	241.5			361.1	241.5
		282.9	239.2			282.9	239.2
		333.5	214.1			333.5	214.1
		591.2	224.6			591.2	224.6
		503.1	227.5			503.1	227.5
August	16	557.1	160.2	August	16	557.1	160.2
		568.1	180.3			568.1	180.3
		525.1	230.9			525.1	230.9
		393	219.7			393	219.7
		429.3	174.5			429.3	174.5
		485.5	247.5			485.5	247.5
		405.1	234.6			405.1	234.6
		366.6	206			366.6	206
		292.8	205.7			292.8	205.7
		191.5	259.4			191.5	259.4
		178.3	223.9			178.3	223.9
		299.4	228.2			299.4	228.2
		346.8	165.7			346.8	165.7
		282.9	184.8			282.9	184.8
August	17	240	229	August	17	240	229
		304.9	186.9			304.9	186.9
		275.2	221.6			275.2	221.6

**Florida Crushed Stone
Brooksville, Florida**

August, 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
August	18	233.4	173.2	August	18	233.4	173.2
		128.8	194.3			128.8	194.3
		48.43	185.8			48.43	185.8
		19.81	205.3			19.81	205.3
		41.84	203.8			41.84	203.8
		515.2	184.8			515.2	184.8
		83.67	174.8			83.67	174.8
		123.3	209			123.3	209
		178.3	200.4			178.3	200.4
		203.6	209.7			203.6	209.7
		220.2	219.2			220.2	219.2
		222.4	214.6			222.4	214.6
		200.3	263.5			200.3	263.5
		258.7	213.9			258.7	213.9
		191.5	230			191.5	230
		138.6	225.3			138.6	225.3
August	19	767.4	168.7	August	19	767.4	168.7
		72.66	207.5			72.66	207.5
		99.09	183.5			99.09	183.5
		144.2	214.8			144.2	214.8
		431.5	172.5			431.5	172.5
		128.8	218			128.8	218
		728.8	230			728.8	230
		493.1	215			493.1	215
		405	236			405	236
		353.3	237			353.3	237
		176.1	205.1			176.1	205.1
		177.2	213.4			177.2	213.4
		157.4	228.2			157.4	228.2
		796	216.1			796	216.1
		170.6	228.7			170.6	228.7
		282.9	204.6			282.9	204.6
August	20	247.7	244.6	August	20	247.7	244.6
		275.2	269			275.2	269
		375.4	280.5			375.4	280.5
		331.3	269.6			331.3	269.6
		424.8	288.6			424.8	288.6
		518.5	176.2			518.5	176.2
		399.5	255.9			399.5	255.9
		481.1	235.1			481.1	235.1
		304.9	235.4			304.9	235.4
		264.2	218.2			264.2	218.2
		297.2	175			297.2	175
		268.6	185			268.6	185
		314.8	2241.5			314.8	

**Florida Crushed Stone
Brooksville, Florida**

August, 1992

WITH SPIKES				WITHOUT SPIKES			
		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)			CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
August	21	422.6	230.7	August	21	422.6	230.7
		449.2	200.1			449.2	200.1
		407.3	180.6			407.3	180.6
		396.3	171.5			396.3	171.5
		157.4	197.7			157.4	197.7
		71.56	241.1			71.56	241.1
		92.48	223.6			92.48	223.6
		95.78	254.9			95.78	254.9
		55.05	209.7			55.05	209.7
		100.1	213.6			100.1	213.6
August	22	137.6	188.5	August	22	137.6	188.5
		103.4	220.2			103.4	220.2
			255.8				255.8
			261.2				261.2
			198				198
			219.4				219.4
			249				249
			280.1				280.1
			272.2				272.2
			45.14			230.2	
August	23	61.65	262.2	August	23	61.65	262.2
		71.56	288.3			71.56	288.3
		79.27	246.4			79.27	246.4
		75.97	292.1			75.97	292.1
		82.55	268.8			82.55	268.8
		72.66	228.3			72.66	228.3
		80.37	248.8			80.37	248.8
		1217	242.5				242.5
		86.98	284.5			86.98	284.5
		60.55	186.2			60.55	186.2
August	24	84.77	290	August	24	84.77	290
		88.08	221.9			88.08	221.9
		105.7	277.4			105.7	277.4
		136.5	272.7			136.5	272.7
		136.4	248.3			136.4	248.3
		136.5	254.2			136.5	254.2
		150.8	259			150.8	259
		150.8	277.8			150.8	277.8
		105.7	245.3			105.7	245.3
		99.09	224.8			99.09	224.8
		212.4	242.9			212.4	242.9
		318.2	267.1			318.2	267.1
		96.88	260.7			96.88	260.7
			273.7				273.7
		239					239

**Florida Crushed Stone
Brooksville, Florida**

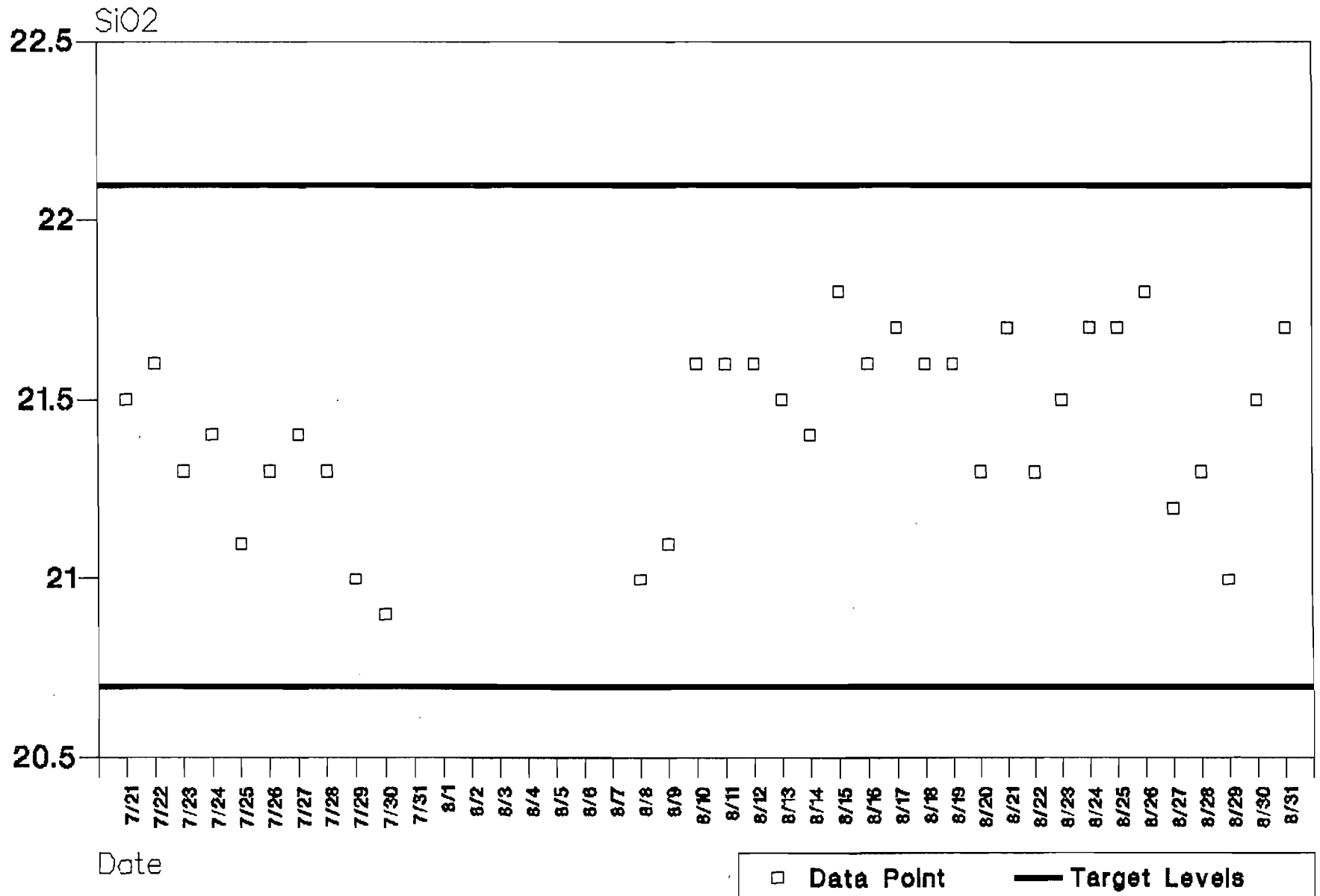
August, 1992

WITH SPIKES			WITHOUT SPIKES		
	CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)		CO at Preheater Exit (ppm)	Stack Gas NOx (ppm)
August 25		219.4 185.2 222.7 71.55 272.4 184.9 208.9 120 171.6 154.1 347.2 94.68 275.6 988.6 232.8 155.2 258 235.6 212.3 229 220.2 252.1 212.6	August 25		219.4 185.2 222.7 71.55 272.4 184.9 208.9 120 171.6 154.1 347.2 94.68 275.6 232.8 155.2 258 235.6 212.3 229 220.2 252.1 212.6
August 26		285.1 222.4 308.2 204.3 248.8 185.2 273 226.3 312.6 219 198.4 195.9 217.8 167.3 228.7 191.5 194.8 190.4 189.1 164 190.2 215.8 210	August 26		285.1 222.4 308.2 204.3 248.8 185.2 273 226.3 312.6 219 198.4 195.9 217.8 167.3 228.7 191.5 194.8 190.4 189.1 164 190.2 215.8 210
August 27		209.1 229.6 209.1 239.5 214.7 224.8 244.4 234.8 292.8 253.9 220.2 259.5 393 237.5 791.6 211.6 550.5 196.8 646.3 219.7 489.9 214.6 731 250.3	August 27		209.1 229.6 209.1 239.5 214.7 224.8 244.4 234.8 292.8 253.9 220.2 259.5 393 237.5 791.6 211.6 550.5 196.8 646.3 219.7 489.9 214.6 731 250.3
Mean	247.3363	236.2815	Mean	238.8663	226.9549
sd	173.9112	141.3192	sd	151.9802	35.70921
n	204	216	n	202	215
Max	1217	2241.5	Max	796	347.2
Min	19.81	153.7	Min	19.81	153.7

Note: Missing Data Indicate Outliers

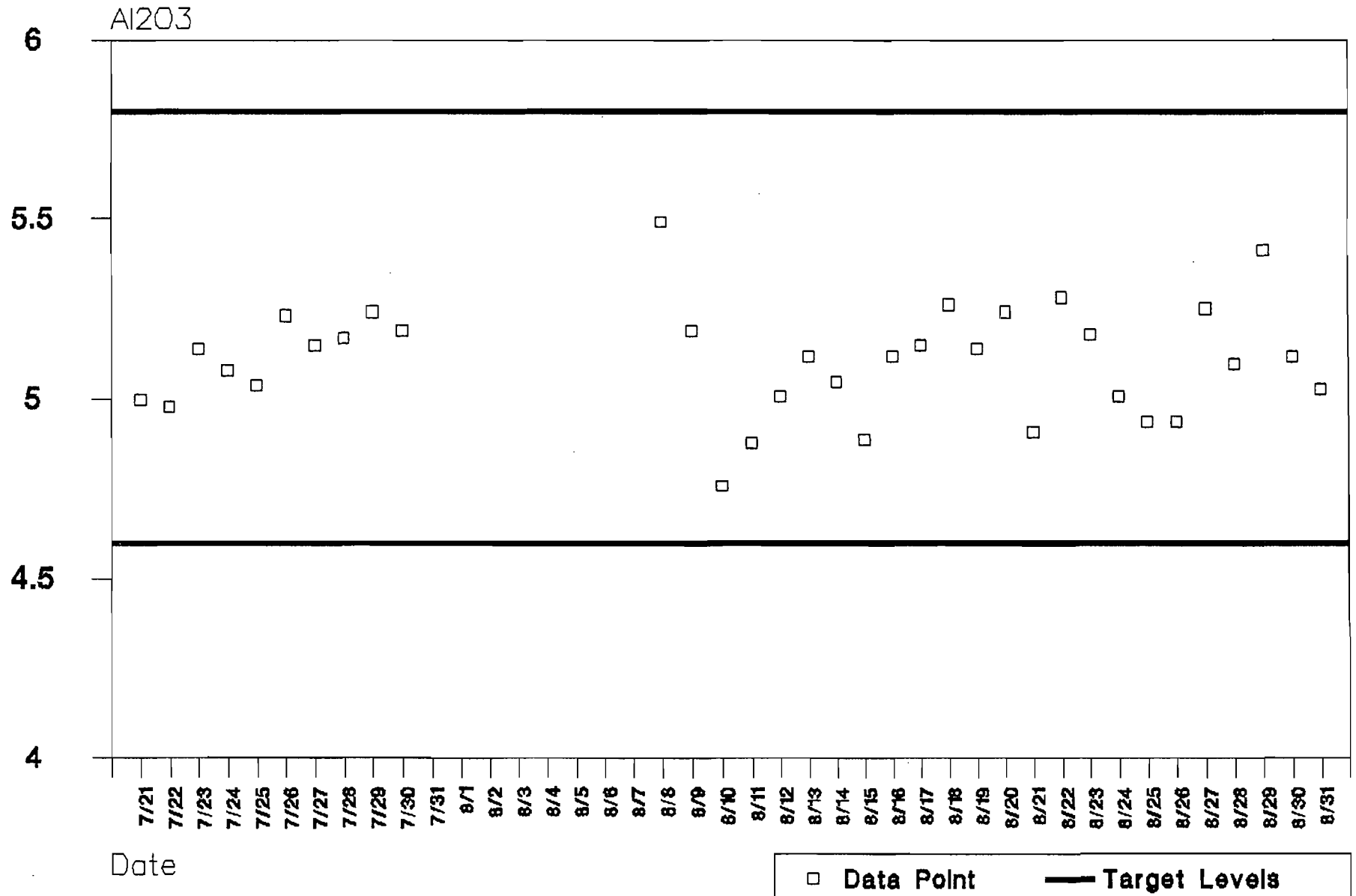
Clinker Composition – SiO₂

Florida Crushed Stone, Brooksville, FL



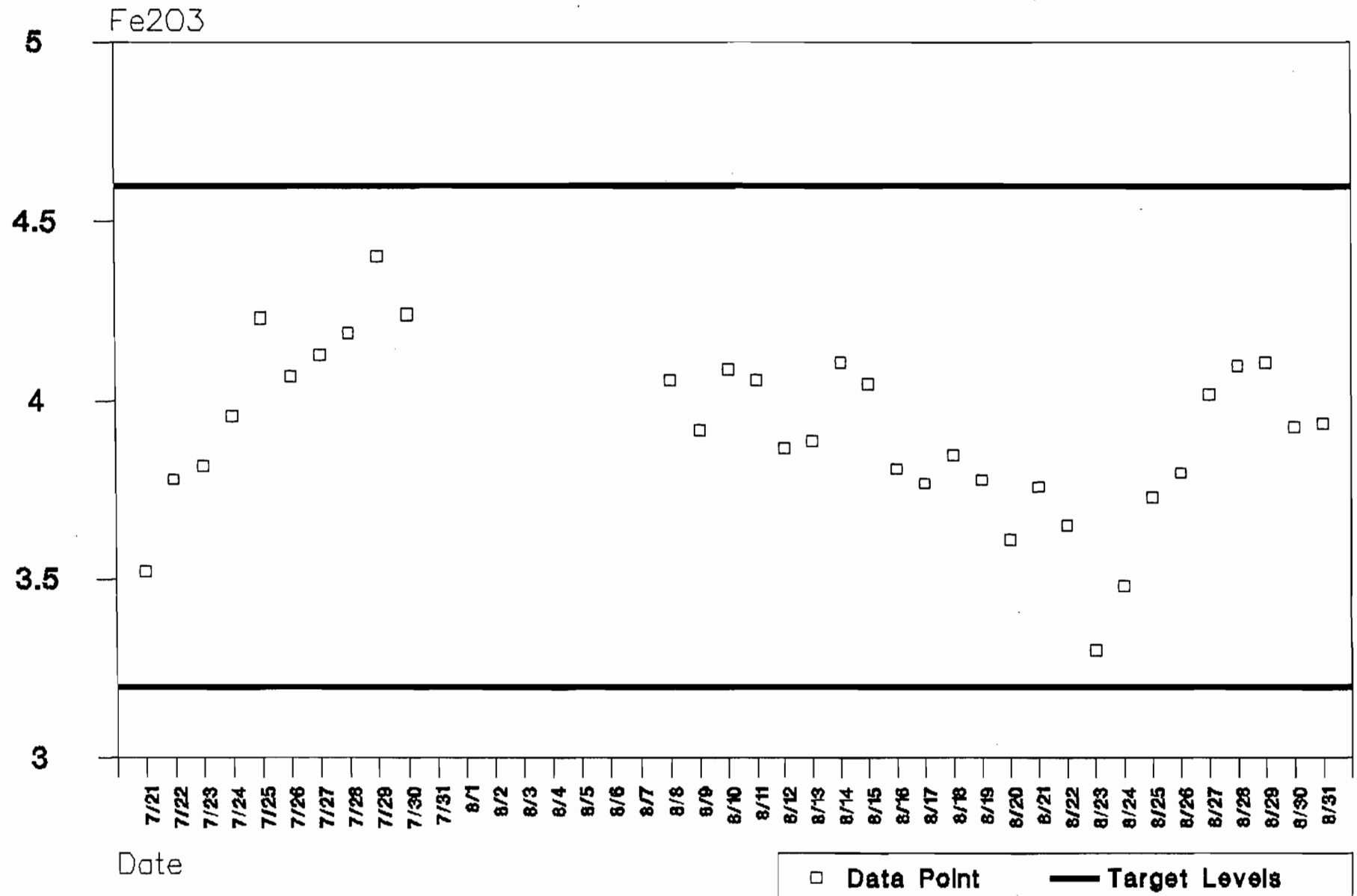
Clinker Composition – Al₂O₃

Florida Crushed Stone, Brooksville, Fl



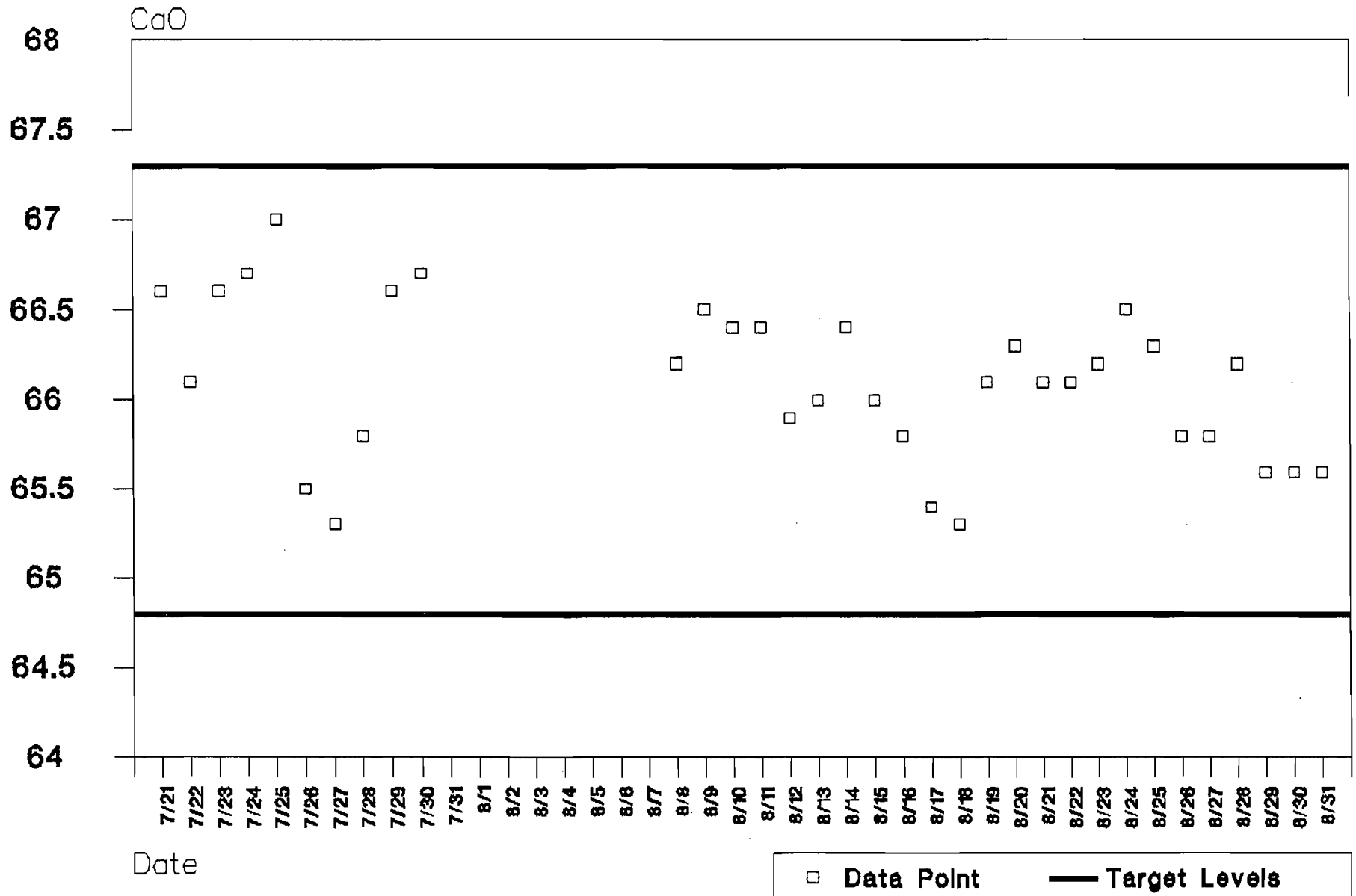
Clinker Composition – Fe₂O₃

Florida Crushed Stone, Brooksville, FL



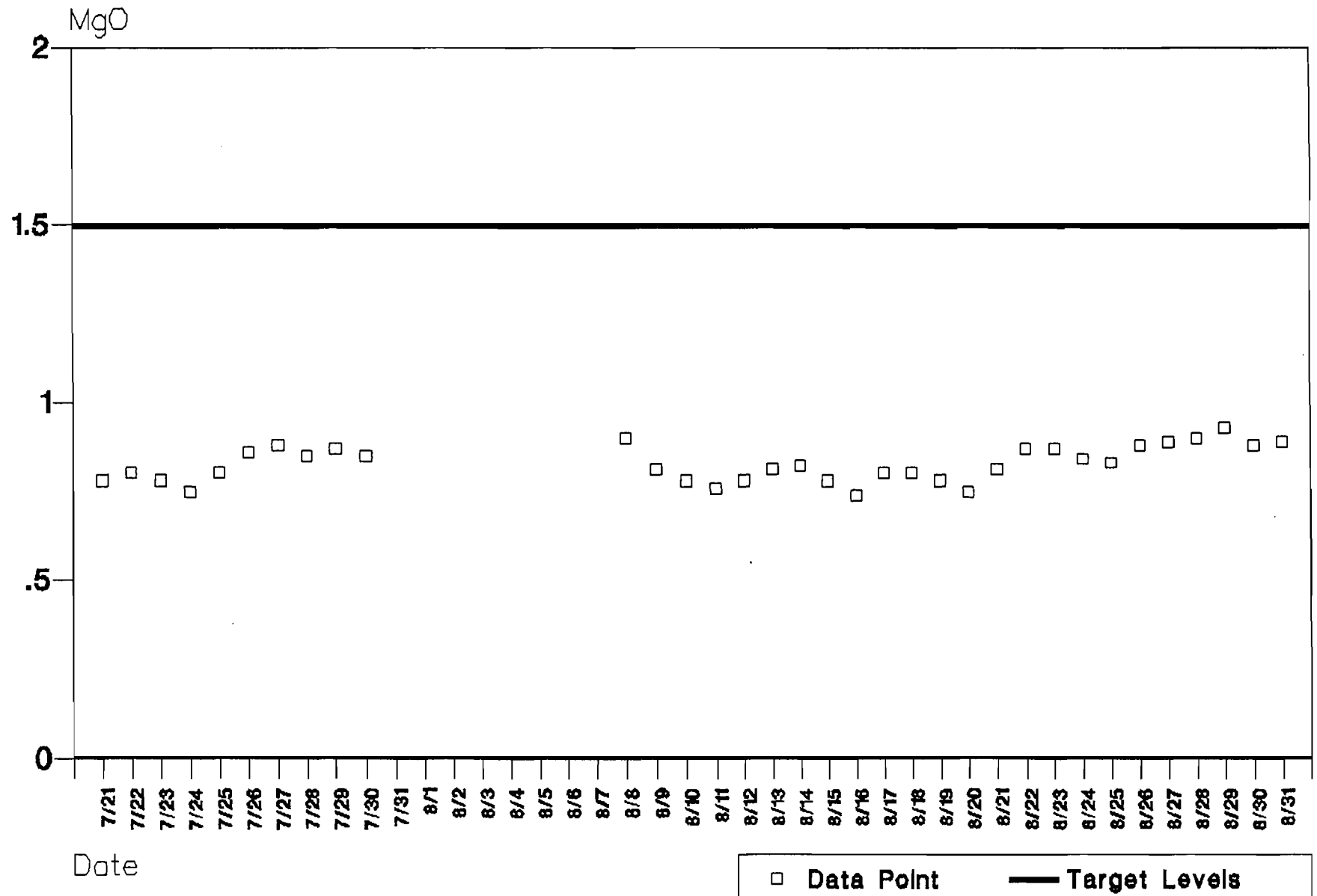
Clinker Composition - CaO

Florida Crushed Stone, Brooksville, Fl



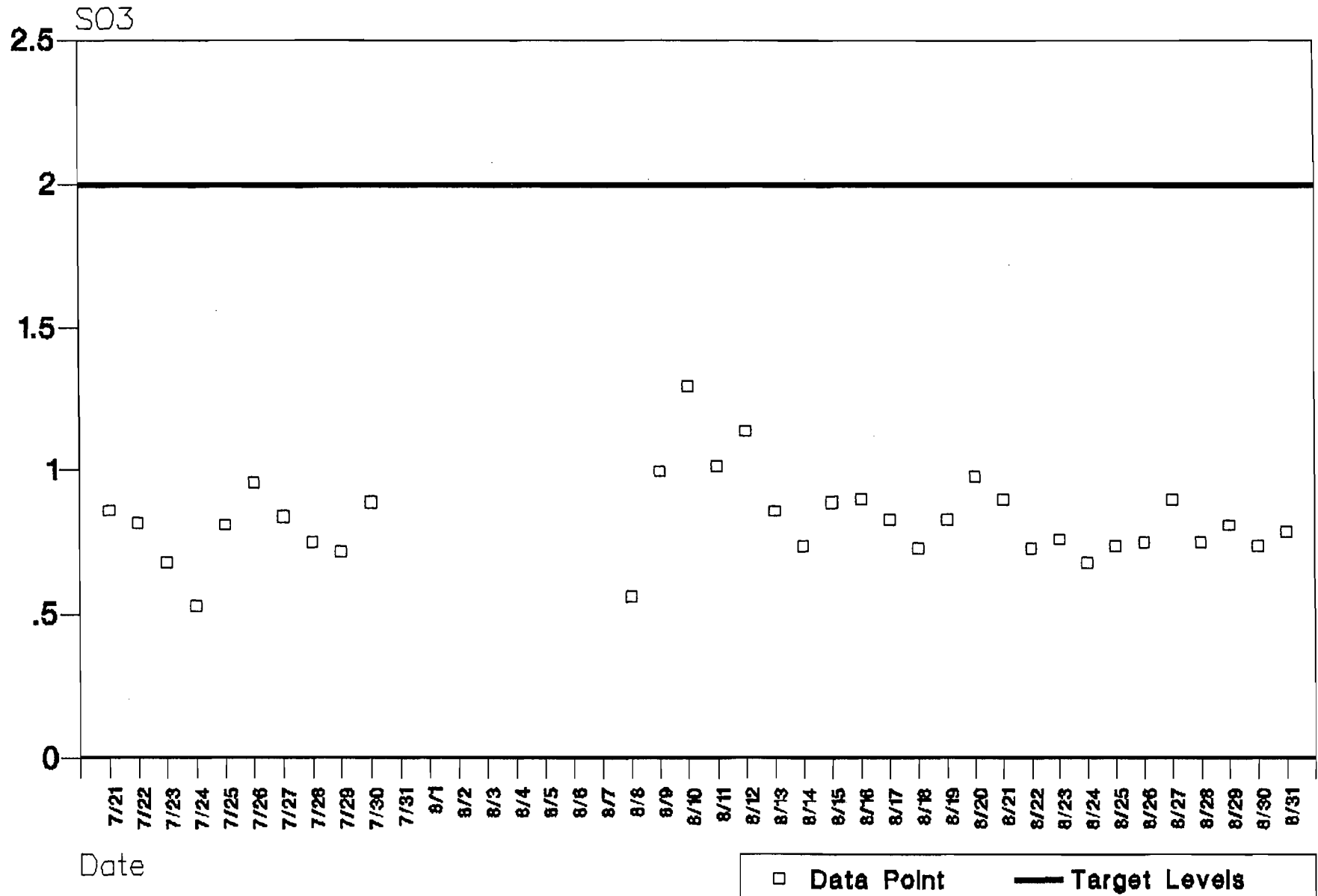
Clinker Composition - MgO

Florida Crushed Stone, Brooksville, Fl



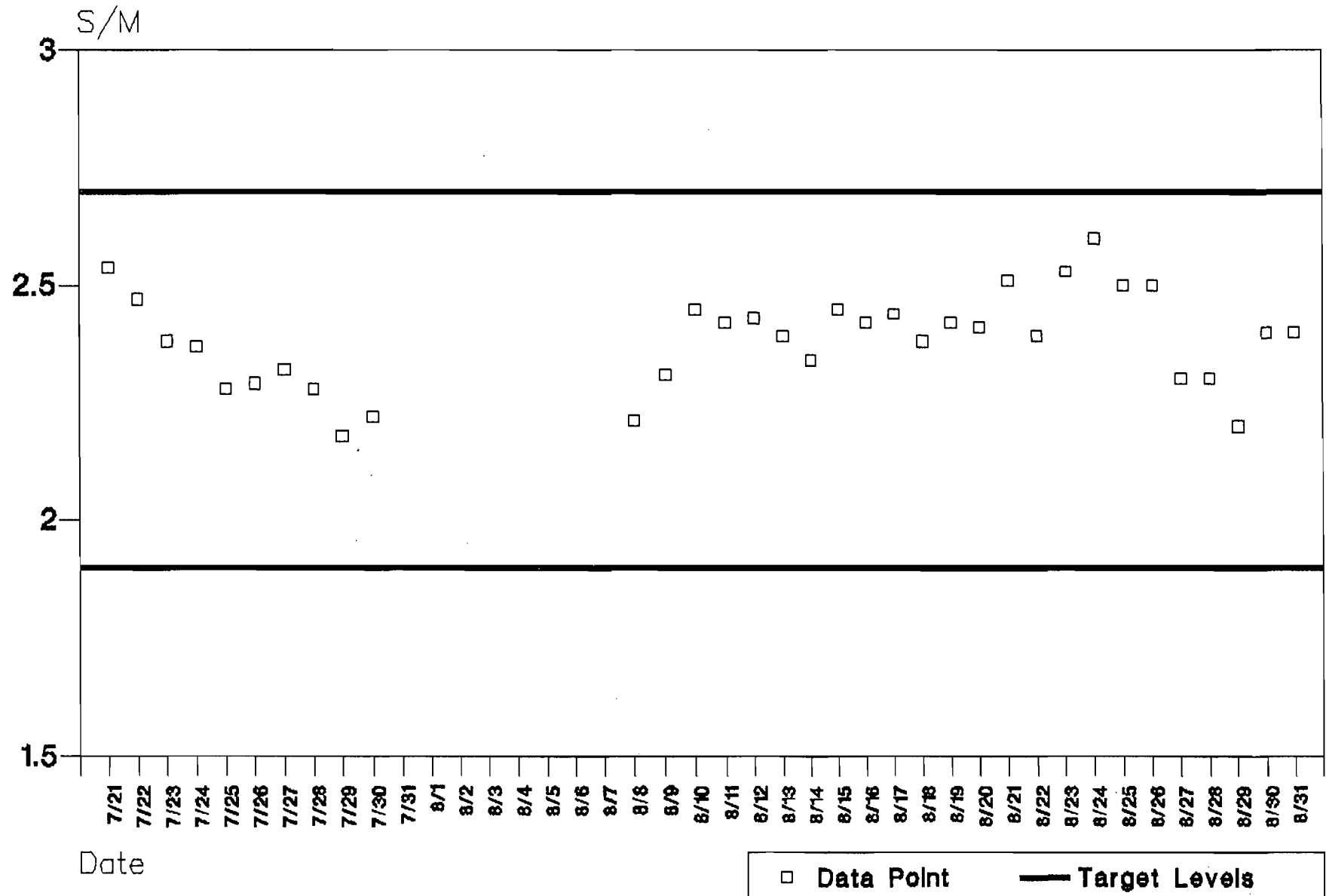
Clinker Composition - S03

Florida Crushed Stone, Brooksville, Fl



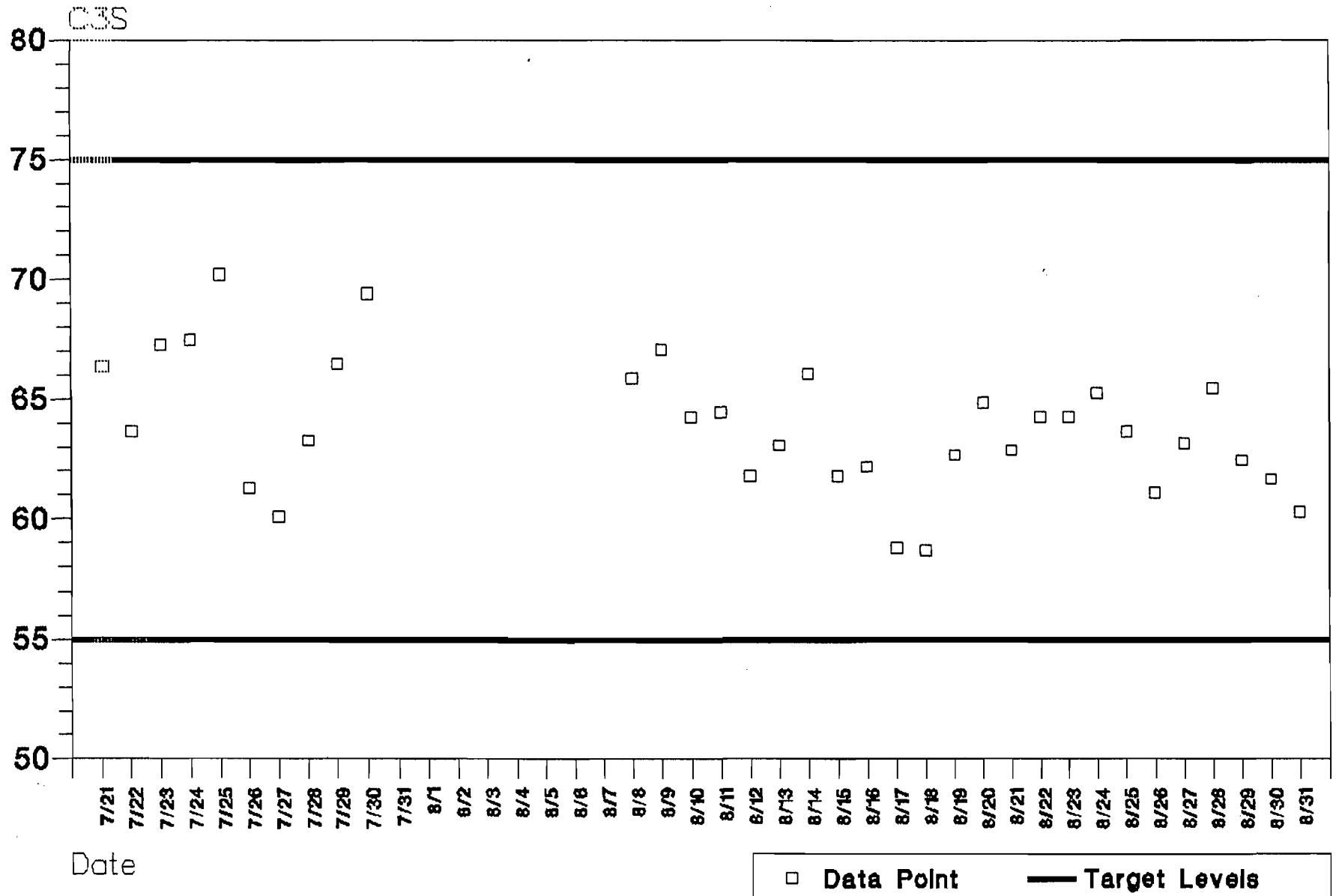
Clinker Composition - S/M

Florida Crushed Stone, Brooksville, Fl



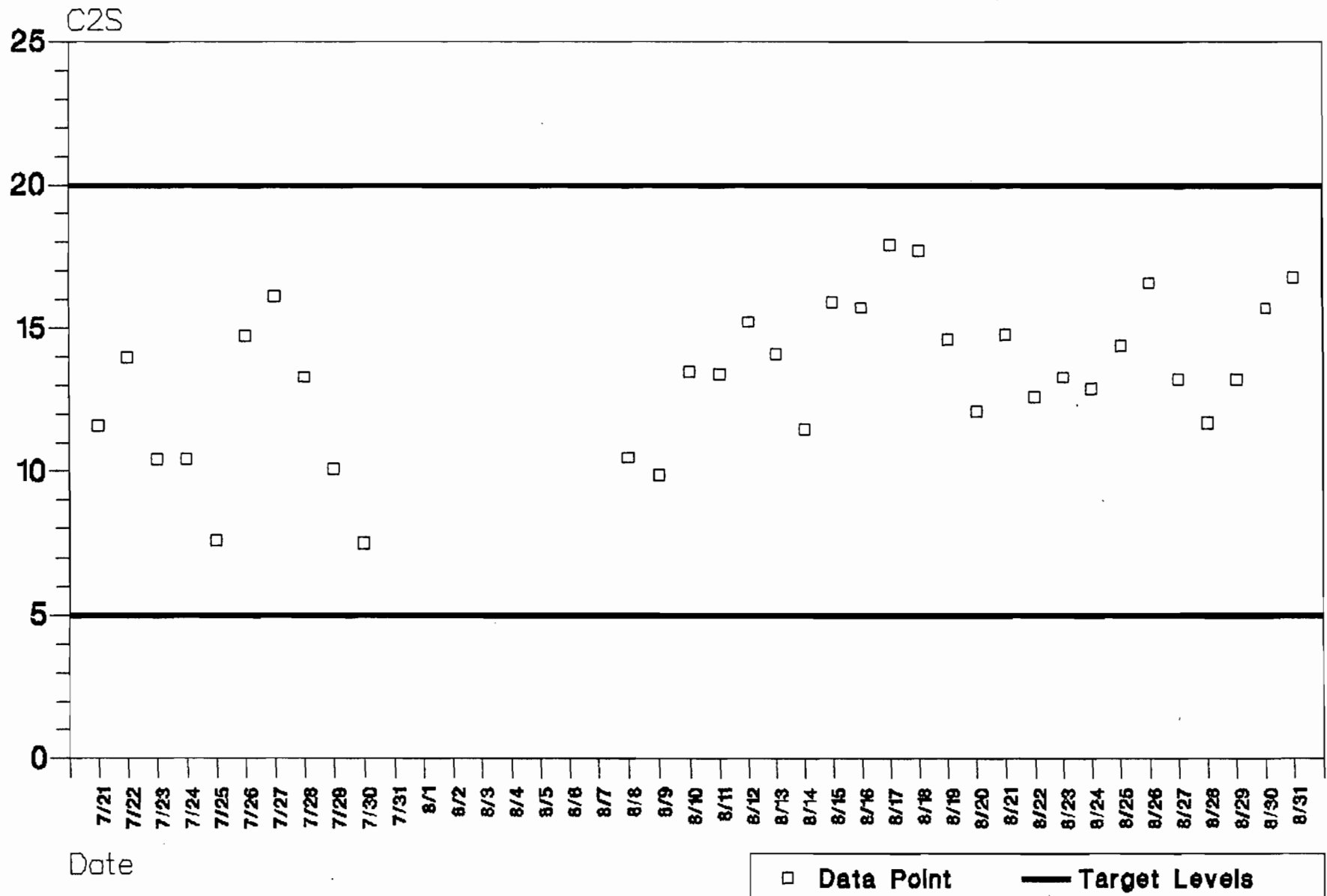
Clinker Composition - C3S

Florida Crushed Stone, Brooksville, Fl



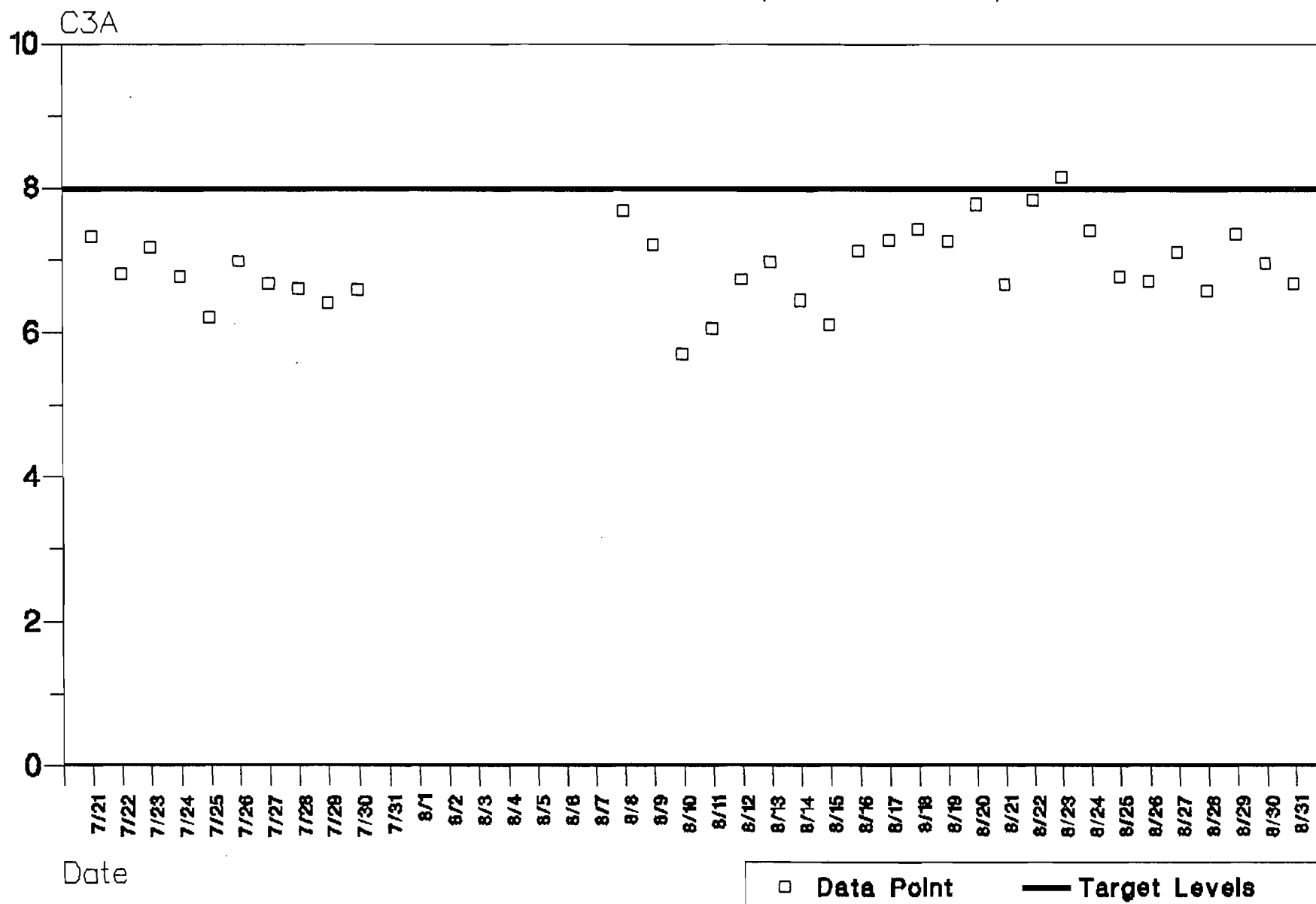
Clinker Composition - C2S

Florida Crushed Stone, Brooksville, Fl



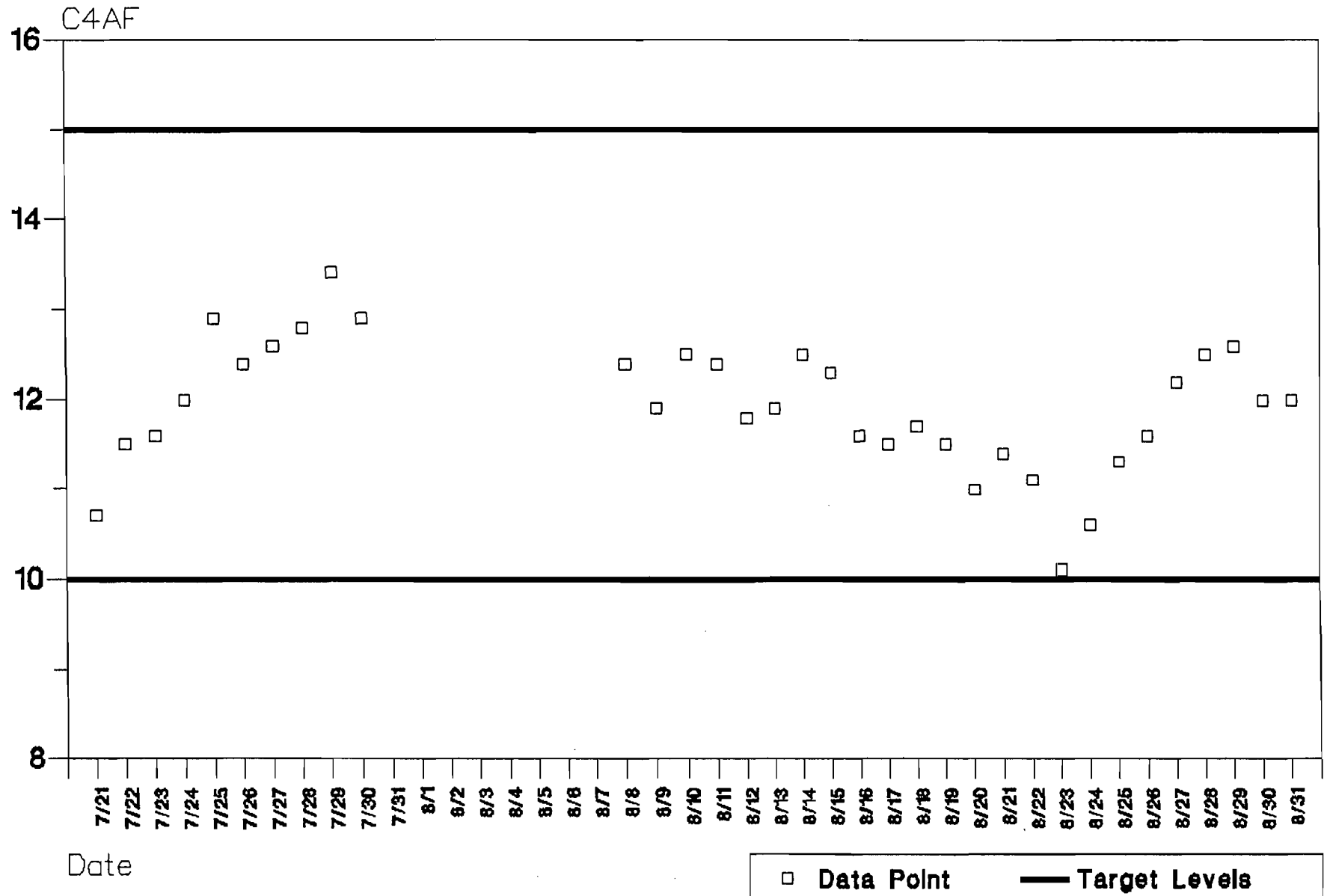
Clinker Composition - C3A

Florida Crushed Stone, Brooksville, Fl



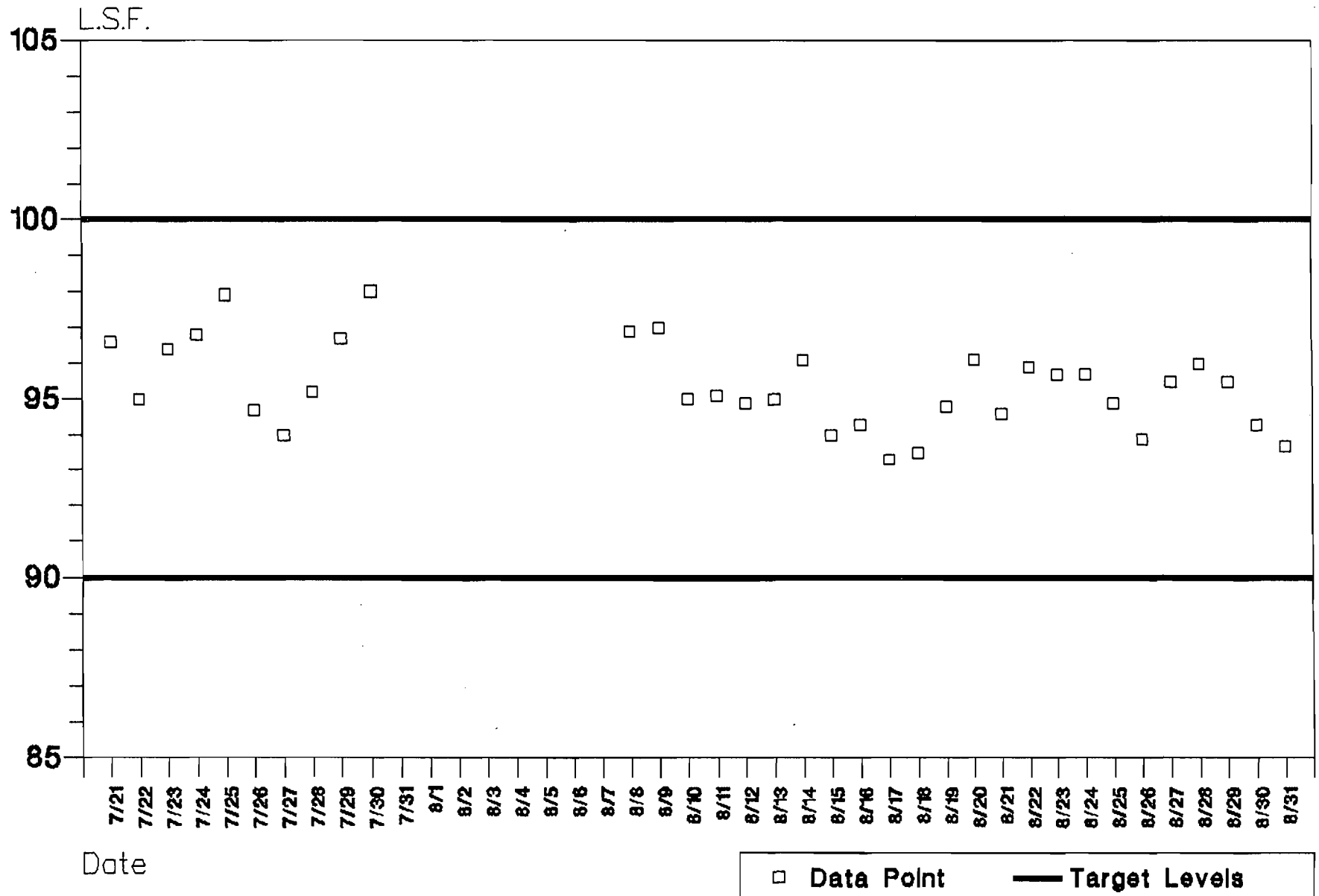
Clinker Composition – C4AF

Florida Crushed Stone, Brooksville, Fl



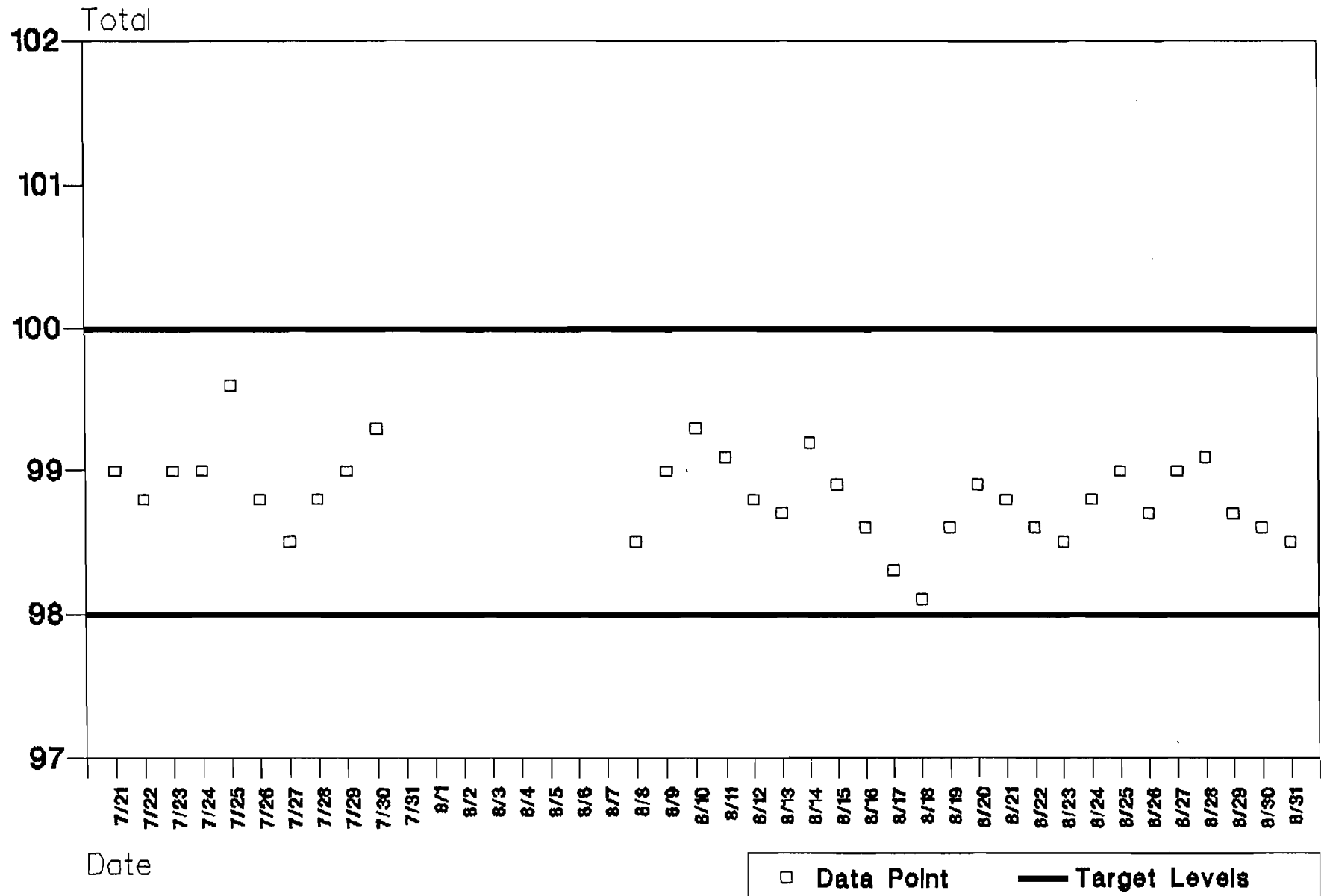
Clinker Composition - L.S.F.

Florida Crushed Stone, Brooksville, Fl



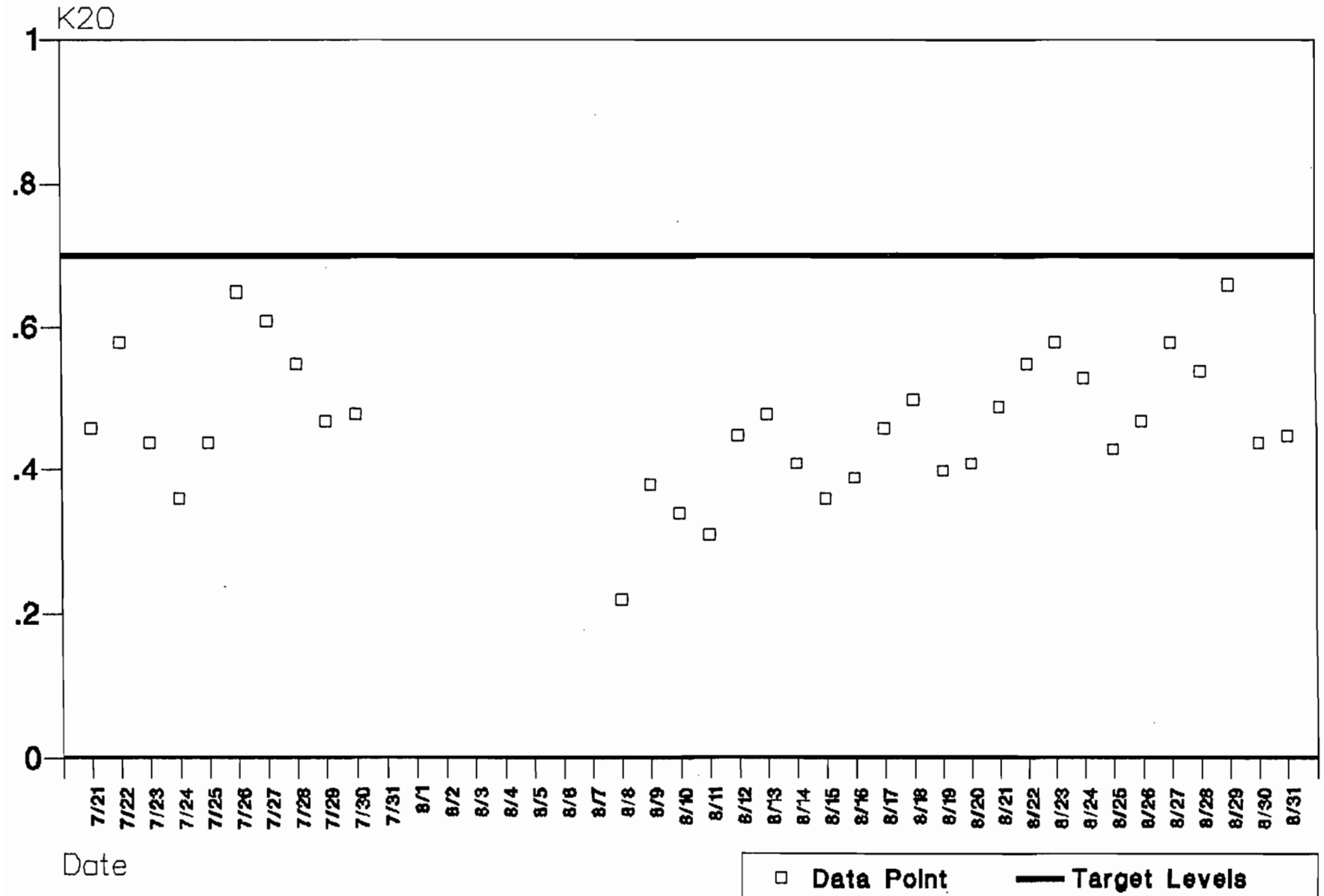
Clinker Composition - Total

Florida Crushed Stone, Brooksville, Fl



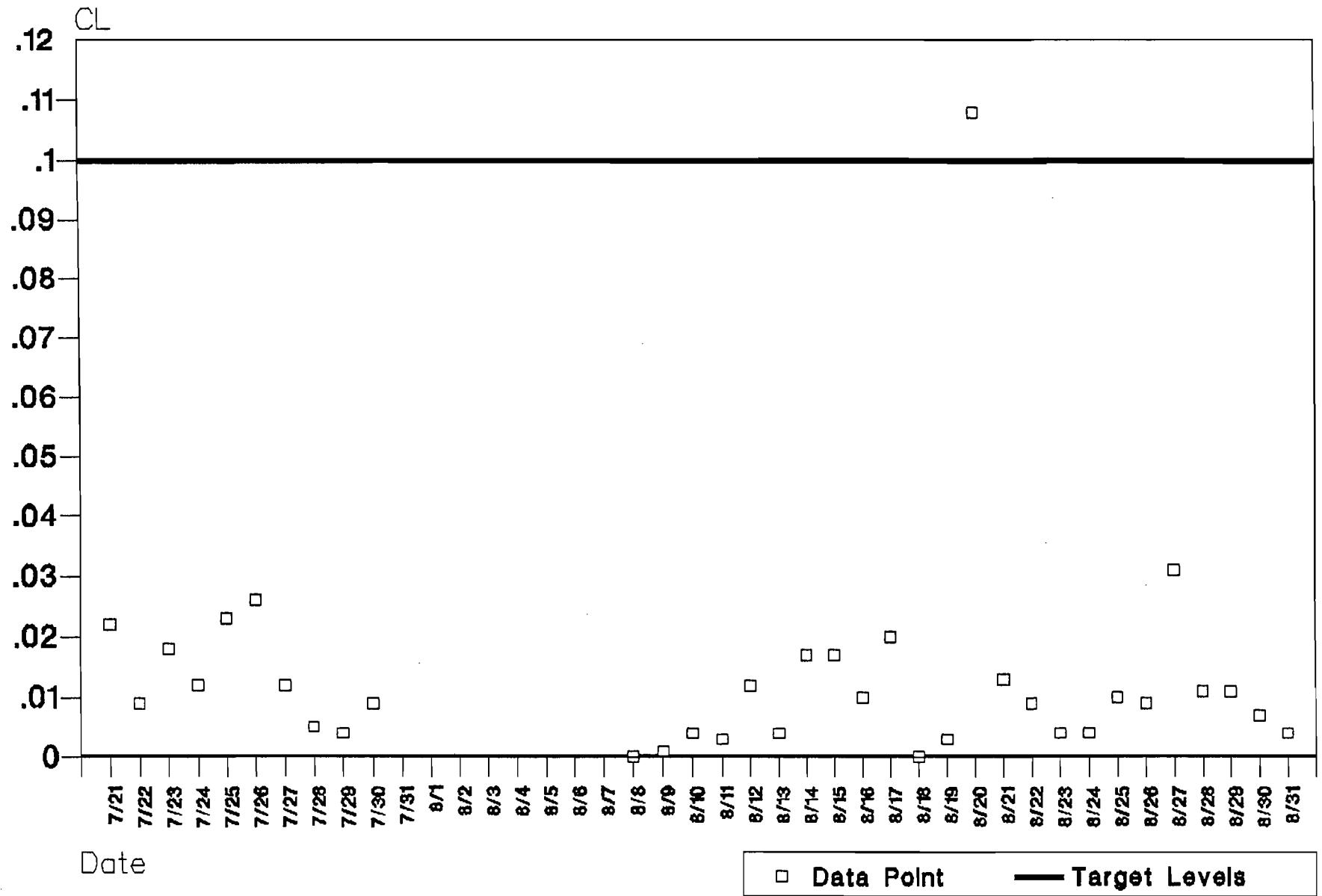
Clinker Composition - K2O

Florida Crushed Stone, Brooksville, Fl



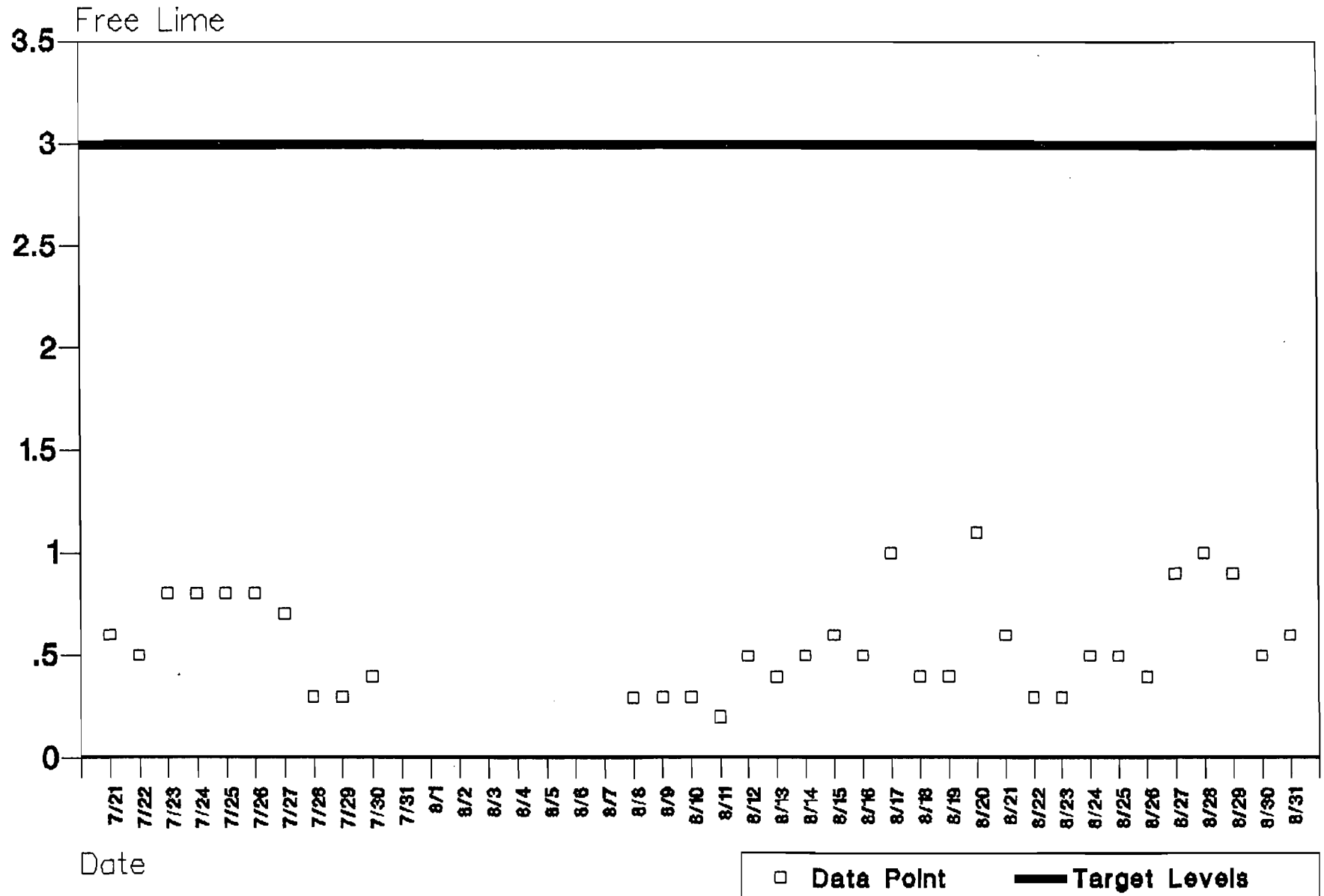
Clinker Composition - CL

Florida Crushed Stone, Brooksville, Fl



Clinker Composition - Free Lime

Florida Crushed Stone, Brooksville, Fl



File Copy



KOOGLER & ASSOCIATES

ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 307-90-01

October 23, 1992

Mr. David A. Buff, M.E., P.E.
KBN Engineering and Applied
Sciences, Inc.
1034 N.W. 57th Street
Gainesville, FL 32605

Subject: Test Reports
Florida Crushed Stone Company
Brooksville, Florida

RECEIVED

OCT 26 1992

Division of Air
Resources Management

Dear Mr. Buff:

This is in response to your letter dated October 15, 1992, requesting additional information on the above project. The comments are presented in the order of your questions.

1. The copy of the July 22, 1992, Summary Report that you received contained preliminary cement plant operating data. Charles Allen, the FCS cement plant manager, forwarded to us the correct cement plant operating data shortly after the testing was completed. The correct cement plant data appear in our final report.
2. In our reported calculations of the T' parameter, a term in the denominator was not raised to the 0.5 power. This resulted in the discrepancy you noted. As you note, the corrections do not change any of the basic conclusions.
3. The metals emissions rates were recalculated and found slightly lower as your pointed out. This was possibly due to rounding differences in our original calculations.
4. We understand the argument you make regarding total hydrocarbons (THC) emissions; however, the values are so low we still feel the conclusions reached in the Summary Report are valid.
5. We were informed by FCS that the Oxygen (%) and the Carbon Monoxide (ppm) shown in the diagrammatic computer printout of plant operating parameters under the heading KILN INLET are concentrations that are measured at the cement plant fan. The oxygen concentration shown on this same diagram within the preheater is the oxygen concentration at the base of the preheater, immediately adjacent to the kiln inlet.

FEDERAL EXPRESS		QUESTIONS? CALL 800-238-5355 TOLL FREE.		AIRBILL PACKAGE TRACKING NUMBER		2221	
706912		2226677003					
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John Kocger		804-377-5822		Bruce Mitchell			
Company		Department/Floor No.		Company		Department/Floor No.	
KOCGER & ASSOC				FEDER Twin Towers Office			
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						Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 6/91 PART #137204 FXEM 2/92 FORMAT #099 099 © 1990-91 FEDEX PRINTED IN U.S.A.	

6. The NOx data for the periods July 21-31 and August 8-31, 1992, as KBN graphically displayed them, have been reviewed. As you have the FCS records for the two periods, we have not yet had the opportunity to review all plant parameters in an attempt to explain differences in NOx levels, if differences do exist. Based on our review of your NOx data presentation, we offer the following comments.

The average NOx concentration (and emission rate) does appear to be higher during the period 8/8-31/92 (August) than during the period 7/21-31/92 (July). It is questionable (based on our visual review of the data) whether or not this difference is significant, however. "Eyeball" averages of emission rates for the two periods show that emissions during the August period averaged about 600 lbs/hr, while during the July period, the average was about 500 lbs/hr. The emission limit for the CPL plant is 1209 lbs/hr.

The second comment is that for both periods, the NOx concentrations and emission rates shown for "TDF Burning" are lower (on average) than for "Baseline". Thus, it appears that even though NOx concentrations and emissions may be somewhat different during the two periods, there appears to be no difference related to TDF burning.

- 7A. A comparison of the measured stack gas flow and the FCS instrument stack flow rate will be made if the FCS data can be obtained. The instrument measurements may not have been recorded.
- 7B. The test protocol states that the results of the clinker and kiln feed analyses will be made available to Hernando County for purposes of explaining differences in plant or emission parameters. The protocol also states that clinker quality and other plant parameters will be used to demonstrate similarity of cement plant operating conditions under the two fuel scenarios. The protocol did not intend to imply that a rigorous analysis of these data would be performed.

FCS personnel monitored clinker quality during the TDF Burn periods as they always monitor the quality. There was nothing in the analyses (copies of which have been provided to you) that indicate the production of off-specification clinker. Thus, no further analyses of clinker quality data were performed.

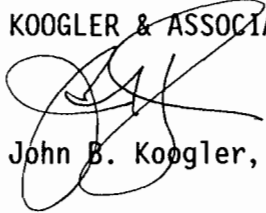
Mr. David A. Buff, M.E., P.E.
KBN Engineering and Applied
Sciences, Inc.

October 23, 1992
Page 3

If you have any further questions, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES


John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

- c. Mr. Bruce Mitchell, FDER, Tallahassee ✓
- Mr. Tom Mountain, Florida Crushed Stone
- Mr. Larry Sellers, Holland & Knight
- Mr. Segundo Fernandez, Oertel & Hoffman
- Mr. Charles Hetrick, Hernando County Commission
- Ms. Kathy Lile, Hernando County Commission
- Mr. Larry Jennings, Hernando County Commission
- Bill Thomas, SWD.
- Brian Mitchell, NPS
- Fowell Hayer, EPA
- Bruce Mitchell 10-26-92 B32



TABLE 5B
COMPARISON OF CHROMIUM EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/22/92	7/29/92
1	0.0106	0.00971
2	0.00909	0.00959
3	0.0126	0.00961
Average	1.08E-02	9.64E-03
σ	0.00176	0.000064
N	3	3

Pooled σ 0.0012

T' 1.1839

T95 2.132

T' < T95 therefore, the difference in emissions is not significant

TABLE 5C
COMPARISON OF LEAD EMISSION RATE
BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/22/92	7/29/92
1	0.012	0.0229
2	0.018	0.0113
3	0.00599	0.0103
Average	1.20E-02	1.48E-02
\bar{T}	0.006005	0.007004
N	3	3

Pooled \bar{T} 0.0065

T' 0.5276

T95 2.132

T' < T95 therefore, the difference in emissions is not significant

TABLE 7
COMPARISON OF NITROGEN OXIDES EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date		
Hourly	674	539
Concentrations	843	517
	687	573
	597	616
	687	628
	636	718
	692	752
	752	975
	605	654
	770	573
	744	590
	839	778
	981	771
	831	663
	754	708
	758	696
	848	742
	818	787
	720	717
	887	746
	870	717
	805	783
	733	
Average	762.22	692.86
\bar{T}	95.3	104
N	23	22

Pooled T 99.64
T' 2.33
T95 1.68

T' > T95 therefore, the difference in emissions is significant

TABLE 10B
COMPARISON OF ACETONE EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/21/92	7/28/92
1	0.151	0.242
2	0.158	0.095
3	0.114	0.074
Average	0.14	0.14
\bar{T}	0.0236	0.0915
N	3	3

Pooled \bar{T} 0.0668

T' 0.0733

T95 2.132

$T' < T95$ therefore, the difference in emissions is not significant

TABLE 10G
COMPARISON OF TOLUENE EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/21/92	7/28/92
1	0.084	0.034
2	0.083	0.029
3	0.09	0.029
Average	0.09	0.03
σ	0.0037	0.0029
N	3	3

Pooled σ 0.0034
T' 20.0
T95 2.132

T' > T95 therefore, the difference in emissions is significant

TABLE 10H
COMPARISON OF CHLOROBENZENE EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/21/92	7/28/92
1	0.01	0.025
2	0.029	0.022
3	0.032	0.023
Average	0.02	0.02
\bar{T}	0.0119	0.0015
N	3	3

Pooled \bar{T} 0.0085

T' 0.058

T_{95} 2.132

$T' < T_{95}$ therefore, the difference in emissions is not significant

TABLE 5D
COMPARISON OF MERCURY EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/22/92	7/29/92
1	0.0122	0.00759
2	0.0133	0.00669
3	0.021	0.0129
Average	1.55E-02	9.06E-03
σ	0.004795	0.003356
N	3	3

Pooled σ 0.0041

T' 2.07

T95 2.132

T' < T95 therefore, the difference in emissions is not significant

TABLE 101
COMPARISON OF ETHYLBENZENE EMISSION RATE

BASELINE AND TDF TEST CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/21/92	7/28/92
1	0.006	0.006
2	0.015	0.007
3	0.011	0.007
Average	0.0107	0.01
\bar{T}	0.0045	0.0006
N	3	3

Pooled \bar{T} 0.0032

T' 1.527

T_{95} 2.132

$T' < T_{95}$ therefore, the difference in emissions is not significant

TABLE 10J
COMPARISON OF XYLENE EMISSION RATE
BASELINE AND TDF TEST CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run	Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
Date	7/21/92	7/28/92
1	0.023	0.02
2	0.05	0.025
3	0.057	0.023
Average	0.043	0.023
\bar{T}	0.018	0.0025
N	3	3
Pooled \bar{T}	0.0129	
T'	1.899	
T95	2.132	

$T' < T95$ therefore, the difference in emissions is not significant

TABLE 11
COMPARISON OF OPACITY OF EMISSIONS
BASELINE AND TDF TEST CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run		Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
7/21	1	0.2	0.5
	1	0.8	0.3
	2	0.3	0
	2	1.3	0
7/22	1	0	0.1
	1	0	0
	2	0	0
	2	0	0
Average		0.33	0.13
T		0.48	0.19
N		8	8

Pooled T 0.365
T' 1.16
T95 1.76

T' > T95 therefore, the difference in emissions is significant

TABLE 12A
COMPARISON OF STACK GAS FLOW
BASELINE AND TDF TEST CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run		Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
7/21	1	595996	584157
	2	600856	596579
	3	612251	608412
7/22	1	579265	564395
	2	608364	581059
	3	605024	588209
Average		600293	587135
\bar{T}		11760	14872
N		6	6

Pooled \bar{T} 13407
 T' 1.70
 T_{95} 1.94

$T' > T_{95}$ therefore, the difference in emissions is significant

TABLE 12B
COMPARISON OF STACK GAS TEMPERATURE
BASELINE AND TDF TEST CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run		Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
7/21	1	359	352
	2	365	347
	3	358	338
7/22	1	352	363
	2	346	364
	3	362	377
Average		357.00	356.83
σ		6.9	13.9
N		6	6

Pooled σ 10.973

T' 0.03

T_{95} 1.94

$T' < T_{95}$ therefore, the difference in emissions is not significant

TABLE 12C
COMPARISON OF STACK GAS MOISTURE
BASELINE AND TDF TEST CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Run		Baseline Emission Rate (lb/hr)	TDF Emission Rate (lb/hr)
7/21	1	9	9
	2	9.6	9.7
	3	8.7	9.6
7/22	1	9.6	9.5
	2	9.1	9.6
	3	9.1	9.6
Average		9.18	9.50
σ		0.35	0.25
N		6	6

Pooled σ

0.304

T'

1.82

T95

1.94

T' > T95 therefore, the difference in emissions is significant

TABLE 1
CPL PLANT OPERATING DATA

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Parameter	Date 7/21/92				Date 7/22/92				Test Average
	Test Run				Test Run				
	1	2	3	Average	1	2	3	Average	
Lime Plant									
Coal feed (tph)	9.4	8.9	8.6	9.0	8.4	8.7	8.7	8.6	8.8
Lime feed (tph)	NR	NR	NR	14.4	NR	NR	NR	18.4	16.4
Power Plant									
Coal feed (tph)	46.3	47.1	47.6	47.0	47.0	47.8	47.3	47.4	47.2
Gen. Rate (MW)	113.8	114.3	114.3	114.1	112.8	115.0	114.0	113.9	114.0
Cement Plant									
Coal feed (tph)	8.8	8.5	8.3	8.5	8.1	9.0	8.4	8.5	8.5
TDF feed (tph)	0	0	0	0	0	0	0	0	0
Heat Input (MMBtu/hr)	221	213	208	214	203	226	211	213	214
Kiln feed (tph)	121.0	121.8	120.7	121.2	119.8	119.9	122.1	120.6	120.9
Clinker Prod. (tph)	78.7	79.1	78.5	78.8	77.9	77.9	79.4	78.4	78.6
Cement Plant Fan									
Temp. (°F)	742	742	752	745	766	766	753	762	754
Current (amp)	121	122	122	122	119	123	122	121	121
Damper (%)	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
Oxygen (%)	5.26	4.41	5.90	5.19	5.37	4.41	5.90	5.23	5.21
CO ₂ (ppm)	332	438	277	349	358	438	277	358	353
Preheater									
Exit Temp. (°F)	778	776	818	791	792	793	778	788	789
Internal Temp. (°F)	1384	1313	1283	1327	1210	1195	1200	1202	1264
Meal Temp. (°F)	1356	1356	1378	1363	1323	1320	1299	1314	1339
Kiln Inlet									
Temp. (°F)	1650	1712	1633	1665	1534	1543	1534	1537	1601
Draft (in. H ₂ O)	0.65	0.55	0.6	0.60	0.88	1.00	0.98	0.95	0.78
Oxygen (%)	8.91	9.14	9.12	9.06	4.84	8.74	NR	6.79	7.92
Combustibles (%)	-0.11	-0.1	-0.11	-0.11	-0.12	-0.06	-0.01	-0.06	-0.09
Bag House									
Inlet Temp (°F)	404	411	410	408	394	392	406	397	403
Fan Speed (%)	74	74	74	74	73	73	73	73	74
Current (amp)	3227	3205	3203	3212	3136	3325	3202	3221	3216
Pressure Drop (in. H ₂ O)	8.1	8.3	7.6	8.0	7.3	7.6	7.6	7.5	7.8
Stack									
Oxygen (%)	6.6	6.3	6.4	6.4	7.0	6.7	6.6	6.8	6.6
NO _x (ppm)	146	145	151	147	160	130	168	153	150
Opacity (%)	4.6	3.8	4.3	4.2	3.5	3.8	3.9	3.7	4.0
Gas Flow (dscfm)	595,996	600,856	612,251	603,034	579,265	608,364	605,024	597,551	600,293

NR - Not reported on hourly basis

TABLE 2
SUMMARY OF METALS EMISSION MEASUREMENTS

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 22, 1992

Metal	Run 1		Run 2		Run 3		Average Emission Rate (lbs/hr)
	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	
Arsenic	2.0	2.11×10^{-3}	2.0	2.13×10^{-3}	1.6	1.93×10^{-3}	0.00206
Chromium	9.9	1.04×10^{-2}	8.4	8.96×10^{-3}	10.3	1.24×10^{-2}	0.01059
Lead	11.2	1.18×10^{-2}	16.6	1.77×10^{-2}	4.9	5.90×10^{-3}	0.01180
Mercury	11.4	1.20×10^{-2}	12.3	1.31×10^{-2}	17.2	2.07×10^{-2}	0.01527
Zinc	13033	13.74	6022	6.42	5484	6.60	8.92

Run No.	Stack Gas Flow Rate (dscfm)	Stack Gas Temperature (°F)	Stack Gas Moisture (%)	Meter Volume (dscf)
1	579265	351.6	9.6	72.663
2	608364	346.0	9.1	75.467
3	605024	362.0	9.1	66.483
<hr style="border-top: 1px dashed black;"/>				
Average	597551	353.2	9.3	-

Emission Rate (lb/hr) = Stack Gas Flow (dscfm) x 60 min/hr x 1/meter volume (dscf)
x sample mass (μ g) x $1/453.6 \times 10^6$ (lb/ μ g)

red 10-19-92
B22



October 15, 1992

Mr. John Koogler, Ph.D., P.E.
Koogler & Associates
4014 N.W. 13 Street
Gainesville, FL 32609

~~Handwritten signature~~
Dist. NPS EPA file
4 copies done 11/6

RECEIVED

OCT 19 1992

Division of Air
Resources Management

RE: Review of Florida Crushed Stone Test Reports

Dear Mr. Koogler:

KBN is in the process of evaluating the test reports for the Florida Crushed Stone (FCS) tire derived fuel (TDF) trial burn. Based on our review to date, we have several questions that we would like clarification or comment on. These questions are enumerated below:

1. In the Summary Report, the 7/22/92 cement plant operating data do not agree with the baseline test report. The parameters in question are kiln feed and clinker production. Please clarify this discrepancy.
2. A check of the values for your T' parameter do not agree with our calculations. For example, for particulate matter, K&A has calculated a value of 2.74 for T', whereas we calculate a value of 2.24. In all cases, the differences are minor, and would not change any of the conclusions. However, the discrepancies are bothersome. Please verify.
3. Based on the formulas presented in the baseline and TDF reports, we calculate a slightly lower value for the metals emission rates. This could be simply due to round-off error. Again, these are not significant, but the differences are troublesome. Please clarify.
4. We do not agree with the conclusions drawn in the Summary Report for the total hydrocarbon (THC) emissions. While it is true that a statistical comparison may not be appropriate because of many values below the minimum detectable limit (MDL), review of the data indicates an increase in THC emissions when TDF firing. For baseline conditions, only 1 hour out of 23 was above the MDL, while under TDF firing, a total of 10 hours out of 23 were above the MDL. If a value of one-half the MDL is used for all values below the MDL, the average baseline emission rate would be approximately 2 lb/hr, while TDF firing emissions would be approximately 3.8 lb/hr. This indicates an increase in the THC emissions when firing TDF. Please review the data and provide your comments.
5. Please provide the source of the CO concentrations reported for the cement plant fan location. It appears that the kiln inlet CO concentrations, as shown in the FCS computer printouts of plant operating data, were used to represent this location. Also, the percent O₂ values shown



in the reports for the kiln inlet do not match the data from the computer printouts. It appears the O₂ from within the preheater, as shown on the printouts, was used.

6. Review of the NO_x data (ppm and lb/hr) from the FCS printouts for the August 8-31 period (coal/TDF firing) indicate an increase over those levels reported for the July 21-30 period (coal only and coal/TDF firing). A plot of the NO_x values is provided in the attached graphs. Please review the plant data and provide an analysis to determine if this increase is due to TDF burning, or can be explained by other plant operating parameters.
7. A few items that have been agreed to or requested have not yet been provided to KBN. These are as follows:
 - A. A comparison of the measured stack gas flow rate during the stack testing and the FCS instrument recorded stack flow rate was requested to be performed.
 - B. The test protocol document states that clinker quality would be used to demonstrate the similarity of plant operating conditions. The test reports or summary report do not include any discussion of clinker quality or its relationship with plant operating parameters.
8. The air toxic modeling analysis to be provided according to the protocol document was received from K&A on October 13, 1992. KBN is reviewing this information, and may have questions related to this document.

We look forward to receiving this information so that we may continue our analysis. Please call if you have any questions.

Sincerely,

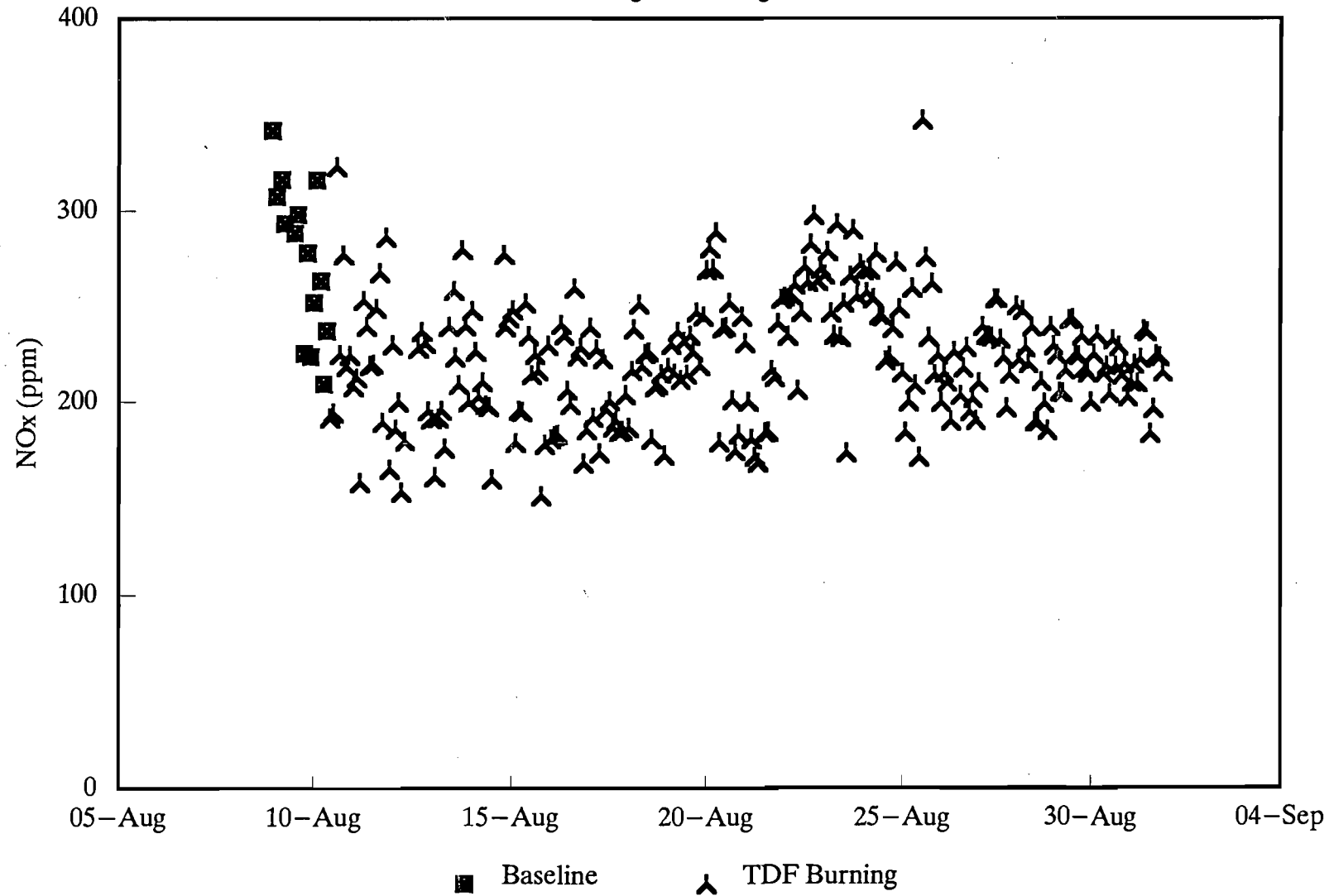
A handwritten signature in cursive script that reads 'David A. Buff'.

David A. Buff, M.E., P.E.
Principal Engineer

cc: Segundo Fernandez, Oertel & Hoffman
Charles Hetrick, Hernando County
Board of County Commissioners
Larry Jennings, Hernando County
Kathy Liles, Hernando County
Tom Mountain, FCS
Bruce Mitchell, FDER
Larry Sellers, Holland & Knight
B. Thomas, SW Dept
G. Harper, EPA
B. Mitchell, NPS

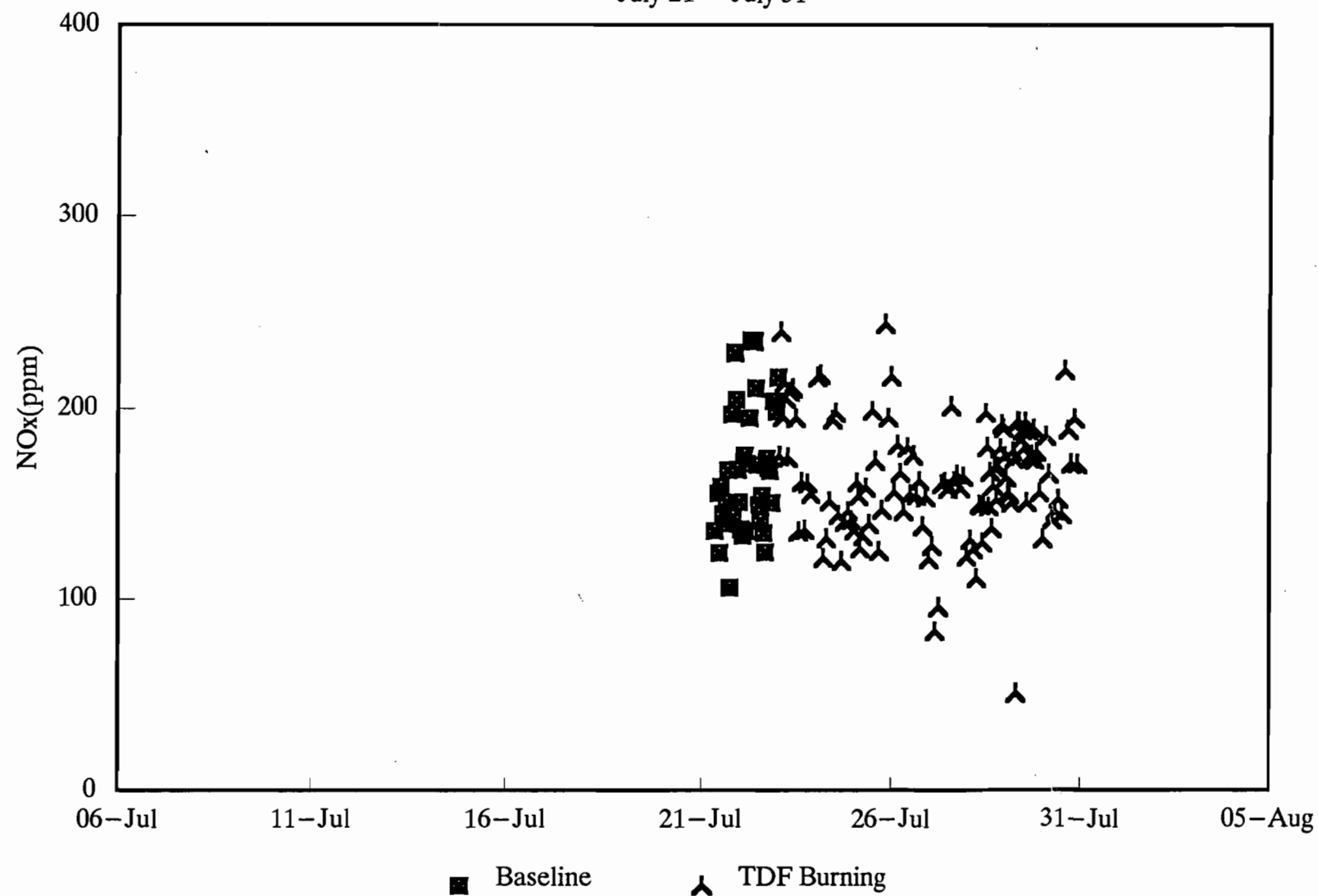
Stack NOx (ppm)

August 8 – August 31



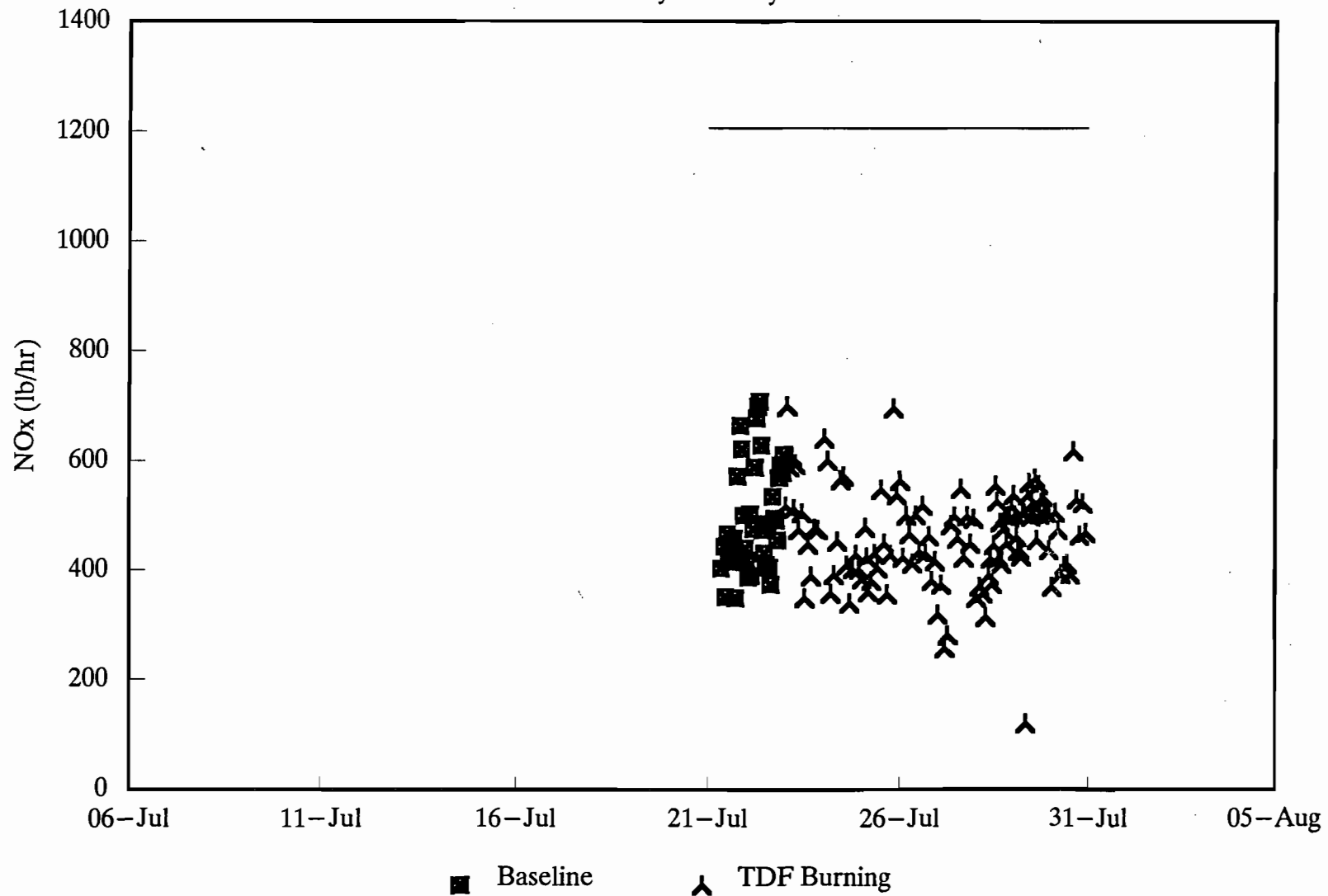
Stack NOx (ppm)

July 21 – July 31



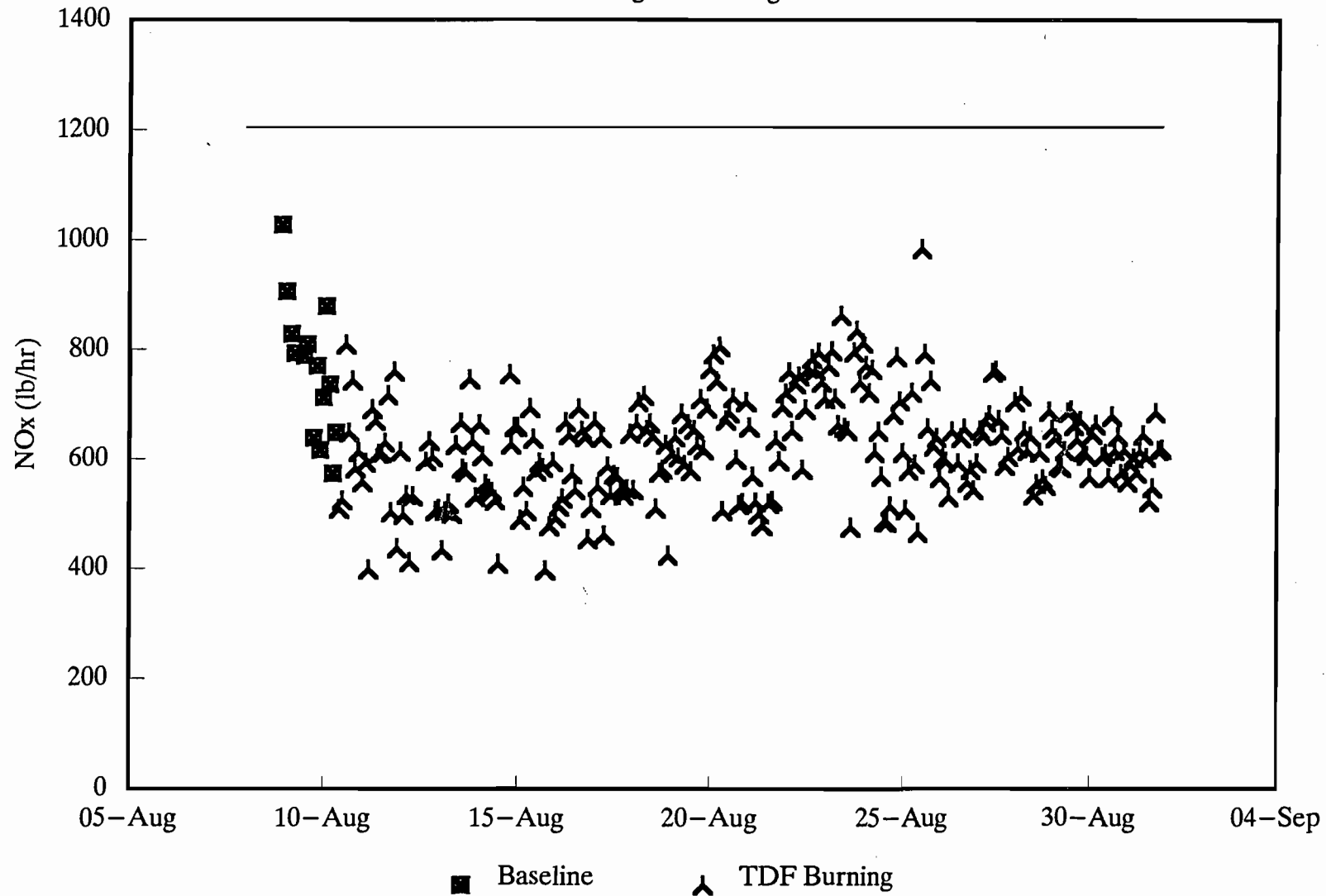
Stack NOx (lb/hr)

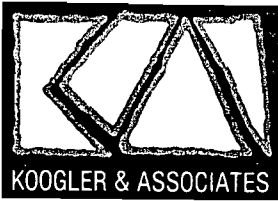
July 21 – July 31



Stack NOx (lb/hr)

August 8 – August 31





ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 307-90-01

October 13, 1992

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OCT 14 1992

Division of Air
Resources Management

Mr. Tom Mountain
Florida Crushed Stone Company
P.O. Box 1508
Brooksville, FL 34605-1508

Subject: Air Quality Impact Analysis
Coal and Coal/TDF Emission Tests
July 21-29, 1992

Dear Mr. Mountain:

During the period July 21-29, 1992, tests were conducted at the Florida Crushed Stone CPL plant to determine the affects of using tire derived fuel (TDF) in the cement plant on cement plant operations, clinker quality and emissions from the CPL plant. The protocol approved for these tests required that air quality modeling be conducted to assess the impacts of certain constituents on ambient air quality at the Florida Crushed Stone property line. The constituents that were to be included in the impact analysis included metals, certain specific volatile organic compounds and hydrogen chloride.

On July 21 and 22, 1992, emission measurements were conducted on the CPL plant stack while the entire CPL plant was fired with low sulfur coal. These tests are referred to as baseline tests. During the period July 28-29, 1992, similar tests were conducted at the CPL plant while TDF was being used to provide approximately 15 percent of the heat input to the cement plant. The results of the emission measurements, which are comparatively presented in our report entitled, *Comparison of Particulate Matter, Hydrogen Chloride, Metals, Carbon Monoxide, Total Hydrocarbons, Speciated Hydrocarbons and Nitrogen Oxides Emission Rates and Plant Operating Conditions Under Coal and Coal/TDF Firing Conditions*, demonstrated that the use of TDF did not result in an increase in the emission rate of any of the measured metals, volatile organic compounds or hydrogen chloride. The results indicated that emission rates of some of the constituents could even be reduced by the use of TDF.

The approach selected for the air quality impact analysis was to use the SCREEN air quality model to calculate maximum expected hourly impacts of each designated constituent at the Florida Crushed Stone property line

nearest the CPL stack. This property line was 1915 meters east of the stack as shown on the attached figure. If the maximum 1-hour impact predicted by the SCREEN model was less than the 8-hour, 24-hour and annual No Threat Level (NTL) guidelines established by FDER for a constituent, no further modeling would be required for that constituent. If, on the other hand, the maximum expected 1-hour impact exceeded one or more of the NTLs for a specific constituent, more detailed modeling would be conducted for that constituent.

For modeling, an arbitrary emission rate of 10.0 grams per second (79.4 pounds per hour) was input into the SCREEN model, Version 88300. The model was run with the full meteorological data option and building dimensions were input to account for the possible effects of plume downwash. Two sets of building dimensions were input; one set representing the raw meal silos and the second set representing the boiler/turbine building of the power plant. Other structures considered are listed in the attached table. The raw meal silos are 200 feet high, 75 feet in crosswind dimension and 255 feet from the CPL plant stack. The boiler/turbine building is 137 feet high, 185 feet in crosswind dimension and 590 feet from the CPL plant stack. The SCREEN model was run a third time with no building dimensions. The outputs from the three SCREEN model runs are attached. The modeling results demonstrate that plume downwash is not a factor in assessing the property line impacts of emissions from the CPL plant stack.

The highest average emission rates of the five metals, twelve volatile organic compounds and hydrogen chloride measured during the two test periods are summarized in the attached table. The maximum property-line impacts of these emissions were determined by multiplying the maximum impact predicted by the SCREEN model (4.991 micrograms per cubic meter, maximum 1-hour average) by a ratio of the measured emission rates to the modeled emission rate (79.4 pounds per hour). The resulting maximum 1-hour impact for each constituent is listed in the attached table.

Also listed in the attached table are the guideline NTLs established by FDER for each of the constituents. The NTLs were developed by FDER to provide guidance in assessing the ambient air concentrations of constituents for which there are no air quality standards. As the term implies, the Department presumes there will be "no threat" to human health and welfare if the guideline concentrations are not exceeded.

The results summarized in the attached table demonstrate that the conservatively estimated one-hour impact of each constituent is well below the respective NTLs for the 8-hour, 24-hour, and annual periods. As the maximum one-hour impact of each constituent is less than all NTLs for that constituent, it follows that the expected 8-hour, 24-hour and annual

Mr. Tom Mountain
Florida Crushed Stone Company

October 13, 1992
Page 3

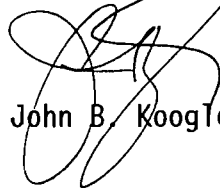
impacts of each constituent will be even smaller fractions of the respective NTLs.

The results of this SCREEN modeling analysis demonstrate that the emission rates of the metals, volatile organic compounds and hydrogen chloride from the CPL plant will not be a threat to human health or welfare. As a result, no further modeling is necessary.

If there are any questions regarding this analysis, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

c: Mr. Bruce Mitchell, FDER-Tallahassee
Mr. C. Hetrick, Hernando County
Mr. David Buff, KBN
Mr. A. Cleveland, Oertel, Hoffman
Mr. Larry Sellers, Holland & Knight
Mr. Carl Lunderstadt, FCS, Leesburg
Mr. Randy Thompson, FCS
Mr. Brian Beals, EPA-Region IV, Atlanta
Mr. Brian Mitchell, National Park Service



SCREEN MODEL ANALYSIS OF
CONSTITUENTS FROM CPL PLANT

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

Constituent	Emissions(1) (lb/hr)	Max 1-hr Impact(2) ($\mu\text{g}/\text{m}^3$)	NTLs(3) ($\mu\text{g}/\text{m}^3$)		
			8-hr	24-hr	Annual
As	0.00208	0.00013	2.0	0.48	0.00023
Cr	0.01076	0.00068	5.0	1.2	-
Pb	0.0148	0.00093	0.5	0.12	0.09
Hg	0.01550	0.00097	0.5	0.12	0.3
Zn	9.06	0.569	10	2.4	-
Bromomethane	BQL	-	190	46	0.8
Acetone	0.141	0.0089	35600	8544	-
Carbon Disulfide	0.101	0.0064	310	74.4	200
1,1,1-trichloroethane	BQL	-	38200	9168	-
Benzene	0.416	0.0261	30	7.2	0.12
Trichloroethene	BQL	-	2690	645	-
Toluene	0.086	0.00540	3770	898	300
Chlorobenzene	0.024	0.00151	3450	898	-
Ethylbenzene	0.011	0.00069	4340	1042	1000
Xylene	0.043	0.00270	4340	1042	80
Styrene	0.031	0.0020	2130	511	-
Hexane	BQL	-	1760	422	200
Hydrogen Chloride	71.620	4.50	75	18	7.0

(1) Maximum average emission rate measured during baseline or WTDF tests, 7/21-29/92.

(2) Maximum one-hour impact from SCREEN model calculated as follows:
(Measured Emission) x (Modeled Impact, or $4.99 \mu\text{g}/\text{m}^3$)/(Modeled Emissions,
or 79.4 lbs/hr)

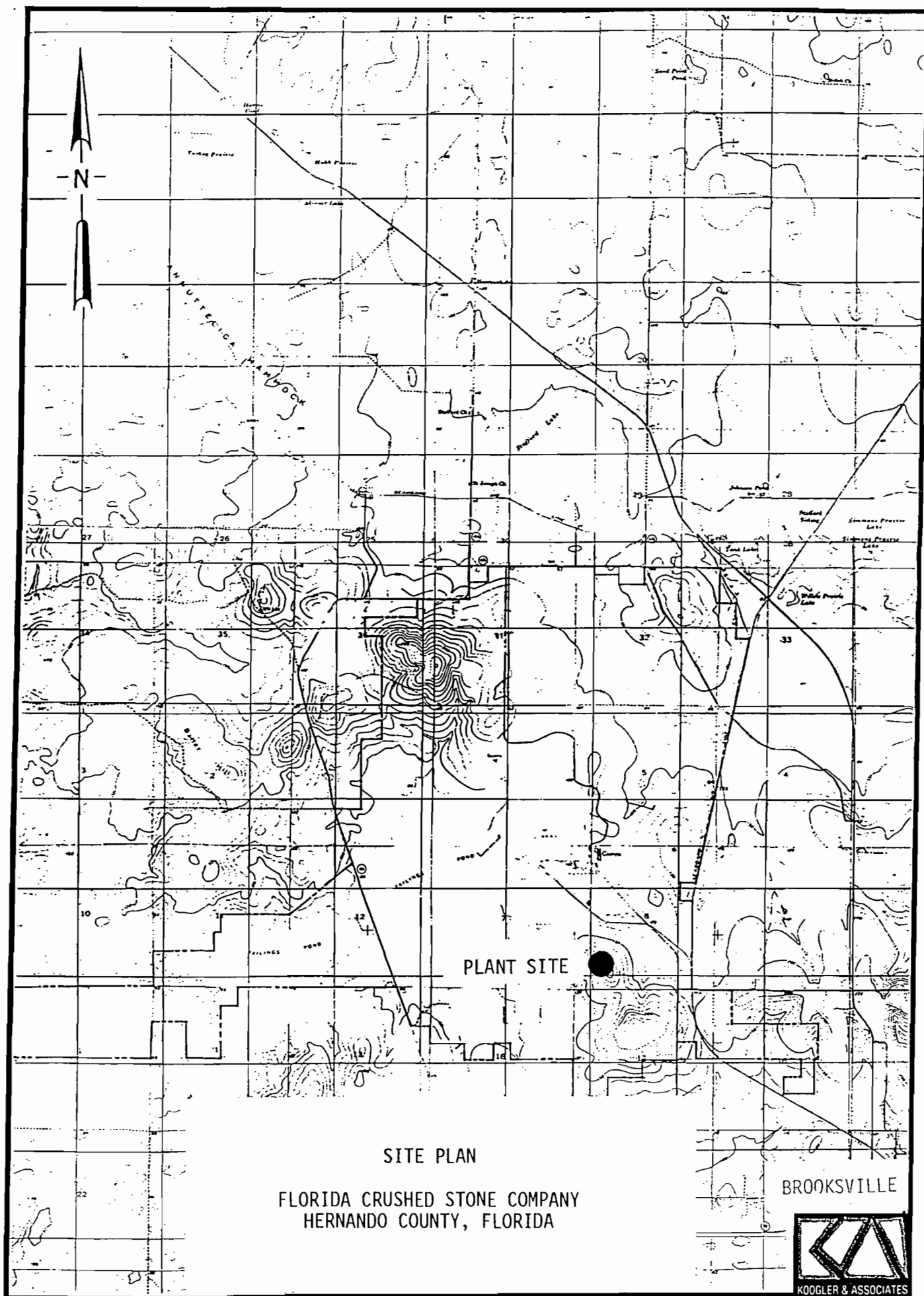
(3) FDER guideline NTLs, Version 3.0.

STRUCTURE ANALYSIS FOR
BUILDING WAKE EFFECT POTENTIAL

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

Structure	Height (ft)	X-wind Dimension (ft)	5 L (1) (ft)	Distance from Structure to CPL Stack (ft)	Potential for Down Wash
Raw Meal Storage	145	45	225	255	No
Raw Meal Silos	200	75	375	300	Yes
Preheater	220	35	175	350	No
Boiler/Turbine Bldg.	137	185	685	590	Yes
Cement/Clinker Silos	200	130	650	930	No

(1) Five times the lesser of the height or X-wind dimension of the structure.



10-06-92

10:55:54

*** SCREEN-1.1 MODEL RUN ***

*** VERSION DATED 88300 ***

FLORIDA CRUSHED STONE AIR TOXICS (NO BLDG)

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 10.00
STACK HEIGHT (M) = 97.60
STK INSIDE DIAM (M) = 5.69
STK EXIT VELOCITY (M/S) = 18.85
STK GAS EXIT TEMP (K) = 453.00
AMBIENT AIR TEMP (K) = 293.00
RECEPTOR HEIGHT (M) = .00
IOPT (1=URB,2=RUR) = 2
BUILDING HEIGHT (M) = .00
MIN HORIZ BLDG DIM (M) = .00
MAX HORIZ BLDG DIM (M) = .00

BUOY. FLUX = 528.43 M**4/S**3; MOM. FLUX = 1860.19 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
2000.	4.846	1	2.0	2.3	808.7	807.7	434.0	1978.6	NO
2100.	4.686	1	2.0	2.3	808.7	807.7	448.8	2191.7	NO
2200.	4.535	1	2.0	2.3	808.7	807.7	463.7	2416.7	NO
2300.	4.394	1	2.0	2.3	808.7	807.7	478.6	2653.5	NO
2400.	4.261	1	2.0	2.3	808.7	807.7	493.5	2902.2	NO
2500.	4.137	1	2.0	2.3	808.7	807.7	508.4	3162.9	NO
2600.	4.019	1	2.0	2.3	808.7	807.7	523.3	3435.6	NO
2700.	3.907	1	2.0	2.3	808.7	807.7	538.2	3720.3	NO
2800.	3.802	1	2.0	2.3	808.7	807.7	553.1	4017.2	NO
2900.	3.703	1	2.0	2.3	808.7	807.7	568.0	4326.2	NO
3000.	3.608	1	2.0	2.3	808.7	807.7	582.8	4647.3	NO
3500.	3.202	1	2.0	2.3	808.7	807.7	656.8	5000.0	NO
4000.	2.897	2	2.0	2.3	808.7	807.7	565.0	539.8	NO
4500.	2.965	2	2.0	2.3	808.7	807.7	619.0	604.3	NO
5000.	2.915	2	2.0	2.3	808.7	807.7	672.8	670.4	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1915. M:

1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
-------	-------	---	-----	-----	-------	-------	-------	--------	----

DWASH= MEANS NO CALC MADE (CONC = 0.0)

DWASH=NO MEANS NO BUILDING DOWNWASH USED

DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED

DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED

DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
-----	-----	-----	-----
SIMPLE TERRAIN	4.991	1915.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

10-06-92
10:54:16

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

FLORIDA CRUSHED STONE AIR TOXICS (2)

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 10.00
STACK HEIGHT (M) = 97.60
STK INSIDE DIAM (M) = 5.69
STK EXIT VELOCITY (M/S) = 18.85
STK GAS EXIT TEMP (K) = 453.00
AMBIENT AIR TEMP (K) = 293.00
RECEPTOR HEIGHT (M) = .00
IOPT (1=URB,2=RUR) = 2
BUILDING HEIGHT (M) = 41.80
MIN HORIZ BLDG DIM (M) = 56.40
MAX HORIZ BLDG DIM (M) = 56.40

BUOY. FLUX = 528.43 M**4/S**3; MOM. FLUX = 1860.19 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
2000.	4.846	1	2.0	2.3	808.7	807.7	434.0	1978.6	NO
2100.	4.686	1	2.0	2.3	808.7	807.7	448.8	2191.7	NO
2200.	4.535	1	2.0	2.3	808.7	807.7	463.7	2416.7	NO
2300.	4.394	1	2.0	2.3	808.7	807.7	478.6	2653.5	NO
2400.	4.261	1	2.0	2.3	808.7	807.7	493.5	2902.2	NO
2500.	4.137	1	2.0	2.3	808.7	807.7	508.4	3162.9	NO
2600.	4.019	1	2.0	2.3	808.7	807.7	523.3	3435.6	NO
2700.	3.907	1	2.0	2.3	808.7	807.7	538.2	3720.3	NO
2800.	3.802	1	2.0	2.3	808.7	807.7	553.1	4017.2	NO
2900.	3.703	1	2.0	2.3	808.7	807.7	568.0	4326.2	NO
3000.	3.608	1	2.0	2.3	808.7	807.7	582.8	4647.3	NO
3500.	3.202	1	2.0	2.3	808.7	807.7	656.8	5000.0	NO
4000.	2.897	2	2.0	2.3	808.7	807.7	565.0	539.8	NO
4500.	2.965	2	2.0	2.3	808.7	807.7	619.0	604.3	NO
5000.	2.915	2	2.0	2.3	808.7	807.7	672.8	670.4	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1915. M:

1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
-------	-------	---	-----	-----	-------	-------	-------	--------	----

DWASH= MEANS NO CALC MADE (CONC = 0.0)

DWASH=NO MEANS NO BUILDING DOWNWASH USED

DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED

DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED

DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ RS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	53.37	CAVITY HT (M)	=	53.37
CAVITY LENGTH (M)	=	65.00	CAVITY LENGTH (M)	=	65.00
ALONGWIND DIM (M)	=	56.40	ALONGWIND DIM (M)	=	56.40

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
-----	-----	-----	-----
SIMPLE TERRAIN	4.991	1915.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

10-06-92

10:52:18

*** SCREEN-1.1 MODEL RUN ***

*** VERSION DATED 88300 ***

FLORIDA CRUSHED STONE AIR TOXICS

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 10.00
STACK HEIGHT (M) = 97.60
STK INSIDE DIAM (M) = 5.69
STK EXIT VELOCITY (M/S) = 18.85
STK GAS EXIT TEMP (K) = 453.00
AMBIENT AIR TEMP (K) = 293.00
RECEPTOR HEIGHT (M) = .00
IOPT (1=URB,2=RUR) = 2
BUILDING HEIGHT (M) = 61.00
MIN HORIZ BLDG DIM (M) = 22.90
MAX HORIZ BLDG DIM (M) = 22.90

BUOY. FLUX = 528.43 M**4/S**3; MOM. FLUX = 1860.19 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
2000.	4.846	1	2.0	2.3	808.7	807.7	434.0	1978.6	NO
2100.	4.686	1	2.0	2.3	808.7	807.7	448.8	2191.7	NO
2200.	4.535	1	2.0	2.3	808.7	807.7	463.7	2416.7	NO
2300.	4.394	1	2.0	2.3	808.7	807.7	478.6	2653.5	NO
2400.	4.261	1	2.0	2.3	808.7	807.7	493.5	2902.2	NO
2500.	4.137	1	2.0	2.3	808.7	807.7	508.4	3162.9	NO
2600.	4.019	1	2.0	2.3	808.7	807.7	523.3	3435.6	NO
2700.	3.907	1	2.0	2.3	808.7	807.7	538.2	3720.3	NO
2800.	3.802	1	2.0	2.3	808.7	807.7	553.1	4017.2	NO
2900.	3.703	1	2.0	2.3	808.7	807.7	568.0	4326.2	NO
3000.	3.608	1	2.0	2.3	808.7	807.7	582.8	4647.3	NO
3500.	3.202	1	2.0	2.3	808.7	807.7	656.8	5000.0	NO
4000.	2.897	2	2.0	2.3	808.7	807.7	565.0	539.8	NO
4500.	2.965	2	2.0	2.3	808.7	807.7	619.0	604.3	NO
5000.	2.915	2	2.0	2.3	808.7	807.7	672.8	670.4	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1915. M:

1915.	4.991	1	2.0	2.3	808.7	807.7	421.4	1806.8	NO
-------	-------	---	-----	-----	-------	-------	-------	--------	----

DWASH= MEANS NO CALC MADE (CONC = 0.0)

DWASH=NO MEANS NO BUILDING DOWNWASH USED

DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED

DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED

DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

CONC (UG/M**3)	=	1063.	CONC (UG/M**3)	=	1063.
CRIT WS @10M (M/S)	=	5.69	CRIT WS @10M (M/S)	=	5.69
CRIT WS @ HS (M/S)	=	8.98	CRIT WS @ HS (M/S)	=	8.98
DILUTION WS (M/S)	=	4.49	DILUTION WS (M/S)	=	4.49
CAVITY HT (M)	=	120.91	CAVITY HT (M)	=	120.91
CAVITY LENGTH (M)	=	65.00	CAVITY LENGTH (M)	=	65.00
ALONGWIND DIM (M)	=	22.90	ALONGWIND DIM (M)	=	22.90

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.991	1915.	0.
BUILDING CAVITY-1	1063.	65.	-- (DIST = CAVITY LENGTH)
BUILDING CAVITY-2	1063.	65.	-- (DIST = CAVITY LENGTH)

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Best Available Copy



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

10-13-92
02:43 pm
Told Wendy. Did
not receive the complete
FAX. She is to send the
rest. gsa

FAX TRANSMITTAL FORM

TO:

Bruce Mitchell

FROM:

John Koogler

REMARKS:

3011-20-01

SENT BY:

Wendy

DATE:

10/13/92

FAX PHONE:

904-377-7158

The text being transmitted consists of 12 pages
PLUS this one.

REMARKS:

SUMMARY OF PARTICULATE MATTER,
HYDROGEN CHLORIDE, VOLATILE ORGANIC COMPOUNDS,
TOTAL HYDROCARBONS, CARBON MONOXIDE,
NITROGEN OXIDES AND METALS EMISSION RATES
AND VISIBLE EMISSIONS OBSERVATIONS

BASELINE FIRING CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CEMENT/POWER/LIME PLANT

BROOKSVILLE, FLORIDA

JULY 21-22, 1992

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 N.W. 13TH STREET
GAINESVILLE, FL 32609
(904) 377-5822



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2.0	PROCESS DESCRIPTION	4
3.0	LOCATION OF SAMPLING PORTS	5
4.0	TEST METHODS	7
5.0	SUMMARY OF RESULTS	8

APPENDIX

Particulate Matter

Hydrogen Chloride

Metals

Speciated Volatile Organic Compounds

Carbon Monoxide, Total Hydrocarbon and
Nitrogen Oxides Monitoring Data

Visible Emissions

Plant Operating Data

Coal Analyses

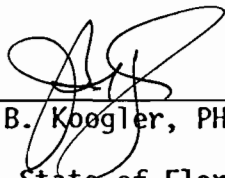
Equipment Calibrations

Project Participants

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




SEAL



John B. Koogler, PH.D., P.E.

State of Florida
Registration No. 12925



Date

1.0 INTRODUCTION

The Florida Crushed Stone Company (FCS) operates a cement/power/lime (CPL) plant in Hernando County, northwest of Brooksville. The cement plant was permitted under Florida Department of Environmental Regulation (FDER) Air Construction Permit AC27-118674 and the facility was permitted under Permit PSD-FL-091. The cement plant presently operates under permit A027-183508 at a permitted feed rate of 110.6 tons per hour and a clinker production rate of 75 tons per hour. The plant is normally fired with low-sulfur coal at a permitted heat input rate of up to 248 MMBTU per hour.

In March 1990, FCS applied to FDER requesting approval to burn tire derived fuel (TDF) as a supplemental heat source in the cement kiln of the CPL plant. On June 6, 1990, FDER issued an amendment to the referenced permits authorizing performance tests on the cement plant while using TDF to supply up to 15 percent of the heat input to the kiln. In September 1990, the tests were conducted to measure air pollutant emissions from the CPL plant while the plant was operating under baseline conditions and with shredded TDF supplying up to 15 percent of the heat input to the plant. In September 1991, FCS requested approval from FDER to conduct additional tests with TDF. On October 9, 1991, FDER authorized FCS to conduct tests under baseline conditions and while using whole-tire TDF to provide up to 15 percent of the heat input to the plant. These tests were conducted during the period November 13 - 21, 1991.

On May 15, 1992, FCS requested approval from FDER to conduct additional tests with TDF. On July 20, 1992, FDER authorized FCS to conduct tests under baseline conditions and while using whole-tire TDF to provide up to 15 percent of the heat input to the plant. These tests were conducted during the period July 21-29, 1992. The results of the baseline tests conducted on July 21 and 22, 1992, are reported herein.

The baseline tests were conducted during the period 0810-1914 on July 21, 1992, and 0800-1900 on July 22, 1992. Prior to the test on July 21, 1992, the plant had been operating with coal providing 100 percent of the heat input to the kiln in order to assure equilibrium operating/emissions conditions. The CPL plant had operated with coal providing 100 percent of the heat input since the previous TDF tests in November 1991.

During the baseline test period:

- a. Coal provided 100 percent of the heat input to the cement plant; or approximately 214 MMBTU per hour. The kiln feed rate averaged 120.9 tons per hour and the clinker production rate averaged 78.6 tons per hour.
- b. The power plant operated at a rate of 114 megawatts and the lime plant operated at a rate of 16.4 tons per hour; with coal providing 100 percent of the heat input to both plants.

- d. The total hydrocarbons emission rate averaged less than 4.4 pounds per hour as propane measured by EPA Method 25A. Emission rates of individual organic compounds ranged from below quantifiable limits to 0.416 pounds per hour. There are no permit limits for these compounds.
- e. The nitrogen oxides emission rate averaged 765 pounds per hour. The permitted nitrogen oxides emission rate is 1205 pounds per hour.
- f. The carbon monoxide emission rate averaged 420 pounds per hour. There is no permit limit for carbon monoxide.
- g. The hydrogen chloride emission rate averaged 71.6 pounds per hour. There is no permit limit for hydrogen chloride.
- h. The emission rates of specific metals ranged from 9.06 pounds per hour for zinc to 0.00208 pounds per hour for arsenic.
- i. The highest six-minute rolling average opacity of emissions during the baseline period was 5.0 percent compared with a permitted limit of 10 percent. The average opacity of emissions was 0.3 percent.

2.0 PROCESS DESCRIPTION

The Florida Crushed Stone CPL plant consists of a Portland cement plant, a power plant and a fluid-bed lime calciner. The Portland cement plant has a permitted feed rate of 110.6 tons per hour and a permitted clinker production rate of 75 tons per hour. The plant is normally fired with coal at a maximum rate of 10.3 tons per hour, resulting in a heat input rate of up to 248 MMBTU per hour. During the baseline period, the coal feed rate to the plant averaged 8.5 tons per hour (at 12550 BTU per pound) for an average heat input rate of 214 MMBTU per hour. During the baseline test period, the kiln feed rate averaged 120.9 tons per hour and the clinker production rate averaged 78.6 tons per hour.

The power plant operated at a rate of 114 megawatts and the lime plant operated with a feed rate of 16.4 tons per hour. Both plants were fired with low sulfur coal.

3.0 LOCATION OF SAMPLING PORTS

The locations of the sampling points are shown in Figure 1. Stack gas flow rate measurements and sample collection for particulate matter, metals, hydrogen chloride, and speciated volatile organic compounds emission measurements were made through four sampling ports located at the 194-foot level of the stack. Samples for determining the nitrogen oxides, carbon monoxide and total hydrocarbon concentrations of the stack gas were made at a single point near the center of the duct between the CPL plant I.D. fan and the stack (Figure 1).

The four sampling ports at the 194 foot level of the stack are located at 90 degrees to one another in the 18.65-foot diameter stack; 155 feet above the point where the stack gases are introduced to the stack and 126 feet below the top of the stack. A total of 16 sampling points were used for the velocity and sampling traverses. The sampling points were located in accordance with criteria established by EPA test Method 1 (40CFR60, Appendix A).

Measurements of the nitrogen oxides, carbon monoxide and total hydrocarbon concentrations in the stack gas were made at a single point near the center of the 186-inch by 144-inch rectangular duct between the I.D. fan of the CPL plant and the stack.

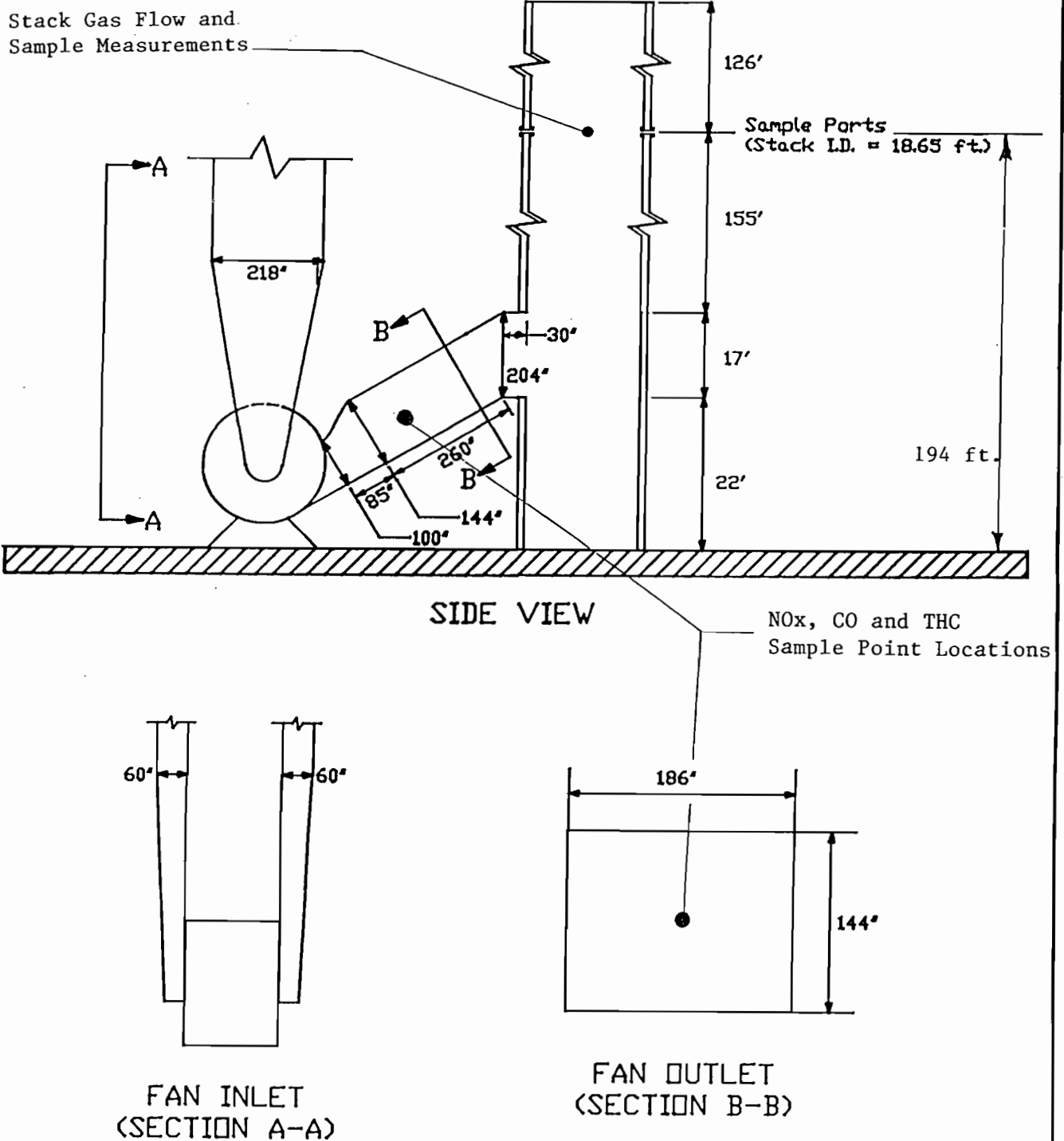


FIGURE 1

SAMPLE POINT LOCATIONS

FLORIDA CRUSHED STONE
CPL PLANT

BROOKSVILLE, FLORIDA



4.0 TEST METHODS

The nitrogen oxides concentrations were continuously measured in accordance with EPA Test Method 7e, carbon monoxide concentrations were continuously measured in accordance with EPA Test Method 10, and total hydrocarbon concentrations were continuously measured in accordance with EPA Test Method 25A. All test methods are described in 40CFR60, Appendix A. The sample of stack gas for these continuous analyzers was collected from a single point in the rectangular duct between the CPL plant I.D. fan and the stack and transported to a heated manifold through a heated teflon sample line. The sample gas stream was then split with the fraction for NOx analysis passing through a cold trap to remove water vapor before the gas stream was introduced to the NOx analyzer. The cold trap was cooled with a mixture of dry ice and ethylene glycol. The gas sample for carbon monoxide was passed through an ascarite column to remove moisture and CO₂ and the sample for total hydrocarbons was transferred directly to the analyzer through another heated teflon line.

Moisture, stack gas flow rate, oxygen and CO₂ were measured in accordance with EPA Methods 1, 2, 3 and 4, 40CFR60, Appendix A. Speciated volatile organic compounds were measured at the 194 foot level of the stack with EPA Method M-0300 using the volatile organic sampling train (VOST). Hydrogen chloride and particulate matter samples were collected in the EPA Method 26 sampling train (40CFR60, Appendix A). Particulate matter was extracted from the probe and filter while HCl was collected in the impinger section. Metals were collected with the Multi-Metals sampling train as described in EPA SW846-0012.

5.0 SUMMARY OF RESULTS

The results of the baseline tests conducted during the period July 21-22, 1992, are summarized in Tables 1-7.

During the baseline test:

- a. The particulate matter emission rate averaged 47.72 pounds per hour, compared with an allowable particulate matter emission rate from the CPL plant of 86.5 pounds per hour (see Table 1).
- b. The cement kiln was fired with low-sulfur coal at a rate of 8.5 tons per hour (214 MMBTU/hr). The feed rate to the plant was 120.9 tons per hour and the clinker production rate was 78.6 tons per hour. The power plant operated at a generating rate of 114 megawatts and the lime plant operated at a feed rate of 16.4 tons per hour. Both plants were fired entirely with low-sulfur coal (Table 7).
- c. The nitrogen oxides emission rate averaged 765 pounds per hour (Table 3) compared with an allowable nitrogen oxides emission rate from the cement, power and lime plants of 1205 pounds per hour.
- d. The carbon monoxide emission rate averaged 420 pounds per hour (Table 3). There is no permit limit for carbon monoxide.

- e. The total hydrocarbon emission rate was less than 4.4 pounds per hour with the majority of the hourly observations being below the limit of detection (Table 3). Emissions rates of individual organic compounds ranged from below quantifiable limits to 0.416 pounds per hour for benzene (see Table 5).
- f. The hydrogen chloride emission rate averaged 71.62 pounds per hour. A summary of the data is presented in Table 4. There is no permit limit for hydrogen chloride.
- g. Stack gas flow, temperature and moisture are summarized in Tables 1 and 2. The gas flow rate averaged 600,293 dscfm at 357°F and 9.2 percent moisture.
- h. The analyses of coal burned in the cement, power and lime plants are summarized in Table 6.
- i. CPL plant operating parameters for the periods of time particulate matter, hydrogen chloride, metals and speciated organic compound samples were collected are summarized in Table 7. Analyses of clinker and raw meal and plant operating data are included in the Appendix.

Field data sheets, field notes, plant operating data and the results of fuel analyses are included in the Appendix of the report.

TABLE 1

SUMMARY OF PARTICULATE MATTER EMISSION MEASUREMENTS
BASELINE CONDITIONSFLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 21, 1992

Run No.	Process Weight Rate (1) (Tons/Hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (Deg F)	Stack Gas Moisture (%)	PARTICULATE MATTER	
					Conc. (gr/dscf)	Emission Rate (Lbs/Hr)
1	120.2	595996	358.6	9.0	0.0106	54.38
2	120.0	600856	364.9	9.6	0.0090	46.13
3	119.7	612251	358.0	8.7	0.0081	42.64
Average	120.0	603034	360.5	9.1	0.0092	47.72

(1) FEED RATE TO PRE-HEATER

TABLE 2
SUMMARY OF METALS EMISSION MEASUREMENTS

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 22, 1992

Metal	Run 1		Run 2		Run 3		Average Emission Rate (lbs/hr)
	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	
Arsenic	2.0	2.14×10^{-3}	2.0	2.16×10^{-3}	1.6	1.95×10^{-3}	0.00208
Chromium	9.9	1.06×10^{-2}	8.4	9.09×10^{-3}	10.3	1.26×10^{-2}	0.01076
Lead	11.2	1.20×10^{-2}	16.6	1.80×10^{-2}	4.9	5.99×10^{-3}	0.01200
Mercury	11.4	1.22×10^{-2}	12.3	1.33×10^{-2}	17.2	2.10×10^{-2}	0.01550
Zinc	13033	13.95	6022	6.52	5484	6.70	9.06

Run No.	Stack Gas Flow Rate (dscfm)	Stack Gas Temperature (°F)	Stack Gas Moisture (%)	Meter Volume (dscf)
1	579265	351.6	9.6	72.663
2	608364	346.0	9.1	75.467
3	605024	362.0	9.1	66.483

Average	597551	353.2	9.3	-

Emission Rate (lb/hr) = Stack Gas Flow (dscfm) x 60 min/hr x 1/meter volume (dscf)
x sample mass (μ g) x $1/453.6 \times 10^6$ (lb/ μ g)

TABLE 3
SUMMARY OF CARBON MONOXIDE, TOTAL HYDROCARBONS
AND NITROGEN OXIDES EMISSION RATES

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Date	Time	CO		THC(1)		NOx(2)	
		Conc (ppm)	Emission Rate (lbs/hr)	Conc (ppm)	Emission Rate (lbs/hr)	Conc (ppm)	Emission Rate (lbs/hr)
7-21-92	0810-0850	236	621	2.8	11.6	156	674
	0850-0945	186	489	<1	<4.1	195	843
	0945-1045	143	376	<1	<4.1	159	687
	1045-1145	162	426	<1	<4.1	138	597
	1145-1245	122	321	<1	<4.1	159	687
	1245-1345	130	342	<1	<4.1	147	636
	1345-1445	180	474	<1	<4.1	160	692
	1445-1550	208	547	<1	<4.1	174	752
	1550-1645	221	582	<1	<4.1	140	605
	1645-1745	216	568	<1	<4.1	178	770
	1745-1845	203	534	<1	<4.1	172	744
	1845-1915	153	403	<1	<4.1	194	839

Stack Gas Flow = 603034 dscfm

7-22-92	0800-0845	224	584	<1	<4.1	229	981
	0845-0945	247	644	<1	<4.1	194	831
	0945-1045	180	469	<1	<4.1	176	754
	1045-1145	199	519	<1	<4.1	177	758
	1145-1300	107	279	<1	<4.1	198	848
	1300-1345	94	245	<1	<4.1	191	818
	1345-1445	124	323	<1	<4.1	168	720
	1445-1517	62	162	<1	<4.1	207	887
	1517-1645	69	180	<1	<4.1	203	870
	1645-1745	97	253	<1	<4.1	188	805
	1745-1900	135	352	<1	<4.1	171	733

Stack Gas Flow = 597551 dscfm

Two-Day Average	420	<4.4	765
-----------------	-----	------	-----

(1) As propane

(2) As NO₂

Emissions: NOx = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(46/385 lb/ft³)
CO = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(28/385 lb/ft³)
THC = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(44/385 lb/ft³)

TABLE 4

SUMMARY OF HYDROGEN CHLORIDE EMISSION MEASUREMENTS
BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 21, 1992

Run No.	Process Weight Rate (1) (Tons/Hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (Deg F)	Stack Gas Moisture (%)	HCl	
					Conc. (gr/dscf)	Emission Rate (Lbs/Hr)
1	120.2	595996	358.6	9.0	0.0123	62.88
2	120.0	600856	364.9	9.6	0.0157	80.84
3	119.7	612251	358.0	8.7	0.0136	71.14
Average	120.0	603034	360.5	9.1	0.0139	71.62

(1) FEED RATE TO PRE-HEATER

TABLE 5
SUMMARY OF VOLATILE ORGANIC COMPOUND EMISSIONS

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 21, 1992

	Run 1		Run 2		Run 3		Average
	Sample Mass (ng)	Emission Rate (lbs/hr)	Sample Mass (ng)	Emission Rate (lbs/hr)	Sample Mass (ng)	Emission Rate (lbs/hr)	Emission Rate (lbs/hr)
Bromomethane	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acetone(1)	3364	0.151	3512	0.158	2485	0.114	0.141
Carbon disulfide	1430	0.064	2380	0.107	681	0.031	0.067
1,1,1-trichloroethane	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Benzene	10000	0.449	9000	0.405	8600	0.395	0.416
Trichloroethene	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1880	0.084	1850	0.083	1930	0.090	0.086
Chlorobenzene	226	0.010	650	0.029	700	0.032	0.024
Ethylbenzene	129	0.006	327	0.015	242	0.015	0.011
Xylene (total)	506	0.023	1100	0.050	1230	0.057	0.043
Styrene	294	0.013	960	0.043	830	0.038	0.031
Hexane	ND	ND	ND	ND	ND	ND	ND
Sample Volume (liters)		49.76		49.96		49.80	
Stack Gas Flow (dscfm)		595996		600856		612251	

(1) Compound(s) reported as acetone could be acetone and/or coelutrated compounds; see Endnotes in Graseby-RTL Analytical Report

BQL = Below Quantitation Limit

ND = Not Detected

$$\text{Emission Rate (lb/hr)} = \text{Stack gas flow (dscfm)} \times 60 \text{ (min/hr)} \times 1/\text{sample volume (l)} \\ \times 28.32 \text{ (l/ft}^3\text{)} \times \text{sample mass (ng)} \times 1/453.6 \times 10^9 \text{ (lb/ng)}$$

TABLE 6
SUMMARY OF COAL ANALYSES

BASELINE CONDITIONS
FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Sample Date	Moisture (%)	Carbon (%)	Hydrogen (%)	Nitrogen (%)	Sulfur (%)	Ash (%)	Oxygen (%)	Chloride (%)
7-21-92	7.89	69.95	4.74	1.45	0.69	8.73	6.55	0.10
7-21-92	4.01	74.38	5.06	1.55	0.69	7.41	6.90	0.11
7-22-92	7.79	69.98	4.71	1.43	0.70	8.54	6.85	0.09
7-22-92	5.25	73.00	4.84	1.42	0.64	7.85	7.00	0.09
Average	6.24	71.83	4.84	1.46	0.68	8.13	6.82	0.10

Sample Date	Arsenic (µg/g)	Mercury (µg/g)	Lead (µg/g)	Chromium (µg/g)	Zinc (µg/g)
7-21-92	1	0.10	93	73	115
7-21-92	<1	0.05	96	85	98
7-22-92	2	0.05	94	72	116
7-22-92	<1	0.03	94	82	105
Average	<1.2	0.06	94	78	108

TABLE 7
CPL PLANT OPERATING DATA

BASELINE CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Parameter	Date 7/21/92				Date 7/22/92				Test Average
	Test Run				Test Run				
	1	2	3	Average	1	2	3	Average	
Lime Plant									
Coal feed (tph)	9.4	8.9	8.6	9.0	8.4	8.7	8.7	8.6	8.8
Lime feed (tph)	NR	NR	NR	14.4	NR	NR	NR	18.4	16.4
Power Plant									
Coal feed (tph)	46.3	47.1	47.6	47.0	47.0	47.8	47.3	47.4	47.2
Gen. Rate (MW)	113.8	114.3	114.3	114.1	112.8	115.0	114.0	113.9	114.0
Cement Plant									
Coal feed (tph)	8.8	8.5	8.3	8.5	8.1	9.0	8.4	8.5	8.5
TDF feed (tph)	0	0	0	0	0	0	0	0	0
Heat Input (MMBtu/hr)	221	213	208	214	203	226	211	213	214
Kiln feed (tph)	121.0	121.8	120.7	121.2	119.8	119.9	122.1	120.6	120.9
Clinker Prod. (tph)	78.7	79.1	78.5	78.8	77.9	77.9	79.4	78.4	78.6
Cement Plant Fan									
Temp. (°F)	742	742	752	745	766	766	753	762	754
Current (amp)	121	122	122	122	119	123	122	121	121
Damper (%)	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
Oxygen (%)	5.26	4.41	5.90	5.19	5.37	4.41	5.90	5.23	5.21
CO (ppm)	332	438	277	349	358	438	277	358	353
Preheater									
Exit Temp. (°F)	778	776	818	791	792	793	778	788	789
Internal Temp. (°F)	1384	1313	1283	1327	1210	1195	1200	1202	1264
Meal Temp. (°F)	1356	1356	1378	1363	1323	1320	1299	1314	1339
Kiln Inlet									
Temp. (°F)	1650	1712	1633	1665	1534	1543	1534	1537	1601
Draft (in. H2O)	0.65	0.55	0.6	0.60	0.88	1.00	0.98	0.95	0.78
Oxygen (%)	8.91	9.14	9.12	9.06	4.84	8.74	NR	6.79	7.92
Combustibles (%)	-0.11	-0.1	-0.11	-0.11	-0.12	-0.06	-0.01	-0.06	-0.09
Bag House									
Inlet Temp (°F)	404	411	410	408	394	392	406	397	403
Fan Speed (%)	74	74	74	74	73	73	73	73	74
Current (amp)	3227	3205	3203	3212	3136	3325	3202	3221	3216
Pressure Drop (in. H2O)	8.1	8.3	7.6	8.0	7.3	7.6	7.6	7.5	7.8
Stack									
Oxygen (%)	6.6	6.3	6.4	6.4	7.0	6.7	6.6	6.8	6.6
NOx (ppm)	146	145	151	147	160	130	168	153	150
Opacity (%)	4.6	3.8	4.3	4.2	3.6	3.8	3.8	3.7	4.0
Gas Flow (dscfm)	595,996	600,856	612,251	603,034	579,265	608,364	605,024	597,551	600,293

NR - Not reported on hourly basis

APPENDIX

PARTICULATE MATTER
HYDROGEN CHLORIDE
METALS
SPECIATED VOLATILE ORGANIC COMPOUNDS
CARBON MONOXIDE, TOTAL HYDROCARBONS
AND NITROGEN OXIDES MONITORING DATA
VISIBLE EMISSIONS
PLANT INFORMATION
COAL ANALYSES
EQUIPMENT CALIBRATIONS
CALIBRATION GAS CERTIFICATES
PROJECT PARTICIPANTS

PARTICULATE MATTER

GENERAL DATA

DATA FILE NAME: HCLPT-BL

Company : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 Source/Unit : CPL STACK - ~~HCL~~ & PART.- BASELINE
 Date : JULY 21, 1992 Cp : 0.840
 Stack dia. : 223.80 inch OR : Duct Length : 0.00 inch
 Oxygen Corr.: 0.0 percent Duct Width : 0.00 inch
 Std. Temp. : 68 dF

FUEL ANALYSIS DATA,
(for calculating F-Factor)

Process Wt.

Hydrogen, wt% :	0.00	Run 1 :	0.0 tons/hr
Carbon, wt% :	0.00	Run 2 :	0.0
Sulfur, wt% :	0.00	Run 3 :	0.0
Nitrogen, wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

RUN	RUN	RUN
1	2	3

Meter Temp., Tm (dF)	104.00	100.00	98.00
Stack Temp., Ts (dF)	358.60	364.90	358.00
Sq.Rt. dP	0.888	0.901	0.909
dH (in. H2O)	1.23	1.23	1.21
Meter Vol., Vm (ft3)	81.231	80.871	78.931
Meter Y	0.998	0.998	0.998
Bar. Press., Pb (in.Hg.)	30.25	30.25	30.25
Vol. H2O, Vlc (ml)	162.6	173.2	153.8
Static Press., Ps (in.H2O)	-1.10	-1.10	-1.10
Test Time (min.)	128.0	128.0	128.0
Nozzle Dia., Dn (in.)	0.224	0.224	0.224
Oxygen, O2 (%)	9.50	10.20	9.50
Carbon Dioxide, CO2 (%)	12.10	11.00	12.00
Carbon Monoxide, CO (%)	0.00	0.00	0.00

Is this Method 5 or Method 5/8 ? (5 or 58) : 5

LABORATORY RESULTS

RUN	RUN	RUN
1	2	3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH)	0.01980	0.01820	0.01690	grams
Filterable Particulate (MF)	0.03330	0.02660	0.02290	
Condensable Particulate (BHW)	0.00000	0.00000	0.00000	

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)	0.00	0.00	0.00	mg H2SO4
Sample Volume, ml	0	0	0	
Sample Aliquot, ml	0	0	0	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - ~~HCL~~ & PART. - BASEL

RUN NO.: 1
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 104 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 358.6 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.789 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 81.231 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 162.6 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.50 % O2 0.00 % CO
12.10 % CO2 78.40 % N2

$$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.960 \text{ dscf}$$

$$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.654 \text{ scf}$$

$$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.090 \text{ : Lower : Bws}$$

$$Bws @ \text{Saturated Conditions} = \text{Vapor Press. of H2O} \text{ : value}$$

$$@ \text{Dew Point Temp.} / (Ps, \text{ in.Hg.}) \dots = 1.000 \text{ : used.}$$

$$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 84.84$$

$$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.32$$

$$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.20$$

$$P(stack) = Pbar + (Ps / 13.6) \dots = 30.17 \text{ in. Hg}$$

$$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 61.47 \text{ ft/sec}$$

$$Qs = vs \times As \times 60 \dots = 1,007,523 \text{ acf/min}$$

$$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 595,996 \text{ dscf/min}$$

$$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 100.71 \%$$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - ~~HCL~~ & PART.- BASEL

RUN NO.: 2
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F | STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 100.00 DEG. F | PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 364.9 DEG. F | STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.811 in. H2O | DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O | DUCT WIDTH = inch
METER VOL., Vm = 80.871 Cu.Ft. | STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 | TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in.Hg | NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 173.2 ml | NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.20 % O2 0.00 % CO
11.00 % CO2 78.80 % N2

$$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 77.167 \text{ dscf}$$

$$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.153 \text{ scf}$$

$$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096 \text{ | Lower | Bws}$$

$$Bws @ \text{Saturated Conditions} = \text{Vapor Press. of H2O @ Dew Point Temp.} / (Ps, \text{ in.Hg.}) \dots = 1.000 \text{ | value | used.}$$

$$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 96.20$$

$$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [1.28 \times (\%N2 + \%CO)] = 30.17$$

$$Ms = (Md \times (1-Bws)) + (18.0 \times Bws) \dots = 29.01$$

$$P(stack) = Pbar + (Ps / 13.6) \dots = 30.17 \text{ in. Hg}$$

$$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 62.80 \text{ ft/sec}$$

$$Qs = vs \times As \times 60 \dots = 1,029,329 \text{ acf/min}$$

$$Qs(std) = Qs \times (1-Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 600,856 \text{ dscf/min}$$

$$I = (Ts+460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 100.16 \%$$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - ~~HCL~~ & PART.- BASEL

RUN NO.: 3
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 98.00 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 358.0 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.827 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.21 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 78.931 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in. Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 153.8 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.50 % O2 0.00 % CO
12.00 % CO2 78.50 % N2

$$V_m(std) = [T(std) + 460 / 29.92] \times V_m \times Y \times (P_b + (dH / 13.6)) / (T_m + 460) \dots = 75.582 \text{ dscf}$$

$$V_w(std) = (8.9148 \times 10^{-5}) \times (T_{std} + 460) \times V_{lc} = 7.239 \text{ scf}$$

$$B_{ws} = V_w(std) / (V_m(std) + V_w(std)) \dots = 0.087 \text{ ; Lower ; Bws}$$

$$B_{ws} @ \text{Saturated Conditions} = \text{Vapor Press. of H}_2\text{O} @ \text{Dew Point Temp.} / (P_s, \text{ in. Hg.}) \dots = 1.000 \text{ ; value ; used.}$$

$$\%EA = (\%O_2 - 0.5\%CO) / (0.264\%N_2 - (\%O_2 - 0.5\%CO)) \times 100 = 84.64$$

$$M_d = (.44 \times \%CO_2) + (.32 \times \%O_2) + [(.28 \times (\%N_2 + \%CO))] = 30.30$$

$$M_s = (M_d \times (1 - B_{ws})) + (18.0 \times B_{ws}) \dots = 29.22$$

$$P(stack) = P_{bar} + (P_s / 13.6) \dots = 30.17 \text{ in. Hg}$$

$$v_s = 85.49 \times C_P \times (Sq.Rt.dP) \times [Sq.Rt.(T_s + 460) / (M_s \times P(stack))] \dots = 62.89 \text{ ft/sec}$$

$$Q_s = v_s \times A_s \times 60 \dots = 1,030,794 \text{ acf/min}$$

$$Q_s(std) = Q_s \times (1 - B_{ws}) \times ((T_{std} + 460) / (T_s + 460)) \times (P(stack) / 29.92) \dots = 612,251 \text{ dscf/min}$$

$$I = (T_s + 460) \times [(0.002669 \times V_{lc}) + (V_m(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times A_n \times v_s \times 60] \dots = 96.28 \%$$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL STACK - HCL & PART. - BASELINE
DATE : JULY 21, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	162.6	173.2	153.8
Vm = Sample gas vol, meter cond., dacf	81.231	80.871	78.931
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.25	30.25	30.25
Pstatic = Stack static pressure, in. H2O	-1.10	-1.10	-1.10
dH = Avg meter pressure diff, in. H2O	1.23	1.23	1.21
Tm = Absolute meter temp., degrees R	564.0	560.0	558.0
Vm(std) = Sample gas vol, Std. cond., dscf	76.960	77.167	75.582
Bws = Water vapor in gas stream, fraction	0.090	0.096	0.087
MF = Moisture factor (1 - Bws)	0.910	0.904	0.913
CO2 = Carbon Dioxide, dry, volume %	12.10	11.00	12.00
O2 = Oxygen, dry, volume %	9.50	10.20	9.50
N2 = Nitrogen, dry volume %	78.40	78.80	78.50
Md = Molecular weight of stack gas, dry	30.32	30.17	30.30
Ms = Molecular weight of stack gas, wet	29.20	29.01	29.22
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8880	0.9007	0.9092
Ts = Absolute stack temp., degrees R	818.6	824.9	818.0
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	595,996	600,856	612,251
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
O = Sample time, minutes	128.00	128.00	128.00
%I = Isokinetic variation, percent	100.71	100.16	96.28

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL STACK - ~~HCL~~ & PART.- BASELINE
DATE : JULY 21, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	53.10	44.80	39.80
Meter Volume, standard cond., Vm(std)	76.960	77.167	75.582
Carbon Dioxide, percent	12.10	11.00	12.00
Oxygen, percent	9.50	10.20	9.50
Particulate Concentration :			
gr/scf	0.0097	0.0081	0.0074
gr/dscf	0.0106	0.0090	0.0081
gr/dscf @ 12 % CO2	0.0106	0.0098	0.0081
gr/dscf @ 0% O2	0.0194	0.0174	0.0148

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL STACK - HCL & PART. - BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

Front Half Wash (FHW)	0.01980 grams	Vm(std)	76.960 ft3
Mass Filter (MF)	0.03330 grams	Vw(std)	7.654 ft3
Back Half Wash (BHW)	0.00000 grams	Qs(std)	595,996 dscfm
Front Half Sulfate (FHS)	mg H2SO4	Bws	0.090
Back Half Sulfate (BHS)	mg H2SO4	CO2	12.10 %
H2O2 Catch (SO2)	mg H2SO4	O2	9.50 %

F-FACTOR

$10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(T_{std} + 460)/528]$ dscf/MMBtu

FILTERABLE PARTICULATE

$15.432 \times (FHW + MF) / [Vm(std) + Vw(std)]$	0.0097 gr/scf
$15.432 \times (FHW + MF) / Vm(std)$	0.0106 gr/dscf
gr/dscf x (12 / %CO2)	0.0106 @ 12% CO2
gr/dscf x [(21 - Oxygen corr.) / (21 - %O2)]	0.0194 @ 0% O2
$0.00857 \times Qs(std) \times gr/dscf$	54.38 lb/hr
$F-Fac \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times gr/dscf$..	lb/MMBtu

TOTAL PARTICULATE

$15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))]$...	0.0097 gr/scf
$15.432 \times (FHW + MF + BHW) / Vm(std)$	0.0106 gr/dscf
gr/dscf x (12 / %CO2)	0.0106 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)]	0.0194 @ 0% O2
$0.00857 \times Qs(std) \times gr/dscf$	54.38 lb/hr
$F-Fac \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times gr/dscf$..	lb/MMBtu

TOTAL SULFATE

$0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)]$	gr/scf
$0.015432 \times (FHS + BHS) / Vm(std)$	gr/dscf
gr/dscf x (12 / %CO2)	@ 12% CO2
$0.00857 \times Qs(std) \times gr/dscf$	lb/hr
$F-Fac \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times gr/dscf$..	lb/MMBtu

SULFUR DIOXIDE (SO2)

$1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)]$	ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)]	@ O2 corr.
ppm x (1 - Bws)	ppm (wet)
$8.223E-5 \times Qs(std) \times 64.062 \times ppm / [T(std) + 460]$..	lb/hr
$F-Factor \times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times [20.9 / (20.9 - \%O_2)] \times ppm$	lb/MMBtu
lb/hr / (dscfm x 60 min/hr)	lb/dscf

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL STACK - HCL & PART. - BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

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*****
Front Half Wash (FHW)      0.01820 grams   : Vm(std)  77.167 ft3
Mass Filter (MF)           0.02660 grams   : Vw(std)   8.153 ft3
Back Half Wash (BHW)       0.00000 grams   : Qs(std) 600,856 dscfm
Front Half Sulfate (FHS)    mg H2SO4 : Bws      0.096
Back Half Sulfate (BHS)    mg H2SO4 : CO2       11.00 %
H2O2 Catch (SO2)          mg H2SO4 : O2        10.20 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0081 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0090 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0098 @ 12% CO2
gd/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0174 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 46.13 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0081 gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)) ..... 0.0090 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0098 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0174 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 46.13 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
-----
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```


EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL STACK - ~~HCL~~ & PART. - BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.01690 grams      | Vm(std)  75.582 ft3
Mass Filter (MF)           0.02290 grams      | Vw(std)   7.239 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 612,251 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.087
Back Half Sulfate (BHS)    mg H2SO4      | CO2       12.00 %
H2O2 Catch (SO2)          mg H2SO4      | O2        9.50 %
*****
```

F-FACTOR

 $10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [T_{std} + 460] / 5280$ dscf/MMBtu

FILTERABLE PARTICULATE

 $15.432 \times (FHW + MF) / [Vm(std) + Vw(std)]$ 0.0074 gr/scf
 $15.432 \times (FHW + MF) / Vm(std)$ 0.0081 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0081 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0148 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 42.64 lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

TOTAL PARTICULATE

 $15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))]$... 0.0074 gr/scf
 $15.432 \times (FHW + MF + BHW) / Vm(std)$ 0.0081 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0081 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0148 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 42.64 lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

TOTAL SULFATE

 $0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)]$ gr/scf
 $0.015432 \times (FHS + BHS) / Vm(std)$ gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ @ 12% CO2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

SULFUR DIOXIDE (SO2)

 $1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)]$ ppm
 ppm $\times [(20.9 - \text{Oxygen Corr.}) / (20.9 - \%O_2)]$ @ O2 corr.
 ppm $\times (1 - Bws)$ ppm (wet)
 $8.223E-5 \times Qs(std) \times 64.062 \times \text{ppm} / [T(std) + 460]$.. lb/hr
 $F\text{-Factor} \times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times [20.9 / (20.9 - \%O_2)] \times \text{ppm}$ 1b/MMBtu
 lb/hr / (dscfm $\times 60 \text{ min/hr}$) 1b/dscf

Plant: Fla Crushed Stone
Sample Loc.: CPZ Stack (Baseline)
Control Type: Baghouse
Sample Type: HCL Part
Date: 7-25-92 Run No.: 1
Time Start: 0925 Time End: 1150
Sample Time: 8 min/port 128 total min.
Dry Bulb: °F Wet Bulb: °F VP @ DP:
Bar. Pressure: 30.25 "Hg Stack Press.: 30.17 "Hg Ps: 1.1 "H2O
Moisture: 7 % FDA: Gas Density Factor:
Temperature: 88 °F Wind Dir.: E Wind Speed: 3-8
Weather: Clear Thermocouple Readout: KA-1
Sample Box #: KA-1 Meter Box No.: KA-1
Meter Y: 100998 @ Delta H: 1.658 Pitot Corr.: 0.84
Nozzle Diameter: 0.224 in. Probe Length: 8 ft
Probe Heater Setting: 4 Nomograph Cf: 1.56
Stack Dimentions: 223.8 in Umbilical: 100'
Stack Area: 273.18 ft² Thermocouple
Effective Stack Area: 273.18 ft² Probe No.: KA-77
Stack Height: ft Pitot Tube: KA-SI

Material Processing Rate:
Final Gas Meter Reading: 387.931 ft³
Initial Gas Meter Reading: 306.700 ft³
Total Metered Gas Volume: 81.231 ft³
Condensate Gain in Impingers: 150 mL
Weight Gain in Silica Gel: 12.6 g
Total Moisture Gain: 162.6 mL
Silica Gel Container No.: 1
Filter Number:

Leak Check - Meter Box
Initial: 0.011 cfm @ 15 in. H2O
Final: 0.00 cfm @ 4 in. H2O

Leak Check - Pitot Tubes
Impact 3 "H2O for 15 sec: Stable Leak
Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bell

Stack Test Observers: O2 9.5
CO2 12.1

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				0.888		1.23	358.6			104		
1-1-1			6.7	0.70	1.09	1.09	362	252	76	92	3	
2			9.2	0.70	1.09	1.09	362	256	62	92	3	
2-1			11.6	0.72	1.12	1.12	363	253	63	93	3	
2			14.0	0.75	1.17	1.17	366	250	63	94	3	
3-1			16.4	0.75	1.17	1.17	365	262	63	96	3	
2			18.8	0.77	1.2	1.2	364	249	63	98	3	
4-1-1			21.1	0.75	1.17	1.17	364	263	63	99	3	
2			23.7	0.78	1.22	1.22	367	267	62	101	3	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			26.2	0.79	1.23	1.23	346	265	72	102	3	
2			28.8	0.79	1.23	1.23	372	264	60	102	3	
2-1			31.3	0.79	1.23	1.23	373	264	60	103	3	
2			33.9	0.81	1.26	1.26	371	265	59	103	3	
3-1			36.4	0.79	1.23	1.23	369	272	57	105	3	
2			39.0	0.79	1.23	1.23	366	258	58	106	3	
4-1			41.6	0.70	1.09	1.09	364	261	57	108	3	
2			44.0	0.74	1.15	1.15	362	262	61	108	3	
3-1-1			46.5	0.82	1.28	1.28	354	257	64	106	3	
2			49.1	0.87	1.36	1.36	363	254	62	107	4	
2-1			51.7	0.87	1.36	1.36	362	252	61	108	4	
3-2			54.3	0.88	1.37	1.37	359	257	63	108	4	
3-1			57.0	0.88	1.37	1.37	359	245	63	108	4	
2			59.6	0.85	1.33	1.33	357	245	64	108	4	
4-1			62.3	0.78	1.22	1.22	328	232	65	108	4	
2			64.8	0.78	1.22	1.22	324	254	66	109	4	
4-1-1			67.4	0.83	1.29	1.29	344	261	72	108	3	
2			70.1	0.83	1.29	1.29	353	259	62	108	3	
2-1			72.6	0.83	1.29	1.29	354	251	60	109	3	
2			75.2	0.80	1.25	1.25	355	245	61	110	3	
3-1			77.7	0.80	1.25	1.25	358	259	62	111	3	
2			79.0	0.80	1.25	1.25	357	257	62	111	3	
4-1			82.8	0.74	1.15	1.15	356	263	62	111	3	
2			85.4	0.77	1.2	1.2	357	258	64	111	3	

Plant: Fla Crushed Stone
 Sample Loc.: CPL Stack (Baseline)
 Control Type: Baghouse
 Sample Type: HCL & Part
 Date: 7-21-92 Run No.: 332
 Time Start: 1302 Time End: 1521
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.25 "Hg Stack Press.: 30.17 "Hg Ps: -1.1 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-7
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.1 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-SI

Material Processing Rate:
 Final Gas Meter Reading: 469.071 ft³
 Initial Gas Meter Reading: 388.200 ft³
 Total Metered Gas Volume: 80.871 ft³
 Condensate Gain in Impingers: 160 mL
 Weight Gain in Silica Gel: 13.2 g
 Total Moisture Gain: 173.2 mL
 Silica Gel Container No.: 3
 Filter Number:

Leak Check - Meter Box

Initial: 0.009 cfm @ 15 in. H2O
 Final: 0.00 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak
 Static 3 "H2O for 15 sec: Stable, Leak



Test Conducted By: R Paul - Bell

Stack Test Observers: O2 10.2
CO2 11.0

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.807</u>		<u>1.23</u>	<u>364.9</u>			<u>100</u>		
1-1-1			<u>88.2</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>370</u>	<u>249</u>	<u>72</u>	<u>102</u>	<u>4</u>	
2			<u>90.8</u>	<u>0.85</u>	<u>1.29</u>	<u>1.29</u>	<u>369</u>	<u>248</u>	<u>54</u>	<u>101</u>	<u>4</u>	
2-1			<u>93.3</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>367</u>	<u>251</u>	<u>53</u>	<u>101</u>	<u>4</u>	
2			<u>95.9</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>365</u>	<u>245</u>	<u>53</u>	<u>101</u>	<u>4</u>	
3-1			<u>98.7</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>368</u>	<u>250</u>	<u>55</u>	<u>101</u>	<u>4</u>	
2			<u>400.9</u>	<u>0.85</u>	<u>1.29</u>	<u>1.29</u>	<u>364</u>	<u>250</u>	<u>56</u>	<u>101</u>	<u>4</u>	
4-1			<u>3.1</u>	<u>0.80</u>	<u>1.22</u>	<u>1.22</u>	<u>354</u>	<u>247</u>	<u>56</u>	<u>101</u>	<u>4</u>	
2			<u>5.9</u>	<u>0.75</u>	<u>1.14</u>	<u>1.14</u>	<u>349</u>	<u>250</u>	<u>57</u>	<u>101</u>	<u>4</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (°Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			8.4	0.88	1.34	1.34	343	261	63	100	4	
2			11.0	0.83	1.26	1.26	368	258	58	100	4	
2-1			13.5	0.90	1.37	1.37	368	243	58	100	4	
2			16.1	0.83	1.26	1.26	367	260	59	100	4	
3-1			18.8	0.83	1.26	1.26	366	250	60	100	4	
2			21.4	0.83	1.26	1.26	365	254	61	100	4	
4-1			24.0	0.75	1.14	1.14	366	257	62	100	4	
2			26.4	0.75	1.14	1.14	367	260	63	100	4	
3-1			28.8	0.80	1.22	1.22	369	256	69	101	4	
2			31.4	0.80	1.22	1.22	372	260	66	101	4	
3-1			34.1	0.83	1.26	1.26	376	256	62	101	4	
2			36.6	0.83	1.26	1.26	379	255	62	100	4	
3-1			39.1	0.83	1.26	1.26	379	259	60	99	4	
2			41.6	0.80	1.22	1.22	380	261	60	99	4	
4-1			44.1	0.80	1.22	1.22	379	257	59	99	4	
2			46.6	0.77	1.17	1.17	377	261	59	95	4	
4-1-1			49.0	0.85	1.29	1.29	366	249	66	99	4	
2			51.6	0.80	1.22	1.22	376	240	62	99	4	
2-1			54.1	0.84	1.28	1.28	377	237	61	99	4	
2			56.9	0.84	1.28	1.28	378	234	61	99	4	
3-1			59.6	0.82	1.25	1.25	380	231	60	99	4	
2			62.0	0.82	1.25	1.25	381	234	60	99	4	
4-1			64.5	0.69	1.05	1.05	307	238	61	99	4	
2			66.8	0.69	1.05	1.05	289	242	61	99	4	

Plant: Fla. Crushed Stone
 Sample Loc.: C.P. 2 Stack (Baseline)
 Control Type: Bag House
 Sample Type: HCL & Part
 Date: 7-21-92 Run No.: 3
 Time Start: 1612 Time End: 1831
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.25 "Hg Stack Press.: 30.17 "Hg Ps: 1.1 "H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-7
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.5 in.
 Probe Heater Setting: 4 Nomograph Cf: 1.47
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 548.400 ft³
 Initial Gas Meter Reading: 469.469 ft³
 Total Metered Gas Volume: 78.931 ft³
 Condensate Gain in Impingers: 140 mL
 Weight Gain in Silica Gel: 138 g
 Total Moisture Gain: 1538 mL
 Silica Gel Container No.: 16
 Filter Number:

Leak Check - Meter Box

Initial: 0.00 cfm @ 15 in. H₂O
 Final: 0.00 cfm @ 4 in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable Leak
 Static 3 "H₂O for 15 sec: Stable Leak



Test Conducted By:

R Paul - L Bull

Stack Test Observers:

02 9.5
CO₂ 12.0

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				<u>0.9092</u>		<u>1.21</u>	<u>358</u>			<u>98</u>		
<u>1-1-1</u>			<u>69.4</u>	<u>0.80</u>	<u>1.18</u>	<u>1.18</u>	<u>370</u>	<u>248</u>	<u>78</u>	<u>95</u>	<u>4</u>	
<u>2</u>			<u>71.9</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>370</u>	<u>234</u>	<u>67</u>	<u>95</u>	<u>4</u>	
<u>2-1</u>			<u>74.1</u>	<u>0.86</u>	<u>1.26</u>	<u>1.26</u>	<u>371</u>	<u>235</u>	<u>63</u>	<u>95</u>	<u>4</u>	
<u>2</u>			<u>76.8</u>	<u>0.86</u>	<u>1.26</u>	<u>1.26</u>	<u>371</u>	<u>231</u>	<u>63</u>	<u>96</u>	<u>4</u>	
<u>3-1</u>			<u>79.2</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>370</u>	<u>237</u>	<u>62</u>	<u>97</u>	<u>4</u>	
<u>2</u>			<u>81.7</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>368</u>	<u>242</u>	<u>62</u>	<u>98</u>	<u>4</u>	
<u>4-1</u>			<u>84.1</u>	<u>0.70</u>	<u>1.03</u>	<u>1.03</u>	<u>307</u>	<u>233</u>	<u>63</u>	<u>99</u>	<u>3</u>	
<u>2</u>			<u>86.5</u>	<u>0.70</u>	<u>1.03</u>	<u>1.03</u>	<u>253</u>	<u>240</u>	<u>64</u>	<u>99</u>	<u>3</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			88.7	0.83	1.22	1.22	357	253	73	100	4	
2			91.2	0.83	1.22	1.22	366	249	65	100	4	
2-1			93.7	0.83	1.22	1.22	366	259	64	100	4	
2			96.1	0.83	1.22	1.22	363	251	64	100	4	
3-1			98.6	0.83	1.22	1.22	361	250	64	99	4	
2			50.1	0.78	1.15	1.15	364	248	64	98	4	
4-1			3.3	0.83	1.22	1.22	370	253	65	98	4	
2			6.0	0.83	1.22	1.22	371	259	64	98	4	
3-1-1			8.5	0.83	1.22	1.22	369	271	68	98	4	
2			11.0	0.83	1.22	1.22	374	269	61	98	4	
2-1			13.2	0.83	1.22	1.22	296	247	59	99	4	
2			16.0	0.83	1.22	1.22	302 298	248	58	99	4	
3-1			18.4	0.83	1.22	1.22	298	242	58	100	4	
2			21.0	0.85	1.25	1.25	307	247	59	100	4	
4-1			23.5	0.83	1.22	1.22	378	253	60	100	4	
2			25.9	0.83	1.22	1.22	382	252	56	100	4	
4-1-1			28.4	0.85	1.25	1.25	384	262	67	99	4	
2			31.0	0.88	1.29	1.29	381	253	61	99	4	
2-1			33.4	0.83	1.22	1.22	379	257	60	99	4	
2			35.9	0.85	1.25	1.25	379	250	60	99	4	
3-1			38.4	0.85	1.25	1.25	383	241	60	99	4	
2			41.0	0.85	1.25	1.25	388	263	60	98	4	
4-1			43.5	0.82	1.21	1.21	384	251	60	98	4	
2			45.9	0.88	1.29	1.29	384	243	60	98	4	

SAMPLING RATE CALCULATIONS

Date 7-21-92

Plant Name FCI

Location CP2-Stack

Source Baseline

- ΔH = Orifice Reading (Inches H_2O)
 D_n = Nozzle Diameter (Inches)
 ΔH_e = Meter Box Constant
 B_w = Moisture Fraction
 T_m = Meter Temperature ($^{\circ}F$)
 T_s = Stack Temperature ($^{\circ}F$)
 M_s = Wet Molecular Weight of Stack Gas (From Table)
 ΔP = Pitot Reading (Inches H_2O)

$$\left[\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_e (D_n)^4 17741 \right] \Delta P = \Delta H, 75.85$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{558}{28.3 (810)} 22923$$

$$\frac{555}{28.0 (820)} 22960$$

$$\frac{570}{28.0 (820)} 22960$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	0.0243	0.0248	0.0242
$\times (1 - B_w)^2 =$	0.8649	0.8281	0.8281
$\times \Delta H_e =$	1.658	1.658	1.658
$\times (D_n)^4 =$	0.0025	0.0025	0.0025
$\times 17741 =$	17741	17741	17741
$\times \Delta P =$	1.56	1.52	1.47
	619.3		



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GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

PARTICULATE LAB DATA SHEET

TEST DATE 7-21-92

PLANT NAME Fla Crushed Stone

SOURCE CPL Stack - Part

Baseline

	Run 1	Run 2	Run 3	Blank
Container No.	<u>KA-900</u>	<u>KA-902</u>	<u>KA-42</u>	<u>KA-44</u>
Total Volume (ml)	<u>240</u>	<u>200</u>	<u>200</u>	<u>200</u>
Aliquot Evaporated (ml)	<u>240</u>	<u>200</u>	<u>200</u>	<u>200</u>
Final Weight (g)	<u>101.3388</u>	<u>101.8104</u>	<u>98.5818</u>	<u>98.4874</u>
Tare Weight (g)	- <u>101.3190</u>	- <u>101.7922</u>	- <u>98.5649</u>	- <u>98.4870</u> ^{RP}
Gross Weight Gained (g)	<u>0.0198</u>	<u>0.0182</u>	<u>0.0169</u>	<u>0.0002</u> <u>98.4874</u>
Average Blank (g)	- <u>0</u>	- <u>—</u>	- <u>—</u>	- <u>—</u>
Net Weight (g)	<u>0.0198</u>	<u>0.0182</u>	<u>0.0169</u>	<u>—</u>
Aliquot Factor	x <u>1.0</u>	x <u>1.0</u>	x <u>1.0</u>	x <u>—</u>
Total Net Weight (mg)	<u>19.8</u>	<u>18.2</u>	<u>16.9</u>	<u>—</u>
Container No.	<u>1-C</u>	<u>2-C</u>	<u>3-C</u>	<u>4-F</u>
Filter No.	<u>5Q</u>	<u>6Q</u>	<u>7Q</u>	<u>—</u>
Final Weight (g)	<u>0.5031</u>	<u>0.4929</u>	<u>0.4924</u>	<u>—</u>
Tare Weight (g)	- <u>0.4698</u>	- <u>0.4663</u>	- <u>0.4695</u>	- <u>—</u>
Gross Weight Gained (g)	<u>0.0333</u>	<u>0.0266</u>	<u>0.0229</u>	<u>—</u>
Average Blank (g)	- <u>—</u>	- <u>—</u>	- <u>—</u>	- <u>—</u>
Total Net Weight (mg)	<u>33.3</u>	<u>26.6</u>	<u>22.9</u>	<u>—</u>

Tare Balance Check

0.0 0.0000 10.0 10.0000
1.0 1.0002 50.0 50.0005
5.0 5.0003 100.0 100.0007
T/H 77

Final Balance Check

0.0 0.0000 10.0 10.0001
1.0 1.0002 50.0 50.0009
5.0 5.0002 100.0 100.0009
T/H —

By RC Paul

Date 7-23-92

By 7-24-92

Date RC Paul

CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name Fla Crushed Stone
 Sample Location Brooksville Fla
CPI Stack (Baseline)

HCL by Ion Chromatography

Sample Identification	Remarks
1-BZ-P	Probe Wash Run 1
2-BZ-P	} } }
3-BZ-P	
1-BZ-F	
2-BZ-F	Filter Run 1
3-BZ-F	} } }
1-BZ-H	
2-BZ-H	
3-BZ-H	} } }
1-3-16	

RUN HCL
 " "
 " "

Sampled By: (Signature) RC Paul Date: 7-21-92 Time: See data

Relinquished By: (Sign) RC Paul Date: 7-24-92 Time: 0857

Received By: (Sign) Jim D Tanner Date: 7/24/92 Time: 0857

Relinquished By: (Sign) Jim D Tanner Date: 7/24/92 Time: 1540

Received By: (Sign) _____ Date: _____ Time: _____

Relinquished By: (Sign) _____ Date: _____ Time: _____

Received By Lab: (Sign) Tom Park APB Date: 7/24/92 Time: 1540

Sample Shipped VIA: _____ UPS _____ Fed Express _____ Bus _____

Shipping Bill Number: _____



Best Available Copy

CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name Fla Crushed Stone
 Sample Location Brooksville, Fla
CPL Stack (Baseline)

Sample Identification	Remarks
<u>1-BZ-H</u>	<u>Impinger Catch for HCL Run</u>
<u>2-BZ-H</u>	<u>2</u>
<u>3-BZ-H</u>	<u>3</u>
	<u>HCL by Don Chromatography</u>

Sampled By: (Signature) RC Paul Date: 7-21-92 Time: See data

Relinquished By: (Sign) RC Paul Date: 7-24-92 Time: 0857

Received By: (Sign) Jim D Tanner Date: 7-24-92 Time: 0857

Relinquished By: (Sign) Jim D Tanner Date: 7-24-92 Time: 1540

Received By: (Sign) _____ Date: _____ Time: _____

Relinquished By: (Sign) _____ Date: _____ Time: _____

Received By Lab: (Sign) Tom Paul AM Date: 7/24/92 Time: 1540

Sample Shipped VIA: _____ UPS _____ Fed Express _____ Bus _____

Shipping Bill Number: _____



HYDROGEN CHLORIDE



GENERAL DATA

DATA FILE NAME: HCLPT-BL

Company : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 Source/Unit : CPL STACK - HCL & ~~PART.~~ - BASELINE
 Date : JULY 21, 1992 Cp : 0.840
 Stack dia. : 223.80 inch OR : Duct Length : 0.00 inch
 Oxygen Corr.: 0.0 percent Duct Width : 0.00 inch
 Std. Temp. : 68 dF

FUEL ANALYSIS DATA,
(for calculating F-Factor)

Process Wt.

Hydrogen, wt% :	0.00	Run 1 :	0.0 tons/hr
Carbon, wt% :	0.00	Run 2 :	0.0
Sulfur, wt% :	0.00	Run 3 :	0.0
Nitrogen, wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

RUN	RUN	RUN
1	2	3

Meter Temp., Tm (dF)	104.00	100.00	98.00
Stack Temp., Ts (dF)	358.60	364.90	358.00
Sq.Rt. dP	0.888	0.901	0.909
dH (in. H2O)	1.23	1.23	1.21
Meter Vol., Vm (ft3)	81.231	80.871	78.931
Meter Y	0.998	0.998	0.998
Bar. Press., Pb (in.Hg.)	30.25	30.25	30.25
Vol. H2O, Vlc (ml)	162.6	173.2	153.8
Static Press., Ps (in.H2O)	-1.10	-1.10	-1.10
Test Time (min.)	128.0	128.0	128.0
Nozzle Dia., Dn (in.)	0.224	0.224	0.224
Oxygen, O2 (%)	9.50	10.20	9.50
Carbon Dioxide, CO2 (%)	12.10	11.00	12.00
Carbon Monoxide, CO (%)	0.00	0.00	0.00

Is this Method 5 or Method 5/8 ?

(5 or 58) :

5

LABORATORY RESULTS

RUN	RUN	RUN
1	2	3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH)	0.00000	0.00000	0.00000	grams
Filterable Particulate (MF)	0.00000	0.00000	0.00000	
Condensable Particulate (BHW)	0.06140	0.07850	0.06640	

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)	0.00	0.00	0.00	mg H2SO4
Sample Volume, ml	0	0	0	
Sample Aliquot, ml	0	0	0	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - HCL & ~~PART.~~ - BASEL

RUN NO.: 1
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 104 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 358.6 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.789 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 81.231 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 162.6 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.50 % O2 0.00 % CO
12.10 % CO2 78.40 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots\dots = 76.960 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.654 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots\dots\dots = 0.090$: Lower
: Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 84.84$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.32$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots\dots\dots = 29.20$

$P(stack) = Pbar + (Ps / 13.6) \dots\dots\dots = 30.17 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots\dots\dots = 61.47 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots\dots\dots = 1,007,523 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots\dots\dots = 595,996 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots\dots\dots = 100.71 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - HCL & ~~PART.~~ - BASEL

RUN NO.: 2
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 100.00 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 364.9 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.811 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 80.871 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 173.2 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.20 % O2 0.00 % CO
11.00 % CO2 78.80 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots\dots = 77.167 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.153 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots\dots\dots = 0.096$: Lower
: Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 96.20$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [1.28 \times (\%N2 + \%CO)] = 30.17$

$Ms = (Md \times (1-Bws)) + (18.0 \times Bws) \dots\dots\dots = 29.01$

$P(stack) = Pbar + (Ps / 13.6) \dots\dots\dots = 30.17 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots\dots\dots = 62.80 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots\dots\dots = 1,029,329 \text{ acf/min}$

$Qs(std) = Qs \times (1-Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots\dots\dots = 600,856 \text{ dscf/min}$

$I = (Ts+460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots\dots\dots = 100.16 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - HCL & ~~PART~~ - BASEL

RUN NO.: 3
DATE : JULY 21, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 98.00 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 358.0 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.827 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.21 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 78.931 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.25 in. Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 153.8 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.50 % O2 0.00 % CO
12.00 % CO2 78.50 % N2

$V_m(std) = [T(std) + 460 / 29.92] \times V_m \times Y \times$
 $(P_b + (dH / 13.6)) / (T_m + 460) \dots = 75.582 \text{ dscf}$

$V_w(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.239 \text{ scf}$

$Bws = V_w(std) / (V_m(std) + V_w(std)) \dots = 0.087$: Lower
: Bws

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

$\%EA = (\%O_2 - 0.5\%CO) / (0.264\%N_2 - (\%O_2 - 0.5\%CO)) \times 100 = 84.64$

$Md = (.44 \times \%CO_2) + (.32 \times \%O_2) + [1.28 \times (\%N_2 + \%CO)] = 30.30$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.22$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.17 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))]$:
= 62.89 ft/sec

$Qs = vs \times As \times 60 \dots = 1,030,794 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 612,251 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 96.28 \%$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 CPL STACK - HCL & PART. - BASELINE
 DATE : JULY 21, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	162.6	173.2	153.8
Vm = Sample gas vol, meter cond., dacf	81.231	80.871	78.931
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.25	30.25	30.25
Pstatic = Stack static pressure, in. H2O	-1.10	-1.10	-1.10
dH = Avg meter pressure diff, in. H2O	1.23	1.23	1.21
Tm = Absolute meter temp., degrees R	564.0	560.0	558.0
Vm(std) = Sample gas vol, Std. cond., dscf	76.960	77.167	75.582
Bws = Water vapor in gas stream, fraction	0.090	0.096	0.087
MF = Moisture factor (1 - Bws)	0.910	0.904	0.913
CO2 = Carbon Dioxide, dry, volume %	12.10	11.00	12.00
O2 = Oxygen, dry, volume %	9.50	10.20	9.50
N2 = Nitrogen, dry volume %	78.40	78.80	78.50
Md = Molecular weight of stack gas, dry	30.32	30.17	30.30
Ms = Molecular weight of stack gas, wet	29.20	29.01	29.22
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8880	0.9007	0.9092
Ts = Absolute stack temp., degrees R	818.6	824.9	818.0
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	595,996	600,856	612,251
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
Q = Sample time, minutes	128.00	128.00	128.00
%I = Isokinetic variation, percent	100.71	100.16	96.28

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 CPL STACK - HCL & ~~PART.~~ - BASELINE
 DATE : JULY 21, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	61.40	78.50	66.40
Meter Volume, standard cond., Vm(std)	76.960	77.167	75.582
Carbon Dioxide, percent	12.10	11.00	12.00
Oxygen, percent	9.50	10.20	9.50
Particulate Concentration :			
gr/scf	0.0112	0.0142	0.0124
gr/dscf	0.0123	0.0157	0.0136
gr/dscf @ 12 % CO2	0.0122	0.0171	0.0136
gr/dscf @ 0% O2	0.0225	0.0000	0.0000

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL STACK - HCL & PART. - BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  76.960 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   7.654 ft3
Back Half Wash (BHW)       0.06140 grams      | Qs(std) 595,996 dscfm
Front Half Sulfate (FHS)           mg H2SO4 | Bws       0.090
Back Half Sulfate (BHS)           mg H2SO4 | CO2      12.10 %
H2O2 Catch (SO2)           mg H2SO4 | O2       9.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0112 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0123 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0122 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0225 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 62.88 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
-----
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm  

ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.  

ppm x (1 - Bws) ..... ppm (wet)  

8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr  

F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... 1b/MMBtu  

lb/hr / (dscfm x 60 min/hr) ..... 1b/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL STACK - HCL & PART.- BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  77.167 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   8.153 ft3
Back Half Wash (BHW)       0.07850 grams      | Qs(std) 600,856 dscfm
Front Half Sulfate (FHS)           mg H2SO4 | Bws      0.096
Back Half Sulfate (BHS)           mg H2SO4 | CO2      11.00 %
H2O2 Catch (SO2)           mg H2SO4 | O2       10.20 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gd/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0142 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0157 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0171 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0305 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 80.84 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... 1b/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... 1b/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL STACK - HCL & PART. - BASELINE DATE : JULY 21, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      : Vm(std)  75.582 ft3
Mass Filter (MF)           0.00000 grams      : Vw(std)   7.239 ft3
Back Half Wash (BHW)      0.06640 grams      : Qs(std) 612,251 dscfm
Front Half Sulfate (FHS)           mg H2SO4 : Bws      0.087
Back Half Sulfate (BHS)           mg H2SO4 : CO2      12.00 %
H2O2 Catch (SO2)           mg H2SO4 : O2       9.50 %
*****
```

F-FACTOR

 $10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(T_{std} + 460)/528]$ dscf/MMBtu

FILTERABLE PARTICULATE

 $15.432 \times (FHW + MF) / [Vm(std) + Vw(std)]$ 0.0000 gr/scf
 $15.432 \times (FHW + MF) / Vm(std)$ 0.0000 gr/dscf
gr/dscf $\times (12 / \%CO_2)$ 0.0000 @ 12% CO2
gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0000 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 0.00 lb/hr
F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

TOTAL PARTICULATE

 $15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))]$... 0.0124 gr/scf
 $15.432 \times (FHW + MF + BHW) / Vm(std)$ 0.0136 gr/dscf
gr/dscf $\times (12 / \%CO_2)$ 0.0136 @ 12% CO2
gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0248 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 71.14 lb/hr
F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

TOTAL SULFATE

 $0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)]$ gr/scf
 $0.015432 \times (FHS + BHS) / Vm(std)$ gr/dscf
gr/dscf $\times (12 / \%CO_2)$ @ 12% CO2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ lb/hr
F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

SULFUR DIOXIDE (SO2)

 $1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)]$ ppm
ppm $\times [(20.9 - \text{Oxygen Corr.}) / (20.9 - \%O_2)]$ @ O2 corr.
ppm $\times (1 - Bws)$ ppm (wet)
 $8.223E-5 \times Qs(std) \times 64.062 \times \text{ppm} / [T(std) + 460]$.. lb/hr
F-Factor $\times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times$
 $[20.9 / (20.9 - \%O_2)] \times \text{ppm}$ lb/MMBtu
lb/hr / (dscfm $\times 60 \text{ min/hr}$) lb/dscf

Plant: Fla Crushed Stone
 Sample Loc.: CPZ Stack (Baseline)
 Control Type: Baghouse
 Sample Type: HCL Part
 Date: 7-25-92 Run No.: 1
 Time Start: 0925 Time End: 1150
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.25 "Hg Stack Press.: 30.17 "Hg Ps: 1.1 "H2O
 Moisture: 7 % FDA: Gas Density Factor:
 Temperature: 88 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Clear Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 100998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.14 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.56
 Stack Dimentions: 223.8 in Umbilical: 100'
 Stack Area: 273.18 ft² Thermocouple
 Effective Stack Area: 273.18 ft² Probe No.: KA-71
 Stack Height: ft Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 387.931 ft³
 Initial Gas Meter Reading: 306.700 ft³
 Total Metered Gas Volume: 81.231 ft³
 Condensate Gain in Impingers: 150 mL
 Weight Gain in Silica Gel: 12.6 g
 Total Moisture Gain: 112.6 mL
 Silica Gel Container No.: 1
 Filter Number:

Leak Check - Meter Box

Initial: 0.011 cfm @ 15 in. H2O
 Final: 0.00 cfm @ 4 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bell

Stack Test Observers: O2 9.5
CO2 12.1

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				0.888		1.23	358.6			104		
1-1-1			6.7	0.70	1.09	1.09	362	252	76	92	3	
2			9.2	0.70	1.09	1.09	361	256	62	92	3	
2-1			11.6	0.72	1.12	1.12	363	253	63	93	3	
2			14.0	0.75	1.17	1.17	366	250	63	94	3	
3-1			16.4	0.75	1.17	1.17	365	262	63	96	3	
2			18.8	0.77	1.2	1.2	364	249	63	98	3	
4-1-1			21.1	0.75	1.17	1.17	364	263	63	99	3	
2			23.7	0.78	1.22	1.22	367	267	62	101	3	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			26.2	0.79	1.23	1.23	346	265	72	102	3	
2			28.8	0.79	1.23	1.23	372	264	60	102	3	
2-1			31.3	0.79	1.23	1.23	373	264	60	103	3	
2			33.9	0.81	1.26	1.26	371	265	59	103	3	
3-1			36.4	0.79	1.23	1.23	369	272	57	105	3	
2			39.0	0.79	1.23	1.23	366	258	58	106	3	
4-1			41.6	0.70	1.09	1.09	364	261	57	108	3	
2			44.0	0.74	1.15	1.15	362	262	61	108	3	
3-1-1			46.5	0.82	1.28	1.28	354	257	64	106	3	
2			49.1	0.87	1.36	1.36	363	254	62	107	4	
2-1			51.7	0.87	1.36	1.36	362	252	61	108	4	
3-2			54.3	0.88	1.37	1.37	359	257	63	108	4	
3-1			57.0	0.88	1.37	1.37	359	245	63	108	4	
2			59.6	0.85	1.33	1.33	357	245	64	108	4	
4-1			62.3	0.78	1.22	1.22	328	232	65	108	4	
2			64.8	0.78	1.22	1.22	324	254	66	109	4	
4-1-1			67.4	0.83	1.29	1.29	344	261	72	108	3	
2			70.1	0.83	1.29	1.29	353	259	62	108	3	
2-1			72.6	0.83	1.29	1.29	354	251	60	109	3	
2			75.2	0.80	1.25	1.25	355	245	61	110	3	
3-1			77.7	0.80	1.25	1.25	358	259	62	111	3	
2			79.0	0.80	1.25	1.25	357	257	62	111	3	
4-1			82.8	0.74	1.15	1.15	356	263	62	111	3	
2			85.4	0.77	1.2	1.2	357	258	64	111	3	

Plant: Fla Crushed Stone
 Sample Loc.: CP 2 Stack (Baseline)
 Control Type: Baghouse
 Sample Type: HCL & Part
 Date: 7-21-92 Run No.: 302
 Time Start: 1302 Time End: 1521
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.25 "Hg Stack Press.: 30.17 "Hg Ps: -1.1 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 81 in. ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-ST

Material Processing Rate:

Final Gas Meter Reading: 469.071 ft³

Initial Gas Meter Reading: 388.200 ft³

Total Metered Gas Volume: 80.871 ft³

Condensate Gain in Impingers: 160 mL

Weight Gain in Silica Gel: 13.2 g

Total Moisture Gain: 173.2 mL

Silica Gel Container No.: 3

Filter Number:

Leak Check - Meter Box

Initial: 0.009 cfm @ 15 in. H2O

Final: 0.00 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 "H2O for 15 sec: Stable, Leak



Test Conducted By: R Paul - J Bell

Stack Test Observers: O2 10.2

CO2 11.0

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.9007</u>		<u>1.23</u>	<u>364.9</u>			<u>100</u>		
1-1-1			<u>88.2</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>370</u>	<u>249</u>	<u>72</u>	<u>102</u>	<u>4</u>	
2			<u>90.8</u>	<u>0.85</u>	<u>1.29</u>	<u>1.29</u>	<u>369</u>	<u>248</u>	<u>54</u>	<u>101</u>	<u>4</u>	
2-1			<u>93.3</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>367</u>	<u>251</u>	<u>53</u>	<u>101</u>	<u>4</u>	
2			<u>95.9</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>365</u>	<u>245</u>	<u>53</u>	<u>101</u>	<u>4</u>	
3-1			<u>98.7</u>	<u>0.83</u>	<u>1.26</u>	<u>1.26</u>	<u>368</u>	<u>250</u>	<u>55</u>	<u>101</u>	<u>4</u>	
2			<u>400.9</u>	<u>0.85</u>	<u>1.29</u>	<u>1.29</u>	<u>364</u>	<u>250</u>	<u>56</u>	<u>101</u>	<u>4</u>	
4-1			<u>3.1</u>	<u>0.80</u>	<u>1.22</u>	<u>1.22</u>	<u>354</u>	<u>247</u>	<u>56</u>	<u>101</u>	<u>4</u>	
2			<u>5.9</u>	<u>0.75</u>	<u>1.14</u>	<u>1.14</u>	<u>349</u>	<u>250</u>	<u>57</u>	<u>101</u>	<u>4</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			8.4	0.88	1.34	1.34	343	261	63	100	4	
2			11.0	0.83	1.26	1.26	368	258	58	100	4	
2-1			13.5	0.90	1.37	1.37	368	243	58	100	4	
2			16.1	0.83	1.26	1.26	367	260	59	100	4	
3-1			18.8	0.83	1.26	1.26	366	250	60	100	4	
2			21.4	0.83	1.26	1.26	365	254	61	100	4	
4-1			24.0	0.75	1.14	1.14	366	257	62	100	4	
2			26.4	0.75	1.14	1.14	367	260	63	100	4	
3-1			28.8	0.80	1.22	1.22	369	256	69	101	4	
2			31.4	0.80	1.22	1.22	372	260	66	101	4	
3-1			34.1	0.83	1.26	1.26	376	256	62	101	4	
2			36.6	0.83	1.26	1.26	379	255	62	100	4	
3-1			39.1	0.83	1.26	1.26	379	259	60	99	4	
2			41.6	0.80	1.22	1.22	380	261	60	99	4	
4-1			44.1	0.80	1.22	1.22	379	257	59	99	4	
2			46.6	0.77	1.17	1.17	377	261	59	95	4	
4-1-1			49.0	0.85	1.29	1.29	366	249	66	99	4	
2			51.6	0.80	1.22	1.22	376	240	62	99	4	
2-1			54.1	0.84	1.28	1.28	377	237	61	99	4	
2			56.9	0.84	1.28	1.28	378	234	61	99	4	
3-1			59.6	0.82	1.25	1.25	380	231	60	99	4	
2			62.0	0.82	1.25	1.25	381	234	60	99	4	
4-1			64.5	0.69	1.05	1.05	307	238	61	99	4	
2			66.8	0.69	1.05	1.05	289	242	61	99	4	

Plant: Fla Crushed Stone
 Sample Loc.: C.P. 2 Stack (Baseline)
 Control Type: Baghouse
 Sample Type: HCL Part
 Date: 7-21-92 Run No.: 3
 Time Start: 1612 Time End: 1831
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.25 "Hg Stack Press.: 30.17 "Hg Ps: 1.1 "H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.75 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.47
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 548.400 ft³
 Initial Gas Meter Reading: 469.469 ft³
 Total Metered Gas Volume: 78.931 ft³
 Condensate Gain in Impingers: 140 mL
 Weight Gain in Silica Gel: 138 g
 Total Moisture Gain: 1538 mL
 Silica Gel Container No.: 16
 Filter Number:

Leak Check - Meter Box

Initial: 0.00 cfm @ 15 in. H₂O
 Final: 0.00 cfm @ 4 in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable Leak
 Static 3 "H₂O for 15 sec: Stable Leak



Test Conducted By: R Paul - Bell

Stack Test Observers: 02 9.5
CO₂ 12.0

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				<u>0.9092</u>		<u>1.21</u>	<u>358</u>			<u>98</u>		
1-1-1			<u>69.4</u>	<u>0.80</u>	<u>1.18</u>	<u>1.18</u>	<u>370</u>	<u>248</u>	<u>78</u>	<u>95</u>	<u>4</u>	
2			<u>71.9</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>370</u>	<u>234</u>	<u>67</u>	<u>95</u>	<u>4</u>	
2-1			<u>74.1</u>	<u>0.86</u>	<u>1.26</u>	<u>1.26</u>	<u>371</u>	<u>235</u>	<u>63</u>	<u>95</u>	<u>4</u>	
2			<u>76.8</u>	<u>0.86</u>	<u>1.26</u>	<u>1.26</u>	<u>371</u>	<u>231</u>	<u>63</u>	<u>96</u>	<u>4</u>	
3-1			<u>79.2</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>370</u>	<u>237</u>	<u>62</u>	<u>97</u>	<u>4</u>	
2			<u>81.7</u>	<u>0.83</u>	<u>1.22</u>	<u>1.22</u>	<u>368</u>	<u>242</u>	<u>62</u>	<u>98</u>	<u>4</u>	
4-1			<u>84.1</u>	<u>0.70</u>	<u>1.03</u>	<u>1.03</u>	<u>307</u>	<u>233</u>	<u>63</u>	<u>99</u>	<u>3</u>	
2			<u>86.5</u>	<u>0.70</u>	<u>1.03</u>	<u>1.03</u>	<u>253</u>	<u>240</u>	<u>64</u>	<u>99</u>	<u>3</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			88.7	0.83	1.22	1.22	357	253	73	100	4	
2			91.2	0.83	1.22	1.22	366	249	65	100	4	
2-1			93.7	0.83	1.22	1.22	366	259	64	100	4	
2			96.1	0.83	1.22	1.22	363	251	64	100	4	
3-1			98.6	0.83	1.22	1.22	361	250	64	99	4	
2			501.1	0.78	1.15	1.15	364	248	64	98	4	
4-1			3.3	0.83	1.22	1.22	370	253	65	98	4	
2			6.0	0.83	1.22	1.22	371	259	64	98	4	
3-1-1			8.5	0.83	1.22	1.22	369	271	68	98	4	
2			11.0	0.83	1.22	1.22	374	264	61	98	4	
2-1			13.2	0.83	1.22	1.22	296	247	59	99	4	
2			16.0	0.83	1.22	1.22	292 298	248	58	99	4	
3-1			18.4	0.83	1.22	1.22	298	242	58	100	4	
2			21.0	0.84	1.25	1.25	307	247	59	100	4	
4-1			23.5	0.83	1.22	1.22	378	253	60	100	4	
2			25.9	0.83	1.22	1.22	382	252	56	100	4	
4-1-1			28.4	0.85	1.25	1.25	384	262	67	99	4	
2			31.0	0.88	1.29	1.29	381	253	61	99	4	
2-1			33.4	0.83	1.22	1.22	379	257	60	99	4	
2			35.9	0.85	1.25	1.25	379	250	60	99	4	
3-1			38.4	0.85	1.25	1.25	383	241	60	99	4	
2			41.0	0.85	1.25	1.25	388	263	60	98	4	
4-1			43.5	0.82	1.21	1.21	384	251	60	98	4	
2			45.9	0.88	1.29	1.29	384	243	60	98	4	

SAMPLING RATE CALCULATIONS

Date 7-21-92

Plant Name FCI

Location CP-2 Stack

Source Baseline

ΔH = Orifice Reading (Inches H_2O)
 D_n = Nozzle Diameter (Inches)
 ΔH_e = Meter Box Constant
 B_w = Moisture Fraction
 T_m = Meter Temperature ($^{\circ}F$)
 T_s = Stack Temperature ($^{\circ}F$)
 M_s = Wet Molecular Weight of Stack Gas (From Table)
 ΔP = Pitot Reading (Inches H_2O)

$$\left[\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_e (D_n)^4 17741 \right] \Delta P = \Delta H, 75.85$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{558}{28.3 (810)} 22923$$

$$\frac{555}{28.0 (820)} 22960$$

$$\frac{570}{28.0 (820)} 22960$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	0.0243	0.0248	0.0242
$\times (1 - B_w)^2 =$	0.8649	0.8281	0.8281
$\times \Delta H_e =$	1.658	1.658	1.658
$\times (D_n)^4 =$	0.0025	0.0025	0.0025
$\times 17741 =$	17741	17741	17741
$\times \Delta P =$	1.56	1.52	1.47
	619.3		



E N V I R O N M E N T A L L A B O R A T O R I E S , I N C .

August 5, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

Dear Mason:

Enclosed are the results of our analysis of the samples that we received July 24, 1992.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). PPB is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note that the chloride tests were performed by ESE, Inc. of Gainesville, Florida (DHRS#s 82138 and E82067).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

A handwritten signature in black ink that reads 'Tom Park'. The signature is written in a cursive style with a large, sweeping 'T' and a stylized 'P'.

Tom Park
Project Manager

TP/beh

Enclosure



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028

DATE: 08/05/92

DHRS #: 82282, E82001

Table 1. Ion Chromatography Data: Florida Crushed Stone

<u>PPB#</u>	<u>Station ID</u>	<u>HCL</u> <u>(total milligrams)</u>
68655	1-BL-H	61.4
68656	2-BL-H	78.5
68657	3-BL-H	66.4


PROJECT MANAGER

CHAIN OF CUSTODY RECORD

Project Number

307-90-01

Project Name

Fla Crushed Stone

Sample Location

Brooksville Fla

CPI Stack (Baseline)

HCL by Ion Chromatography

Sample Identification

Remarks

1-BZ-P

Probe Wash Run 1

2-BZ-P

2

3-BZ-P

3

1-BZ-F

Filter Run 1

2-BZ-F

2

3-BZ-F

3

1-BZ-H

Inspinger catch HCL Run RUN HCL

2-BZ-H

2

3-BZ-H

3

1-3-16

Selecate Gel Run 1-2-3

Sampled By: (Signature)

RC Paul

Date: 7-21-92

Time: Sec data

Relinquished By: (Sign)

RC Paul

Date: 7-24-92

Time: 0857

Received By: (Sign)

Jim D Tanner

Date: 7/24/92

Time: 0857

Relinquished By: (Sign)

Jim D Tanner

Date: 7/24/92

Time: 1540

Received By: (Sign)

Date:

Time:

Relinquished By: (Sign)

Date:

Time:

Received By Lab: (Sign)

Tom Park

Date: 7/24/92

Time: 1540

Sample Shipped VIA:

UPS

Fed Express

Bus

Shipping Bill Number:



CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name Fla Crushed Stone
 Sample Location Brooksville, Fla
CPL Stack (Baseline)

Sample Identification	Remarks
1-BZ-H	Impinger Catch for HCL Run
2-BZ-H	
3-BZ-H	
	HCL by Don Chromatography

Sampled By: (Signature) RC Paul Date: 7-21-92 Time: See data

Relinquished By: (Sign) RC Paul Date: 7-24-92 Time: 0857

Received By: (Sign) Jim D Tanner Date: 7-24-92 Time: 0857

Relinquished By: (Sign) Jim D Tanner Date: 7-24-92 Time: 1540

Received By: (Sign) _____ Date: _____ Time: _____

Relinquished By: (Sign) _____ Date: _____ Time: _____

Received By Lab: (Sign) Tom Paul AM Date: 7/24/92 Time: 1540

Sample Shipped VIA: _____ UPS _____ Fed Express _____ Bus _____

Shipping Bill Number: _____



METALS

GENERAL DATA

DATA FILE NAME: MULMT-BL

Company	:	FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.			
Source/Unit	:	CPL STACK - MULTI-METALS- BASELINE			
Date	:	JULY 22, 1992	Cp	:	0.840
Stack dia.	:	223.80 inch	OR	:	Duct Length : 0.00 inch
Oxygen Corr.:	:	0.0 percent		:	Duct Width : 0.00 inch
				:	Std. Temp. : 68 dF

FUEL ANALYSIS DATA,

(for calculating F-Factor)

Process Wt.

Hydrogen, wt%	:	0.00	Run 1 :	0.0 tons/hr
Carbon, wt%	:	0.00	Run 2 :	0.0
Sulfur, wt%	:	0.00	Run 3 :	0.0
Nitrogen, wt%	:	0.00		
Oxygen, wt%	:	0.00		
Btu/lb	:	0		

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

RUN	RUN	RUN
1	2	3

Meter Temp., Tm (dF)	107.00	109.70	107.00
Stack Temp., Ts (dF)	351.60	346.00	362.00
Sq. Rt. dP	0.862	0.898	0.902
dH (in. H2O)	1.09	1.23	1.24
Meter Vol., Vm (ft3)	77.028	80.354	70.451
Meter Y	0.998	0.998	0.998
Bar. Press., Pb (in. Hg.)	30.29	30.29	30.29
Vol. H2O, Vlc (ml)	163.3	160.5	141.2
Static Press., Ps (in. H2O)	-1.10	-1.10	-1.10
Test Time (min.)	128.0	128.0	112.0
Nozzle Dia., Dn (in.)	0.224	0.224	0.224
Oxygen, O2 (%)	10.00	10.00	10.00
Carbon Dioxide, CO2 (%)	11.60	11.50	11.50
Carbon Monoxide, CO (%)	0.00	0.00	0.00

Is this Method 5 or Method 5/8 ?

(5 or 58) :

5

LABORATORY RESULTS

RUN	RUN	RUN
1	2	3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH)	0.00000	0.00000	0.00000	grams
Filterable Particulate (MF)	0.00000	0.00000	0.00000	
Condensable Particulate (BHW)	0.00000	0.00000	0.00000	

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)	0.00	0.00	0.00	mg H2SO4
Sample Volume, ml	0	0	0	
Sample Aliquot, ml	0	0	0	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl	0.0000000			

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS- BASE

RUN NO.: 1
DATE : JULY 22, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 107 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 351.6 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.743 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.09 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 77.028 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.29 in.Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 163.3 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.00 % O2 0.00 % CO
11.60 % CO2 78.40 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 72.663 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.687 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096 \text{ ; Lower Bws value used.}$

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) = 1.000

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 93.48$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.26$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.08$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.21 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 59.49 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots = 975,167 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 579,265 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 97.83 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS- BASE

RUN NO.: 2
DATE : JULY 22, 1992

STD. TEMP, Tstd = 68 DEG. F | STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 109.70 DEG. F | PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 346.0 DEG. F | STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.807 in. H2O | DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O | DUCT WIDTH = inch
METER VOL., Vm = 80.354 Cu.Ft. | STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 | TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.29 in.Hg | NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 160.5 ml | NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.00 % O2 0.00 % CO
11.50 % CO2 78.50 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots\dots = 75.467 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.555 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots\dots\dots = 0.091$ | Lower
| Bws

Bws @ Saturated Conditions = Vapor Press. of H2O | value
@ Dew Point Temp. / (Ps, in.Hg.) = 1.000 | used.

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 93.25$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [1.28 \times (\%N2 + \%CO)] = 30.24$

$Ms = (Md \times (1-Bws)) + (18.0 \times Bws) \dots\dots\dots = 29.13$

$P(stack) = Pbar + (Ps / 13.6) \dots\dots\dots = 30.21 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots\dots\dots = 61.73 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots\dots\dots = 1,011,866 \text{ acf/min}$

$Qs(std) = Qs \times (1-Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots\dots\dots = 608,364 \text{ dscf/min}$

$I = (Ts+460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots\dots\dots = 96.75 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS- BASE

RUN NO.: 3
DATE : JULY 22, 1992

STD.TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -1.10 in. H2O
METER TEMP, Tm = 107.00 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 362.0 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.814 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.24 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 70.451 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 112.00 min.
BAR. PRESS., Pb = 30.29 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 141.2 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.00 % O2 0.00 % CO
11.50 % CO2 78.50 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 66.483 \text{ dscf}$
 $Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 6.646 \text{ scf}$
 $Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.091 \text{ : Lower : Bws}$
 $Bws @ \text{ Saturated Conditions} = \text{ Vapor Press. of H2O : value}$
 $@ \text{ Dew Point Temp. } / (Ps, \text{ in.Hg.}) \dots = 1.000 \text{ : used.}$
 $\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 93.25$
 $Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.24$
 $Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.13$
 $P(stack) = Pbar + (Ps / 13.6) \dots = 30.21 \text{ in. Hg}$
 $vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 62.61 \text{ ft/sec}$
 $Qs = vs \times As \times 60 \dots = 1,026,159 \text{ acf/min}$
 $Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 605,024 \text{ dscf/min}$
 $I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [\text{Time} \times P(stack) \times An \times vs \times 60] \dots = 97.94 \%$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL STACK - MULTI-METALS- BASELINE
DATE : JULY 22, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	163.3	160.5	141.2
Vm = Sample gas vol, meter cond., dacf	77.028	80.354	70.451
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.29	30.29	30.29
Pstatic = Stack static pressure, in. H2O	-1.10	-1.10	-1.10
dH = Avg meter pressure diff, in. H2O	1.09	1.23	1.24
Tm = Absolute meter temp., degrees R	567.0	569.7	567.0
Vm(std) = Sample gas vol, Std. cond., dscf	72.663	75.467	66.483
Bws = Water vapor in gas stream, fraction	0.096	0.091	0.091
MF = Moisture factor (1 - Bws)	0.904	0.909	0.909
CO2 = Carbon Dioxide, dry, volume %	11.60	11.50	11.50
O2 = Oxygen, dry, volume %	10.00	10.00	10.00
N2 = Nitrogen, dry volume %	78.40	78.50	78.50
Md = Molecular weight of stack gas, dry	30.26	30.24	30.24
Ms = Molecular weight of stack gas, wet	29.08	29.13	29.13
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8620	0.8982	0.9020
Ts = Absolute stack temp., degrees R	811.6	806.0	822.0
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	579,265	608,364	605,024
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
O = Sample time, minutes	128.00	128.00	112.00
%I = Isokinetic variation, percent	97.83	96.75	97.94

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 CPL STACK - MULTI-METALS- BASELINE
 DATE : JULY 22, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	0.00	0.00	0.00
Meter Volume, standard cond., Vm(std)	72.663	75.467	66.483
Carbon Dioxide, percent	11.60	11.50	11.50
Oxygen, percent	10.00	10.00	10.00
Particulate Concentration :			
gr/scf	0.0000	0.0000	0.0000
gr/dscf	0.0000	0.0000	0.0000
gr/dscf @ 12 % CO2	0.0000	0.0000	0.0000
gr/dscf @ 0% O2	0.0000	0.0000	0.0000

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL STACK - MULTI-METALS- BASELINE DATE : JULY 22, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  72.663 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   7.687 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 579,265 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.096
Back Half Sulfate (BHS)    mg H2SO4      | CO2      11.60 %
H2O2 Catch (SO2)          mg H2SO4      | O2       10.00 %
*****
```

F-FACTOR

 $10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(T_{std} + 460)/528]$ dscf/MMBtu

FILTERABLE PARTICULATE

 $15.432 \times (FHW + MF) / [Vm(std) + Vw(std)]$ 0.0000 gr/scf
 $15.432 \times (FHW + MF) / Vm(std)$ 0.0000 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0000 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen corr.}) / (21 - \%O_2)]$ 0.0000 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 0.00 lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

TOTAL PARTICULATE

 $15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))]$... 0.0000 gr/scf
 $15.432 \times (FHW + MF + BHW) / Vm(std)$ 0.0000 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0000 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0000 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 0.00 lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

TOTAL SULFATE

 $0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)]$ gr/scf
 $0.015432 \times (FHS + BHS) / Vm(std)$ gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ @ 12% CO2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. lb/MMBtu

SULFUR DIOXIDE (SO2)

 $1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)]$ ppm
 ppm $\times [(20.9 - \text{Oxygen Corr.}) / (20.9 - \%O_2)]$ @ O2 corr.
 ppm $\times (1 - Bws)$ ppm (wet)
 $8.223E-5 \times Qs(std) \times 64.062 \times \text{ppm} / [T(std) + 460]$.. lb/hr
 F-Factor $\times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times [20.9 / (20.9 - \%O_2)] \times \text{ppm}$ lb/MMBtu
 lb/hr / (dscfm $\times 60 \text{ min/hr}$) lb/dscf

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL STACK - MULTI-METALS- BASELINE DATE : JULY 22, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  75.467 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   7.555 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 608,364 dscfm
Front Half Sulfate (FHS)   mg H2SO4      | Bws       0.091
Back Half Sulfate (BHS)   mg H2SO4      | CO2      11.50 %
H2O2 Catch (SO2)          mg H2SO4      | O2       10.00 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gd/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0000 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL STACK - MULTI-METALS- BASELINE DATE : JULY 22, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FWH)      0.00000 grams      | Vm(std)  66.483 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   6.646 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 605,024 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.091
Back Half Sulfate (BHS)    mg H2SO4      | CO2      11.50 %
H2O2 Catch (SO2)           mg H2SO4      | O2       10.00 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FWH + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FWH + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FWH + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0000 gr/scf
15.432 x (FWH + MF + BHW) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
-----
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

Plant: Fla Crushed Stone
 Sample Loc.: CP 2 Stack (Baseline)
 Control Type: Baghouse
 Sample Type: Part & Multi-Metals
 Date: 7-22-92 Run No.: 1
 Time Start: 0915 Time End: 1135
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.29 "Hg Stack Press.: 30.21 "Hg Ps: 71 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Clear Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.47
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 625.828 ft³
 Initial Gas Meter Reading: 548.800 ft³
 Total Metered Gas Volume: 77.028 ft³
 Condensate Gain in Impingers: 151 mL
 Weight Gain in Silica Gel: 12.3 g
 Total Moisture Gain: 163.7 mL
 Silica Gel Container No.: 29
 Filter Number:

Leak Check - Meter Box

Initial: 0.00 cfm @ 15 in. H2O
 Final: 0.00 cfm @ 3 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bell

Stack Test Observers: 02 10.0
CO2 11.6

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				0.862		1.09	351.6			107		
1-1			48.8	0.75	1.1	1.1	359	259	72	94	3	
2			51.2	0.75	1.1	1.1	359	258	58	94	3	
2-1			53.4	0.75	1.1	1.1	360	258	56	96	3	
2			56.0	0.70	1.03	1.03	357	260	57	97	3	
3-1			58.1	0.70	1.03	1.03	357	268	57	99	3	
2			60.5	0.72	1.06	1.06	353	260	58	101	3	
4-1			62.8	0.72	1.06	1.06	346	261	57	103	3	
2			65.2	0.65	.96	.96	348	260	60	103	3	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (H _g)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			67.4	0.77	1.13	1.13	350	261	65	104	3	
2			69.9	0.77	1.13	1.13	352	261	64	105	3	
2-1			72.3	0.80	1.18	1.18	352	252	64	105	3	
2			74.9	0.77	1.13	1.13	351	255	64	105	3	
3-1			77.3	0.75	1.1	1.1	354	262	64	107	3	
2			79.8	0.77	1.13	1.13	351	257	65	108	3	
4-1			82.3	0.77	1.13	1.13	349	249	64	108	3	
2			84.8	0.67	.98	.98	348	248	66	108	3	
3-1-1			87.1	0.72	1.06	1.06	350	262	63	110	3	
2			89.5	0.77	1.13	1.13	342	256	62	110	3	
2-1			92.0	0.77	1.13	1.13	353	254	56	111	3	
2			94.4	0.80	1.18	1.18	354	252	57	111	3	
3-1			96.9	0.75	1.1	1.1	357	259	55	112	3	
2			99.3	0.75	1.1	1.1	356	262	57	112	3	
4-1			101.7	0.70	1.03	1.03	344	257	57	113	3	
2			4.1	0.72	1.06	1.06	336	266	57	114	3	
4-1-1			6.5	0.78	1.15	1.15	349	253	63	113	3	
2			9.0	0.78	1.15	1.15	355	262	58	113	3	
2-1			11.4	0.78	1.15	1.15	356	260	56	113	3	
2			13.8	0.78	1.15	1.15	355	261	58	113	3	
3-1			16.3	0.78	1.15	1.15	358	249	58	114	3	
2			18.7	0.78	1.15	1.15	356	262	59	114	3	
4-1			21.2	0.67	.98	.98	342	252	58	114	3	
2			23.5	0.67	.98	.98	339	253	59	114	3	

Plant: Fla Crushed Stone
 Sample Loc.: CPL Stack (Baseline)
 Control Type: Baghouse
 Sample Type: Multi-Metals
 Date: 7-22-92 Run No.: 2
 Time Start: 1302 Time End: 1518
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.29 "Hg Stack Press.: 30.21 "Hg Ps: 1.1 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 88 °F Wind Dir.: E Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 2.24 in. Probe Length: 8 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in Umbilical: 100'
 Stack Area: 273.18 ft² Thermocouple
 Effective Stack Area: 273.18 ft² Probe No.: KA-77
 Stack Height: ft Pitot Tube: KA-ST

Material Processing Rate:
 Final Gas Meter Reading: 706.454 ft³
 Initial Gas Meter Reading: 626.100 ft³
 Total Metered Gas Volume: 80.354 ft³
 Condensate Gain in Impingers: 149 mL
 Weight Gain in Silica Gel: 11.5 g
 Total Moisture Gain: 160.5 mL
 Silica Gel Container No.: 3/
 Filter Number:

Leak Check - Meter Box

Initial: 0.00 cfm @ 15 in. H2O
 Final: 0.011 cfm @ 4 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak

Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bell

Stack Test Observers: O2 10.0
CO2 11.5

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				0.8982		1.229	346			109.7		
1-1-1			26.1	0.82	1.25	1.25	351	264	76	109	3	
2			28.7	0.82	1.25	1.25	351	262	61	109	3	
2-1			31.1	0.82	1.25	1.25	352	249	59	109	3	
2			33.6	0.80	1.23	1.23	353	250	58	109	3	
3-1			36.1	0.82	1.25	1.25	353	271	58	109	3	
2			38.8	0.78	1.19	1.19	352	259	59	108	3	
4-1			41.3	0.78	1.19	1.19	348	255	59	108	3	
2			43.7	0.78	1.19	1.19	349	260	58	108	3	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (H _g)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			46.3	0.80	1.22	1.22	353	254	65	109	3	
2			48.8	0.82	1.25	1.25	353	261	60	109	3	
2-1			51.3	0.82	1.25	1.25	353	265	61	109	3	
2			53.9	0.82	1.25	1.25	351	265	61	109	3	
3-1			56.4	0.82	1.25	1.25	352	264	62	109	3	
2			59.0	0.80	1.22	1.22	353	272	62	109	3	
4-1			61.5	0.75	1.14	1.14	341	250	63	109	3	
2			63.9	0.75	1.14	1.14	337	250	64	109	3	
3-1-1			66.3	0.88	1.34	1.34	346	261	68	110	3	
2			69.0	0.85	1.29	1.29	347	264	62	110	3	
2-1			71.5	0.82	1.25	1.25	347	262	62	110	3	
2			74.0	0.82	1.25	1.25	345	252	62	110	3	
3-1			76.6	0.82	1.25	1.25	345	257	62	110	3	
2			79.1	0.82	1.25	1.25	344	262	61	110	3	
4-1			81.6	0.80	1.22	1.22	324	263	62	110	3	
2			84.1	0.75	1.14	1.14	327	259	62	110	3	
4-1-1			86.6	0.88	1.34	1.34	341	272	69	111	3	
2			89.2	0.85	1.29	1.29	344	249	63	111	3	
2-1			91.6	0.85	1.29	1.29	346	247	62	111	3	
2			94.2	0.85	1.29	1.29	344	255	62	111	3	
3-1			96.8	0.80	1.22	1.22	345	251	62	111	3	
2			99.3	0.80	1.22	1.22	345	253	60	111	3	
4-1			101.8	0.72	1.09	1.09	341	251	62	111	3	
2			4.1	0.72	1.09	1.09	341	253	63	111	3	

Plant: The Crushed Stone
 Sample Loc.: CP2 Stack (Baseline)
 Control Type: Baghouse
 Sample Type: Multi Metals
 Date: 7-22-92 Run No.: 3
 Time Start: 1621 Time End: 1823~
 Sample Time: 8 min/port 128.112 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.29 "Hg Stack Press.: 30.21 "Hg Ps: 1.1 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: Var Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.1 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in Umbilical: 100'
 Stack Area: 273.18 ft² Thermocouple
 Effective Stack Area: 273.18 ft² Probe No.: KA-77
 Stack Height: ft Pitot Tube: KA-SI

Material Processing Rate:
 Final Gas Meter Reading: 777.451 ft³
 Initial Gas Meter Reading: 707.000 ft³
 Total Metered Gas Volume: 70.451 ft³
 Condensate Gain in Impingers: 129 mL
 Weight Gain in Silica Gel: 12.2 g
 Total Moisture Gain: 141.2 mL
 Silica Gel Container No.: 99
 Filter Number:

Leak Check - Meter Box

Initial: 0.00 cfm @ 15 in. H2O
 Final: 0.00 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul Bell

Stack Test Observers: 02 10.0
02 11.5

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.902</u>		<u>1.239</u>	<u>362</u>		<u>84</u>	<u>107</u>		
1-1-1			<u>7.0</u>	<u>0.88</u>	<u>1.34</u>	<u>1.34</u>	<u>351</u>	<u>267</u>	<u>84</u>	<u>104</u>	<u>4</u>	
2			<u>9.7</u>	<u>0.88</u>	<u>1.34</u>	<u>1.34</u>	<u>354</u>	<u>250</u>	<u>72</u>	<u>104</u>	<u>4</u>	
2-1			<u>12.2</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>356</u>	<u>248</u>	<u>69</u>	<u>104</u>	<u>3</u>	
2			<u>14.8</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>357</u>	<u>248</u>	<u>67</u>	<u>104</u>	<u>3</u>	
3-1			<u>17.3</u>	<u>0.80</u>	<u>1.22</u>	<u>1.22</u>	<u>358</u>	<u>239</u>	<u>67</u>	<u>104</u>	<u>3</u>	
2			<u>19.8</u>	<u>0.85</u>	<u>1.29</u>	<u>1.29</u>	<u>360</u>	<u>245</u>	<u>66</u>	<u>105</u>	<u>3</u>	
4-1			<u>22.3</u>	<u>0.77</u>	<u>1.17</u>	<u>1.17</u>	<u>352</u>	<u>240</u>	<u>66</u>	<u>105</u>	<u>3</u>	
2			<u>24.7</u>	<u>0.77</u>	<u>1.17</u>	<u>1.17</u>	<u>241</u>	<u>240</u>	<u>67</u>	<u>105</u>	<u>3</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1			27.1	0.82	1.25	1.25	361	260	79	110	3	
2			29.7	0.82	1.25	1.25	365	250	66	110	3	
2-1			32.2	0.82	1.25	1.25	365	257	66	110	3	
2			34.8	0.82	1.25	1.25	368	255	66	110	3	
3-1			37.1	0.77	1.17	1.17	366	248	66	111	3	
2			39.7	0.77	1.17	1.17	365	255	66	112	3	
4-1			42.2	0.72	1.09	1.09	362	255	65	113	3	
2			44.6	0.72	1.09	1.09	362	256	65	113	3	
3-1			46.9	0.82	1.25	1.25	367	250	73	115	3	
2			49.5	0.82	1.25	1.25	368	265	66	114	3	
2-1			52.0	0.85	1.29	1.29	369	263	63	113	3	
2			54.7	0.85	1.29	1.29	369	258	62	112	3	
3-1			57.2	0.88	1.34	1.34	370	257	62	108	4	
2			59.9	0.88	1.34	1.34	369	259	61	106	4	
4-1			62.6	0.75	1.14	1.14	362	262	61	105	3	
2			65.0	0.75	1.14	1.14	363	264	62	103	3	
4-1-1			67.4	0.85	1.29	1.29	366	262	64	102	4	
2			70.0	0.85	1.29	1.29	366	270	57	101	4	
2-1			72.5	0.80	1.22	1.22	366	265	58	100	3	
2			75.0	0.85	1.29	1.29	366	263	59	99	4	
3-1												
2												
4-1												
2												

Rain
 Thunder
 clouds
 around
 to close

SAMPLING RATE CALCULATIONS

Date 7-22-92

Plant Name FC A.

Location Brooksville

Source CPL Stack
Baseline

ΔH = Orifice Reading (Inches H_2O)
 D_n = Nozzle Diameter (Inches)
 ΔH_E = Meter Box Constant
 B_w = Moisture Fraction
 T_m = Meter Temperature ($^{\circ}F$)
 T_s = Stack Temperature ($^{\circ}F$)
 M_s = Wet Molecular Weight of Stack Gas (From Table)
 ΔP = Pitot Reading (Inches H_2O)

$$\left[\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_E (D_n)^4 17741 \right] \Delta P = \Delta H$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{555}{28.0 (820)} 22960$$

$$\frac{570}{28.0 (815)} 22820$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	0.0242	0.02498	
$\times (1 - B_w)^2 =$	0.8281	0.8281	
$\times \Delta H_E =$	1.658	1.658	
$\times (D_n)^4 =$	0.0025	0.0025	
$\times 17741 =$	17741	17741	
$\times \Delta P =$	147	152	



MULTI METALS WORKSHEET

RUN 1
7-22-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER			
2	ACETONE RINSE	100		
3	0.1N HNO ₃ RINSE	100		
4	IMP. 1-3			
	1	0	<u>114</u>	<u>114</u>
	2	100	<u>130</u>	<u>30</u>
	3	100	<u>107</u>	<u>7</u>
	SUBTOTAL			<u>151</u>
	WASH		<u>100</u>	<u>100 ml</u>
	TOTAL		<u><u>341</u></u>	
5A	IMP 4	0		
5B	IMP 5-6	200 100	<u>102</u>	<u>2</u>
5C	HCl RINSE			
6	SILICA GEL	200 GMS	<u>212.3</u> GMS	<u>12.3</u> GMS
7	ACETONE BLANK	100		
8A	0.1N HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			

MULTI METALS WORKSHEET

RON 2

7-22-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER			
2	ACETONE RINSE	100		
3	0.1N HNO ₃ RINSE	100		
4	IMP. 1-3			
	1	0	<u>114</u>	<u>114</u>
	2	100	<u>130</u>	<u>30</u>
	3	100	<u>105</u>	<u>5</u>
	SUBTOTAL		<u>349</u>	<u>149</u>
	WASH		<u>100</u>	
	TOTAL			
5A	IMP 4	0		
5B	IMP 5-6	200		
5C	HCl RINSE			
6	SILICA GEL	200 GMS	<u>211.5</u> GMS	<u>11.5</u> GMS
7	ACETONE BLANK	100		
8A	0.1N HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			

MULTI METALS WORKSHEET

RUN 3

7-22-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER			
2	ACETONE RINSE	100		
3	0. IN HNO ₃ RINSE	100		
4	IMP. 1-3			
	1	0	<u>98</u>	<u>98</u>
	2	100	<u>128</u>	<u>28</u>
	3	100	<u>103</u>	<u>3</u>
	SUBTOTAL		<u>329</u>	<u>129</u>
	WASH		<u>100</u>	
	TOTAL		<u>429</u>	
5A	IMP 4	0	<u>0</u>	<u>0</u>
5B	IMP 5-6	200/00	<u>100</u>	<u>—</u>
5C	HCl RINSE			
6	SILICA GEL	200 GMS	<u>212.2 GMS</u>	<u>12.2 GMS</u>
7	ACETONE BLANK	100		
8A	0. IN HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			



E N V I R O N M E N T A L L A B O R A T O R I E S , I N C .

August 5, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

Dear Mason:

Enclosed are the results of our analysis of the samples that we received July 24, 1992.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). PPB is certified by the Florida DHRS (Lab Nos. 82282 and E82001).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park
Project Manager

TP/slb

Enclosure



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028DATE: 08/05/92DHRS #: 82282, E82001

Table 1. Metals Data: Florida Crushed Stone Project
(All results as total micrograms) (Page 1 of 2)

Station ID:	PPB#:	Arsenic	Chromium	Lead	Mercury	Zinc
Cont. 1 + 2 Run 1	68666	2.0	9.9	11.2	5.0	13,000
Cont. 1 + 2 Run 2	68667	2.0	8.4	16.6	5.6	6010
Cont. 1 + 2 Run 3	68668	1.6	10.3	4.9	7.2	5470
Cont. 4, Run 1	68669	<5	<3	<4	5.7	33
Cont. 4, Run 2	68670	<5	<3	<4	6.6	12
Cont. 4, Run 3	68671	<5	<3	<4	9.7	14
Cont. 5B, Run 1	68658	NR	NR	NR	0.7	NR
Cont. 5B, Run 2	68659	NR	NR	NR	<0.1	NR
Cont. 5B, Run 3	68660	NR	NR	NR	0.3	NR
Cont. 7 (Acetone Blank)	68661	<1	<3	<1	7.7	43



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028DATE: 08/05/92DHRS #: 82282,E82001

Table 1. Metals Data: Florida Crushed Stone Project
(All results as total micrograms) (Page 2 of 2)

Station ID:	PPB#:	Arsenic	Chromium	Lead	Mercury	Zinc
Cont.8A (0.1N HNO ₃ Blank)	68662	<1	0.7	<1	<0.4	2.8
Cont.8B (DI H ₂ O Blank)	68663	<1	0.5	<1	<0.4	1.7
Cont.9 (5%HNO ₃ + 10% H ₂ O ₂ Blank)	68664	<1	0.8	<1	<0.4	34
Cont.10 (KMnO ₃ Blank)	68665	<1	1.4	<1	<0.4	3.6

PROJECT MANAGER

CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name CPL, Baseline
 Sample Location Brooksville, FL

Sample Identification	Remarks
Container 5B, RUN 1	Mercury
" , RUN 2	"
" RUN 3	"
Container 7	6 metals
" 8A	"
" 8B	"
" 9	"
" 10	"

Sampled By: (Signature) RC Paul Date: 7-22-92 Time: See data
 Relinquished By: (Sign) RC Paul Date: 7-24-92 Time: 0857
 Received By: (Sign) M. Moore Date: 7-24-92 Time: 0900
 Relinquished By: (Sign) M. Moore Date: 7-24-92 Time: 1400
 Received By: (Sign) Jim D. Tanner Date: 7/24/92 Time: 1400
 Relinquished By: (Sign) Jim D. Tanner Date: 7/24/92 Time: 1540
 Received By Lab: (Sign) Tom Paul P/B Date: 7/24/92 Time: 1540

Sample Shipped VIA: UPS Fed Express Bus

Shipping Bill Number: _____



CHAIN OF CUSTODY RECORD

Project Number

307-90-01

Project Name

CPh, Baseline

Sample Location

Brooksville, FL.

* Combine Cont. 1 + 2, RUN 1 for metal analysis
Same for Runs 2 + 3.

Sample Identification	Remarks
Container 1, RUN 1	Filter arsenic, total chromium, lead, mercury, zinc and chlorides
Container 1, RUN 2	" "
Container 1, RUN 3	* " "
" 2, RUN 1	" "
" 2, RUN 2	" "
" 2, RUN 3	" "
Container 4, RUN 1	" "
" 4, RUN 2	" "
" 4, RUN 3	" "

Sampled By: (Signature) RC Paul Date: 7-22-92 Time: See data

Relinquished By: (Sign) RC Paul Date: 7-24-92 Time: 0857

Received By: (Sign) A. Mason Date: 7-24-92 Time: 0900

Relinquished By: (Sign) A. Mason Date: 7-24-92 Time: 1400

Received By: (Sign) Jim D. Tanner Date: 7/24/92 Time: 1400

Relinquished By: (Sign) Jim D. Tanner Date: 7/24/92 Time: 1540

Received By Lab: (Sign) Tom Park Date: 7/24/92 Time: 1540

Sample Shipped VIA: _____ UPS _____ Fed Express _____ Bus

Shipping Bill Number: _____



SPECIATED VOLATILE ORGANIC COMPOUNDS

Stack Dimentions

Leak Check – Meter Box

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 "H2O for 15 sec: Stable, Leak

Test Conducted By: S Bell

Stack Test Observers:

[illegible]

Stack Dimentions

Leak Check – Meter Box

Leak Check – Pitot Tubes



KOOGLER & ASSOCIATES

Stack Test Observers:

[illegible]

Material Processing Rate:	
Final Gas Meter Reading:	ft ³
Initial Gas Meter Reading:	ft ³
Total Metered Gas Volume:	ft ³
Condensate Gain in Impingers:	mL
Weight Gain in Silica Gel:	g
Total Moisture Gain:	mL
Silica Gel Container No.:	
Filter Number:	

Initial: $\frac{0.00}{0.00}$ cfm @ $\frac{6}{4}$ in. H₂O

Impact 3 "H2O for 15 sec:	Stable, Leak
Static 3 "H2O for 15 sec:	Stable, Leak



Test Conducted By: S Bell

Stack Test Observers:

[illegible]

<div style="border: 1px solid black; height: 300px; width: 100%;"></div>	
Stack Dimentions	

Leak Check - Meter Box


Initial: 0.00 cfm @ 5 in. H₂O

Final: 0.00 cfm @ 3 in. H₂O

Leak Check - Pitot Tubes

Impact 3" H₂O for 15 sec: Stable, Leak

Static 3" H₂O for 15 sec: Stable, Leak

[illegible]

Stack Dimensions



KOOGLER & ASSOCIATES

[illegible]

Stack Dimensions

Leak Check - Meter Box

Leak Check - Pitot Tubes



KOOGLER & ASSOCIATES

Test Conducted By:

Stack Test Observers:

[illegible]

Stack Dimensions

Leak Check - Meter Box

Leak Check - Pitot Tubes



KOOGLER & ASSOCIATES

Stack Test Observers:

[illegible]

Stack Dimentions	
------------------	--

Leak Check – Meter Box

Leak Check – Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 °H2O for 15 sec: Stable, Leak



Test Conducted By:

Stack Test Observers:

[illegible]


Stack Dimentions	
------------------	--

Leak Check - Meter Box

Initial:	<u>000</u>	cfm @	<u>4</u>	in. H ₂ O
Final:	<u>0.00</u>	cfm @	<u>2</u>	in. H ₂ O

Leak Check - Pitoi Tubes

Impact 3 "H ₂ O for 15 sec:	Stable,	Leak
Static 3 "H ₂ O for 15 sec:	Stable,	Leak



KOOGLER & ASSOCIATES

[illegible]

Stack Dimentions

Leak Check – Meter Box

Leak Check - Pitot Tubes



KOOZLER & ASSOCIATES

Test Conducted By:

Stack Test Observers:

[illegible]

Stack Dimentions

Leak Check - Meter Box


Initial: 0.00 cfm @ 4 in. H₂O

Final: 0.00 cfm @ 2 in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak

Static 3 "H₂O for 15 sec: Stable, Leak



KOOGLER & ASSOCIATES

[illegible]

Material Processing Rate:	
Final Gas Meter Reading:	ft ³
Initial Gas Meter Reading:	ft ³
Total Metered Gas Volume:	ft ³
Condensate Gain in Impingers:	mL
Weight Gain in Silica Gel:	g
Total Moisture Gain:	mL
Silica Gel Container No.:	
Filter Number:	

Initial: 0.00 cfm @ 4 in. H₂O
Final: 0.00 cfm @ 2 in. H₂O

Impact 3 H₂O for 15 sec: Stable, Leak

Static 3 "H2O for 15 sec: Stable, Leak



Test Conducted By:

Stack Test Observers:

[illegible]

Stack Dimentions	
------------------	--

Leak Check - Meter Box

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 "H2O for 15 sec: Stable, Leak



Test Conducted By:

Stack Test Observers:

[illegible]

VOST GC/MS REPORT

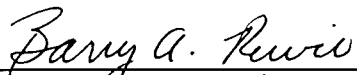
prepared for

KOOGLER AND ASSOCIATES

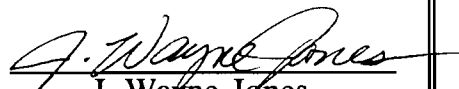
[Project # 307-90-01]

by

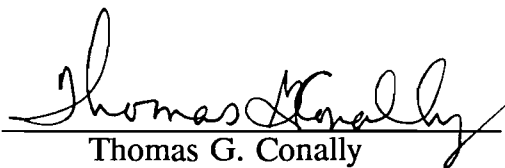
GRASEBY RTL



Barry A. Ruvio
Chemist/Prepared



J. Wayne Jones
Chemist/Reviewed



Thomas G. Conally
Laboratory Manager

RTL ID # 92072350

August 21, 1992

August 21, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, FL 32609

RE: RTL ID #92072350

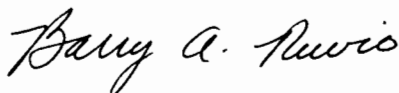
Dear Mr. Joye:

Enclosed please find the results of analysis for the samples submitted to our laboratory on 7/23/92.

If you have any questions concerning these reports, please contact me at the number listed below.

Sincerely,

GRASEBY RTL



Barry A. Ruvio
Chemist

BAR/mcg

Enclosures

INTRODUCTION

Scope:

To analyze (VOST) Tenax/Charcoal cartridges for the target compound list (TCL) and tentatively identify hexane by Desorb-Purge-Trap-Desorb Gas Chromatography/Mass Spectrometry (DPTD GC/MS).

Method Summary:

Sample cartridges are analyzed by desorb-purge-trap-desorb gas chromatography/mass spectrometry (DPTD GC/MS). Daily analytical checks are performed on cartridge blanks and reagent water. The daily GC/MS performance test required for this method is described in SW 846, Method 8240. The key Abundance Criteria for 4-Bromofluorobenzene (BFB) must be met before any samples are analyzed. All standards, blanks and samples are spiked with a known amount of BFB to maintain a constant check of system performance.

Sample Desorption:

The DPTD GC/MS procedures are those described in SW 846 Method 5040. The spiked sample cartridge is placed in the thermal desorption apparatus (Nutech 8533) and desorbed in the VOST system by heat to 200 °C for 10 minutes. Consideration is given for individual analysis of cartridges. The desorbed components then pass into the bottom of the water column, are purged from the water and collected on the internal analytical sorbent trap. After the 10-minute desorption period, the compounds are desorbed from the analytical trap into the GC/MS system.

Calculations:

All compounds detected that coincide with those of the Target Compound List (TCL) are calculated using equation #1 and response factors derived from in-house standards. All tentatively identified compounds are calculated, using equation #2 and a standard TIC response factor of one (1.0). Compounds quantified by equation #2 are qualified as being estimates.

$$\text{Eqn \#1: } [X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot RF}$$

$$\text{Eqn \#2: } [X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot 1.0}$$

Where:

- [X] = amount of compound, ng
- [IS] = amount of internal standard, ng
- A_X = response of compound
- A_{IS} = response of internal standard
- RF = response factor

ANALYTICAL CONDITIONS

Equipment:

HP 5970 GC/MSD tuned to BFB criteria

GC Conditions:

Temp 1 : 0 °C
Time 1 : 4.0 minutes
Ramp Rate : 6.0 °C/minute
Temp 2 : 160 °C
Time 2 : 5.0 minutes

Column:

VOCOL (Supelco),
Length 60 m,
Film thickness 1.5 µm,
Internal diameter 0.75 mm,
Construction of Borosilicate glass
with fused silica ends

Mass Spectrometer Conditions:

Run Time : 25 minutes
Scan Range : 35 - 260 AMU
Scan Delay : 2.37 minutes
Ion Source Temp : 200 °C
Electron Multiplier : 2300 ± 200 EV
Separator Temp : 225 °C

Sample Chronicle:

Client	Koogler and Associates
RTL Project ID	RTL ID #92072350
Analysis Type	VOST Tenax/charcoal
Date of Collection	7/21/92
Date Received	7/23/92
Date Authorized	7/23/92
Date Analyzed	7/31/92, 8/3/92, 8/4/92
Date Reported	8/21/92

Narrative:

We received 17 VOST samples for analysis on 7/23/92. Because of anticipated high levels of carbon dioxide in all samples we installed a scan delay of 2.37 minutes for all samples. The purpose of the scan delay was to prevent detector saturation and possible instrument shut-down if carbon dioxide levels became too high.

The original scope requested the combining of specific run sets after initially running "Run 1 set 1" to determine amounts per the cartridge pair. After analyzing "Run 1 set 1" we determined that the calibration range needed to be raised in order to accomodate high levels of benzene, and that because of these high levels, cartridges should not be combined. We recommended extending the calibration range for the remaining samples to 20 - 2000 ng, and this was agreed to by Koogler and Associates on August 3, 1992.

No hexane was detected in any of the samples analyzed. We did however find hexene in every sample. We would be happy to provide this data if you so desire. Please contact us if you have questions or if you need more information. We look forward to serving your analytical needs in the future.

REFERENCES

Federal Register, 44, 69464, December 3, 1979

Protocol for the Collection and Analysis of Volatile POHCs Using VOST, EPA-600/8-84-007 available from ORD Publications, Center for Environmental Research Information, Cincinnati, Ohio 45268

NIOSH Manual of Analytical Methods, HEW Publication No. (NIOSH) 75-121, available from Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402

Supelco Bulletin 769, "Determination of Organic Vapors in the Industrial Atmosphere", 1977: Supelco, Inc., Bellefonte, PA 16823

Test Methods for Evaluation of Solid Waste, SW 846 Methods 0030, 8240, 5040, 5030

Compendium of Methods for the Determination of Toxic Organic Compounds in Air, PB87-168688, Battelle Columbus Laboratories, Columbus, Ohio

SAMPLE RESULTS

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-1

File ID: T0550

Sample ID: Lab Blank

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	81
Toluene-d ₈	95
4-Bromofluorobenzene	88

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone		BQL
75-15-0	Carbon disulfide		BQL
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene		BQL
79-01-6	Trichloroethene		BQL
108-88-3	Toluene		BQL
108-90-7	Chlorobenzene		BQL
100-41-4	Ethylbenzene		BQL
1330-20-7	Xylene (total)		BQL
100-42-5	Styrene		BQL

Quantitation Range (ng): 20 – 1000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND= not detected

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-2

File ID: T0551

Sample ID: Field Blank

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	74
Toluene-d ₈	90
4-Bromofluorobenzene	73

CAS Number	Target Compound	Results (ng)
74-83-9	Bromomethane	BQL
67-64-1	Acetone	BQL
75-15-0	Carbon disulfide	BQL
71-55-6	1,1,1-Trichloroethane	BQL
71-43-2	Benzene	BQL
79-01-6	Trichloroethene	BQL
108-88-3	Toluene	BQL
108-90-7	Chlorobenzene	BQL
100-41-4	Ethylbenzene	BQL
1330-20-7	Xylene (total)	BQL
100-42-5	Styrene	BQL

Quantitation Range (ng): 20 – 1000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND= not detected

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-3

File ID: T0552

Sample ID: Run 1, Set 1

Description: VOST pair

Surrogate Percent Recovery

1,2-Dichloroethane-d ₄	76
Toluene-d ₈	77
4-Bromofluorobenzene	96

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	28-790 ^a	
75-15-0	Carbon disulfide	120	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,600	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	270	
108-90-7	Chlorobenzene		BQL
100-41-4	Ethylbenzene	32	
1330-20-7	Xylene (total)	130	
100-42-5	Styrene	25	

Quantitation Range (ng): 20 – 1000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-4

File ID: T0558

Sample ID: Run 1, Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	80
Toluene-d ₈	86
4-Bromofluorobenzene	88

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	360-1,200 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane	540	BQL
71-43-2	Benzene	2,100 ^b	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	47	BQL
1330-20-7	Xylene (total)	56	BQL
100-42-5	Styrene		

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-5

File ID: T0559

Sample ID: Run 1, Set 3

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	80
Toluene-d ₈	72
4-Bromofluorobenzene	121

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	130-890 ^a 650	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,100 ^b 520	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	36	
1330-20-7	Xylene (total)	100	
100-42-5	Styrene	29	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-6

File ID: T0560

Sample ID: Run 1, Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	73
Toluene-d ₈	73
4-Bromofluorobenzene	86

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	320-810 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		BQL
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,100 ^b	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	61	
1330-20-7	Xylene (total)	220	
100-42-5	Styrene	240	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-7

File ID: T0561

Sample ID: Run 1, Set 5

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	73
Toluene-d ₈	75
4-Bromofluorobenzene	78

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	1,100 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		120
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,100 ^b	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene		230
108-90-7	Chlorobenzene		BQL
100-41-4	Ethylbenzene		BQL
1330-20-7	Xylene (total)		BQL
100-42-5	Styrene		BQL

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-8

File ID: T0562

Sample ID: Run 2, Set 1

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	70
Toluene-d ₈	71
4-Bromofluorobenzene	80

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	620 ^a 600	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,000 370 120 49	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene		
1330-20-7	Xylene (total)	190	
100-42-5	Styrene	200	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-9

File ID: T0563

Sample ID: Run 2, Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	74
Toluene-d ₈	73
4-Bromofluorobenzene	79

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	530-800 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide	900	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,100 ^b	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene	460	
108-90-7	Chlorobenzene	110	
100-41-4	Ethylbenzene	70	
1330-20-7	Xylene (total)	230	
100-42-5	Styrene	200	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-10

File ID: T0564

Sample ID: Run 2, Set 3

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	72
Toluene-d ₈	73
4-Bromofluorobenzene	83

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	65-980 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane	570	BQL
71-43-2	Benzene	1,900	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	75	
1330-20-7	Xylene (total)	170	
100-42-5	Styrene	210	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-11

File ID: T0565

Sample ID: Run 2, Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	81
Toluene-d ₈	77
4-Bromofluorobenzene	83

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	670-1,000 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		190
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,600	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene		
1330-20-7	Xylene (total)	210	
100-42-5	Styrene	180	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-12

File ID: T0569

Sample ID: Run 2, Set 5

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	98
Toluene-d ₈	78
4-Bromofluorobenzene	100

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	640-1,100 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane	120	BQL
71-43-2	Benzene	1,400	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	66	
1330-20-7	Xylene (total)	300	
100-42-5	Styrene	170	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-13

File ID: T0570

Sample ID: Run 3, Set 1

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	86
Toluene-d ₈	82
4-Bromofluorobenzene	91

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	150-650 ^a 170	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	2,100 ^b 380 130 43	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene		
1330-20-7	Xylene (total)	160	
100-42-5	Styrene	150	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-14

File ID: T0571

Sample ID: Run 3, Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	84
Toluene-d ₈	85
4-Bromofluorobenzene	92

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	230-740 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane	290	BQL
71-43-2	Benzene	2,100 ^b	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	47	
1330-20-7	Xylene (total)	160	
100-42-5	Styrene	130	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-15

File ID: T0572

Sample ID: Run 3, Set 3

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	82
Toluene-d ₈	81
4-Bromofluorobenzene	98

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	320-890 ^a	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane	75	BQL
71-43-2	Benzene	1,800	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	77	
1330-20-7	Xylene (total)	290	
100-42-5	Styrene	220	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-16

File ID: T0573

Sample ID: Run 3, Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	83
Toluene-d ₈	94
4-Bromofluorobenzene	94

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	230-830 ^a 57	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,200	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene		
1330-20-7	Xylene (total)	330	
100-42-5	Styrene	160	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92072350-17

File ID: T0574

Sample ID: Run 3, Set 5

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	80
Toluene-d ₈	79
4-Bromofluorobenzene	94

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	260-670 ^a 89	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,400	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	67	
1330-20-7	Xylene (total)	290	
100-42-5	Styrene	170	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	ND	86

ND = not detected

a: See Endnotes

Endnotes:

- a: The reported amount for acetone is speculative. Several parameters did not meet routine QC performance standards such as, ion ratios and retention time. In view of special circumstances, ie., an apparent inability to adequately resolve several coeluting compounds, it is impossible to predict with certainty if acetone is present in this sample.
- b: This amount is beyond the established calibration range. Linearity should not be assumed for results which greatly exceed the calibration range.

CHAIN OF CUSTODY RECORD

Project Number 307-90-1
Project Name CPL, BASELINE
Sample Location BROOKSVILLE, FL

ALL SAMPLES WILL BE HIGH IN CO₂!

Sample Identification	Remarks
VOST RUN 1, SET 1	ACETONE, BENZENE, TOLUENE, TRICHLOROETHYLENE, CHLOROBENZENE, ETHYLBENZENE, XYLENE, STYRENE, BROMOMETHANE, CARBON DISULFIDE, HEXANE AND 1,1,1-TRICHLOROETHANE
" " 1, SET 2	"
" " 1, SET 3	"
" " 1, SET 4	"
" " 1, SET 5	"
" RUN 2, SET 1	"
" " 2, SET 2	"
" " 2, SET 3	"
" " 2, SET 4	"
" " 2, SET 5	"

Sampled By: (Signature) Steph Bell Date: 7/21/92 Time: 19:00
Relinquished By: (Sign) Steph Bell Date: 7/21/92 Time: 1930
Received By: (Sign) Mason Jaze Date: 7/21/92 Time: 1930
Relinquished By: (Sign) Mason Jaze Date: 7/22/92 Time: 0900
Received By: (Sign) _____ Date: _____ Time: _____
Relinquished By: (Sign) _____ Date: _____ Time: _____
Received By Lab: (Sign) Wayne Jones Date: 7/23/92 Time: 12:00

Sample Shipped VIA: _____ UPS ☒ Fed Express _____ Bus

Shipping Bill Number: _____



CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name CPL, BASELINE
 Sample Location BROOKSVILLE, FL.

Sample Identification	Remarks
VOST RUN 3, set 1	same as runs 1 & 2
" " 2	"
" " 3	"
" " 4	"
" " 5	"
FIELD BLANK	"
LAB BLANK	"

Sampled By: (Signature) Steph Bell Date: 7/21/92 Time: 19:00
 Relinquished By: (Sign) Steph Bell Date: 7/21/92 Time: 19:30
 Received By: (Sign) Marion Joyce Date: 2/21/92 Time: 1930
 Relinquished By: (Sign) Marion Joyce Date: 2/22/92 Time: 0900
 Received By: (Sign) _____ Date: _____ Time: _____
 Relinquished By: (Sign) _____ Date: _____ Time: _____
 Received By Lab: (Sign) Wayne Jones Date: 7/23/92 Time: 12:00

Sample Shipped VIA: ☐ UPS ☒ Fed Express ☐ Bus

Shipping Bill Number: _____



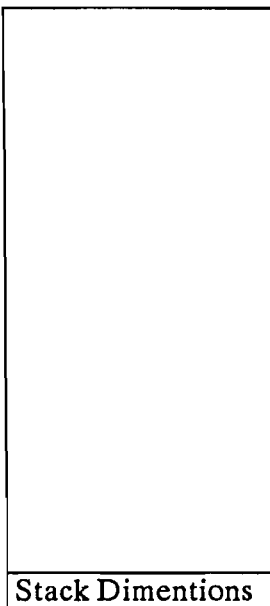
CARBON MONOXIDE, TOTAL HYDROCARBON
AND NITROGEN OXIDES MONITORING DATA



BEST AVAILABLE COPY

O₂ 9.5%
CO₂ 12.1%

Plant: CPL
Sample Loc.: BROOKSVILLE
Control Type: BAGHOUSE
Sample Type: CO, NOx, THC, O₂
Date: 7-21-92 Run No.: #1
Time Start: 0925 Time End: 1130
Sample Time: _____ min/port 120 total min.
Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
Bar. Pressure 30.25 Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
Moisture: _____ % FDA: _____ Gas Density Factor: _____
Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
Weather: _____ Thermocouple Readout: _____
Sample Box #: _____ Meter Box No.: _____
Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
Nozzle Diameter: _____ in. Probe Length: _____ ft
Probe Heater Setting: _____ Nomograph Cf: _____
Stack Dimentions: _____ in
Stack Area: _____ ft²
Effective Stack Area: _____ ft²
Stack Height: _____ ft



Stack Dimentions

Material Processing Rate: _____
Final Gas Meter Reading: _____ ft³
Initial Gas Meter Reading: _____ ft³
Total Metered Gas Volume: _____ ft³
Condensate Gain in Impingers: _____ mL
Weight Gain in Silica Gel: 12.6 g
Total Moisture Gain: _____ mL
Silica Gel Container No.: 1
Filter Number: 5
Leak Check - Meter Box
Initial: _____ cfm @ _____ in. H₂O
Final: _____ cfm @ _____ in. H₂O
Leak Check - Pitot Tubes
Impact 3 "H₂O for 15 sec: Stable, Leak
Static 3 "H₂O for 15 sec: Stable, Leak
Test Conducted By: Mr. JOYE, ST. BELL,
T. JONES, R. PAUL
Stack Test Observers: CH. SUN LEE

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (*H2O)	Meter Orifice Pressure Difference (*H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL NOx Meter Temperature (°F)	Vacuum on Sample Train (*Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			90%	10%					
Average:												9.43	0	158	164
		0810							204	138	6.6	10	4	213	158
		0820							204	159	6.6	10	4	214	159
		0830										10	2	299	299
		0840										9.5	2	258	150
		0850										9.5	2	391	165
		0900							190	141	6.2	9.5	2	236	151
		0915										9.2	0	166	190
		0930							173	232	6.3	9.5	0	210	22'



1022	"	"	1	SET 2	"	"	02
1110	"	"	1	SET 3			02
1143	"	"	1	SET 4			
1216	"	"	1	SET 5			1202

[illegible]



0057 RUN 2, SET 1 1341 and 1402
 RUN 2, SET 2 " 1341 and 1402
 RUN 2, SET 3 " 1410 and 1430
 RUN 2, SET 4 " 1452 and 1514
 RUN 2, SET 5 " 1523 and 1543
 Or 10.2 %
 CO2 11.0 %

Plant: CPL
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NOx, CO, THC, O2
 Date: 7-21-92 Run No.: #2 BL
 Time Start: 1302 Time End: 1515
 Sample Time: min/port 120 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP: °F
 Bar. Pressure 30.25 Hg Stack Press.: "Hg Ps: "H2O
 Moisture: % FDA: Gas Density Factor:
 Temperature: 98 °F Wind Dir.: VARIABLE Wind Speed: 2-4
 Weather: CLEAR-SUNNY Thermocouple Readout:
 Sample Box #: Meter Box No.:
 Meter Y: @ Delta H: Pitot Corr.:
 Nozzle Diameter: in. Probe Length: ft
 Probe Heater Setting: Nomograph Cf:
 Stack Dimentions: in
 Stack Area: ft²
 Effective Stack Area: ft²
 Stack Height: ft

Material Processing Rate:
 Final Gas Meter Reading: ft³
 Initial Gas Meter Reading: ft³
 Total Metered Gas Volume: ft³
 Condensate Gain in Impingers: mL
 Weight Gain in Silica Gel: 13.2 g
 Total Moisture Gain: mL
 Silica Gel Container No.: 3
 Filter Number: 6

Leak Check - Meter Box

Initial: cfm @ in. H2O
 Final: cfm @ in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak
 Static 3 "H2O for 15 sec: Stable, Leak

Stack Dimentions

Umbilical:
 Thermocouple:
 Probe No.:
 Pitot Tube:

Test Conducted By: M. JOYE, S. BELL,
R. PAUL T. JONES
 Stack Test Observers: CHI SUN LEE
Dave Buff

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual									
Average:												9.35	<1	165.2	157.4
		1205										9.5	0	185	162
		1215							6.6	167	130	9.5	0	124	155
		1230										9.5	1	92	167
		1245										9.8	1	87	150
		1300							6.7	185	112	9.5	1	100	145
		1320								1		9.2	0	122	155
		1330							6.4	172	133	9.5	0	175	138
		1345										9.5	0	122	150

Dave Buff visit

[illegible]



VOST RUN 3, SET 1, start 1614 end 1636
 VOST RUN 3, SET 2, start 1645 end 1705
 " RUN 3, SET 3, start 1714 end 1733
 " RUN 3, SET 4, start 1743 end 1802
 " RUN 3, SET 5, start 1811 end 1831

O₂ 9.5%
 CO₂ 12.04%

Plant: CPL
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂
 Date: 7-21-92 Run No.: 3 BL
 Time Start: 1612 Time End: 1830
 Sample Time: _____ min/port 120 total min.
 Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
 Bar. Pressure 30.25 Hg Stack Press.: _____ Hg Ps: _____ H₂O
 Moisture: _____ % FDA: _____ Gas Density Factor: _____
 Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
 Weather: _____ Thermocouple Readout: _____
 Sample Box #: _____ Meter Box No.: _____
 Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
 Nozzle Diameter: _____ in. Probe Length: _____ ft
 Probe Heater Setting: _____ Nomograph Cf: _____
 Stack Dimentions: _____ in
 Stack Area: _____ ft²
 Effective Stack Area: _____ ft²
 Stack Height: _____ ft

Stack Dimentions

Material Processing Rate: _____
 Final Gas Meter Reading: _____ ft³
 Initial Gas Meter Reading: _____ ft³
 Total Metered Gas Volume: _____ ft³
 Condensate Gain in Impingers: 140 mL
 Weight Gain in Silica Gel: 13.8 g
 Total Moisture Gain: _____ mL
 Silica Gel Container No.: 16
 Filter Number: 7

Leak Check - Meter Box
 Initial: _____ cfm @ _____ in. H₂O
 Final: _____ cfm @ _____ in. H₂O
 Leak Check - Pitot Tubes
 Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Test Conducted By: M. JOYE, R. PAUL
SBELL, T. JONES
 Stack Test Observers: HOWARD COUCH, HERNANDO
COUNTY

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			0.2	50.2	NOx				
Average:												9.21	0	222.9	163
		1600							6.5	232	136	9.3	0	152	153
		1612	Start Run 3									9.2	0	192	132
		1630	HOWARD COUCH VISIT									9.5	0	200	145
		1645							6.5	156	100	9.5	0	339	130
		1700										9.3	0	155	148
		1715							6.2	210	137	9.0	0	235	158
		1730										9.2	0	187	180
		1745							6.4	142	234	9.2	0	286	225



4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

[illegible]

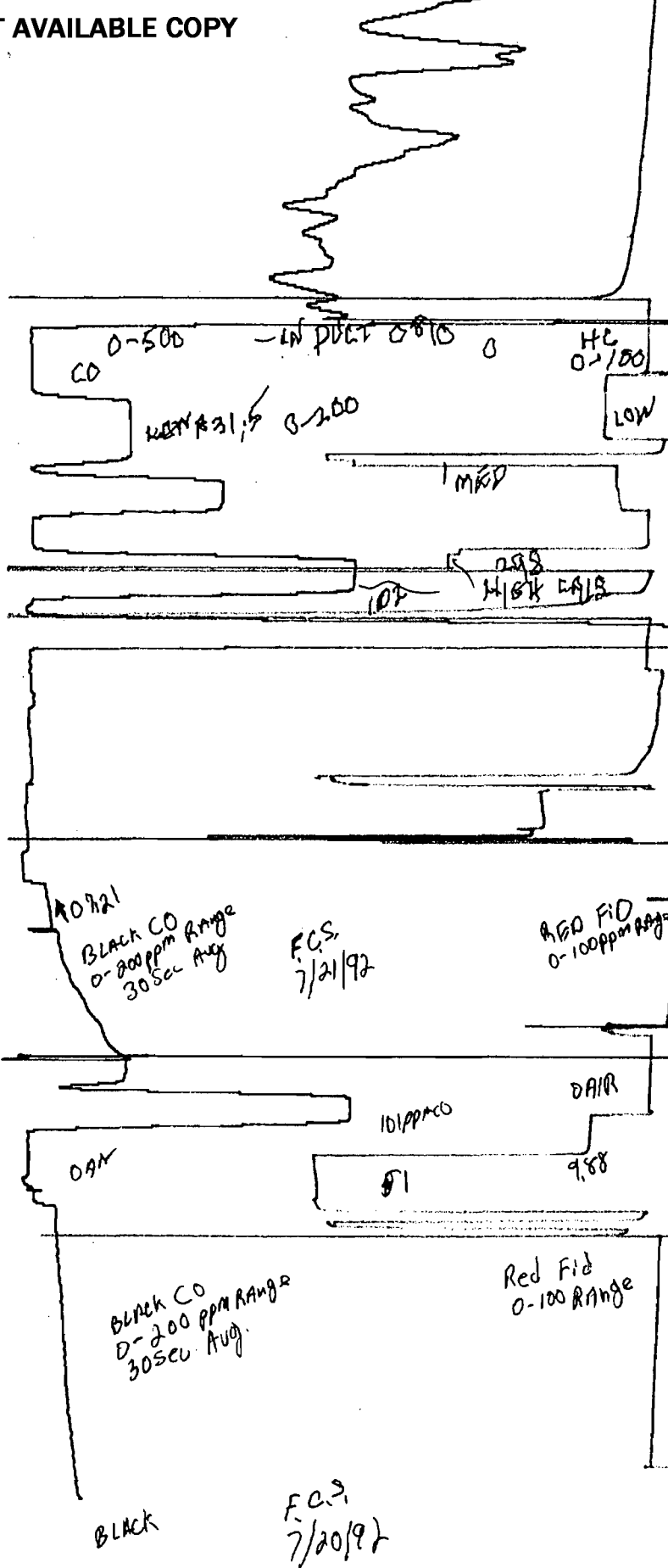
7-21-92 INITIAL CALS.

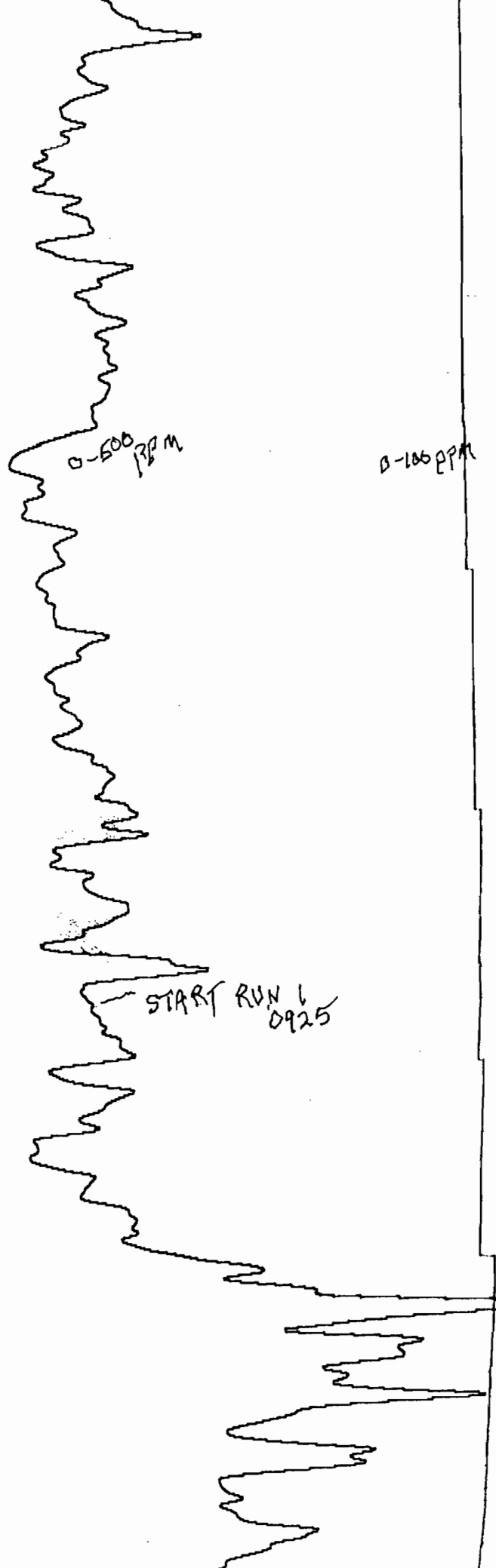
FID

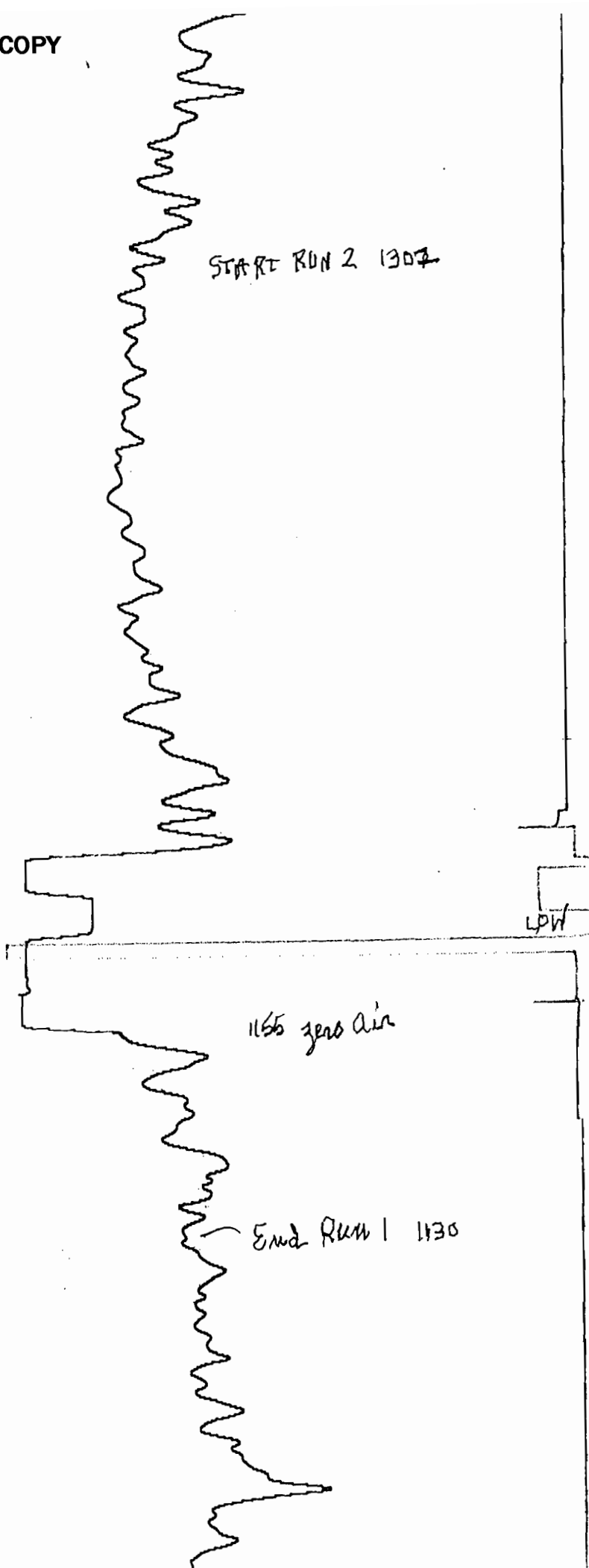
HIGH READS	298 ppm	298 ppm
MED "	52 ppm	51.1 ppm
LOW "	10 ppm	9.88

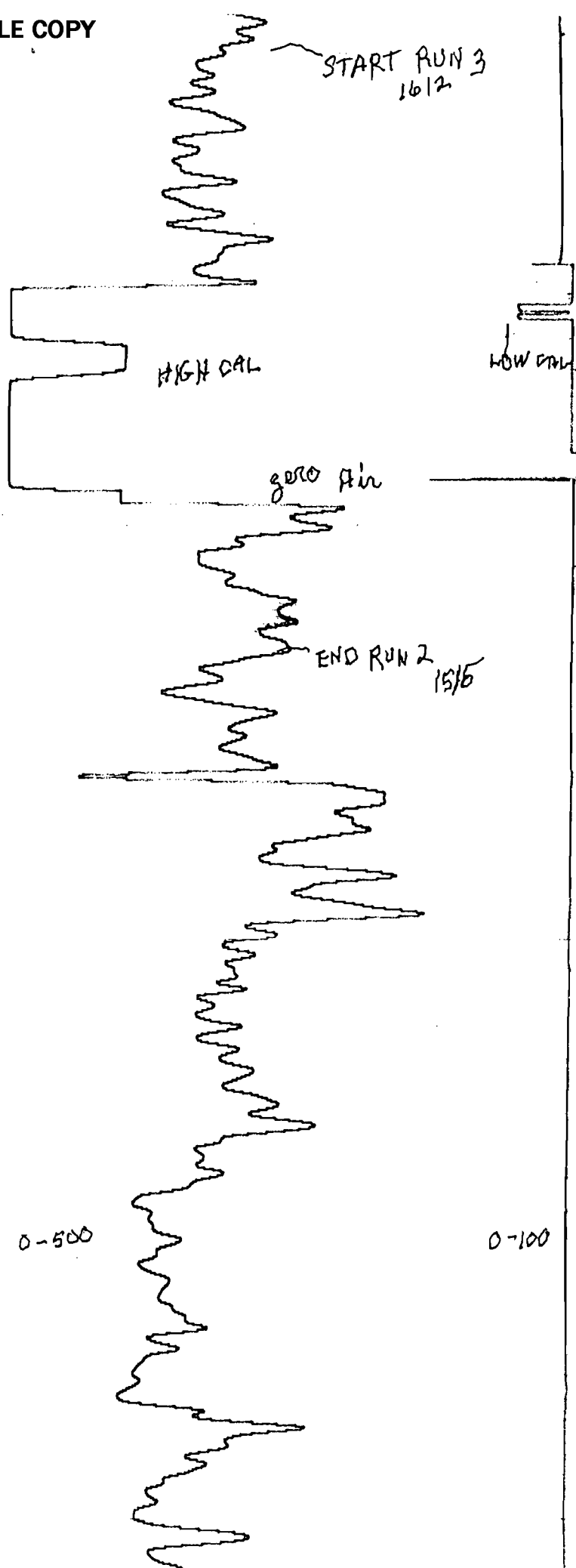
CO HIGH READS	100 ppm	101
MED "	61 ppm	60.3
LOW "	31.5 ppm	30.5

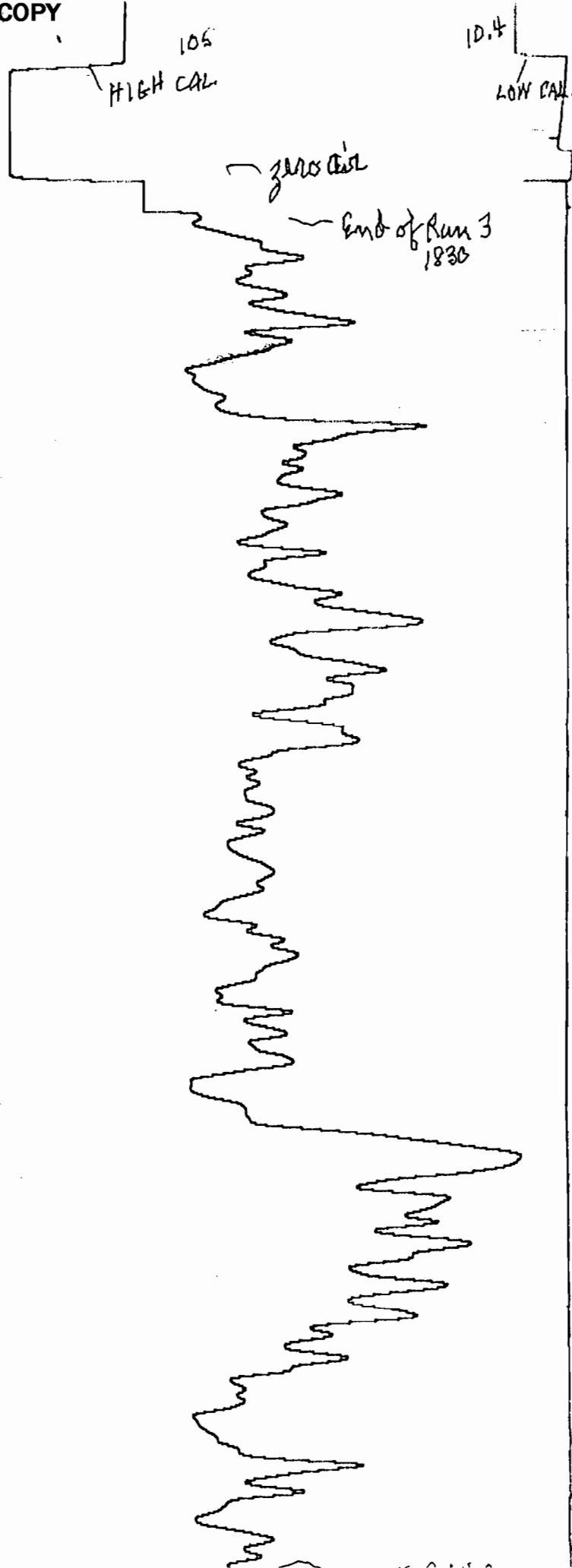
NO _x HIGH READS	210 ppm	208 ppm
MED	53 ppm	53.3
LOW	10.0	10.2

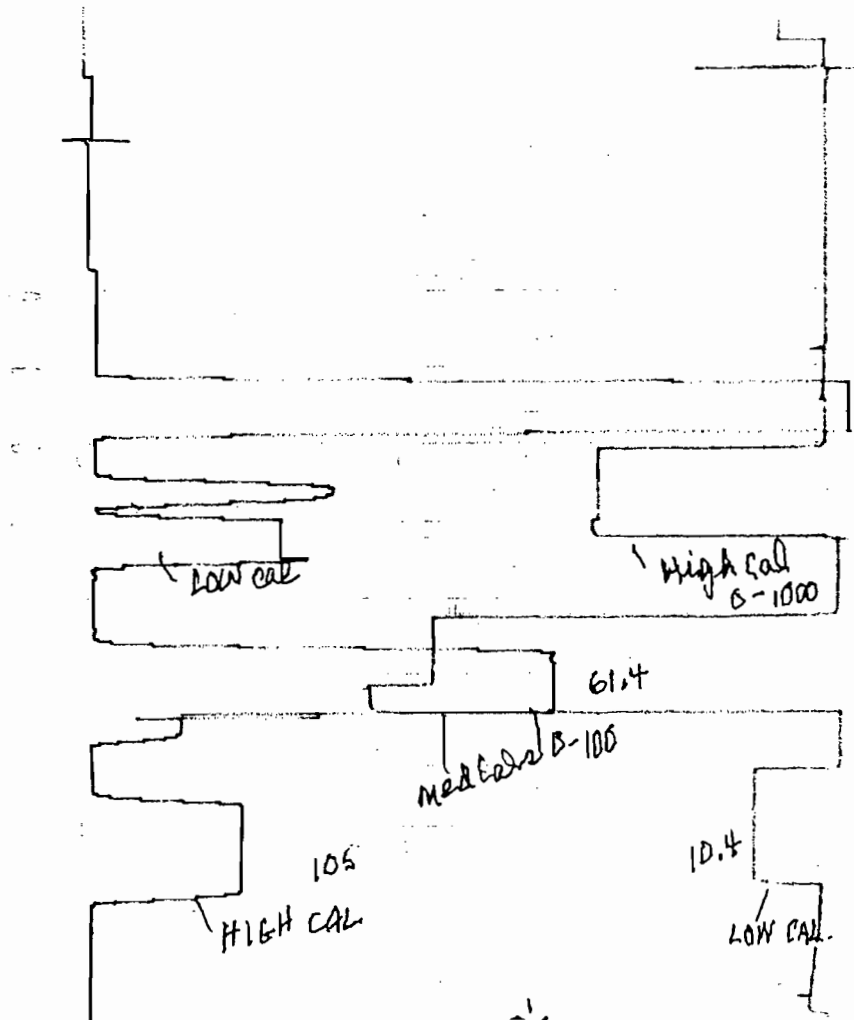


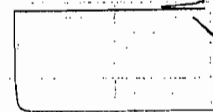
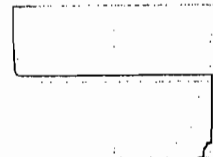












low cal

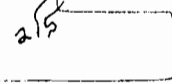


54 ppm



med cal
0-100

2/5



100

90

80

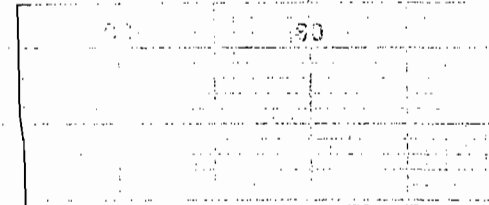
70

60

50

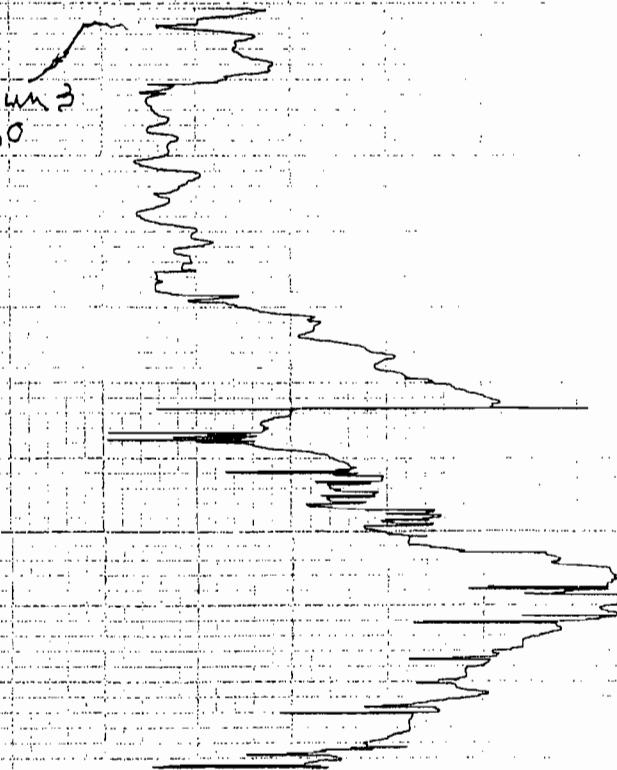
40

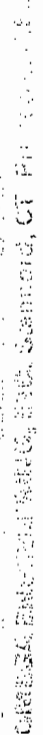
HIGH CAL



zero cal

end of Run 2
1830



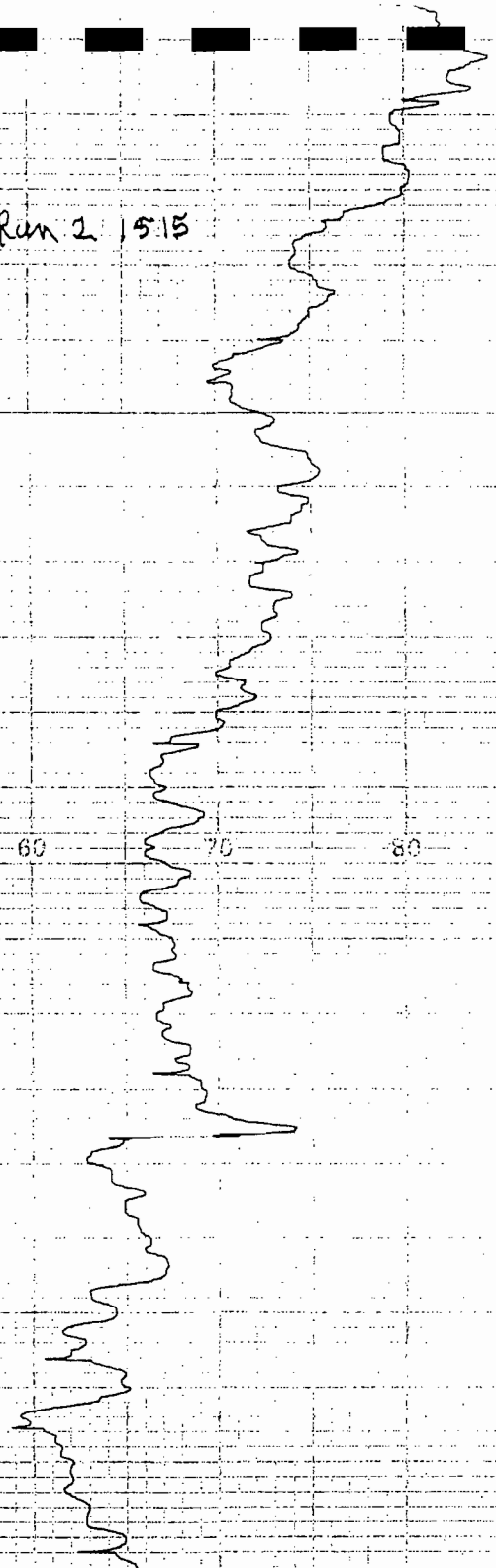


zero line

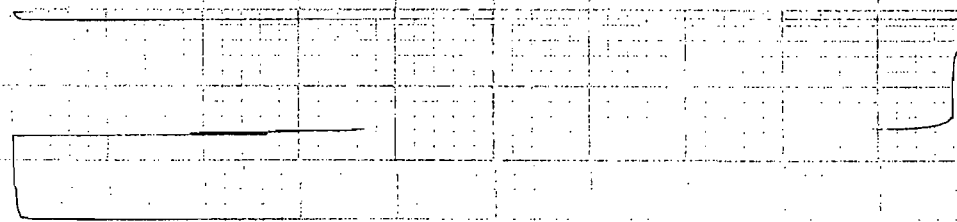
End Run 2 15:15

0-250

0 10 20 30 40 50 60 70 80 90 100



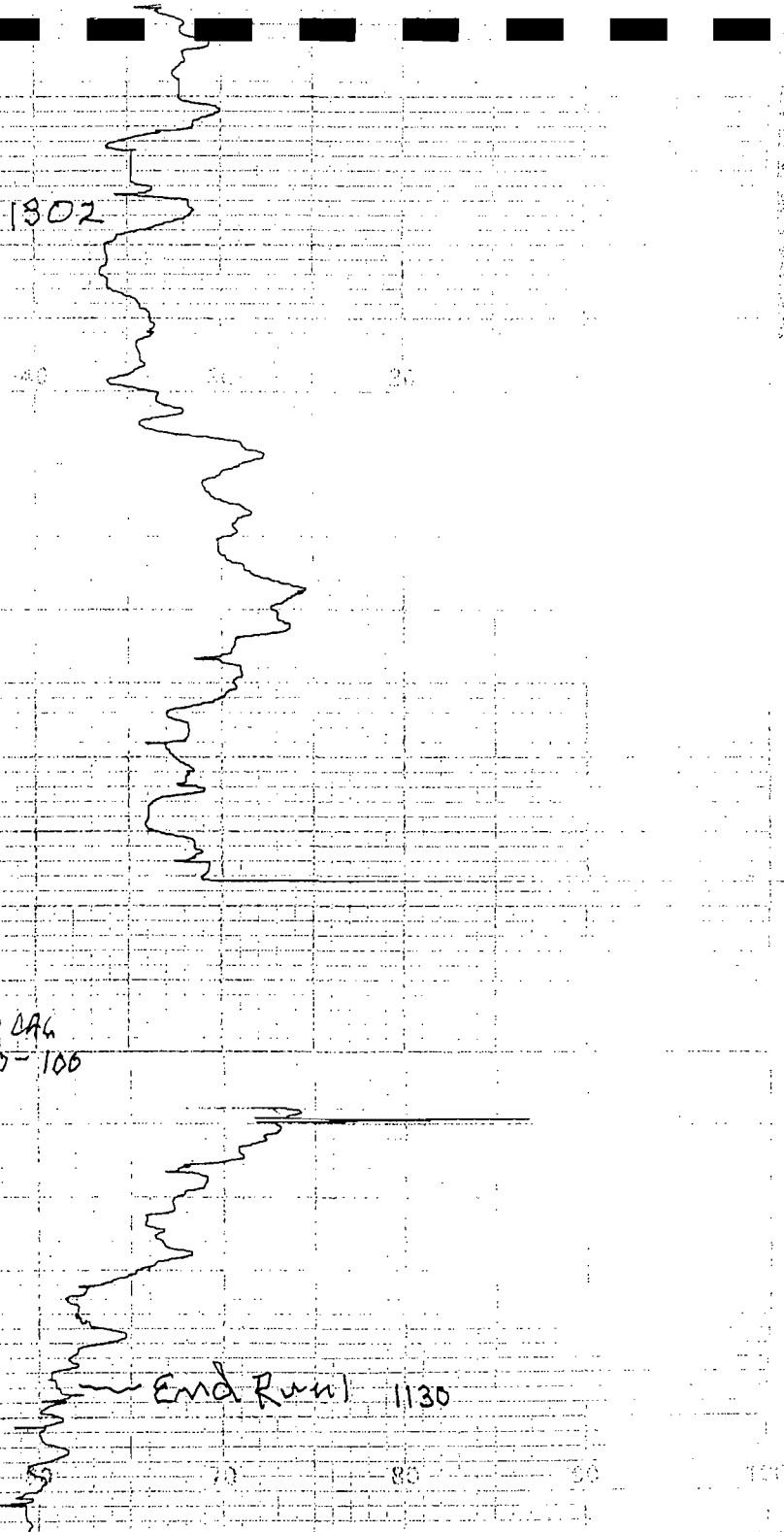
START RUN 2 1802



MED CAL
0-100

1.55 zero air

End Run 1 1130



100 90 80 70 60 50 40 30 20 10 0

5.4250 ppm

START RUN 1
0925

MEGA ENGINEERING, INC.

0 10 20 30 40 50 60 70 80

IN DUOT 0810 0-250 NOx

LOW 10.2

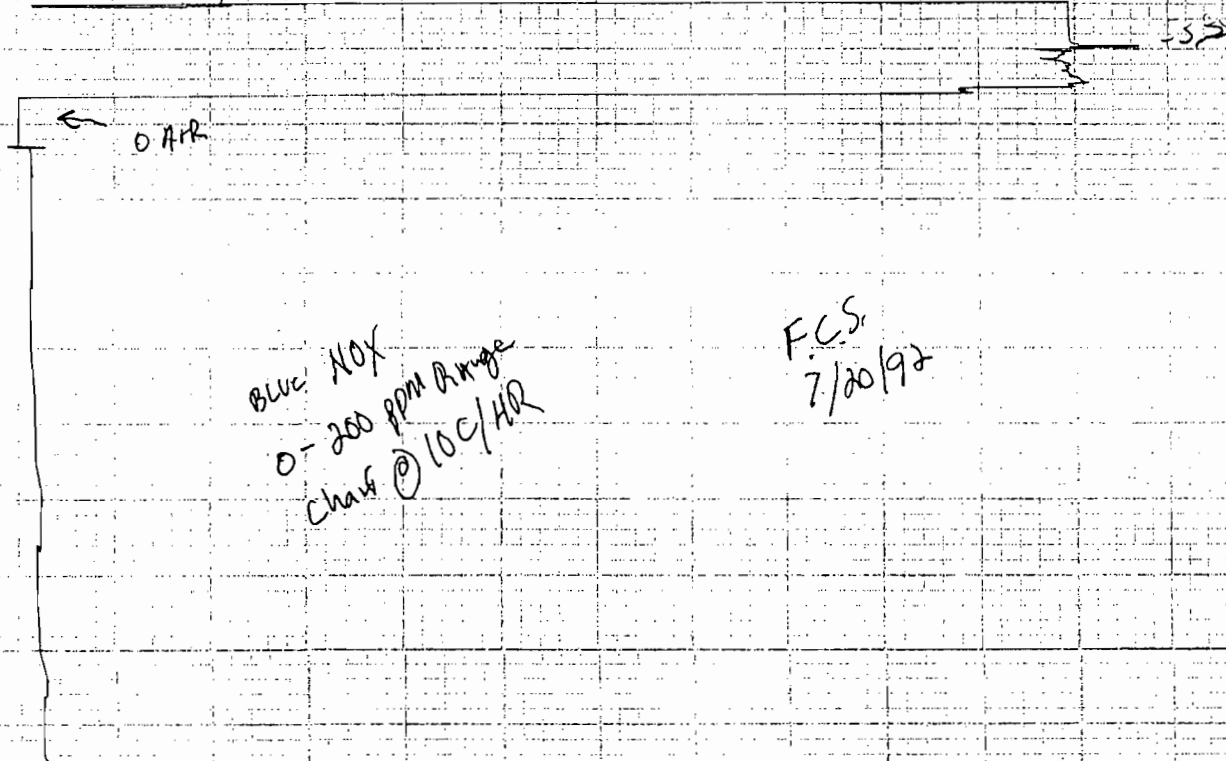
MED
READS 54
0-100

HIGH 0.2
200 ppm 0-1000

ALICE NOA

ne

P.S





SO₂ RUN 1, SET 1 start 0922 end 1042
 RUN 1, SET 2 start 1000 end 1020

O₂ 10.2
 CO₂ 11.6

Plant: CPL
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NOx, CO, THC, O₂ - MM
 Date: 7-22-92 Run No.: 1
 Time Start: 0915 Time End: 1134
 Sample Time: 4 min/port 120 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.29 Hg Stack Press.: °Hg Ps: °H2O
 Moisture: % FDA: Gas Density Factor:
 Temperature: °F Wind Dir.: Wind Speed:
 Weather: Thermocouple Readout:
 Sample Box #: Meter Box No.:
 Meter Y: @ Delta H: Pitot Corr.:
 Nozzle Diameter: in. Probe Length: ft
 Probe Heater Setting: Nomograph Cf:
 Stack Dimentions: in Umbilical:
 Stack Area: ft² Thermocouple
 Effective Stack Area: ft² Probe No.:
 Stack Height: ft Pitot Tube:

Material Processing Rate:
 Final Gas Meter Reading: ft³
 Initial Gas Meter Reading: ft³
 Total Metered Gas Volume: ft³
 Condensate Gain in Impingers: mL
 Weight Gain in Silica Gel: g
 Total Moisture Gain: mL
 Silica Gel Container No.: 29
 Filter Number: 8

Leak Check - Meter Box

Initial: cfm @ in. H₂O
 Final: cfm @ in. H₂O

Leak Check - Pitot Tubes

Impact 3 °H₂O for 15 sec: Stable, Leak
 Static 3 °H₂O for 15 sec: Stable, Leak

Stack Dimentions

Test Conducted By: McJOYE, R. PAUL,
S. BELL, T. JONES, SCOTT SHEPLAK
 Stack Test Observers: JASON GORRE (DER)
DAVE BUFF (KBM)

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (°H ₂ O)	Meter Orifice Pressure Difference (°H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL	CPL	CPL	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (°Hg)				
Average:									O ₂	SO ₂	NOx	10.2			
		0800										10.5	0	231	235
		0815							7.2	135	276	10.5	0	248	240
		0830										10.5	0	208	218
		0845							7.0	166	219	10.5	0	210	224
		0900										10.6	0	298	205
		0915							6.9	167	205	10.2	0	272	196
		0930										10.1	0	284	190
		0945							7.4	176	171	10.5	0	133	184

[illegible]



Run 2, Set 2, 1355, end 1415

O₂ 10.96
CO₂ 11.57%

Plant: CPL
Sample Loc.: BROOKSVILLE
Control Type: BAGHOUSE
Sample Type: NO₂, CO, THC, O₂ - MM
Date: 7-22-92 Run No.: 2
Time Start: 1305 Time End: 1517
Sample Time: _____ min/port _____ total min.
Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
Bar. Pressure 30.29 "Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
Moisture: _____ % FDA: _____ Gas Density Factor: _____
Temperature: 95 °F Wind Dir.: _____ Wind Speed: _____
Weather: _____ Thermocouple Readout: _____
Sample Box #: _____ Meter Box No.: _____
Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
Nozzle Diameter: _____ in. Probe Length: _____ ft
Probe Heater Setting: _____ Nomograph Cf: _____
Stack Dimentions: _____ in
Stack Area: _____ ft²
Effective Stack Area: _____ ft²
Stack Height: _____ ft

Stack Dimentions

Material Processing Rate: _____
Final Gas Meter Reading: _____ ft³
Initial Gas Meter Reading: _____ ft³
Total Metered Gas Volume: _____ ft³
Condensate Gain in Impingers: _____ mL
Weight Gain in Silica Gel: _____ g
Total Moisture Gain: _____ mL
Silica Gel Container No.: 31
Filter Number: 9
Leak Check - Meter Box
Initial: _____ cfm @ _____ in. H₂O
Final: _____ cfm @ _____ in. H₂O
Leak Check - Pitot Tubes
Impact 3 "H₂O for 15 sec: Stable, Leak
Static 3 "H₂O for 15 sec: Stable, Leak
Test Conducted By: McJOYE, R. PAUL,
S. BELL, T. JONES
Stack Test Observers: SCOTT SHEAR - DER-
DAVE BUFF - KLM

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			O2	502	NOx				
Average:												9.9			
		1305										10.0	0	87	202
		1315							6.9	169	169	10.0	0	113	195
		1330										10.0	0	119	190
		1345										10.0	0	57	175
		1400							6.7	187	131	9.8	0	90	165
		1415										9.8	0	121	170
		1430							6.9	166	152	9.8	0	144	165
		1445										9.8	0	140	170

[illegible]



SO₂ RUN 3, set 1 start 1653, end 1713
 RUN 3, set 2 start 1724, end 1744

O₂ 10.0%

CO₂ 11.5%

Plant: CPL
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂ - MM
 Date: 7-22-92 Run No.: 3
 Time Start: 1620 Time End: 1820
 Sample Time: 4 min/port 120 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP: °F
 Bar. Pressure "Hg Stack Press.: "Hg Ps: "H₂O
 Moisture: % FDA: °F Gas Density Factor: °F
 Temperature: °F Wind Dir.: °F Wind Speed: °F
 Weather: °F Thermocouple Readout: °F
 Sample Box #: °F Meter Box No.: °F
 Meter Y: °F @ Delta H: °F Pitot Corr.: °F
 Nozzle Diameter: in. Probe Length: ft
 Probe Heater Setting: °F Nomograph Cf: °F
 Stack Dimentions: in
 Stack Area: ft²
 Effective Stack Area: ft²
 Stack Height: ft

Material Processing Rate: ft³
 Final Gas Meter Reading: ft³
 Initial Gas Meter Reading: ft³
 Total Metered Gas Volume: ft³
 Condensate Gain in Impingers: mL
 Weight Gain in Silica Gel: g
 Total Moisture Gain: mL
 Silica Gel Container No.: 99
 Filter Number: 10

Leak Check - Meter Box

Initial: °F cfm @ °F in. H₂O
 Final: °F cfm @ °F in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Stack Dimentions

Umbilical: °F
 Thermocouple °F
 Probe No.: °F
 Pitot Tube: °F

Test Conducted By: M. JOYE, R. PAUL,
S. BELL, T. JONES
 Stack Test Observers: DAVE BULL - KRM
HOWARD COOCH, Hernando County

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (*H2O)	Meter Orifice Pressure Difference (*H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train (*Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			Or	Scr	Nox				
Average:												10.0			
		1615										10.0	0	66	205
		1620	start run 3						6.8	187	190	10.0	0	60	205
		1630										10.0	0	83	202
		1645							6.8	202	170	10.0	0	65	198
		1700										10.5	0	103	195
		1715							6.9	209	181	10.0	0	88	195
		1730										10.0	0	85	185
		1745							6.6	201	169	9.8	0	110	175



Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (*H ₂ O)	Meter Orifice Pressure Difference (*H ₂ O)		Stack Gas Temp. (°F)	Sample Box Temp. (°F)	CPL	CPL	CPL	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)	
					Calculated	Actual			Last Impinger Temp. (°F)	Meter Temp. (°F)	Vacuum on Sample Train (in. Hg)					
		1800							02	502	NOx	10.0	0	101	175	
		1815						6.7	186	185		9.8	0	151	160	
		1820	down due to rain and lightning										9.8	0	138	170
		zero air											0	0	0	
		HIGH cal											302	106.6	202	
		Med cal											50.5	60.8	51.5	
		LOW cal											9.5	31.5	9.9	
													7			
		1845											10.5	158	180	
		1900											9.8	129	172	
		NOx 810 ppm Cal Reads 760 ppm														

START RUN 1
0915

0-500
CO

0-100
THE

↑ STACK 08:08

← 30.5 ppm CO

← 60.3 ppm CO

← 51 ppm

298 ppm
0-200 Range
9.8 ppm

← 0.11

← 101 ppm CO

0 AIR →

↑ 081

BLACK
0-200 ppm Range
30 Sec Avg

FCS.
7/22/92
CHART @ 10 cm/hr

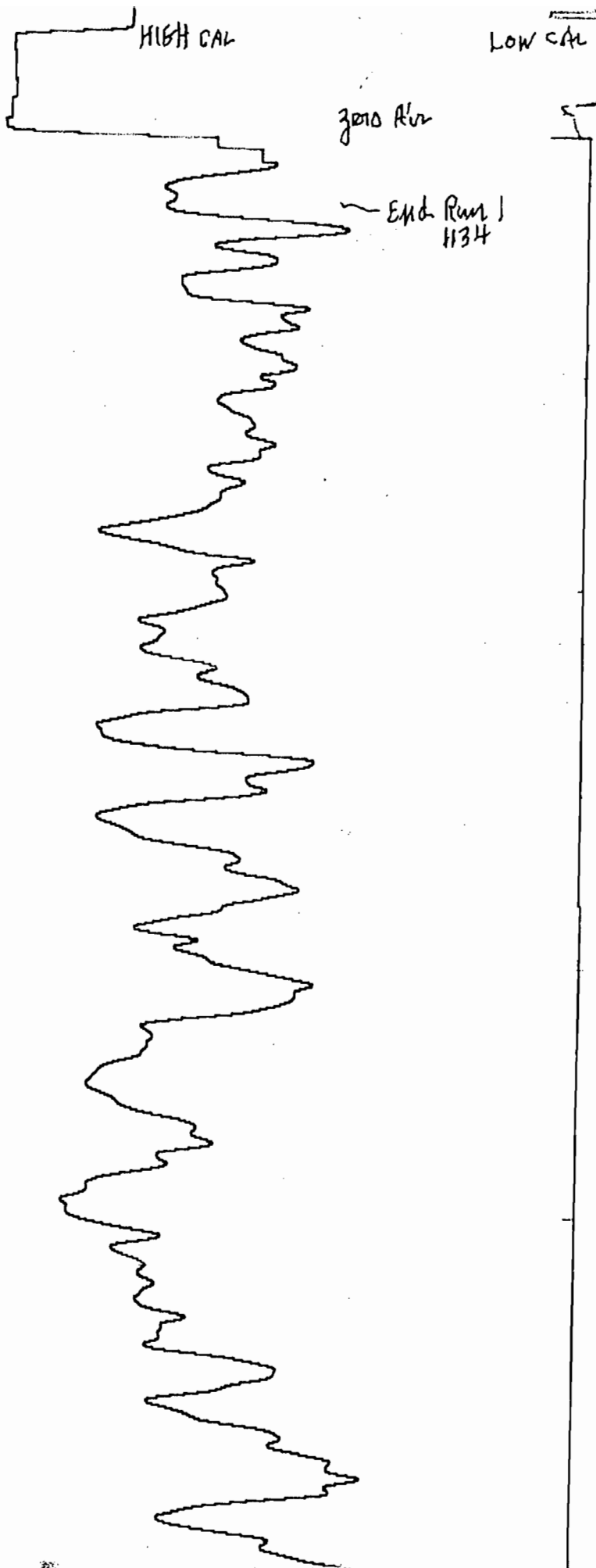
FID.
0-100 ppm
Range

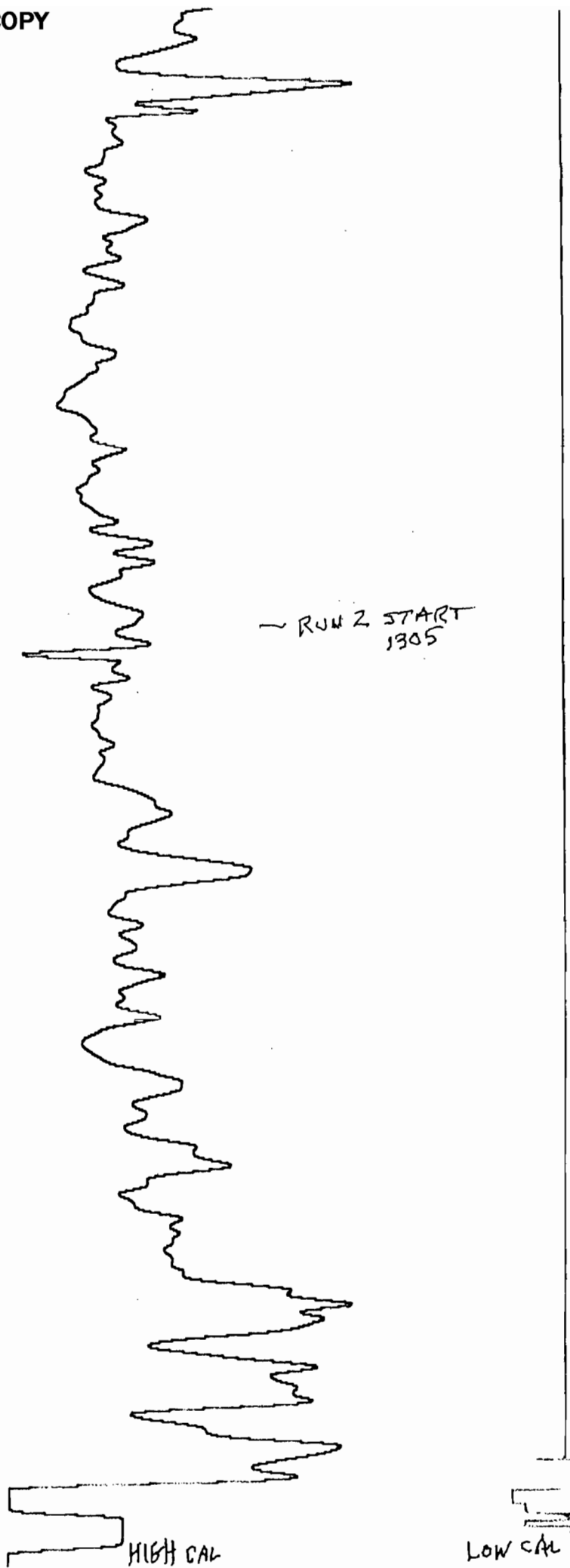
HIGH CAL

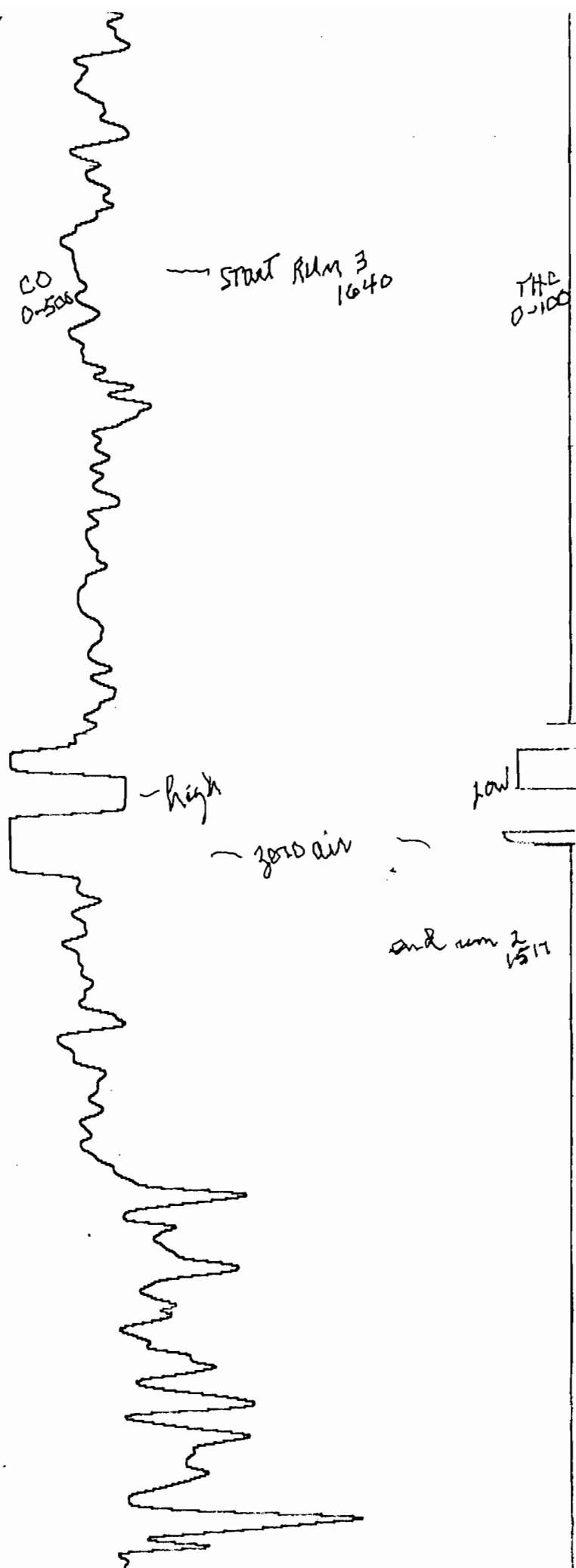
LOW CAL

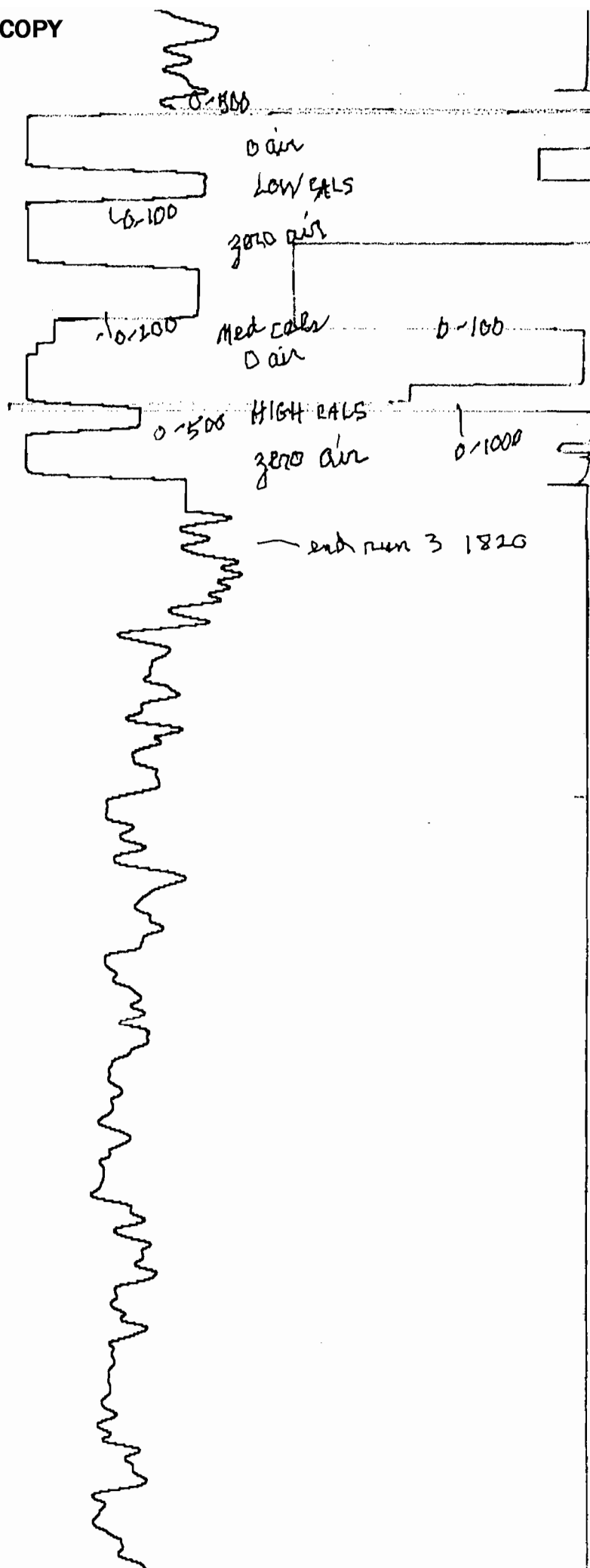
3010 R/r

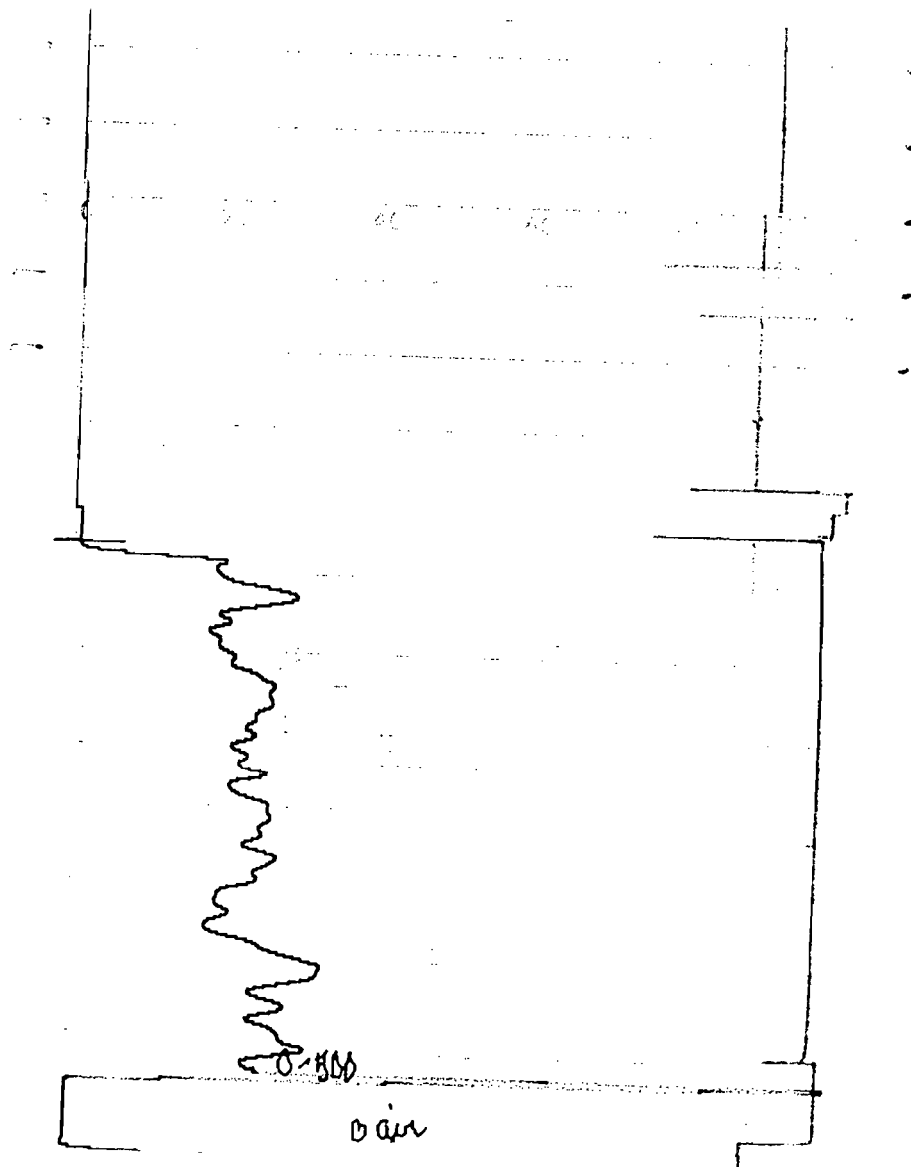
End Run 1
1134











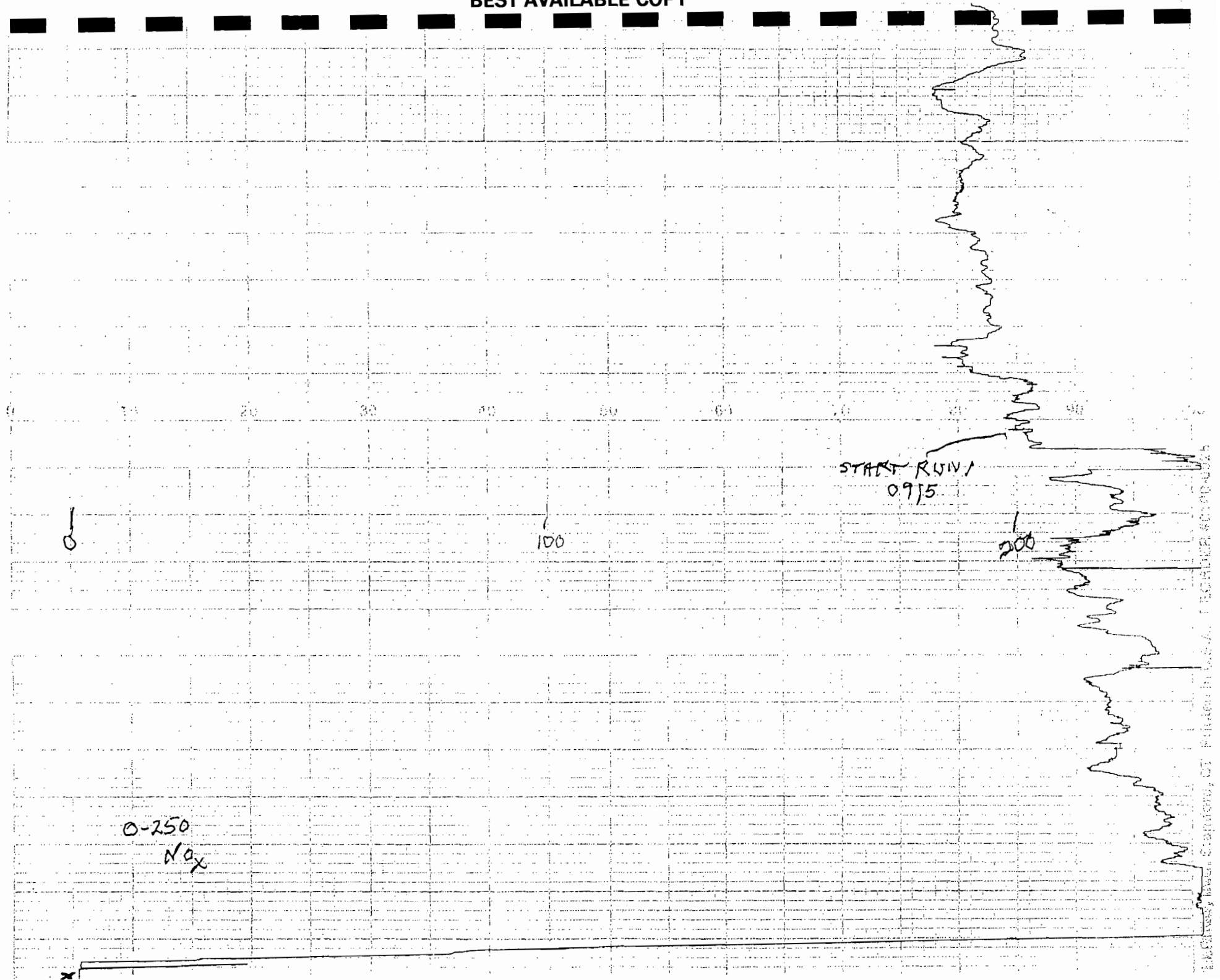
NOx

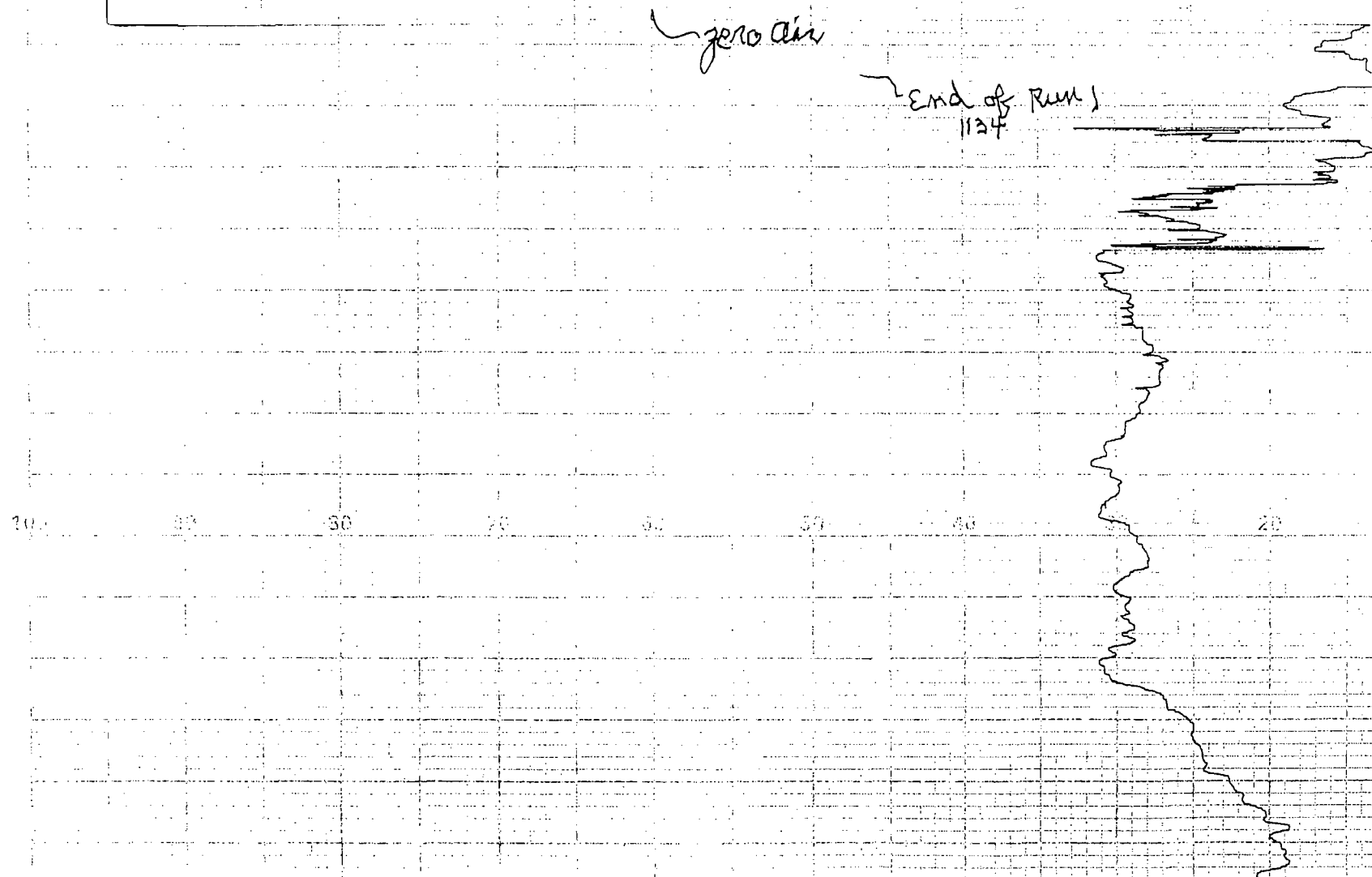
ORIR

0733

BLUE
NOx
0-250 ppm Range
F.C.S.
7/27/92
CHART @ 10 cm/Hr

NO OF LINES IN RANGE 00





100 90 80 70 60 50 40 30 20

1305 START RUN 2

01-10-1964 10:00 AM

6

NOX

500

800

START Run 3 1646
O-1000 ppm

O-1600

zero air

high cal

and run 7
1517

men use 100

0 air

HIGH OBL
0-1000

zero air

end run 3 1820

100

90

80

70

60

50

40

30

20

10

0

0 AIR

0-1000

0 AIR

810 PPM CAL
FCS
READS 760 PPM

100 50 0 50 100

0 air 0-1000

LOW CAL
0-100

zero air

FCS. 7/22/92

O₂ - 20.9%

CO 101 - 100.3
60.3 59.5
30.5 29.8

0 - 0

FID 298 - 300
51. - 51
9.88 - 10

0 - 0

NOX 208 208
53.3 - 53
10.2 - 9.5
0 - 0

VISIBLE EMISSIONS

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1200-1230

	SECONDS	5	15	30	45
	----- OPACITY (%) -----				
MINUTES / 1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	5	0	0	0
7	0	0	0	0	0
8	0	0	0	0	5
9	5	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	5	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	5	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.2 %

MAXIMUM OPACITY: 5 %

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

TREG JONES

_____, has completed the
STATE OF FLORIDA visible emissions evaluation training and is a qualified
observer of visible emissions as specified by EPA reference method 9.

THIS CERTIFICATE EXPIRES Dec 2, 1992

Michael R. Clark
CERTIFICATE OFFICER

Treg Jones
BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1200-1230

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.2
7	0.2	0.2	0.2	0.2
8	0.2	0.2	0.2	0.4
9	0.6	0.6	0.6	0.6
10	0.6	0.6	0.6	0.6
11	0.6	0.6	0.6	0.6
12	0.6	0.4	0.4	0.4
13	0.4	0.4	0.4	0.4
14	0.4	0.4	0.4	0.2
15	0.0	0.0	0.0	0.0
16	0.2	0.2	0.2	0.2
17	0.2	0.2	0.2	0.2
18	0.2	0.2	0.2	0.2
19	0.2	0.2	0.2	0.2
20	0.2	0.2	0.2	0.2
21	0.2	0.2	0.2	0.2
22	0.0	0.0	0.0	0.0
23	0.2	0.2	0.2	0.2
24	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2
26	0.2	0.2	0.2	0.2
27	0.2	0.2	0.2	0.2
28	0.2	0.2	0.2	0.2
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.6 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1231-1300

	SECONDS / 5	15	30	45
	----- OPACITY (%) -----			
MINUTES / 1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	5	0
5	0	5	5	5
6	5	5	0	0
7	0	0	0	0
8	0	0	0	5
9	5	0	5	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	5	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	5	0
18	0	0	0	5
19	5	0	0	0
20	0	0	5	5
21	5	0	0	0
22	0	0	0	0
23	0	5	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	5	5
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

AVERAGE OPACITY: 0.8 %

MAXIMUM OPACITY: 5 %

STATE OF FLORIDA
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THIS CERTIFICATE EXPIRES Dec 2, 1992

Michael R. Clark
CERTIFICATE OFFICER

Treg Jones
BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1231-1300

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	1.3
7	1.3	1.3	1.3	1.3
8	1.3	1.3	1.3	1.5
9	1.7	1.7	1.9	1.9
10	1.9	1.9	1.7	1.7
11	1.7	1.5	1.3	1.0
12	0.8	0.6	0.6	0.6
13	0.8	0.8	0.8	0.8
14	0.8	0.8	0.8	0.6
15	0.4	0.4	0.2	0.2
16	0.2	0.2	0.2	0.2
17	0.2	0.2	0.4	0.4
18	0.4	0.4	0.4	0.6
19	0.6	0.6	0.6	0.6
20	0.6	0.6	0.8	1.0
21	1.3	1.3	1.3	1.3
22	1.3	1.3	1.3	1.3
23	1.3	1.5	1.3	1.3
24	1.3	1.3	1.3	1.0
25	0.8	0.8	0.8	0.8
26	0.8	0.8	0.8	0.8
27	0.6	0.6	0.6	0.6
28	0.6	0.6	0.6	0.6
29	0.6	0.4	0.4	0.4
30	0.4	0.4	0.4	0.4

HIGHEST SIX-MINUTE ROLLING AVERAGE: 1.9 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1500-1530

MINUTES /	SECONDS	5	15	30	45
	OPACITY (%)				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	5
5	5	5	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	5
17	5	5	5	0	0
18	0	0	0	0	5
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.3 %

MAXIMUM OPACITY: 5 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1500-1530

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.6
7	0.6	0.6	0.6	0.6
8	0.6	0.6	0.6	0.6
9	0.6	0.6	0.6	0.6
10	0.6	0.6	0.6	0.4
11	0.2	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.2
17	0.4	0.6	0.8	0.8
18	0.8	0.8	0.8	1.0
19	1.0	1.0	1.0	1.0
20	1.0	1.0	1.0	1.0
21	1.0	1.0	1.0	1.0
22	1.0	1.0	1.0	0.8
23	0.6	0.4	0.2	0.2
24	0.2	0.2	0.2	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 1.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1531-1600

MINUTES /	SECONDS	OPACITY (%)			
	5	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	5	5	0	
15	5	5	5	5	
16	5	5	5	5	
17	5	5	5	5	
18	5	5	5	5	
19	5	5	5	5	
20	5	5	5	5	
21	5	5	5	5	
22	5	0	0	0	
23	0	0	5	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

AVERAGE OPACITY: 1.3 %

MAXIMUM OPACITY: 5 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 21, 1992
TIME : 1531-1600

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.2	0.4	0.4
15	0.6	0.8	1.0	1.3
16	1.5	1.7	1.9	2.1
17	2.3	2.5	2.7	2.9
18	3.1	3.3	3.5	3.8
19	4.0	4.2	4.4	4.6
20	4.8	4.8	4.8	5.0
21	5.0	5.0	5.0	5.0
22	5.0	4.8	4.6	4.4
23	4.2	4.0	4.0	3.8
24	3.5	3.3	3.1	2.9
25	2.7	2.5	2.3	2.1
26	1.9	1.7	1.5	1.3
27	1.0	0.8	0.6	0.4
28	0.2	0.2	0.2	0.2
29	0.2	0.2	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 5.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1155-1225

MINUTES /	SECONDS / 5	15	30	45
	----- OPACITY (%) -----			
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1155-1225

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1225-1255

		SECONDS /	5	15	30	45
		----- OPACITY (%) -----				
MINUTES /						
1		0	0	0	0	0
2		0	0	0	0	0
3		0	0	0	0	0
4		0	0	0	0	0
5		0	0	0	0	0
6		0	0	0	0	0
7		0	0	0	0	0
8		0	0	0	0	0
9		0	0	0	0	0
10		0	0	0	0	0
11		0	0	0	0	0
12		0	0	0	0	0
13		0	0	0	0	0
14		0	0	0	0	0
15		0	0	0	0	0
16		0	0	0	0	0
17		0	0	0	0	0
18		0	0	0	0	0
19		0	0	0	0	0
20		0	0	0	0	0
21		0	0	0	0	0
22		0	0	0	0	0
23		0	0	0	0	0
24		0	0	0	0	0
25		0	0	0	0	0
26		0	0	0	0	0
27		0	0	0	0	0
28		0	0	0	0	0
29		0	0	0	0	0
30		0	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1225-1255

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE : CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1540-1610

MINUTES /	SECONDS	5	15	30	45
	OPACITY (%)				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1540-1610

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE : CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1610-1640

MINUTES /	SECONDS	OPACITY (%)			
	/ 5	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / BASELINE
DATE : JULY 22, 1992
TIME : 1610-1640

MINUTES --- SIX-MINUTE ROLLING AVERAGES ---

1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %



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CONTINUED ON VEO FORM NUMBER 2111

1 OF 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME		END TIME	
FLORIDA CRUSHED STONE CO.			21 JULY 92				1200		1300	
ADDRESS			SEC	0	15	30	45	COMMENTS		
P.O. BOX 1508 / 10811 CEMENT PLANT RD			MIN							
HERNANDO COUNTY			1	0	0	0	0			
CITY	STATE	ZIP	2	0	0	0	0			
BROOKSVILLE	FL.	34601	3	0	0	0	0			
PHONE	SOURCE ID NUMBER		4	0	0	0	0			
	A027-118544 & A027-185508		5	0	0	0	0			
PROCESS EQUIPMENT PLANT		OPERATING MODE	6	0	5	0	0			
CEMENT-POWER-LIME		OPERATING MODE	7	0	0	0	0			
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	5			
BAGHOUSE		72% SPEED	9	5	0	0	0			
DESCRIBE EMISSION POINT			10	0	0	0	0			
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0			
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER		12	0	0	0	0			
START 300' STOP 300'	START 300' STOP 300'		13	0	0	0	0			
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER		14	0	0	0	0			
START 1000' STOP 1000'	START NW STOP NW		15	0	0	0	0			
DESCRIBE EMISSIONS			16	5	0	0	0			
START	STOP		17	0	0	0	0			
EMISSION COLOR	PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>		18	0	0	0	0			
CLEAR CLEAR START WHITE STOP WHITE	FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>		19	0	0	0	0			
WATER DROPLETS PRESENT:	IF WATER DROPLET PLUME:		20	0	0	0	0			
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>	ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>		21	0	0	0	0			
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			22	0	0	0	0			
START 30' ABOVE STACK STOP 30' ABOVE STACK			23	5	0	0	0			
DESCRIBE BACKGROUND			24	0	0	0	0			
START SKY	STOP SKY		25	0	0	0	0			
BACKGROUND COLOR	SKY CONDITIONS		26	0	0	0	0			
START BLUE STOP BLUE	START CLEAR STOP CLEAR		27	0	0	0	0			
WIND SPEED	WIND DIRECTION		28	0	0	0	0			
START 2-4 STOP 2-4	START VAR. STOP VAR.		29	0	0	0	0	INTERMITTENT CLOUDS MOVING INTO BACKGROUND		
AMBIENT TEMP.	WET BULB TEMP.	RH. percent	30	0	0	0	0			
START 98° STOP 98°	92°									

Source Layout Sketch Draw North Arrow

COMMENTS

CEMENT-130TPH

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

OBSERVER'S NAME (PRINT)

TREK E. JONES

OBSERVER'S SIGNATURE

Greg E. Jones

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

ETA

DATE

21 JULY 92



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CONTINUED ON VEO FORM NUMBER Rev'd #1

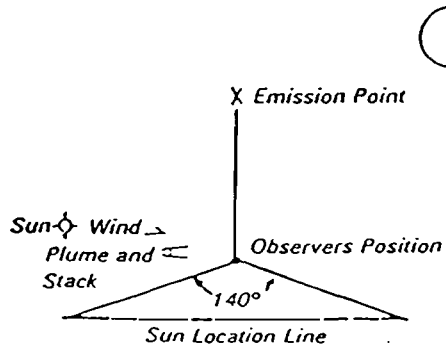
2 of 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			21 JULY 92				1200	1300
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN					
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.		3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	5	0	
	AC 27-118674 AO 27-183508		5	0	5	5	5	
PROCESS EQUIPMENT		OPERATING MODE	6	5	5	0	0	
C-P-L			7	0	0	0	0	
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	5	
BAGHOUSE			9	5	0	5	0	
DESCRIBE EMISSION POINT			10	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL			12	0	0	0	0	
START 300' STOP 300'			13	5	0	0	0	
DISTANCE FROM OBSERVER			14	0	0	0	0	
START 1000' STOP 1000'			15	0	0	0	0	
DIRECTION FROM OBSERVER			16	0	0	0	0	
START NW STOP NW			17	0	0	5	0	
DESCRIBE EMISSIONS			18	0	0	0	0	
START STOP			19	5	0	0	0	
EMISSION COLOR			20	0	0	0	0	
START CLEAR STOP CLEAR			21	5	0	0	0	
PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>			22	0	0	0	0	
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>			23	0	0	0	0	
IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>			24	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			25	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			26	0	0	5	0	
DESCRIBE BACKGROUND			27	0	0	0	5	
START SKY STOP SKY			28	5	0	0	0	
BACKGROUND COLOR			29	0	0	5	5	
START BLUE STOP BLUE			30	0	0	0	0	
WIND SPEED								
START 2-4 STOP 2-4								
WIND DIRECTION								
START VAR. STOP VAR.								
AMBIENT TEMP.								
START 98° STOP 98°								
WET BULB TEMP.								
92°								
RH, percent								

Source Layout Sketch

Draw North Arrow



COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

TREG E. JONES

DATE

21 JULY 92

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

ETA

DATE

21 JULY 92



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CONTINUED ON VEO FORM NUMBER *Rev #2*

1 OF 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE		START TIME	END TIME
FLORIDA CRUSHED STONE CO.			21 JULY 92		1500	1600
ADDRESS			SEC	0	15	30
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN	0	15	30
HERNANDO COUNTY			1	0	0	0
CITY	STATE	ZIP	2	0	0	0
BROOKSVILLE	FL.	34601	3	0	0	0
PHONE	SOURCE ID NUMBER		4	0	0	0
	AC 27-118674 & 1027-123208		5	5	5	0
PROCESS EQUIPMENT		OPERATING MODE	6	0	0	0
CEMENT - POWER LINE PLANT			7	0	0	0
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0
BAGHOUSE		72% DEMAND	9	0	0	0
DESCRIBE EMISSION POINT			10	0	0	0
START TOP OF STACK STOP TOP OF STACK			11	0	0	0
HEIGHT ABOVE GROUND LEVEL			12	0	0	0
START 300' STOP 300'			13	0	0	0
DISTANCE FROM OBSERVER			14	0	0	0
START 1000' STOP 1000'			15	0	0	0
DIRECTION FROM OBSERVER			16	0	0	0
START ESE STOP ESE			17	5	5	5
DESCRIBE EMISSIONS			18	0	0	0
START CLEAR STOP CLEAR / LIGHT COAL			19	0	0	0
EMISSION COLOR		PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>	20	0	0	0
START CLEAR STOP CLEAR		FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>	21	0	0	0
WATER DROPLETS PRESENT:		IF WATER DROPLET PLUME:	22	0	0	0
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>		ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>	23	0	0	0
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			24	0	0	0
START 30' ABOVE STACK STOP 30' ABOVE STACK			25	0	0	0
DESCRIBE BACKGROUND			26	0	0	0
START BROKEN SKY STOP CLOUDS			27	0	0	0
BACKGROUND COLOR		SKY CONDITIONS	28	0	0	0
START WHITE STOP WHITE		START SCATT. STOP BROKEN	29	0	0	0
WIND SPEED		WIND DIRECTION	30	0	0	0
START 3-5 STOP 3-5		START VAR. STOP VAR.				
AMBIENT TEMP.		WET BULB TEMP.				
START 96° STOP 92°		RH. percent				
Source Layout Sketch			Draw North Arrow			
COMMENTS			OBSERVER'S NAME (PRINT)			
CEMENT - 130 TPH			TREG E. JONES			
			OBSERVER'S SIGNATURE		DATE	
			<i>Treg E. Jones</i>		21 JULY 92	
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS			ORGANIZATION			
SIGNATURE			KOOGLER & ASSOC.			
TITLE		DATE	CERTIFIED BY		DATE	
			ETA		21 JULY 92	



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CONTINUED ON VEO FORM NUMBER *Env #2*

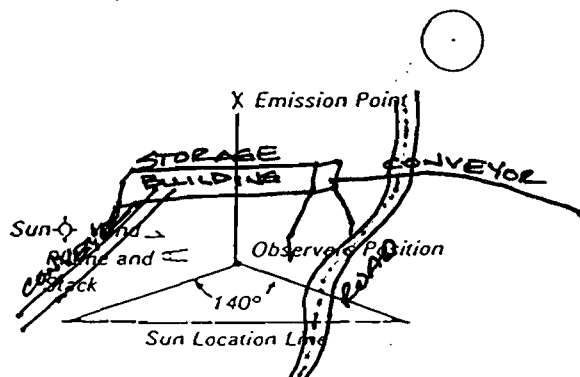
2 OF 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE		START TIME	END TIME
FLORIDA CRUSHED STONE CO.			21 JULY 92		1500	1600
ADDRESS			SEC	0	15	30
P.O. Box 1508 / 10311 CEMENT PLANT RD.			MIN	0	15	30
HERNANDO COUNTY			1	0	0	0
CITY	STATE	ZIP	2	0	0	0
BROOKSVILLE	FL.	34601	3	0	0	0
PHONE	SOURCE ID NUMBER		4	0	0	0
	AC27-118674 #		5	0	0	0
PROCESS EQUIPMENT		OPERATING MODE	6	0	0	0
C-P-L PLANT			7	0	0	0
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0
BAGHOUSE		72% DEMAND	9	0	0	0
DESCRIBE EMISSION POINT			10	0	0	0
START TOP OF STACK STOP TOP OF STACK			11	0	0	0
HEIGHT ABOVE GROUND LEVEL			12	0	0	0
START 300' STOP 300'			13	0	0	0
HEIGHT RELATIVE TO OBSERVER			14	0	0	0
START 250' STOP 250'			15	0	0	0
DISTANCE FROM OBSERVER			16	0	0	0
START 1000' STOP 1000'			17	0	0	0
DIRECTION FROM OBSERVER			18	0	0	0
START ESE STOP ESE			19	0	0	0
DESCRIBE EMISSIONS			20	0	0	0
START CLEAR STOP CLEAR/LIGHT COAL			21	0	0	0
EMISSION COLOR			22	0	0	0
START CLEAR STOP CLEAR			23	0	0	0
PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>			24	0	0	0
FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>			25	0	0	0
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>			26	0	0	0
IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>			27	0	0	0
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			28	0	0	0
START 30' ABOVE STACK STOP 30' ABOVE STACK			29	0	0	0
DESCRIBE BACKGROUND			30	0	0	0
START DARK CLOUDS STOP WHITE PUFFY CLOUDS						
BACKGROUND COLOR						
START GREY STOP WHITE						
SKY CONDITIONS						
START SCATT. STOP BROKE						
WIND SPEED						
START 3-5 STOP 3-5						
WIND DIRECTION						
START VAR. STOP VAR.						
AMBIENT TEMP.						
START 96° STOP 92°						
WET BULB TEMP.						
RH. percent						

Source Layout Sketch

Draw North Arrow



COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE

TITLE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E. Jones

DATE

21 JULY 92

ORGANIZATION

KOUGLER & ASSOC.

CERTIFIED BY

ETA

DATE

21 JUL 92



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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CONTINUED ON VEO FORM NUMBER Env #1

1 of 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			22 JULY 92				1155	1255
ADDRESS			SEC	MIN			COMMENTS	
P.O. Box 1508 / 10311 CEMENT PLANT RD			0	15	30	45		
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	AC27-1184-14		5	0	0	0	0	
	A027-185508		6	0	0	0	0	
PROCESS EQUIPMENT PLANT		OPERATING-MODE	7	0	0	0	0	
CEMENT-POWER-LINE		OPERATING MODE	8	0	0	0	0	
CONTROL EQUIPMENT		71% SPEED DEMAND	9	0	0	0	0	
BARRHOUSE			10	0	0	0	0	
DESCRIBE EMISSION POINT			11	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			12	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER		13	0	0	0	0	
START 300' STOP 300'	START 300' STOP 300'		14	0	0	0	0	
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER		15	0	0	0	0	
START 1000' STOP 1000'	START NW STOP NW		16	0	0	0	0	
DESCRIBE EMISSIONS			17	0	0	0	0	
START STOP			18	0	0	0	0	
EMISSION COLOR	PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>		19	0	0	0	0	
START CLEAR STOP CLEAR	FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>		20	0	0	0	0	
WATER DROPLETS PRESENT:	IF WATER DROPLET PLUME:		21	0	0	0	0	
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>	ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>		22	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			23	0	0	0	0	WHITE CLOUD FOR BACKGROUND
START 30' ABOVE START STOP 30' ABOVE STACK			24	0	0	0	0	
DESCRIBE BACKGROUND			25	0	0	0	0	
START SKY / CLEAR STOP SKY			26	0	0	0	0	
BACKGROUND COLOR	SKY CONDITIONS		27	0	0	0	0	
START BLUE STOP BLUE	START MOIST STOP BUNNY STOP SCATT		28	0	0	0	0	
WIND SPEED	WIND DIRECTION		29	0	0	0	0	
START 3-5 STOP 3-5	START VAR. STOP VAR.		30	0	0	0	0	
AMBIENT TEMP.	WET BULB TEMP.	RH. percent						
START 94° STOP 95°								
Source Layout Sketch			Draw North Arrow					
COMMENTS			OBSERVER'S NAME (PRINT)					
CEMENT - 130 TPD			TREG E. JONES					
			OBSERVER'S SIGNATURE				DATE	
			Treg E Jones				22 JULY 92	
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS			ORGANIZATION					
SIGNATURE			KOOGLER & ASSOC.					
TITLE			CERTIFIED BY				DATE	
			ETA				7-15-92	



ENVIRONMENTAL SERVICES
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CONTINUED ON VEO FORM NUMBER Run #12 08 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME		END TIME	
FLORIDA CRUSHED STONE CO.			22 JULY 92				1155		1255	
ADDRESS			SEC	0	15	30	45	COMMENTS		
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN							
HERNANDO COUNTY			1	0	0	0	0	BLUE SKY BR		
CITY	STATE	ZIP	2	0	0	0	0			
BROOKSVILLE	FL.	34601	3	0	0	0	0			
PHONE	SOURCE ID NUMBER		4	0	0	0	0			
	AC 27-1186-14		5	0	0	0	0			
	AO-27-183508		6	0	0	0	0			
PROCESS EQUIPMENT PLANT		OPERATING MODE	7	0	0	0	0			
CEMENT - POWER - LINE			8	0	0	0	0			
CONTROL EQUIPMENT		OPERATING MODE	9	0	0	0	0	WHITE CLOUD BR		
BAGHOUSE		71% DEMAND	10	0	0	0	0			
DESCRIBE EMISSION POINT			11	0	0	0	0			
START TOP OF STACK STOP TOP OF STACK			12	0	0	0	0			
HEIGHT ABOVE GROUND LEVEL		HEIGHT RELATIVE TO OBSERVER	13	0	0	0	0			
START 300' STOP 300'		START 300' STOP 300'	14	0	0	0	0	BLUE SKY BR		
DISTANCE FROM OBSERVER		DIRECTION FROM OBSERVER	15	0	0	0	0			
START 1000' STOP 1000'		START NW STOP NW	16	0	0	0	0			
DESCRIBE EMISSIONS			17	0	0	0	0			
START STOP			18	0	0	0	0			
EMISSION COLOR		PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>	19	0	0	0	0			
START CLEAR STOP CLEAR		FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>	20	0	0	0	0			
WATER DROPLETS PRESENT:		IF WATER DROPLET PLUME:	21	0	0	0	0			
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>		ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>	22	0	0	0	0			
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			23	0	0	0	0			
START 30' ABOVE STACK STOP 30' ABOVE STACK			24	0	0	0	0			
DESCRIBE BACKGROUND			25	0	0	0	0			
START SKY STOP SKY			26	0	0	0	0			
BACKGROUND COLOR		SKY CONDITIONS	27	0	0	0	0			
START BLUE STOP BLUE		START BUNNY STOP SCATT.	28	0	0	0	0			
WIND SPEED		WIND DIRECTION	29	0	0	0	0			
START 3-5 STOP 3-5		START VAR. STOP VAR.	30	0	0	0	0			
AMBIENT TEMP.		WET BULB TEMP.	RH, percent							
START 94° STOP 95°										
Source Layout Sketch			Draw North Arrow							
COMMENTS			OBSERVER'S NAME (PRINT)							
			TREG E. JONES							
			OBSERVER'S SIGNATURE					DATE		
			TREG E. JONES					22 JULY 92		
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS			ORGANIZATION							
SIGNATURE			KOOGLER & ASSOC.							
TITLE			CERTIFIED BY					DATE		
			ETA					2 JULY 92		



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CONTINUED ON VEO FORM NUMBER

Run #2

1

02

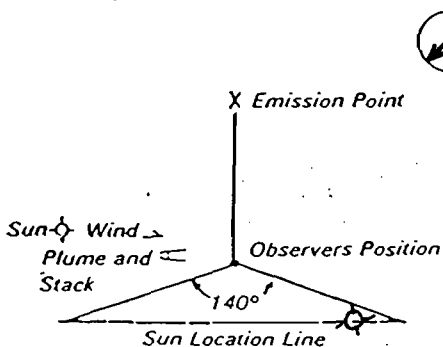
2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME		END TIME		
FLORIDA CRUSHED STONE CO.			22 JULY 92				1540		1640		
ADDRESS			SEC	0	15	30	45	COMMENTS			
P.O. Box 1508 / 10311 CEMENT PLANT RD.			MIN								
HERNANDO COUNTY			1	0	0	0	0				
CITY	STATE	ZIP	2	0	0	0	0				
BROOKVILLE	FL.	34601	3	0	0	0	0				
PHONE	SOURCE ID NUMBER		4	0	0	0	0				
	AC 37-118674 & AO 37-123308		5	0	0	0	0				
PROCESS EQUIPMENT PLANT		OPERATING MODE	6	0	0	0	0				
CEMENT - POWER - LINE			7	0	0	0	0				
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	0				
BAGHOUSE		71% DEMAND	9	0	0	0	0				
DESCRIBE EMISSION POINT			10	0	0	0	0				
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0				
HEIGHT ABOVE GROUND LEVEL		HEIGHT RELATIVE TO OBSERVER	12	0	0	0	0				
START 300' STOP 300'		START 250' STOP 250'	13	0	0	0	0				
DISTANCE FROM OBSERVER		DIRECTION FROM OBSERVER	14	0	0	0	0				
START 1000' STOP 1000'		START ESE STOP ESE	15	0	0	0	0				
DESCRIBE EMISSIONS			16	0	0	0	0				
START STOP			17	0	0	0	0				
EMISSION COLOR		PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>	18	0	0	0	0				
START CLEAR STOP CLEAR		FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>	19	0	0	0	0				
WATER DROPLETS PRESENT:		IF WATER DROPLET PLUME:	20	0	0	0	0				
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>		ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>	21	0	0	0	0				
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			22	0	0	0	0				
START 30 FT ABOVE STACK STOP 30' ABOVE STACK			23	0	0	0	0				
DESCRIBE BACKGROUND			24	0	0	0	0				
START SKY STOP SKY			25	0	0	0	0				
BACKGROUND COLOR		SKY CONDITIONS	26	0	0	0	0				
START BLUE STOP BLUE		START SCATT STOP SCATT.	27	0	0	0	0				
WIND SPEED		WIND DIRECTION	28	0	0	0	0				
START 3-5 STOP 3-5		START VAR STOP VAR.	29	0	0	0	0				
AMBIENT TEMP.		WET BULB TEMP.	30	0	0	0	0				
START 95° STOP 95°		RH, percent									

Source Layout Sketch

Draw North Arrow



COMMENTS

CEMENT - 130TPI

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

TREG E. JONES

DATE

22 JULY 92

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

ETA

DATE

2 JUNE 92



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

CONTINUED ON VEO FORM NUMBER

Run # 2

2 of 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			22 July 92				1540	1640
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. Box 1508 / 10311 CEMENT PLANT RD.			MIN					
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	AC 21-118614 #		5	0	0	0	0	
	AC 37-183308		6	0	0	0	0	
PROCESS EQUIPMENT		OPERATING MODE	7	0	0	0	0	
C-P-L			8	0	0	0	0	
CONTROL EQUIPMENT		OPERATING MODE	9	0	0	0	0	
BAGHOUSE		71% SPEED DEMAND	10	0	0	0	0	
DESCRIBE EMISSION POINT			11	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			12	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER			13	0	0	0	0	
START 300' STOP 300' START 250' STOP 250'			14	0	0	0	0	
DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER			15	0	0	0	0	
START 1000' STOP 1000' START ESE STOP ESE			16	0	0	0	0	
DESCRIBE EMISSIONS			17	0	0	0	0	
START STOP			18	0	0	0	0	
EMISSION COLOR		PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>	19	0	0	0	0	
START CLEAR STOP CLEAR		FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>	20	0	0	0	0	
WATER DROPLETS PRESENT:		IF WATER DROPLET PLUME:	21	0	0	0	0	
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>		ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>	22	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			23	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			24	0	0	0	0	
DESCRIBE BACKGROUND			25	0	0	0	0	
START SKY STOP SKY			26	0	0	0	0	
BACKGROUND COLOR		SKY CONDITIONS	27	0	0	0	0	
START BLUE STOP BLUE		START SCATT. STOP SCATT.	28	0	0	0	0	
WIND SPEED		WIND DIRECTION	29	0	0	0	0	
START 3-5 STOP 3-5		START VAR. STOP VAR.	30	0	0	0	0	
AMBIENT TEMP.		WET BULB TEMP. RH, percent						
START 95° STOP 95°								

Source Layout Sketch Draw North Arrow

COMMENTS

CEMENT - 130 TPH

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E. Jones

DATE

22 July 92

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

ETA

DATE

2 JUL 92

CEMENT PLANT PRODUCTION DATA

TIRE TESTING

DATE: JULY 21, 1992 BASELINE

TIME	COAL (TPH)	KILN FEED (TPH) SET POINT	CLINKER (TPH) SET POINT	TIRES (TPH)
8 AM	9.2	120	78	
9	—	—	—	
10	8.2	120	78	
11	9.4	"	"	
12 PM	8.8	"	"	
1	8.6	"	"	
2	8.9	"	"	
3	8.0	"	"	
4	7.4	"	"	
5	9.1	"	"	
6	7.5	"	"	
7	9.1	"	"	
8	8.5	"	"	
9	8.7	"	"	
10	8.5	"	"	
11	8.7	"	"	
12 AM	8.7	"	"	
1	9.0	"	"	
2	9.0	"	"	
3	9.0	"	"	
4	9.2	"	"	
5	8.7	"	"	
6	8.7	"	"	
7	8.5	"	"	
8 AM	8.2	"	"	
ACT.24 HR/AVG.	8.72	120.6	78.4	
NOTES:				

TIRE TESTING

DATE: JULY 22, 1992 BASELINE

		KILN FEED (TPH)	CLINKER (TPH)	
TIME	COAL (TPH)	SET POINT	SET POINT	TIRES (TPH)
8 AM	8.2	120	78	
9	8.0	"	"	
10	8.0	"	"	
11	8.2	"	"	
12 PM	8.2	"	"	
1	8.1	"	"	
2	9.3	"	"	
3	8.7	"	"	
4	8.3	"	"	
5	8.3	"	"	
6	8.4	"	"	
7	8.6	"	"	
8	8.6	"	"	
9	8.6	"	"	
10	8.7	"	"	
11	8.5	"	"	
12 AM	9.5	"	"	
1	9.0	"	"	
2	9.1	"	"	
3	9.1	"	"	
4	8.7	120	78	
5	8.7	110	71.5	
6	9.5	112.8	73.3	
7	—	—	—	
8 AM	8.3	116.9	75.9	
ACT.24 HR/AVG.	8.51	119.6	77.7	

NOTES:

RUSHED STONE CONTROL REPORT

DATE July 21, 92KF# 4815

COAL

TIME	FINISH MILL CONTROL																SHIFT:	H2O	+ 50	SULFUR	-200
	SILO NO.	FREE CoO	LOSS	SURF AREA	% SO ₃	325	FLOW	PUMP FLOW	SP.G. G.A.		CAO	MGO	K ₂ O	C ₃ S	C ₂ S	C ₃ A	1st				
8AM	1		1.7	3780	2.81	97.0	—	—	—		64.7	.76	.40	54.8	20.8	6.3		1.31	.17	.807	88.3
10AM	1		1.5	3740	2.81	97.0	—	.37	—		64.7	.76	.44	54.4	21.1	6.3		1.05	.24	.723	86.9
12PM	1		1.8	3750	2.91	96.9	—	.36	—		64.6	.76	.45	53.7	21.6	6.5		1.59%	.30	.734	87.5
2PM																					
4PM																					
6PM																					
8PM																					
10PM																					
12AM	1		1.5	3750	3.10	97.4	—	—	—		64.6	.75	.48	53.5	21.7	6.51					
2AM	1		1.0	3720	3.05	96.3	—	.39	—		64.6	.74	.47	53.7	21.5	6.53					
4AM	1		1.6	3740	2.73	96.7	—	.33	—		65.1	.75	.40	56.0	19.9	6.61					
6AM	1		1.6	3720	2.71	96.5	—	.33	—		65.1	.74	.40	55.8	20.3	6.55					
AVG.																					

MIXMEN NOTES:

Kiln Feed Cal. Bin 11:00am

Sio ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	G.S	C ₃ A
14.4	3.15	2.18	43.8	69	7.17

FM ↑ 10:05 PM

MIXMEN
NOTES:

Kiln Feed Cal. Bin 11:00pm

SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	C ₃ S	C ₃ A
14.4	3.15	2.18	43.8	69	7.17

FM ↑ 10:05 PM

CLINKER CONTROL

TIME	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	SO ₃	SIM	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	L.S.F.	TOTAL	SILO	K ₂ O	CL	TEMP.
7:00 AM	21.6	4.97	3.50	67.1	.79	.43	2.6	69.2	9.8	7.3	10.7	97.1	98.8	HQ	.37	.009	
9:00 AM	22.1	4.79	3.34	67.7	.78	.12	2.7	70.6	10.1	7.1	10.2	97.0	99.1	HQ	.16	.004	
11:00 AM	21.9	4.70	3.26	66.1	.74	1.74	2.8	61.6	16.3	6.9	9.9	94.0	99.4	HQ	.80	.006	
2:00 PM	21.7	4.83	3.24	67.2	.74	.90	2.7	69.2	9.9	7.3	9.9	97.1	99.1	HQ	.52	.007	
4:00 PM	21.1	4.92	3.32	64.4	1.15	2.36	2.6	57.5	17.1	7.4	10.1	93.6	99.9	HQ	.82	.193	
6:00 PM	21.3	5.15	3.48	67.4	.74	.26	2.5	72.0	6.9	7.7	10.6	98.6	98.8	HQ	.26	.012	
8:00 PM	21.4	4.97	3.65	67.2	.76	.29	2.5	71.5	7.4	7.0	11.1	98.2	98.6	HQ	.21	.019	
10:00 PM	21.4	5.13	3.64	66.3	.74	.91	2.4	64.8	12.6	7.4	11.1	95.8	98.7	HQ	.50	.000	
12:00 AM	21.1	5.34	3.81	66.0	.75	1.10	2.31	63.6	12.6	7.71	11.6	95.9	98.8	HQ	.56	.002	
2:00 AM	21.5	5.06	3.63	66.5	.74	1.07	2.48	64.8	12.8	7.97	11.1	95.7	99.1	HQ	.53	.008	
4:00 AM	21.4	5.09	3.76	66.5	.76	.73	2.38	66.1	11.4	7.49	11.4	96.4	98.8	HQ	.43	.002	
6:00 AM	21.7	5.13	3.65	66.7	.75	.41	2.47	65.8	12.6	7.49	11.1	95.9	98.1	HQ	.30	.001	
AVG.																	

CLINKER

TIME	% F. LIME
8AM	.43
10AM	.43
12PM	.42
2PM	.87
4PM	2.13
6PM	1.33
8PM	.39
10PM	.20
12AM	.24
2AM	.29
4AM	

KILN FEED

SHIFT	SO ₃	+70	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	TOTAL	L.S.F.	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	CL.
1st	.41	.94	14.0	3.14	3.39	43.0	.43	77.5	77.5	67	—	3.55	—	.151
2nd	.52	.86	14.3	3.38	3.14	43.9	.43	77.9	77.9	63	—	3.2	—	.140
AVG.	.45	.90	14.3	3.24	3.39	44.0	.43	77.3	76.5	69	—	2.97	—	.142

BLAINE

1	2
3650	3750
3750	4050

7121192

TIME	RAW MILL FEEDERS					CONTROL TESTS																	
						C ₃ A	S/R	SO ₃	SiO ₂	Al ₂ O ₃	AVG.	Fe ₂ O ₃	AVG.	CAO	C ₃ S	AVG	CL.	+70	SILO	TPH	T.T.	HRS	
7AM						6.3	2.6	.42	16.0	3.30	3.26	2.82	2.68	42.9	41	50	.133	.71	2	150	300	2	
8AM						6.6	2.7	.44	15.2	3.5	3.22	2.21	2.52	42.5	57	52	.13	.82	2	150	450	3	
9AM						7.1	2.9	.42	16.6	3.05	3.18	1.51	2.27	43.0	41	49	.105	1.1	2	150	600	4	
10AM						7.1	2.9	.40	17.4	3.26	3.20	2.30	2.28	41.5	18	43	.106	1.2	2	150	750	5	
11AM						7.0	2.8	.38	14.2	3.27	3.21	2.67	2.35	42.9	64	46	.102	.73	2	150	900	6	
12PM						6.9	2.7	.40	11.3	3.20	3.21	2.66	2.39	44.5	107	55	.109	.54	2	150	1050	7	
1PM	13.7 13.6	3.16 3.19	2.61 2.36	5.8		6.8	2.6	.43	10.2	3.26	3.22	2.87	2.45	44.8	121	63	.128	.54	2	150	1200	8	Blank
2PM						4.6	2.1	.35	12.7	3.03	—	3.00	—	43.8	89	—	.194	1.3	1	150	150	1	
3PM						4.6	2.3	.41	15.3	3.13	3.04	3.16	3.08	42.0	45	67	.107	1.7	1	150	300	2	
4PM						5.0	2.5	.37	16.2	3.06	3.07	2.57	2.91	42.0	37	57	.100	1.6	1	150	450	3	
5PM	14.5 14.4	3.20 3.23	2.54 2.47	6.2		—	—	.39	16.6	3.39	3.19	2.55	2.50	41.6	25	74	1.00	1.5	2	150	1350	9	Blank
6PM						5.7	2.6	.39	17.0	3.49	3.18	2.42	2.79	41.9	23	48	.104	1.5	1	150	600	4	
7PM						5.9	2.7	.37	16.3	3.03	3.15	2.16	2.66	42.4	39	46	.098	1.4	1	150	750	5	
8PM						6.1	2.7	.38	14.7	2.99	3.12	2.03	2.56	43.2	63	49	.113	1.4	1	150	900	6	
9PM						6.1	2.8	.37	15.0	2.82	3.08	2.09	2.49	42.8	59	50	.115	1.5	1	150	1050	7	
10PM						5.9	2.8	.38	12.9	2.77	3.04	2.59	2.50	43.7	48	55	.119	1.4	1	150	1200	8	
11PM						5.70	2.73	.38	13.8	3.10	3.05	3.29	2.59	42.7	67	56	.110	1.3	1	150	1350	9	
12AM	14.7 14.7	3.12 3.12	2.74 2.76	5.5		5.73	2.69	.40	16.4	3.69	3.11	3.49	2.68	40.8	18	52	.100	1.7	1	150	1500	10	
1AM						6.80	2.71	.41	15.4	3.23	—	2.45	—	42.0	44	—	.110	1.2	2	150	150	1	
2AM						6.18	2.76	.36	14.7	3.28	3.06	2.37	2.41	43.1	63	53	.104	.99	2	150	300	2	
3AM						5.97	2.78	.40	15.3	2.70	3.01	2.52	2.45	42.7	52	53	.113	1.0	2	150	450	3	
4AM						5.70	2.78	.40	15.3	2.92	2.79	2.58	2.48	42.5	51	53	.111	1.1	2	150	600	4	
5AM						5.73	2.68	.41	15.1	3.19	3.12	2.78	2.69	42.2	49	52	.110	1.2	1	150	1650	11	
6AM						5.63	2.68	.40	14.7	2.81	3.09	2.65	2.69	42.7	60	53	.118	.87	1	150	1800	12	
AVG.																							

Finish Mill Results must be on board one Hour
After Mill Starts. (10:00 p.m.)

QUALITY CONTROL TECHNICIANS

1st

2nd

3rd

TARGETS

[illegible]

RUSHED STONE CONTROL REPORT

DATE July 22, 92KF# 7951

COAL

TIME	FINISH MILL CONTROL															SHIFT:	H2O	+ 50	SULFUR	-200
	SILO NO.	FREE CaO	LOSS	SURF AREA	% SO ₃	325	FLOW	PUMP FLOW	SP.G. G.A.	CAO	MGO	K ₂ O	C ₃ S	C ₂ S	C ₃ A	1st				
2BAM	1		1.7	3990	2.71	97.3	—	—	—	65.2	.73	.39	57.0	19.0	6.7					
9AM	1		1.4	4180	3.05	98.0	—	.31	—	64.8	.72	.42	55.0	20.3	6.7	2nd	1.20	.21	.736	87.6
12PM	1		1.4	3970	2.92	96.8	—	.31	—	64.8	.73	.44	55.1	20.0	6.8	3rd	1.438	.26	.828	86.9
2PM																MIXMEN NOTES:				
4PM																				
6PM																				
8PM																				
10PM																				
12AM	2		1.5	4060	2.95	97.1	—	—	—	64.7	.72	.45	54.6	20.5	6.79					
2AM	1		1.8	3960	2.87	97.2	1950	.32	1.04	64.7	.73	.41	54.6	20.5	6.71					
4AM	2		1.7	3970	3.02	97.4	—	.32	—	64.4	.73	.45	52.8	22.0	6.70					
6AM	2		1.6	3950	3.05	97.3	—	.32	—	64.4	.72	.45	52.2	22.6	6.57					
AVG.																				

- CLINKER CONTROL

TIME	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	SO ₃	SIM	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	L.S.F.	TOTAL	SILO	K ₂ O	CL.	TEMP.
7:00 AM	21.6	5.15	3.82	66.1	.77	.70	2.4	63.3	14.1	7.2	11.6	95.1	98.5	112	.37	.000	
9:00 AM	21.7	5.04	3.65	65.8	.79	1.02	2.5	60.7	16.6	7.2	11.1	93.9	98.6	112	.49	.001	
11:00 AM	21.5	5.12	3.74	64.7	.80	1.44	2.4	56.1	19.5	7.2	11.4	92.5	98.2	112	.71	.010	
1:00 PM	21.7	4.97	3.70	65.4	.77	.90	2.5	59.8	17.2	6.9	11.3	93.6	98.0	112	.62	.007	
3:00 PM	21.7	4.68	3.74	66.7	.77	.43	2.6	68.8	10.3	6.1	11.4	96.6	99.5	112	.67	.090	
5:00 PM	21.8	4.80	3.73	66.4	.78	.88	2.6	65.0	13.4	6.4	11.4	95.2	99.1	112	.64	.000	
7:00 PM	21.8	4.82	3.72	66.2	.89	.87	2.6	63.9	14.2	6.5	11.3	94.8	99.1	112	.64	.015	
9:00 PM	21.6	5.01	3.84	66.6	.81	.51	2.4	62.2	12.1	6.8	11.7	95.9	99.0	112	.48	.000	
11:00 PM	21.7	4.94	3.77	66.4	.78	.57	2.49	65.2	13.1	6.72	11.5	95.4	98.7	112	.50	.000	
1	21.3	5.23	3.98	66.6	.82	.45	2.31	67.0	10.5	7.18	12.1	96.7	98.9	112	.44	.000	
3	21.3	5.13	3.92	66.5	.81	.72	2.34	65.2	11.9	6.90	12.1	96.0	99.0	112	.65	.000	
5	21.7	4.85	3.75	66.4	.71	1.22	2.52	63.1	14.6	6.51	11.4	94.7	99.2	112	.71	.000	
AVG.																	

CLINKER

TIME	% F. LIME
2BAM	.43
9AM	.37
12PM	.5
2PM	.55
4PM	.86
6PM	.37
8PM	.74
10PM	.22
12AM	.18
2AM	.31
4AM	.38
6AM	.26

KILN FEED

SHIFT	SO ₃	+70	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	TOTAL	L.S.F.	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	CL.
2nd 1st	1.45	1.1	14.2	2.97	2.18	43.6	.44	77.6	97.5	72	—	6.43	—	.162
	.41		14.7	3.18	2.53	43.6	.44	77.5	95.0	65	—	6.33	—	.114
3rd 2nd	1.41	.78	13.2	2.87	2.44	43.5	.44	77.2	100.2	72	—	6.43	—	.130
	.40		13.6	2.98	2.35	43.6	.43	77.0	101.1	72	—	6.03	—	.115
3rd 3rd	1.41	.76	13.5	2.91	2.25	43.5	.44	77.1	100.3	72	—	6.43	—	.115

BLAINE

1	2
3650	3750
75.1	72.5

[illegible]



FLORIDA CRUSHED STONE COMPANY
CEMENT / POWER / LIME PLANT

T D F TEST DATA

POWER/ LIME PLANTS

7-21-92

0600 - 2400 Hours

Net Generation - 2059 MWH/114.4 MW

Power Plant Coal - 851.6 Tons/47.3 TPH

Lime Plant Coal - 157.6 Tons/8.8 TPH

Lime Feed - 260 Tons/14.4 TPH

Long:
we have this
information on an
hourly basis?

Pam O

7-22-92

MN - 1800 Hours

Net Generation - 2059 MWH/114.4 MW

Power Plant Coal - 860.3 Tons/47.8 TPH

Lime Plant Coal - 145.9 Tons/8.1 TPH

Lime Feed - 332 Tons/18.4 TPH

Mason:

We don't have
Lime Plant Feed
by the hour.

Pam O.

DATA SOURCES:

Generation - From FPC inadvertant report

Coal - From Bailey Logs

Lime Feed - Calculated from dryer production scale and D-16 silo measurement

FAX TRANSMITTAL MEMO

TO: MASON JOYE

DEPT: KAGGLE + FCS FAX #: (904) 377-7158

FROM: T. MOUNTAIN PHONE:

CO: FCS FAX #:

Post-It brand fax transmittal memo 7671

NO. OF
PAGES

3

RUN 1 0925-1150

2 1302-1521

3 1612-1821

TDF Test data

7/21/92

	<u>Hour Ending</u>	<u>Net Generation</u>	<u>Power Plant Coal</u>		<u>Lime Plant Coal</u>	
			KPPH / TPH		KPPH / TPH	
	0700	113	91.88	45.94	19.6	9.8
	0800	114	93.75	46.88	17.3	8.65
1	0900	113	90.88	45.44	18.7	9.35
	1000	115	92.5	46.25	20.9	10.45
	1100	113	93.38	46.69	18.0	9.0
	1200	114	93.63	46.82	17.3	8.65
2	1300	114	93.5	46.75	16.6	8.30
	1400	114	94.63	47.32	17.2	8.60
	1500	115	94.63	47.32	19.8	9.90
3	1600	115	97.13	48.56	16.4	8.20
	1700	114	95.13	47.57	15.2	7.60
	1800	115	94.88	47.44	16.7	8.35
	1900	114	95.75	47.88	19.5	9.75
	2000	114	93.38	46.69	19.0	9.50
	2100	117	98.13	48.57	15.9	7.95
	2200	116	96.0	48.0	16.6	8.3
	2300	114	97.76	48.88	16.3	8.15
	2400	115	96.25	48.13	14.1	7.05

RUN 1 0915-1135
 2 1302-1518
 3 1621-1823

TDF Test Data
 7/22/92

<u>Hour Ending</u>	<u>Net Generation</u>	<u>Power Plant Coal</u>	<u>Hour Plant Coal</u>
		KPPH / TPH	KPH / TPH
0100	114	95.75 / 47.88	16.8 / 9.7
0200	113	98.38 / 49.19	16.8 / 8.4
0300	116	96.25 / 48.13	14.6 / 7.3
0400	115	96.25 / 48.13	12.6 / 6.3
0500	117	98.38 / 49.19	4.4 / 2.2
0600	116	97.38 / 48.69	16.8 / 8.4
0700	117	97.50 / 48.75	16.5 / 8.25
0800	113	93.88 / 46.94	18.7 / 9.35
0900	115	95.75 / 47.88	17.3 / 8.65
1000	111	92.5 / 46.25	16.5 / 8.25
1100	112	93.88 / 46.94	16.7 / 8.35
1200	113	93.88 / 46.94	16.7 / 8.35
1300	115	95.5 / 47.75	17.1 / 8.55
1400	116	95.63 / 47.82	17.7 / 8.85
1500	114	95.75 / 47.88	17.4 / 8.7
1600	114	95.63 / 47.82	17.3 / 8.65
1700	114	93.88 / 46.94	17.5 / 8.75
1800	114	94.38 / 47.19	17.7 / 8.85

COAL ANALYSES



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., P.O. BOX 127
SOUTH HOLLAND, IL 60473
TELEPHONE: (708) 331-2900
FAX: (708) 333-3060

August 20, 1992

KOOGLER & ASSOCIATES
Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us Coal

Sample ID: Coal, Cement Plant

Date: 7/21/92

Sample taken at -----

Project No: 307-90-01

Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 21, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38351

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	7.89	xxxxxx
% Carbon	69.95	75.94
% Hydrogen	4.74	5.15
% Nitrogen	1.45	1.57
% Sulfur	0.69	0.75
% Ash	8.73	9.48
% Oxygen(diff)	6.55	7.11
	100.00	100.00
% Chlorine	0.10	0.11

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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Date: 7/21/92
Project No: 307-90-01
Project Name: CPL-FCS
Location: Brooksville, FL

P.O. No. 080592

Analysis Report No. 71-38351

Page 2 of 2

Dry Basis, ug/g

Arsenic, As	1
Mercury, Hg	0.10

Ignited Basis, ug/g

Lead, Pb	93
Chromium, Cr	73
Zinc, Zn	115

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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Sample identification by
Koogler & Associates

Kind of sample

reported to us Coal

Sample ID: Coal, Power & Lime Plants

Date: 7/21/92

Sample taken at -----

Project No: 307-90-01

Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 21, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38352

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	4.01	xxxxxx
% Carbon	74.38	77.49
% Hydrogen	5.06	5.27
% Nitrogen	1.55	1.61
% Sulfur	0.69	0.72
% Ash	7.41	7.72
% Oxygen(diff)	6.90	7.19
	100.00	100.00
% Chlorine	0.11	0.11

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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Sample ID: Coal, Power & Lime Plants
Date: 7/21/92
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Project Name: CPL-FCS
Location: Brooksville, FL

P.O. No. 080592

Analysis Report No. 71-38352

Page 2 of 2

Dry Basis, ug/g

Arsenic, As	<1
Mercury, Hg	0.05

Ignited Basis, ug/g

Lead, Pb	96
Chromium, Cr	85
Zinc, Zn	98

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
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4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us Coal

Sample taken at -----

Sample taken by Koogler & Associates

Date sampled July 22, 1992

Date received August 6, 1992

Sample ID: Coal, Cement Plant
Date: 7/22/92
Project No: 307-90-01
Project Name: CPL-FCS
Location: Brooksville, FL

P.O. No. 080592

Analysis Report No. 71-38353

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	7.79	xxxxxx
% Carbon	69.98	75.89
% Hydrogen	4.71	5.11
% Nitrogen	1.43	1.55
% Sulfur	0.70	0.76
% Ash	8.54	9.26
% Oxygen(diff)	6.85	7.43
	100.00	100.00
% Chlorine	0.09	0.10

Respectfully submitted,
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Project No: 307-90-01

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Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 22, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38353

Page 2 of 2

Dry Basis, ug/g

Arsenic, As	2
Mercury, Hg	0.05

Ignited Basis, ug/g

Lead, Pb	94
Chromium, Cr	72
Zinc, Zn	116

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
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Kind of sample
reported to us Coal

Sample taken at -----

Sample taken by Koogler & Associates

Date sampled July 22, 1992

Date received August 6, 1992

Sample ID: Coal, Power & Lime Plants
Date: 7/22/92
Project No: 307-90-01
Project Name: CPL-FCS
Location: Brooksville, FL

P.O. No. 080592

Analysis Report No. 71-38354

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	5.25	xxxxxx
% Carbon	73.00	77.05
% Hydrogen	4.84	5.11
% Nitrogen	1.42	1.50
% Sulfur	0.64	0.68
% Ash	7.85	8.29
% Oxygen(diff)	<u>7.00</u>	<u>7.37</u>
	100.00	100.00
% Chlorine	0.09	0.10

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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Koogler & Associates

Kind of sample
reported to us Coal

Sample taken at -----

Sample taken by Koogler & Associates

Date sampled July 22, 1992

Date received August 6, 1992

Sample ID: Coal, Power & Lime Plants
Date: 7/22/92
Project No: 307-90-01
Project Name: CPL-FCS
Location: Brooksville, FL

P.O. No. 080592

Analysis Report No. 71-38354

Page 2 of 2

Dry Basis, ug/g

Arsenic, As	<1
Mercury, Hg	0.03

Ignited Basis, ug/g

Lead, Pb	94
Chromium, Cr	82
Zinc, Zn	105

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

EQUIPMENT CALIBRATIONS

NOZZLE CALIBRATION

DATE 7-21-92

PLANT NAME Fla Crushed Stone

LOCATION Brooksville, Fla

SOURCE CPZ Stack (Baseline)

Measurement No.

Inside Diameter (inches)

1

0.223

2

0.225

3

0.224

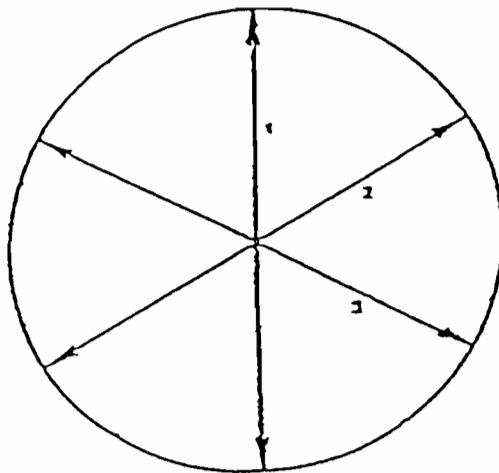
Average

0.224

Area of Nozzle

0.000274 ft²

Calibrated by: RC Paul



Nozzle X-Section

NOZZLE CALIBRATION

DATE 7-22-92
PLANT NAME Fla Crushed Stone
LOCATION Brooksville Fla
SOURCE CPI Stack (Baseline)

Measurement No.Inside Diameter (inches)10.22320.22530.224

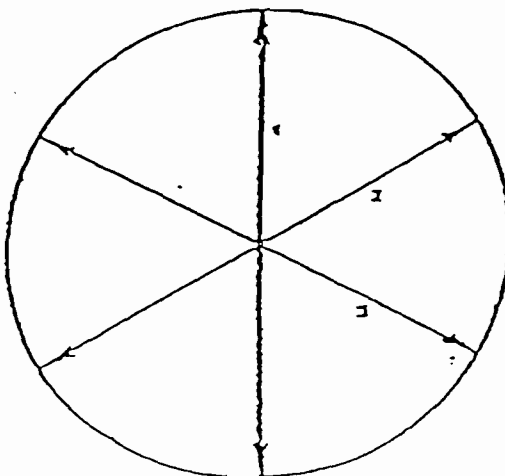
Average

0.224

Area of Nozzle

0.000274 ft²

Calibrated by:

RC Paul

Nozzle X-Section



PITOT TUBE CALIBRATION MEASUREMENTS

PITOT TUBE IDENTIFICATION NO. KA-SI

DATE CALIBRATED 11-11-91

PITOT TUBE ASSEMBLY LEVEL ? ☒ YES ☐ NO

PITOT TUBE OPENINGS DAMAGED ? ☐ YES (EXPLAIN BELOW) ☒ NO

$\alpha_1 = 2.5^\circ$ ($<10^\circ$) $\alpha_2 = 2.0^\circ$ ($<10^\circ$)

$\beta_1 = 1.5^\circ$ ($<5^\circ$) $\beta_2 = 2.0^\circ$ ($<5^\circ$)

$\gamma = 2.0^\circ$, $\theta = 1.5^\circ$, $A = 0.934$ IN. = (PA+PB)

$Z = A \sin \gamma = 0.0326$ IN. (<0.125 IN.)

$W = A \sin \theta = 0.0245$ IN. (<0.031 IN.)

$P_A = 0.464$ IN. $P_B = 0.470$ IN.

$D_t = 0.374$ IN. (≥ 0.1875 IN. ≤ 0.3750 IN.)

COMMENTS: Pitot tubes looked OK on test day

CALIBRATION REQUIRED? ☐ YES ☒ NO

CALIBRATED BY: RC Paul

PTCMFORM 1/8/87



POST TEST THERMOCOUPLE
CALIBRATION

DATE 7-21-92

PLANT NAME Fla Crushed Stone

LOCATION Brooksville Fla

SOURCE CPL Stack (Baseline)

Thermocouple Readout # KA-1

Umbilical Cord # 100'

Switch Box # KA-1

Thermocouple # KA-77

Average Stack Temperature °F 361

*Observed Mercury in Glass (ASTM) °F 366

Observed Thermocouple Reading °F 369

Percent Difference $\frac{(ASTM + 460) - (Thermo + 460)}{(ASTM + 460)} \times 100 = .036$

Tolerance $\leq 1.5\%$

* Observed temperature must be within ten percent of the average stack temperature.

RC Paul
Signature



POST TEST THERMOCOUPLE
CALIBRATION

DATE 7-22-92
PLANT NAME Fla Crushed Stone
LOCATION Brooksville Fla
SOURCE CPZ Slack (Baseline)

Thermocouple Readout # KA-1
Umbilical Cord # 100'
Switch Box # KA-1
Thermocouple # KA-77
Average Stack Temperature °F 353
*Observed Mercury in Glass (ASTM) °F 348
Observed Thermocouple Reading °F 352

Percent Difference $\frac{(ASTM + 460) - (Thermo + 460)}{(ASTM + 460)} \times 100 = \underline{0.50}$

Tolerance $\leq 1.5\%$

* Observed temperature must be within ten percent of the average stack temperature.

RC Paul
Signature



BEST AVAILABLE COPY

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES ANNUAL THERMOCOUPLE CALIBRATIONS

Umbilical Cord No. <u>100FT</u> TC No. <u>KA-64</u>	BOX 1						BOX 2					
	STACK		BOX		IMP		STACK		BOX		IMP	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
Ice Bath	35	35	34	34	34	34	35	35	35	34	35	35
Ambient	72	72	72	72	72	72	73	72	73	72	72	72
212°	212	213	213	214	212	213	213	214	213	213	214	214
400°	451	451	451	451	450	450	449	449	448	448	448	448

Thermocouple Readout No. <u>KA-2</u>	UMBILICAL CORD NO. <u>100</u>						UMBILICAL CORD NO. <u>200</u>					
	STACK		BOX		IMP		STACK		BOX		IMP	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
Ice Bath	36	35	35	34	35	34	35	34	35	34	35	34
Ambient	72	73	72	73	72	73	73	73	73	73	73	73
212°	212	213	213	214	214	214	212	213	214	214	213	214
400°	452	452	450	450	428	428	451	451	451	451	450	450

Thermocouple Probe No.	TEMPERATURE							
	ICE BATH		AMBIENT		212°		400°	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
KA-64	35	35	72	72	212	213	419	419
KA-61	35	34	73	73	214	214	419	419
KA-12	35	34	73	73	215	214	418	418
KA-63	35	35	73	73	213	213	420	420
KA-62	35	34	73	73	213	212	421	422
KA-65	35	34	72	73	215	214	422	422
KA-77	34	34	72	72	213	212	400	400
KA-70	35	34	73	73	213	213	410	412
KA-50	35	35	72	73	214	214	428	428
KA-108	35	35	72	73	215	214	408	409
KA-109	35	35	72	72	215	215	412	412

- 1 Thermocouple reading (°F)
- 2 American Society of Testing Materials
Mercury in glass thermometer (°F)

Signature Stephen Bell
Date 10-7-91

POST-TEST DRY GAS METER CALIBRATION FORM

Date: 8-4-92

Meter Box No.: KA-1

Plant: The Crushed Stone (Baseline)

Barometric Pressure, P_b = 30.00

In Hg

Test Meter No.: KA-1

Pretest Y_1 : 0.998

Orifice Manometer Sitting, (ΔH) In. H ₂ O	Gas Volume		Dry Gas Meter Temperature				Time (θ), Min.	Vacuum Sitting In. Hg.	Y_1	$\frac{Y_1 P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6}) (t_T + 460)}$
	Test Meter (V_T), Ft.	Dry Gas Meter (V_d), Ft.	Test Meter (t_T), °F	Inlet (t_{d1}), °F	Outlet (t_{d0}), °F	Average (t_d), °F				
1.2	6.486	6.445	83			84	10	6"	1.005	
1.2	15.170	15.169	80			84	24	6"	1.004	
1.2	5.696	5.702	77			85	9	6"	1.011	
									$Y = 1.007$	

* If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

V_T = Gas volume passing through the test meter, ft³.

V_d = Gas volume passing through the dry gas meter, ft³.

t_T = Temperature of the gas in the test meter, °F.

t_{d1} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d0} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d1} and t_{d0} , °F.

ΔH = Pressure differential across orifice, In. H₂O

Y_1 = Ratio of accuracy of test meter to dry gas meter for each run.

Y = Average ratio of accuracy of test meter to dry gas meter for all three runs;
tolerance = pretest $Y \pm 0.05Y$.

P_b = Barometric pressure, In. Hg.

θ = Time of calibration run, min.



METER CALIBRATION FORM

GAS METER METHOD

DATE: 6-11-92METER BOX NO: KA-1BAROMETRIC PRESSURE: 29.89

TEST Δ HD	ORI- FICE Δ HD	TEST GAS METER VOLUME			DRY GAS METER VOLUME			TEMP OF TEST METER °F	TEMP OF DRY METER °F	RUN TIME MINUTES
		FINAL	INITIAL	ACTUAL FT ³	FINAL	INITIAL	ACTUAL FT ³			
22	.50	688.796	675.302	5.494	101.013	95.482	5.531	82	86	13
23	1.0	712.603	705.307	7.296	133.088	125.693	7.385	82	89	12.5
23	1.6	675.302	667.934	7.368	95.482	88.103	7.379	81	85	10
26	2.5	705.307	696.098	9.209	125.693	116.389	9.304	82	88	10
30	3.5	696.098	680.796	15.302	116.389	101.013	15.376	82	86	14

GAS METER THERMOMETER CALIBRATION

N.B.S. MERCURY °F	METER BOX °F
32	34
44	46
75	75
92	93
101	102

SIGNATURE: RC Paul

DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. KA-1 BAROMETRIC PRESS. 29.89 IN. HG.

DATE 6/11/92 PERFORMED BY ROC

	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5
VACUUM ("Hg)	0.0	0.0	0.0	0.0	0.0
dHw ("H2O)	-0.22	-0.23	-0.23	-0.26	-0.30
dHd ("H2O)	0.50	1.00	1.60	2.50	3.50
INITIAL WTM	675.302	705.307	667.934	696.098	680.796
FINAL WTM	680.796	712.603	675.302	705.307	696.098
INITIAL DGM	95.48	125.69	88.10	116.39	101.01
FINAL DGM	101.01	133.08	95.48	125.69	116.39
TEMP. WTM (F)	82.00	82.00	81.00	82.00	82.00
TEMP. DGM (F)	86.00	89.00	85.00	88.00	86.00
TEST TIME (MIN.)	13.00	12.50	10.00	10.00	14.00

NET VOLUME WTM	5.494	7.296	7.368	9.209	15.302
NET VOLUME DGM	5.531	7.385	7.379	9.304	15.376
Y	1.000	0.999	1.003	0.995	0.995
dH@	1.597	1.666	1.679	1.676	1.672

AVERAGE Y = 0.998

ACCEPTABLE Y RANGE = 0.978 TO 1.018

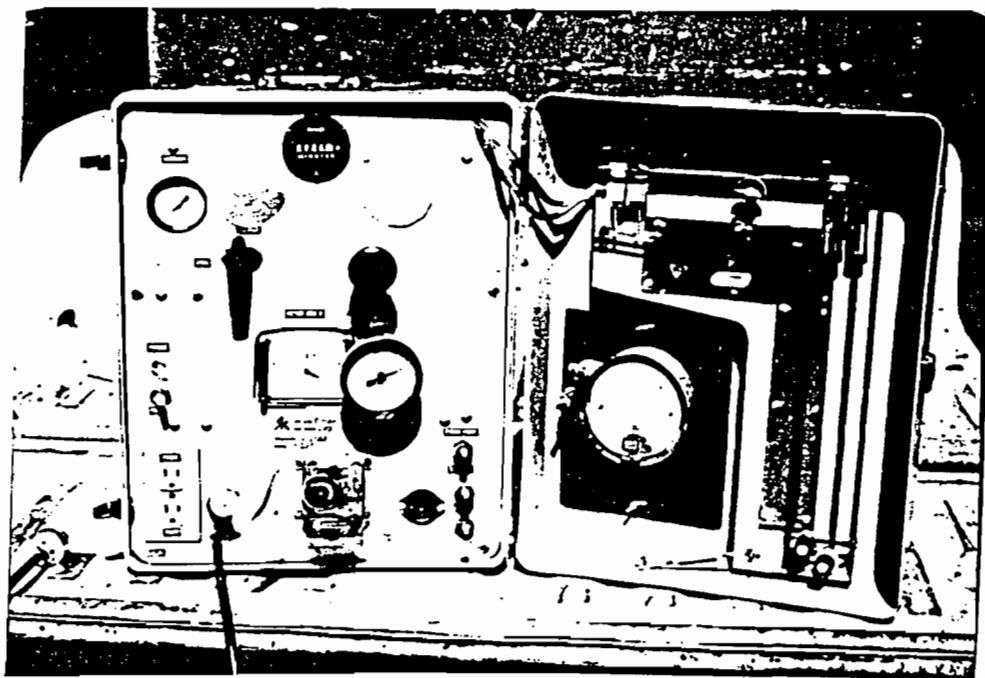
AVERAGE dH@ = 1.658

$Y = (V_w (P_b - (dH_w / 13.6)) \times (T_d + 460)) / (V_d (P_b + (dH_d / 13.6)) \times (T_w + 460))$

$dH@ = 0.0317 \times dH_d / (P_b (T_d + 460)) \times ((T_w + 460) \times \text{time}) / V_w^2$

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

SOURCE SAMPLING EQUIPMENT



METER BOX

Equipment used in Source Sampling is either manufactured by or assembled by Koogler & Associates. The guidelines followed are A.P.T.D. 0581, Details of Isokinetic Source Sampling Equipment, and A.P.T.D. 0576, Maintenance, Calibration and Operation of Isokinetic Source Sampling Equipment.

CALIBRATION GAS CERTIFICATES

NOx

NEW GAS



ALPHAGAZ

LaPorte, Texas 77571 • (713) 474-8400

Customer : TAMPA OXYGEN
P.O. Number : 26573
AGZ Document: #1393450
Lot/Item No.: #
Valve Type: CGA 660
Cert. Date : 07-02-1992

Cylinder # AL 2549

Component	mole ppm
Sulfur Dioxide	753. ppm
Nitric Oxide	810. ppm
Nitrogen Dioxide	<0.5 ppm
NITROGEN	Balance

Re-certify: 07-02-1993

OLD GAS

SPECIALTY GASES DIVISION

2445 SOUTH ST., P.O. BOX 65-80
LONG BEACH, CA 90805
TEL: (214) 492-5306

Serial: FF110
CAL 9071

Concentration of reference: 168.76
1437.3155 in N₂
952 ± 10 in N₂

CYL: CC73790 CGA: 660

PRES: 3000 psi VOL: 142 CF

ASSAY DATE: 17-May-90 EXP. DATE: 17-Nov-90

Analytical Method: per Section 3.0.4 procedure G1

COMPONENT	REQUESTED	ANALYZED
Sulfur Dioxide	<u>800 ppm</u>	<u>870 ppm</u>
Nitric Oxide	<u>800 ppm</u>	<u>835 ppm</u>
T. NOX.	<u>800 ppm</u>	<u>840 ppm</u>
Nitrogen Dioxide		
Carbon Monoxide		
Carbon Dioxide		
Oxygen		
Propane		
Nitrogen	<u>Bal</u>	<u>Bal</u>
Air		

SIGNED: [Signature]

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC68401	Protocol No. 1			
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1			
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7			
COMPONENT		CONCENTRATION	GAS ANALYZER EMPLOYED		
Nitric oxide	10.2 ppm	Manufacturer	Thermo Env. Inst.		
Nitrogen	Balance Gas	Model Number	10AR		
REFERENCE STANDARD EMPLOYED FOR ANALYSIS			Serial Number	30323-237	
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER	Last Calibrated	3/6/92
Nitric oxide	19.4 ppm	FF28622	2629a	Analytical Principle	Chemiluminescent

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	7.76 volts	4.10 volts	0.00 volts	7.76 volts	4.10 volts
0.01	7.74	4.08	0.00	7.75	4.09
0.00	7.74	4.08	0.00	7.74	4.09
Mean Analytical Result: 10.2 ppm			Mean Analytical Result: 10.2 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC73656	Protocol No. 1	
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1	
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7	
COMPONENT		CONCENTRATION	
Nitric oxide		53.3 ppm	
Nitrogen		Balance Gas	
REFERENCE STANDARD EMPLOYED FOR ANALYSIS		GAS ANALYZER EMPLOYED	
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Nitric oxide	97.1 ppm	CAL-12829	1684b
		Serial Number	30323-237
		Last Calibrated	3/6/92
		Analytical Principle	Chemiluminescent

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	9.71 volts	5.33 volts	0.00 volts	9.71 volts	5.33 volts
0.00	9.68	5.31	0.00	9.71	5.33
0.01	9.67	5.31	0.00	9.70	5.32
Mean Analytical Result: 53.3 ppm			Mean Analytical Result: 53.3 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC73658	Protocol No. 1	
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1	
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7	
COMPONENT		CONCENTRATION	
Nitric oxide		208 ppm	
Nitrogen		Balance Gas	
REFERENCE STANDARD EMPLOYED FOR ANALYSIS		GAS ANALYZER EMPLOYED	
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Nitric oxide	250 ppm	CLM-764	1685b
		Serial Number	30323-237
		Last Calibrated	3/6/92
		Analytical Principle	Chemiluminescent

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	10.00 volts	8.32 volts	0.00 volts	10.00 volts	8.30 volts
0.01	10.02	8.34	0.00	9.98	8.29
0.00	10.03	8.36	0.00	9.97	8.28
Mean Analytical Result: 208 ppm			Mean Analytical Result: 208 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

31-May-91
GATOR OXYGEN

P.O. #: 6281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER # AL530

COMPONENT:

MEAN CONCENTRATION:

NITRIC OXIDE
Total NOx
NITROGEN

195 +/- 11 ppm
196 ppm
BALANCE

Cylinder pressure:
Expiration date:

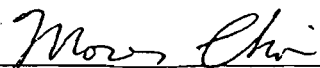
1800 psi
30-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1.

The concentration of the Nitric Oxide was determined by direct comparison with NBS SRM 1686b, Sample No.:42-02-H, S/N CLM000829, 490 +/- 5 ppm Nitric Oxide in Nitrogen, dated May 14, 1990.

The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone.

S/N 00100508, 0-1000 ppm range. The last multipoint calibration was done on May 24, 1991.



Authorized signature



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

31-May-91
GATOR OXYGEN

P.O.#: 6281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER # CC82137

COMPONENT:

MEAN CONCENTRATION:

NITRIC OXIDE

58.3 +/- 1.5 ppm

Total NOx

60.6 ppm

NITROGEN

BALANCE

Cylinder pressure:

1800 psig

Expiration date:

29-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Nitric Oxide was determined by direct comparison with NIST SRM 1684b, Sample No.:44-12-M, S/N: CAL-12775, 94.6 +/- 1.1 ppm Nitric Oxide in Nitrogen, Exp. date May 14, 1992. The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone. S/N 00100508, 0-100 ppm range. The last multipoint calibration was done on May 24, 1991.



Authorized signature

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

31-May-91
GATOR OXYGENP.O.#: 6281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER #AL-1962

COMPONENT:

MEAN CONCENTRATION:

NITRIC OXIDE
Total NOx
NITROGEN9.84 +/-0.32 ppm
10.61 ppm
BALANCECylinder pressure:
Expiration date:1800 psig
28-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Nitric Oxide was determined by direct comparison with NBS SRM 2628a, Sample No.:49-49-B, S/N CAL-9902, 9.55 +/- 0.16 ppm Nitric Oxide in Nitrogen, dated April 10, 1987. The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone. S/N 00100508, 0-25 ppm range. The last multipoint calibration was done on May 24, 1991.

Moss Chai
Analyst

CO

Best Available Copy

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-17617 CYLINDER #: CC82385 CYL. PRESSURE: 2000 PSIG
 EXPIRATION DATE: 11/19/93 BATCH#: _____ LAST ANALYSIS DATE: 5/19/92
 CUSTOMER: ALPHAGAS P.O.# G21711978
 METHOD: EPA PROTOCOL # 3.0.4. G-1

STANDARD:

SRM #: 1681
 CYL. #: CIM313
 CONC. 872 PPM

INSTRUMENT:

COMPONENT: BECKMAN NOIR
 MODEL #: 865
 SERIAL #: 0103409
 LAST CAL.: 4/1/92

COMPONENT: CO
 MEAN CONC: 632 PPM

REPLICATE CONC.
 DATE: 5/12/92 DATE: 5/19/92
630 PPM 630 PPM
633 PPM 631 PPM
635 PPM 630 PPM

COMPONENT: _____
 MEAN CONC: _____

REPLICATE CONC.
 DATE: _____ DATE: _____

COMPONENT: _____
 MEAN CONC: _____

COMPONENT: _____
 MEAN CONC: _____

DATE: _____ DATE: _____

BALANCE GAS NITROGEN

Best Available Copy

REPLICATE DATA

COMPONENT: CO

DATE: 5-12-92

DATE: 5/19/92

S 0 R 432.5 C 280.5

S 0 R 438.5 C 284.2

R 433 Z 0 C 282

R 439 Z 0 C 285

Z 0 C 283 R 433

Z 0 C 284.5 R 439

REPLICATE DATA

COMPONENT:

DATE:

DATE:

S R C

S R C

R S C

R S C

S C R

S C R

REPLICATE DATA

COMPONENT

DATE:

DATE:

S R C

S R C

R S C

R S C

S C R

S C R

S=ZERO C=CANDIDATE R=REFERENCE

ANALYST: *John Dorn*

APPROVED BY:

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC110717	Protocol No. 1	
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1	
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7	
COMPONENT		CONCENTRATION	GAS ANALYZER EMPLOYED
Carbon monoxide	30.5 ppm	Manufacturer	Siemens
Nitrogen	Balance Gas	Model Number	Ultramat 5E
REFERENCE STANDARD EMPLOYED FOR ANALYSIS			Serial Number
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Carbon monoxide	24.08 ppm	FF-30390	2635a
Last Calibrated			2/25/92
Analytical Principle			NDIR

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.0 ppm	24.1 ppm	30.6 ppm	0.0 ppm	24.1 ppm	30.5 ppm
0.0	24.1	30.7	0.0	24.1	30.4
0.0	24.2	30.7	0.1	24.3	30.7
Mean Analytical Result: 30.6 ppm			Mean Analytical Result: 30.4 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	



P.O. Box 5548
45 South St.

0-Mar-91
ATOR OXYGEN

Phone (213)492-5340
Long Beach, CA 90805

P.O. # G-206
GAINESVILLE, FL.

CERTIFICATION OF CYLINDER #cc-58064

COMPONENT:

Carbon Monoxide
NITROGEN

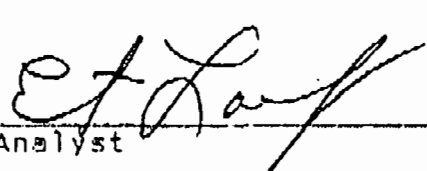
MEAN CONCENTRATION:

102.6 +/- 2.66 ppm
Balance

Cylinder pressure
Expiration date

1900 psi
18-Sep-92

This mixture was prepared and analyzed following EPA Revised
Traceability Protocol No.1, Section 3.0.4, Procedure G1.
The concentration of the Carbon Monoxide was determined by direct
comparison with NBS SRM 1679b, Sample No.:3-45-F, S/N FF-19983, 95.4 +/-
9 ppm Carbon Monoxide in Nitrogen, dated Jan. 22, 1988. The analysis
was performed on a Bendix 6501-5CA NDIR, S/N Y01229-8, 0-250 ppm
range. The last multipoint calibration was done on MARCH 12, 1991.


Analyst

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

EPA PROTOCOL NO.1 DATA SHEET COMPONENT: CARBON MONOXIDE 0-250ppm

NBS SRM 1679b:3-45-F, FF-19983, 95.4 +/- 0.9ppm CO in N2

	TRIAD #1	TRIAD #2	TRIAD #3	TRIAD #4	TRIAD #5	TRIAD #6
DATE	03/12/91	03/12/91	03/12/91	03/19/91	03/19/91	03/19/91
	VDC	VDC	VDC	VDC	VDC	VDC
FF-19983	0.9420	0.9420	0.9420	0.9300	0.9350	0.9340
ZERO	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
CC-58064	1.0100	1.0110	1.0110	1.0050	1.0060	1.0050

EPA PROTOCOL NO.1 WORK SHEET COMPONENT: CARBON MONOXIDE 28.6-124p

NBS SRM 1679b:3-45-F, FF-19983, 95.4 +/- 0.9ppm CO in N2

	TRIAD #1	TRIAD #2	TRIAD #3	TRIAD #4	TRIAD #5	TRIAD #6
DATE	03/12/91	03/12/91	03/12/91	03/19/91	03/19/91	03/19/91
	VDC	VDC	VDC	VDC	VDC	VDC
FF-19983	0.9420	0.9420	0.9420	0.9300	0.9350	0.9340
ZERO	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
CC-58064	1.0100	1.0110	1.0110	1.0050	1.0060	1.0050

ASSAY: 102.29 102.40 102.40 103.10 102.65 102.66

VALID	VALID	VALID	VALID	VALID	VALID
TRIADS 1,2,3 MEAN:	102.36	TRIADS 4,5,6 MEAN:	102.80		
CARBON MONOXIDE		CONCENTRATION IN ppm:	102.6		

VARIABILITY	VDC	PPM x PPM
ZERO :	0.0002	0.0025
SRM :	0.0036	0.8100
SRMd :	0.0002	0.0025
MIXd :	0.0002	0.0025
LINEARITY :	0.0100	6.2500
TOLERANCE	SQRT SUM :	2.7 ppm



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

BIG THREE / ALPHAGAZ

P.O. Box 6139
Lakewood, CA 90714

Phone (213) 492-5340
FAX (213) 492-5349

06-May-91
GATOR OXYGEN

P.O.: G-206
GAINESVILLE, FL

CERTIFICATION OF CYLINDER #CC68301

COMPONENT:

MEAN CONCENTRATION:

Carbon Monoxide
Nitrogen

511~~8~~⁴ +/- 14 ppm.
Balance

Cylinder pressure
Expiration date:

2000 psi
02-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, Procedure G1. The concentration of the Carbon Monoxide was determined by direct comparison with SRM 1681b, S/N CLM-000341, Sample I-49-G, 968 +/- 9 ppm Carbon Monoxide in Nitrogen, dated Jan. 10, 1989. The analysis was performed on a Bendix 6501-5CA NDIR, S/N Y01229-8, 0-1000 ppm range & a calibration range of 290-1258 ppm. The last multipoint calibration was done on April 26, 1991.

Moses Choi
Analyst

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

EPA PROTOCOL NO.1 DATA SHEET COMPONENT: CARBON MONOXIDE 0-1000ppm
NIST SRM 1681b CLM-000341 I-49-G 968 +/- 9 ppm CO in N2
DATE : 04/29/91 : 04/29/91 : 04/29/91 : 05/06/91 : 05/06/91 : 05/06/91 :
: VDC : VDC : VDC : VDC : VDC : VDC :
CLM-000341 : 0.3020 : 0.3030 : 0.3030 : 0.3030 : 0.3030 : 0.3030 :
ZERO : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 :
CC68301 : 0.1420 : 0.1420 : 0.1420 : 0.1430 : 0.1420 : 0.1430 :

EPA PROTOCOL NO.1 WORK SHEET COMPONENT: CARBON MONOXIDE 290.4 to 1258
NIST SRM 1681b CLM-000341 I-49-G 968 +/- 9 ppm CO in N2
DATE : 04/29/91 : 04/29/91 : 04/29/91 : 05/06/91 : 05/06/91 : 05/06/91 :
: VDC : VDC : VDC : VDC : VDC : VDC :
CLM-000341 : 0.3020 : 0.3030 : 0.3030 : 0.3030 : 0.3030 : 0.3030 :
ZERO : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 :
CC68301 : 0.1420 : 0.1420 : 0.1420 : 0.1430 : 0.1420 : 0.1430 :
ASSAY: 511.13 509.62 509.62 512.47 509.62 512.47
VALID VALID VALID VALID VALID VALID
TRIADS 4,5,6 MEAN: 510.1 TRIADS 4,5,6 MEAN: 511.5
CARBON MONOXIDE CONCENTRATION IN ppm: 511

VARIABILITY VDC PPM x PPM
ZERO : 0.0005 0.2500
SRM : 0.0090 81.0000
SRMd : 0.0010 1.0000
MIXd : 0.0010 1.0000
LINEARITY : 0.0100 100.0000
TOLERANCE SQRT SUM : 14 ppm

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16601 CYLINDER #: CC68392 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 10/6/93 BATCH#: LAST ANALYSIS DATE: 4/6/92

CUSTOMER: ALPHAGAZ

P.O. #
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1679

CYL. #: FF28138

CONC. 102 PPM

INSTRUMENT:

COMPONENT: BECKMAN NDIR

MODEL #: 865

SERIAL #: 0103409

LAST CAL.: 1/2/92

COMPONENT CO
MEAN CONC: 101 PPM

REPLICATE CONC.	
DATE: 3/20/92	DATE: 4/6/92
102 PPM	102 PPM
100 PPM	101 PPM
101 PPM	101 PPM

COMPONENT
MEAN CONC:

REPLICATE CONC.	
DATE:	DATE:

COMPONENT
MEAN CONC:

BALANCE GAS NITROGEN

REPLICATE DATA

DATE: 3/20/92

Z 0 R 441.5 C 442.5

R 442 Z 0 C 433.3

Z 0 C 437.7 R 442

COMPONENT: CO

DATE 4/6/92

Z 0 R 464 C 463.5

R 464.5 Z 0 C 460

Z 0 C 460.4 R 465

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Tommy Allison

APPROVED BY: _____

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

PROPANE

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16604 CYLINDER #: 110706 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 9/20/93 BATCH#: _____ LAST ANALYSIS DATE: 3/20/92

CUSTOMER: ALPHAGAZ

P.O.# _____
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1666 _____

CYL. #: FF28723 _____

CONC. 9.83 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN THC _____

MODEL #: 400 _____

SERIAL #: 1003052 _____

LAST CAL.: 1/2/92 _____

COMPONENT C3H8
MEAN CONC.: 9.88 PPM

REPLICATE CONC.
DATE: 3/20/92 DATE _____
9.88 PPM _____
9.88 PPM _____
9.89 PPM _____

COMPONENT
MEAN CONC.

COMPONENT _____
MEAN CONC.: _____

DATE: _____ REPLICATE CONC.
DATE: _____

BALANCE GAS AIR

REPLICATE DATA

DATE: 3/20/92

Z 0 R 370 C 372

R 371 Z 0 C 373

Z 0 C 373.3 R 371

COMPONENT: C3H8

DATE _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Dan Cox

APPROVED BY: _____

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NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16605 CYLINDER #: CC108167 CYL. PRESSURE: 2000 PSIG
EXPIRATION DATE: 9/20/93 BATCH#: LAST ANALYSIS DATE: 3/20/92
CUSTOMER: ALPHAGAS P.O. #
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1669B
CYL. #: CLM812
CONC. 464 PPM

INSTRUMENT:

COMPONENT: BECKMAN THC
MODEL #: 400
SERIAL #: 1003052
LAST CAL.: 1/2/92

COMPONENT C3H8
MEAN CONC: 298 PPM

REPLICATE CONC.
DATE: 3/20/92 DATE
297 PPM
298 PPM
298 PPM

COMPONENT
MEAN CONC.

COMPONENT
MEAN CONC:

REPLICATE CONC.
DATE: DATE

BALANCE GAS AIR

REPLICATE DATA

DATE: 3/20/92

Z 0 R 333 C 213

R 332 Z 0 C 213

Z 0 C 213 R 332

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: C3H8

DATE _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: David Gx

APPROVED BY: _____

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DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16601 CYLINDER #: CC68392 CYL. PRESSURE: 2000 PSIG
EXPIRATION DATE: 10/6/93 BATCH#: LAST ANALYSIS DATE: 4/6/92
CUSTOMER: ALPHAGAZ P.O.#
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1679
CYL. #: FF28138
CONC. 102 PPM

INSTRUMENT:

COMPONENT: BECKMAN NDIR
MODEL #: 865
SERIAL #: 0103409
LAST CAL.: 1/2/92

COMPONENT CO
MEAN CONC: 101 PPM

REPLICATE CONC.
DATE: 3/20/92 DATE 4/6/92
102 PPM 102 PPM
100 PPM 101 PPM
101 PPM 101 PPM

COMPONENT
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMPONENT
MEAN CONC:

BALANCE GAS NITROGEN

REPLICATE DATA

DATE: 3/20/92

Z 0 R 441.5 C 442.5

R 442 Z 0 C 433.3

Z 0 C 437.7 R 442

COMPONENT: CO

DATE 4/6/92

Z 0 R 464 C 463.5

R 464.5 Z 0 C 460

Z 0 C 460.4 R 465

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Tommy Allison

APPROVED BY: _____

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DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16071 CYLINDER #: CC88622 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 8/19/93 BATCH#: _____ LAST ANALYSIS DATE: 2/19/92

CUSTOMER: ALPHAGAZ

P.O.# GZ1524-978
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1666B

CYL. #: FF19120

CONC. 9.40 PPM

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 1/2/92

COMPONENT C3H8
MEAN CONC: 10.1 PPM

REPLICATE CONC.
DATE: 2/19/92 DATE: _____
10.1 PPM
10.1 PPM
10.1 PPM

COMPONENT _____
MEAN CONC: _____

REPLICATE CONC.
DATE: _____ DATE: _____

COMPONENT _____
MEAN CONC. _____

BALANCE GAS AIR

REPLICATE DATA

COMPONENT: C3H8

DATE: 2/19/92

DATE _____

Z 0 R 395 C 423

Z _____ R _____ C _____

R 395 Z 0 C 423.5

R _____ Z _____ C _____

Z 0 C 421 R 393

Z _____ C _____ R _____

REPLICATE DATA

COMPONENT: _____

DATE: _____

DATE: _____

Z - R _____ C _____

Z _____ R _____ C _____

R _____ Z _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Daniel

APPROVED BY: _____

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630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16070 CYLINDER #: CC102452 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 8/19/93 BATCH#: _____ LAST ANALYSIS DATE: 2/19/92

CUSTOMER: ALPHAGAZ

P.O.# GZ1524-978
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1667B

CYL. #: FF27001

CONC. 47.3 PPM

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 1/2/92

COMPONENT C3H8
MEAN CONC: 51.1 PPM

REPLICATE CONC.
DATE: 2/19/92 DATE: _____
51.1 PPM
51.1 PPM
51.2 PPM

COMPONENT _____
MEAN CONC: _____

REPLICATE CONC.
DATE: _____ DATE: _____

COMPONENT _____
MEAN CONC. _____

BALANCE GAS AIR

REPLICATE DATA

COMPONENT: C3H8

DATE: 2/19/92

DATE _____

Z 0 R 421 C 454

Z _____ R _____ C _____

R 421 Z 0 C 454.5

R _____ Z _____ C _____

Z 0 C 455.5 R 421

Z _____ C _____ R _____

REPLICATE DATA

COMPONENT: _____

DATE: _____

DATE: _____

Z - R _____ C _____

Z _____ R _____ C _____

R _____ Z _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Davis

APPROVED BY: _____

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PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

John B. Koogler, Ph.D., P.E.

Project Advisor

N. Mason Joye, Jr.

Project Supervisor

Rodney Paul

Field Test Crew

Stephen Bell

Field Test Crew

Treg Jones

Field Test Crew



SUMMARY OF PARTICULATE MATTER,
HYDROGEN CHLORIDE, VOLATILE ORGANIC COMPOUNDS,
TOTAL HYDROCARBONS, CARBON MONOXIDE,
NITROGEN OXIDES AND METALS EMISSION RATES
AND VISIBLE EMISSIONS OBSERVATIONS

COAL/TDF FIRING CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CEMENT/POWER/LIME PLANT

BROOKSVILLE, FLORIDA

JULY 28-29, 1992

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 N.W. 13TH STREET
GAINESVILLE, FL 32609
(904) 377-5822



TABLE OF CONTENTS

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2.0	PROCESS DESCRIPTION	4
3.0	LOCATION OF SAMPLING PORTS	5
4.0	TEST METHODS	7
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APPENDIX

Particulate Matter

Hydrogen Chloride

Metals

Speciated Volatile Organic Compounds

Carbon Monoxide, Total Hydrocarbon and
Nitrogen Oxides Monitoring Data

Visible Emissions

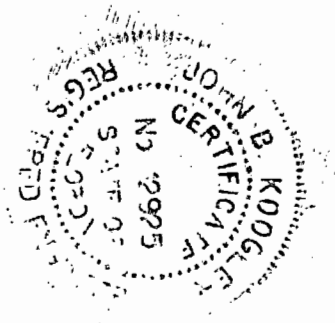
Plant Operating Data


Coal and TDF Analyses

Equipment Calibrations

Project Participants

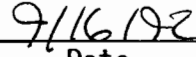
To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.





John B. Koogler, PH.D., P.E.

State of Florida
Registration No. 12925



Date

SEAL

1.0 INTRODUCTION

The Florida Crushed Stone Company (FCS) operates a cement/power/lime (CPL) plant in Hernando County, northwest of Brooksville. The cement plant was permitted under Florida Department of Environmental Regulation (FDER) Air Construction Permit AC27-118674 and the facility was permitted under Permit PSD-FL-091. The cement plant presently operates under permit A027-183508 at a permitted feed rate of 110.6 tons per hour and a clinker production rate of 75 tons per hour. The plant is normally fired with low-sulfur coal at a heat input rate of up to 248 MMBTU per hour.

In March 1990, FCS applied to FDER requesting approval to burn tire derived fuel (TDF) as a supplemental heat source in the cement kiln of the CPL plant. On June 6, 1990, FDER issued an amendment to the referenced permits authorizing performance tests on the cement plant while using TDF to supply up to 15 percent of the heat input to the kiln. In September 1990, the tests were conducted to measure air pollutant emissions from the CPL plant while the plant was operating under baseline conditions and with shredded TDF supplying up to 15 percent of the heat input to the plant. In September 1991, FCS requested approval from FDER to conduct additional tests with TDF. On October 9, 1991, FDER authorized FCS to conduct tests under baseline conditions and while using whole-tire TDF to provide up to 15 percent of the heat input to the plant. These tests were conducted during the period November 13 - 21, 1991.

On May 15, 1992, FCS requested approval from FDER to conduct additional tests with TDF. On July 20, 1992, FDER authorized FCS to conduct tests under baseline conditions and while using whole-tire TDF to provide up to 15 percent of the heat input to the plant. These tests were conducted during the period July 21-29, 1992. The results of the TDF tests conducted on July 28 and 29, 1992, are reported herein.

The TDF tests were conducted during the period 0715-1900 on July 28, 1992, and 0655-1817 on July 29, 1992. Prior to the test on July 28, 1992, the plant had been operating for five days with coal providing approximately 85 percent of the heat input to the kiln and TDF providing approximately 15 percent of the heat input in order to assure equilibrium operating/emissions conditions. The use of TDF in the cement plant began at 0800 on July 23, 1992 (see plant data in Appendix).

During the TDF test period:

- a. Coal provided 80.7 percent of the heat input to the cement plant; or approximately 183.2 MMBTU per hour and TDF provided 19.3 percent of the heat input to the cement plant; or approximately 43.9 MMBTU per hour. The kiln feed rate averaged 117.6 tons per hour and the clinker production rate averaged 76.4 tons per hour (Table 7).
- b. The power plant operated at a rate of 110.6 megawatts and the lime plant operated at an average rate of 20.8 tons per hour; with coal providing 100 percent of the heat input to both plants (Table 7).

- c. The particulate matter emission rate for the CPL plant averaged 62.66 pounds per hour compared with a permitted emission rate of 86.5 pounds per hour (Table 1).
- d. The total hydrocarbon emission rate was less than 4.1 pounds per hour as propane measured by EPA Method 25A. The majority of the observations were below the limit of detection (Table 3). Emission rates of individual volatile organic compounds ranged from less than quantifiable levels to 0.200 pounds per hour of benzene (Table 5). There are no permit limits for these compounds.
- e. The nitrogen oxides emission rate averaged 696 pounds per hour. The permitted emission rate is 1205 pounds per hour (Table 3).
- f. The carbon monoxide emission rate averaged 660 pounds per hour (Table 3). There is no permit limit for carbon monoxide.
- g. The hydrogen chloride emission rate averaged 65.93 pounds per hour (Table 4). There is no permit limit for hydrogen chloride.
- h. The emission rates of metals ranged from 6.29 pounds per hour for zinc to 0.00187 pounds per hour for arsenic.
- i. The highest six-minute rolling average opacity of emissions observed during the TDF test period was 1.0 percent. The average opacity of emissions for the TDF test period was 0.1 percent.

2.0 PROCESS DESCRIPTION

The Florida Crushed Stone CPL plant consists of a Portland cement plant, a power plant and a fluid-bed lime calciner. The Portland cement plant has a permitted feed rate of 110.6 tons per hour and a permitted clinker production rate of 75 tons per hour. The cement plant is normally fired with coal at a maximum rate of 10.3 tons per hour, resulting in a heat input rate of up to 248 MMBTU per hour. During the TDF test period, the coal feed rate to the cement plant averaged 7.3 tons per hour (at 12550 BTU per pound) for an average heat input rate of 183 MMBTU per hour. The TDF feed rate to the plant averaged 1.33 tons per hour (at 16500 BTU per pound) for an average heat input rate of 43.9 MMBTU per hour. The total heat input to the cement plant was 227 MMBTU per hour, with coal providing 80.7 percent of the thermal energy and TDF providing 19.3 percent of the energy.

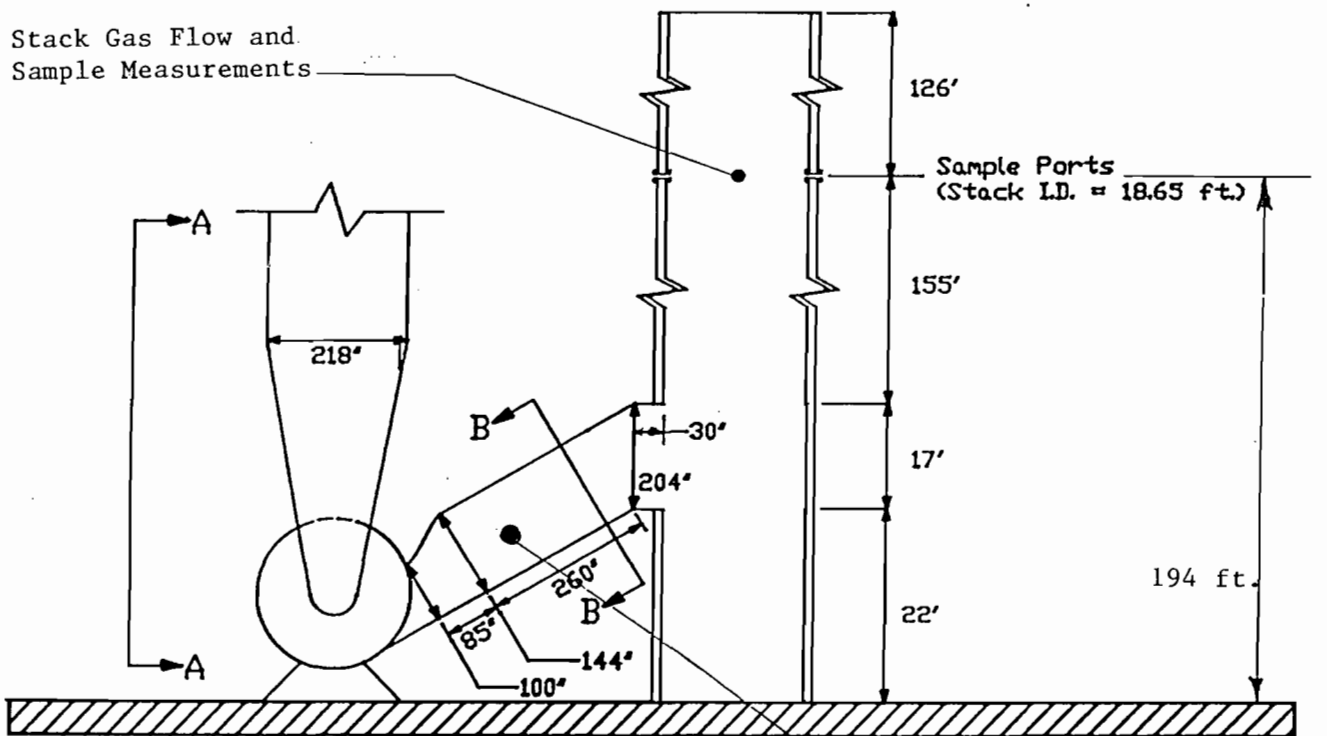
During the TDF test period, the kiln feed rate averaged 117.6 tons per hour and the clinker production rate averaged approximately 76.4 tons per hour. The power plant operated at an average rate of 110.6 megawatts and at a coal feed rate of 48.3 tons per hour. The lime plant operated at a rate of 20.8 tons per hour and at a coal feed rate of 12.9 tons per hour. Neither of these plants were affected by the use of TDF in the cement plant.

3.0 LOCATION OF SAMPLING PORTS

The locations of the sampling points are shown in Figure 1. Stack gas flow rate measurements and sample collection for particulate matter, metals, hydrogen chloride, and speciated volatile organic compounds emission measurements were made through four sampling ports located at the 194-foot level of the stack. Samples for determining the nitrogen oxides, carbon monoxide and total hydrocarbon concentrations of the stack gas were made at a single point near the center of the duct between the CPL plant I.D. fan and the stack (Figure 1).

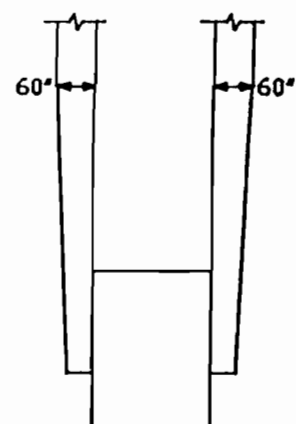
The four sampling ports at the 194 foot level of the stack are located at 90 degrees to one another in the 18.65-foot diameter stack; 155 feet above the point where the stack gases are introduced to the stack and 126 feet below the top of the stack. A total of 16 sampling points were used for the velocity and sampling traverses. The sampling points were located in accordance with criteria established by EPA test Method 1 (40CFR60, Appendix A).

Measurements of the nitrogen oxides, carbon monoxide and total hydrocarbon concentrations in the stack gas were made at a single point near the center of the 186-inch by 144-inch rectangular duct between the I.D. fan of the CPL plant and the stack.

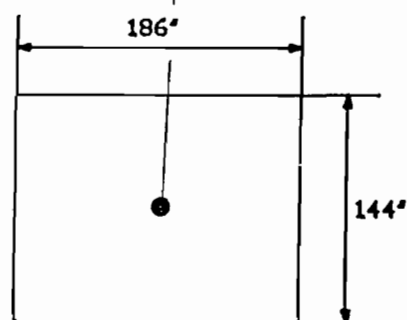


SIDE VIEW

NOx, CO and THC
Sample Point Locations



FAN INLET
(SECTION A-A)



FAN OUTLET
(SECTION B-B)

FIGURE 1

SAMPLE POINT LOCATIONS

FLORIDA CRUSHED STONE
CPL PLANT

BROOKSVILLE, FLORIDA



4.0 TEST METHODS

The nitrogen oxides concentrations were continuously measured in accordance with EPA Test Method 7e, carbon monoxide concentrations were continuously measured in accordance with EPA Test Method 10, and total hydrocarbon concentrations were continuously measured in accordance with EPA Test Method 25A. All test methods are described in 40CFR60, Appendix A. The sample of stack gas for these continuous analyzers was collected from a single point in the rectangular duct between the CPL plant I.D. fan and the stack and transported to a heated manifold through a heated teflon sample line. The sample gas stream was then split with the fraction for NO_x analysis passing through a cold trap to remove water vapor before the gas stream was introduced to the NO_x analyzer. The cold trap was cooled with a mixture of dry ice and ethylene glycol. The gas sample for carbon monoxide was passed through an ascarite column to remove moisture and CO₂ and the sample for total hydrocarbons was transferred directly to the analyzer through another heated teflon line.

Moisture, stack gas flow rate, oxygen and CO₂ were measured in accordance with EPA Methods 1, 2, 3 and 4, 40CFR60, Appendix A. Speciated volatile organic compounds were measured at the 194 foot level of the stack with EPA Method M-0300 using the volatile organic sampling train (VOST). Hydrogen chloride and particulate matter samples were collected in the EPA Method 26 sampling train (40CFR60, Appendix A). Particulate matter was extracted from the probe and filter while HCl was collected in the impinger section. Metals were collected with the Multi-Metals sampling train as described in EPA SW846-0012.

5.0 SUMMARY OF RESULTS

The results of the TDF tests conducted during the period July 28-29, 1992, are summarized in Tables 1-7.

During the TDF tests:

- a. The particulate matter emission rate averaged 62.66 pounds per hour, compared with an allowable particulate matter emission rate from the CPL plant of 86.5 pounds per hour (see Table 1).
- b. The cement kiln was fired with low-sulfur coal at a rate of 7.3 tons per hour (183 MMBTU/hr) and whole TDF at a rate of 1.33 tons per hour (43.9 MMBTU/hr). The total heat input rate to the kiln averaged 227 MMBTU per hour (Table 7).

The feed rate to the cement kiln averaged 117.6 tons per hour and the clinker production rate averaged 76.4 tons per hour. The power plant operated at a generating rate of 110.6 megawatts and the lime plant operated at a rate of 20.8 tons per hour. Both the power and lime plants were fired entirely with low-sulfur coal (Table 7).

- c. The nitrogen oxides emission rate averaged 696 pounds per hour (Table 3) compared with an allowable nitrogen oxides emission rate from the cement, power and lime plants of 1205 pounds per hour.

- d. The carbon monoxide emission rate averaged 660 pounds per hour (Table 3). There is no permit limit for carbon monoxide.
- e. The total hydrocarbon emission rate was less than 4.1 pounds per hour with the majority of the hourly observations being below the limit of detection (Table 3). Emissions rates of individual organic compounds ranged from below quantifiable limits to 0.200 pounds per hour of benzene (see Table 5).
- f. The hydrogen chloride emission rate averaged 65.93 pounds per hour. A summary of the data is presented in Table 4. There is no permit limit for hydrogen chloride.
- g. Stack gas flow, temperature and moisture are summarized in Tables 1 and 2. The gas flow rate averaged 587,135 dscfm at 357°F and 9.5 percent moisture.
- h. The analyses of coal and the TDF burned in the cement, power and lime plants are summarized in Table 6.
- i. CPL plant operating parameters for the periods of time particulate matter, hydrogen chloride, metals and speciated organic compound samples were collected are summarized in Table 7. Analyses of clinker and raw meal and plant operating data are included in the Appendix.

Field data sheets, field notes, plant operating data and the results of fuel analyses are included in the Appendix of the report.

TABLE 1
SUMMARY OF PARTICULATE MATTER EMISSION MEASUREMENTS
TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 28, 1992

Run No.	Process Weight Rate (1) (Tons/Hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (Deg F)	Stack Gas Moisture (%)	Particulate Matter	
					Conc. (gr/dscf)	Emission Rate (Lbs/Hr)
1	122.5	584157	351.6	9.0	0.0108	54.11
2	126.0	596579	347.2	9.7	0.0118	60.42
3	123.5	608412	337.9	9.6	0.0141	73.44
Average	124.0	596382	345.6	9.4	0.0122	62.66

(1) Feed rate to preheater

TABLE 2
SUMMARY OF METALS EMISSION MEASUREMENTS

TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Metal	Run 1		Run 2		Run 3		Average Emission Rate (lbs/hr)
	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	Sample Mass (μ g)	Emission Rate (lbs/hr)	
Arsenic	1.5	1.52×10^{-3}	1.8	1.82×10^{-3}	2.2	2.27×10^{-3}	0.00187
Chromium	9.9	9.71×10^{-3}	9.5	9.59×10^{-3}	9.3	9.61×10^{-3}	0.00964
Lead	22.6	2.29×10^{-2}	11.2	1.13×10^{-2}	10.0	1.03×10^{-2}	0.01483
Mercury	7.5	7.59×10^{-3}	9.63	9.69×10^{-3}	12.5	1.29×10^{-2}	0.01006
Zinc	6981	7.07	6430	6.49	5145	5.32	6.29

Run No.	Stack Gas Flow Rate (dscfm)	Stack Gas Temperature ($^{\circ}$ F)	Stack Gas Moisture (%)	Meter Volume (dscf)
1	564395	363.0	9.5	74.827
2	581059	363.9	9.6	77.277
3	588209	377.0	9.6	76.430

Average	577887	368.0	9.6	-

Emission Rate (lb/hr) = Stack Gas Flow (dscfm) x 60 min/hr x 1/meter volume (dscf)
x sample mass (μ g) x $1/453.6 \times 10^6$ (lb/ μ g)

TABLE 3
SUMMARY OF CARBON MONOXIDE, TOTAL HYDROCARBONS
AND NITROGEN OXIDES EMISSION RATES

TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Date	Time	CO		THC(1)		NOx(2)	
		Conc (ppm)	Emission Rate (lbs/hr)	Conc (ppm)	Emission Rate (lbs/hr)	Conc (ppm)	Emission Rate (lbs/hr)
7-28-92	0715-0800	217	565	2.0	8.2	126	539
	0800-0900	389	1012	2.0	8.2	121	517
	0900-1000	507	1319	2.0	8.2	134	573
	1000-1100	538	1400	1.6	6.5	144	616
	1100-1200	404	1051	1.8	7.4	147	628
	1200-1300	338	880	1.0	4.1	168	718
	1300-1400	308	802	1.0	4.1	176	752
	1400-1450	165	429	<1.0	<4.1	228	975
	1500-1600	235	612	<1.0	<4.1	153	654
	1600-1700	175	455	<1.0	<4.1	134	573
	1700-1800	172	448	<1.0	<4.1	138	590
	1800-1900	188	489	<1.0	<4.1	182	778
Stack Gas Flow = 596382 dscfm							
7-29-92	0655-0800	309	779	<1.0	<4.0	186	771
	0800-0900	136	343	<1.0	<4.0	160	663
	0900-1000	291	734	<1.0	<4.0	171	708
	1000-1100	270	681	<1.0	<4.0	168	696
	1100-1300	162	409	<1.0	<4.0	179	742
	1300-1400	159	401	<1.0	<4.0	190	787
	1400-1500	198	499	<1.0	<4.0	173	717
	1500-1600	162	409	1.1	4.4	180	746
	1600-1700	184	464	1.2	4.8	173	717
	1700-1800	233	588	1.0	4.0	189	783
Stack Gas Flow = 577887 dscfm							
Two-Day Average			660	<4.1		696	

(1) As propane

(2) As NO₂

Emissions: NOx = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(46/385 lb/ft³)
CO = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(28/385 lb/ft³)
THC = (Stack Gas Flow - dscfm)(60 min/hr)(10⁻⁶)(conc.-ppm)(44/385 lb/ft³)

TABLE 4
SUMMARY OF HYDROGEN CHLORIDE EMISSION MEASUREMENTS
TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

JULY 28, 1992

Run No.	Process Weight Rate (1) (Tons/Hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (Deg F)	Stack Gas Moisture (%)	HCl	
					Conc. (gr/dscf)	Emission Rate (Lbs/Hr)
1	122.5	584157	351.6	9.0	0.0170	84.97
2	126.0	596579	347.2	9.7	0.0125	63.82
3	123.5	608412	337.9	9.6	0.0094	48.99
Average	124.0	596382	345.6	9.4	0.0130	65.93

(1) Feed rate to preheater

TABLE 5
SUMMARY OF VOLATILE ORGANIC COMPOUND EMISSIONS

TDF CONDITIONS

**FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA**

JULY 21, 1992

	Run 1		Run 2		Run 3		Average Emission Rate (lbs/hr)
	Sample Mass (ng)	Emission Rate (lbs/hr)	Sample Mass (ng)	Emission Rate (lbs/hr)	Sample Mass (ng)	Emission Rate (lbs/hr)	
Bromomethane	24	0.001	BQL	BQL	BQL	BQL	BQL
Acetone(1)	5560	0.242	2130	0.095	1630	0.074	0.137
Carbon disulfide	4810	0.209	1050	0.047	1010	0.046	0.101
1,1,1-trichloroethane	44	0.002	BQL	BQL	BQL	BQL	BQL
Benzene	4170(2)	0.227	4080	0.183	4180	0.191	0.200
Trichloroethene	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Toluene	780	0.034	640	0.029	640	0.029	0.031
Chlorobenzene	562	0.025	499	0.022	504	0.023	0.023
Ethylbenzene	146	0.006	150	0.007	149	0.007	0.007
Xylene (total)	470	0.020	565	0.025	505	0.023	0.023
Styrene	512	0.022	442	0.020	481	0.022	0.021
Hexane	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Sample Volume (liters)		50.32		49.96		50.00	
Stack Gas Flow (dscfm)		584157		596579		608412	

(1) Compound(s) reported as acetone could be acetone and/or coelutrated compounds; see Endnotes in Graseby-RTL Analytical Report

(2) Mass from four pairs of traps; sample volume = 40.28 liters

BQL = Below Quantitation Limit

$$\text{Emission Rate (lb/hr)} = \text{Stack gas flow (dscfm)} \times 60 \text{ (min/hr)} \times 1/\text{sample volume (l)} \\ \times 28.32 \text{ (1/ft}^3\text{)} \times \text{sample mass (ng)} \times 1/453.6 \times 10^9 \text{ (1b/ng)}$$

TABLE 6
SUMMARY OF COAL ANALYSES

TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Sample Date	Moisture (%)	Carbon (%)	Hydrogen (%)	Nitrogen (%)	Sulfur (%)	Ash (%)	Oxygen (%)	Chloride (%)
<u>Coal</u>								
7-28-92	6.26	71.53	4.79	1.43	0.74	8.85	6.40	0.09
7-28-92	6.76	71.86	4.73	1.43	0.77	8.27	6.18	0.11
7-29-92	7.09	69.20	4.66	1.46	0.69	9.61	7.29	0.09
7-29-92	5.90	71.32	4.81	1.44	0.69	8.80	7.04	0.09
Average	6.50	70.98	4.75	1.44	0.72	8.88	6.73	0.10
<u>TDF</u>								
7-28-92	1.07	66.42	6.70	0.66	0.98	19.73	4.44	0.06
7-29-92	0.76	65.51	6.17	0.51	1.23	24.18	1.64	0.03
Average	0.92	65.95	6.44	0.58	1.10	21.95	3.04	0.05

Sample Date	Arsenic (µg/g)	Mercury (µg/g)	Lead (µg/g)	Chromium (µg/g)	Zinc (µg/g)
<u>Coal</u>					
7-28-92	3	0.05	86	82	87
7-28-92	3	0.18	92	78	95
7-29-92	1	0.10	98	72	102
7-29-92	1	0.08	88	70	84
Average	2	0.10	91	75	92
<u>TDF</u>					
7-28-92	1	0.03	10	2.0	319
7-29-92	<1	0.04	17	4.0	712
Average	1	0.04	14	3.0	515

TABLE 7
CPL PLANT OPERATING DATA

TDF CONDITIONS

FLORIDA CRUSHED STONE COMPANY
CPL PLANT
BROOKSVILLE, FLORIDA

Parameter	Date 7/28/92				Date 7/29/92				Test Average
	Test Run				Test Run				
	1	2	3	Average	1	2	3	Average	
Lime Plant									
Coal feed (tph)	13.0	11.3	12.0	12.1	14.0	13.3	13.5	13.6	12.9
Lime feed (tph)	20.5	20.0	21.0	20.5	22.0	21.0	20.0	21.0	20.8
Power Plant									
Coal feed (tph)	48.3	49.3	49.3	48.9	47.8	47.5	48.0	47.8	48.3
Gen. Rate (MW)	111.4	111.4	110.8	111.2	110.0	109.1	111.1	110.1	110.6
Cement Plant									
Coal feed (tph)	7.5	7.5	7.6	7.5	6.8	7.4	7.2	7.1	7.3
TDF feed (tph)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Heat Input (MMBtu/hr)	232	232	235	233	215	230	225	223	228
Kiln feed (tph)	116.4	118.2	116.9	117.2	114.9	119.1	120.0	118.0	117.6
Clinker Prod. (tph)	75.6	76.9	75.9	76.1	74.7	77.4	78.0	76.7	76.4
Cement Plant Fan									
Temp. (°F)	768	760	763	764	754	766	761	760	762
Current (amp)	115	121	117	118	114	119	117	117	117
Damper (%)	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8
Oxygen (%)	4.28	4.64	4.14	4.35	3.60	4.30	4.01	3.97	4.16
CO (ppm)	184	139	221	181	375	241	302	306	244
Preheater									
Exit Temp. (°F)	798	784	785	789	774	809	792	792	790
Internal Temp. (°F)	1517	1517	1517	1517	1516	1519	1520	1518	1518
Meal Temp. (°F)	1331	1312	1320	1321	1290	1389	1381	1353	1337
Kiln Inlet									
Temp. (°F)	1604	1610	1612	1609	1647	1604	1619	1623	1616
Draft (in. H2O)	0.67	0.73	0.74	0.71	0.54	0.80	0.85	0.73	0.72
Oxygen (%)	0.91	1.51	1.04	1.15	1.53	1.26	1.23	1.34	1.25
Combustibles (%)	0.03	0.05	0.04	0.04	0.41	0.36	0.28	0.35	0.20
Bag House									
Inlet Temp (°F)	397	402	390	396	405	394	412	404	400
Fan Speed (%)	72	70	70	71	71	71	71	71	71
Current (amp)	3193	3110	3095	3133	3124	3166	3088	3126	3129
Pressure Drop (in. H2O)	7.6	7.5	7.4	7.5	7.6	7.5	7.8	7.6	7.6
Stack									
Oxygen (%)	6.3	6.3	6.3	6.3	6.2	6.3	6.1	6.2	6.3
NOx (ppm)	139	164	153	152	188	172	172	177	165
Opacity (%)	4.0	4.0	4.4	4.1	2.8	2.4	3.8	3.0	3.6
Gas Flow (dscfm)	584,157	596,579	608,412	596,383	564,395	581,059	588,209	577,888	587,135

APPENDIX

PARTICULATE MATTER
HYDROGEN CHLORIDE
METALS
SPECIATED VOLATILE ORGANIC COMPOUNDS
CARBON MONOXIDE, TOTAL HYDROCARBONS
AND NITROGEN OXIDES MONITORING DATA
VISIBLE EMISSIONS
PLANT INFORMATION
COAL AND TDF ANALYSES
EQUIPMENT CALIBRATIONS
CALIBRATION GAS CERTIFICATES
PROJECT PARTICIPANTS

PARTICULATE MATTER

GENERAL DATA

DATA FILE NAME: CPLTDF28

Company : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 Source/Unit : CPL-STACK / HEL & PART / TDF
 Date : JULY 28, 1992 Cp : 0.840
 Stack dia. : 223.80 inch OR : Duct Length : 0.00 inch
 Oxygen Corr.: 0.0 percent Duct Width : 0.00 inch
 Std. Temp. : 68 dF

FUEL ANALYSIS DATA,
(for calculating F-Factor)

Process Wt.

Hydrogen, wt% :	0.00	Run 1 :	0.0 tons/hr
Carbon, wt% :	0.00	Run 2 :	0.0
Sulfur, wt% :	0.00	Run 3 :	0.0
Nitrogen, wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

	RUN	RUN	RUN
	1	2	3

Meter Temp., Tm (dF)	106.30	105.80	99.06
Stack Temp., Ts (dF)	351.60	347.20	337.90
Sq.Rt. dP	0.876	0.907	0.899
dH (in. H2O)	1.17	1.26	1.23
Meter Vol., Vm (ft3)	79.731	81.152	79.689
Meter Y	0.998	0.998	0.998
Bar. Press., Pb (in.Hg.)	30.20	30.20	30.20
Vol. H2O, Vlc (ml)	157.5	175.1	171.8
Static Press., Ps (in.H2O)	-0.88	-0.88	-0.88
Test Time (min.)	128.0	128.0	128.0
Nozzle Dia., Dn (in.)	0.224	0.224	0.224
Oxygen, O2 (%)	10.50	9.40	10.50
Carbon Dioxide, CO2 (%)	16.20	20.60	11.40
Carbon Monoxide, CO (%)	0.00	0.00	0.00

Is this Method 5 or Method 5/8 ? 5.00

5

LABORATORY RESULTS

	RUN	RUN	RUN
	1	2	3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH)	0.02630	0.02620	0.03660	grams
Filterable Particulate (MF)	0.02630	0.03240	0.03280	
Condensable Particulate (BHW)	0.00000	0.00000	0.00000	

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)	0.00	0.00	0.00	mg H2SO4
Sample Volume, ml	0	0	0	
Sample Aliquot, ml	0	0	0	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / ~~HCL~~ & PART / TDF

RUN NO.: 1
DATE : JULY 28, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -0.88 in. H2O
METER TEMP, Tm = 106.3 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 351.6 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.767 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.17 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 79.731 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.20 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 157.5 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
16.20 % CO2 73.30 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots\dots = 75.097 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.414 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots\dots\dots = 0.090$: Lower
: Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 118.63$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + (.28 \times (\%N2 + \%CO)) = 31.01$

$Ms = (Md \times (1-Bws)) + (18.0 \times Bws) \dots\dots\dots = 29.84$

$P(stack) = Pbar + (Ps / 13.6) \dots\dots\dots = 30.14 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots\dots\dots = 59.76 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots\dots\dots = 979,514 \text{ acf/min}$

$Qs(std) = Qs \times (1-Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots\dots\dots = 584,157 \text{ dscf/min}$

$I = (Ts+460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots\dots\dots = 100.26 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / ~~HCL~~ PART / TDF

RUN NO.: 2
DATE : JULY 28, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -0.88 in. H2O
METER TEMP, Tm = 105.80 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 347.2 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.823 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.26 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 81.152 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.20 in.Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 175.1 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.40 % O2 0.00 % CO
20.60 % CO2 70.00 % N2

$$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.520 \text{ dscf}$$

$$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.242 \text{ scf}$$

$$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.097 \text{ ; Lower Bws}$$

$$Bws @ \text{Saturated Conditions} = \text{Vapor Press. of H2O @ Dew Point Temp.} / (Ps, \text{ in.Hg.}) \dots = 1.000 \text{ ; value used.}$$

$$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 103.52$$

$$Md = (.44 \times \%CO2) + (.32 \times \%O2) + (.28 \times (\%N2 + \%CO)) = 31.67$$

$$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 30.34$$

$$P(stack) = Pbar + (Ps / 13.6) \dots = 30.14 \text{ in. Hg}$$

$$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 61.20 \text{ ft/sec}$$

$$Qs = vs \times As \times 60 \dots = 1,003,061 \text{ acf/min}$$

$$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 596,579 \text{ dscf/min}$$

$$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 100.03 \%$$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / ~~HCL~~ % PART / TDF

RUN NO.: 3
DATE : JULY 28, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -0.88 in. H2O
METER TEMP, Tm = 99.06 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 337.9 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.808 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.23 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 79.689 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.20 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 171.8 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
11.40 % CO2 78.10 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.041 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.087 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096$: Lower
: Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 103.77$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.24$

$Ms = (Md \times (1-Bws)) + (18.0 \times Bws) \dots = 29.07$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.14 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots = 61.62 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots = 1,009,925 \text{ acf/min}$

$Qs(std) = Qs \times (1-Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots = 608,412 \text{ dscf/min}$

$I = (Ts+460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots = 97.47 \%$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL-STACK / ~~HCL~~ PART / TDF
DATE : JULY 28, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	157.5	175.1	171.8
Vm = Sample gas vol, meter cond., dacf	79.731	81.152	79.689
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.20	30.20	30.20
Pstatic = Stack static pressure, in. H2O	-0.88	-0.88	-0.88
dH = Avg meter pressure diff, in. H2O	1.17	1.26	1.23
Tm = Absolute meter temp., degrees R	566.3	565.8	559.1
Vm(std) = Sample gas vol, Std. cond., dscf	75.097	76.520	76.041
Bws = Water vapor in gas stream, fraction	0.090	0.097	0.096
MF = Moisture factor (1 - Bws)	0.910	0.903	0.904
CO2 = Carbon Dioxide, dry, volume %	16.20	20.60	11.40
O2 = Oxygen, dry, volume %	10.50	9.40	10.50
N2 = Nitrogen, dry volume %	73.30	70.00	78.10
Md = Molecular weight of stack gas, dry	31.01	31.67	30.24
Ms = Molecular weight of stack gas, wet	29.84	30.34	29.07
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8760	0.9070	0.8990
Ts = Absolute stack temp., degrees R	811.6	807.2	797.9
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	584,157	596,579	608,412
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
0 = Sample time, minutes	128.00	128.00	128.00
%I = Isokinetic variation, percent	100.26	100.03	97.47

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL-STACK / ~~HCL~~ & PART / TDF
DATE : JULY 28, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	52.60	58.60	69.40
Meter Volume, standard cond., Vm(std)	75.097	76.520	76.041
Carbon Dioxide, percent	16.20	20.60	11.40
Oxygen, percent	10.50	9.40	10.50
Particulate Concentration :			
gr/scf	0.0098	0.0107	0.0127
gr/dscf	0.0108	0.0118	0.0141
gr/dscf @ 12 % CO2	0.0080	0.0069	0.0148
gr/dscf @ 0% O2	0.0216	0.0214	0.0282

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL-STACK / ~~HCL~~ PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.02630 grams      | Vm(std)  75.097 ft3
Mass Filter (MF)           0.02630 grams      | Vw(std)   7.414 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 584,157 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.090
Back Half Sulfate (BHS)    mg H2SO4      | CO2      16.20 %
H2O2 Catch (SO2)          mg H2SO4      | O2       10.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0098 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0108 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0080 @ 12% CO2
gr/dscf x [(21 - Oxygen corr.) / (21 - %O2)] ..... 0.0216 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 54.11 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0098 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0108 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0080 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0216 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 54.11 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL-STACK / HCL PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.02620 grams      | Vm(std)  76.520 ft3
Mass Filter (MF)           0.03240 grams      | Vw(std)   8.242 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 596,579 dscfm
Front Half Sulfate (FHS)    mg H2SO4         | Bws       0.097
Back Half Sulfate (BHS)    mg H2SO4         | CO2      20.60 %
H2O2 Catch (SO2)          mg H2SO4         | O2       9.40 %
*****
```

F-FACTOR

 $10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(Tstd + 460)/528]$ dscf/MMBtu

FILTERABLE PARTICULATE

 $15.432 \times (FHW + MF) / [Vm(std) + Vw(std)]$ 0.0107 gr/scf
 $15.432 \times (FHW + MF) / Vm(std)$ 0.0118 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0069 @ 12% CO2
 gd/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0214 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 60.42 lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

TOTAL PARTICULATE

 $15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))]$... 0.0107 gr/scf
 $15.432 \times (FHW + MF + BHW) / Vm(std)$ 0.0118 gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ 0.0069 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)]$ 0.0214 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ 60.42 lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

TOTAL SULFATE

 $0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)]$ gr/scf
 $0.015432 \times (FHS + BHS) / Vm(std)$ gr/dscf
 gr/dscf $\times (12 / \%CO_2)$ @ 12% CO2
 $0.00857 \times Qs(std) \times \text{gr/dscf}$ lb/hr
 F-Fac $\times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf}$.. 1b/MMBtu

SULFUR DIOXIDE (SO2)

 $1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)]$ ppm
 ppm $\times [(20.9 - \text{Oxygen Corr.}) / (20.9 - \%O_2)]$ @ O2 corr.
 ppm $\times (1 - Bws)$ ppm (wet)
 $8.223E-5 \times Qs(std) \times 64.062 \times \text{ppm} / [T(std) + 460]$.. lb/hr
 F-Factor $\times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times [20.9 / (20.9 - \%O_2)] \times \text{ppm}$ 1b/MMBtu
 lb/hr / (dscfm $\times 60 \text{ min/hr}$) 1b/dscf

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL-STACK / ~~WGL~~ PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.03660 grams      | Vm(std)  76.041 ft3
Mass Filter (MF)           0.03280 grams      | Vw(std)   8.087 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 608,412 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.096
Back Half Sulfate (BHS)    mg H2SO4      | CO2      11.40 %
H2O2 Catch (SO2)          mg H2SO4      | O2       10.50 %
*****
```

F-FACTOR

 $10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(Tstd + 460)/528] \dots\dots\dots$ dscf/MMBtu

FILTERABLE PARTICULATE

 $15.432 \times (FHW + MF) / [Vm(std) + Vw(std)] \dots\dots\dots$ 0.0127 gr/scf
 $15.432 \times (FHW + MF) / Vm(std) \dots\dots\dots$ 0.0141 gr/dscf
 gr/dscf $\times (12 / \%CO_2) \dots\dots\dots$ 0.0148 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)] \dots\dots\dots$ 0.0282 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf} \dots\dots\dots$ 73.44 lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf} \dots\dots\dots$ lb/MMBtu

TOTAL PARTICULATE

 $15.432 \times (FHW + MF + BHW) / [(Vm(std) + Vw(std))] \dots\dots\dots$ 0.0127 gr/scf
 $15.432 \times (FHW + MF + BHW) / Vm(std) \dots\dots\dots$ 0.0141 gr/dscf
 gr/dscf $\times (12 / \%CO_2) \dots\dots\dots$ 0.0148 @ 12% CO2
 gr/dscf $\times [(21 - \text{Oxygen Corr.}) / (21 - \%O_2)] \dots\dots\dots$ 0.0282 @ 0% O2
 $0.00857 \times Qs(std) \times \text{gr/dscf} \dots\dots\dots$ 73.44 lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf} \dots\dots\dots$ lb/MMBtu

TOTAL SULFATE

 $0.015432 \times (FHS + BHS) / [Vm(std) + Vw(std)] \dots\dots\dots$ gr/scf
 $0.015432 \times (FHS + BHS) / Vm(std) \dots\dots\dots$ gr/dscf
 gr/dscf $\times (12 / \%CO_2) \dots\dots\dots$ @ 12% CO2
 $0.00857 \times Qs(std) \times \text{gr/dscf} \dots\dots\dots$ lb/hr
 $F\text{-Fac} \times 1.4286E-4 \times [20.9 / (20.9 - \%O_2)] \times \text{gr/dscf} \dots\dots\dots$ lb/MMBtu

SULFUR DIOXIDE (SO2)

 $1.60864 \times [T(std) + 460] \times (mg H_2SO_4) / [98.076 \times Vm(std)] \dots\dots\dots$ ppm
 ppm $\times [(20.9 - \text{Oxygen Corr.}) / (20.9 - \%O_2)] \dots\dots\dots$ @ O2 corr.
 ppm $\times (1 - Bws) \dots\dots\dots$ ppm (wet)
 $8.223E-5 \times Qs(std) \times 64.062 \times \text{ppm} / [T(std) + 460] \dots\dots\dots$ lb/hr
 $F\text{-Factor} \times 64.062 \times [1.3711E-6 / [T(std) + 460]] \times$
 $[20.9 / (20.9 - \%O_2)] \times \text{ppm} \dots\dots\dots$ lb/MMBtu
 lb/hr / (dscfm $\times 60 \text{ min/hr}$) $\dots\dots\dots$ lb/dscf

Plant: Fla Crushed Stone
 Sample Loc.: CP2 Stack (TDF)
 Control Type: Boothouse
 Sample Type: Part 4 HCL
 Date: 7-28-92 Run No.: 1
 Time Start: 0812 Time End: 1033
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 "Hg Stack Press.: 30.14 "Hg Ps: 28.8 "H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 83 °F Wind Dir.: 61 Wind Speed: 3-5
 Weather: Clear Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.1 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Stack Dimentions

Material Processing Rate:
 Final Gas Meter Reading: 857.531 ft³
 Initial Gas Meter Reading: 777.800 ft³
 Total Metered Gas Volume: 79.731 ft³
 Condensate Gain in Impingers: 142. mL
 Weight Gain in Silica Gel: 15.5 g
 Total Moisture Gain: 157.5 mL
 Silica Gel Container No.: 8
 Filter Number:

Leak Check - Meter Box
 Initial: 0.007 cfm @ 15 in. H₂O
 Final: 0.015 cfm @ 35 in. H₂O
 Leak Check - Pitot Tubes
 Impact 3 "H₂O for 15 sec: Stable Leak
 Static 3 "H₂O for 15 sec: Stable Leak



Test Conducted By: RPaul & Bell
 Stack Test Observers: James Jones FDER
02-10.5% CO₂ 16.2%

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				0.8765		1.108	351.6			106.3	1	
1-1-1			77.8	0.82	1.25	1.25	341	247	67	93	2	
2			80.3	0.78	1.19	1.19	338	268	60	93	2	
2-1			82.8	0.78	1.19	1.19	351	272	57	94	2	
2			85.1	0.78	1.19	1.19	356	251	57	96	2	
3-1			87.5	0.73	1.11	1.11	350	264	61	97	2	
2			90.0	0.75	1.14	1.14	353	239	61	98	2	
4-1			92.4	0.72	1.09	1.09	347	247	62	100	2	
2			94.7	0.70	1.06	1.06	331	267	62	101	2	

WST 0817

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			97.0	0.83	1.26	1.26	343	269	68	102	2	
2			99.6	0.78	1.19	1.19	358	259	62	104	2	
2-1			802.0	0.78	1.19	1.19	355	252	61	105	2	
2			4.5	0.80	1.22	1.22	357	257	64	106	2	
3-1			7.2	0.80	1.22	1.22	356	257	64	107	2	
2			9.7	0.80	1.22	1.22	352	241	64	107	2	
4-1			12.5	0.68	1.03	1.03	346	230	65	109	2	
2			14.7	0.70	1.06	1.06	350	234	67	110	2	
3-1-1			17.1	0.82	1.25	1.25	339	258	72	110	3	
2			19.7	0.80	1.22	1.22	355	234	66	111	3	
2-1			22.3	0.80	1.22	1.22	356	226	66	111	3	
2			24.8	0.80	1.22	1.22	348	231	66	112	3	
3-1			27.7	0.78	1.19	1.19	360	246	69	112	3	
2			30.0	0.85	1.29	1.29	360	238	70	112	3	
4-1			32.7	0.73	1.11	1.11	350	231	69	111	3	
2			35.2	0.70	1.06	1.06	357	232	68	111	3	
4-1-1			37.6	0.78	1.19	1.19	343	234	71	111	3	
2			40.1	0.78	1.19	1.19	352	242	63	111	3	
2-1			42.6	0.73	1.11	1.11	355	257	63	111	3	
2			45.1	0.78	1.19	1.19	358	263	63	111	3	
3-1			47.6	0.80	1.22	1.22	356	260	64	111	3	
2			50.2	0.75	1.14	1.14	353	257	63	111	3	
4-1			52.7	0.70	1.06	1.06	351	259	63	111	3	
2			55.1	0.72	1.09	1.09	351	257	66	111	3	

Plant: Fla Crushed Stone
 Sample Loc.: CPJ Stack (TDF)
 Control Type: Baghouse
 Sample Type: Part 4 HCL
 Date: 7-28-92 Run No.: 2
 Time Start: 1203 Time End: 1433
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 Hg Stack Press.: 30.14 "Hg Ps: 20.88 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 58 °F Wind Dir.: W Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA1
 Meter Y: 0998 @ Delta H: 1.568 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.54
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Material Processing Rate:
 Final Gas Meter Reading: 939.752 ft³
 Initial Gas Meter Reading: 858.600 ft³
 Total Metered Gas Volume: 81.152 ft³
 Condensate Gain in Impingers: 158 mL
 Weight Gain in Silica Gel: 17.1 g
 Total Moisture Gain: 175.1 mL
 Silica Gel Container No.: 17
 Filter Number:

Leak Check - Meter Box

Initial: 0.018 cfm @ 15 in. H2O
 Final: 0.006 cfm @ 4 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Stack Dimentions

Umbilical: 100'

Thermocouple

Probe No.: KA-77

Pitot Tube: KA-SI

Test Conducted By: R Paul ABell

Stack Test Observers: James L. O'Donoghue FDFA

02-105 CO2 9.4% 20.6%

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.907</u>		<u>1.26</u>	<u>347.2</u>			<u>105.8</u>		
<u>1-1</u>			<u>58.6</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>343</u>	<u>260</u>	<u>67</u>	<u>107</u>	<u>4</u>	
<u>2</u>			<u>61.2</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>345</u>	<u>256</u>	<u>55</u>	<u>107</u>	<u>4</u>	
<u>2-1</u>			<u>63.8</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>348</u>	<u>257</u>	<u>63</u>	<u>107</u>	<u>4</u>	
<u>2</u>			<u>166.4</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>344</u>	<u>259</u>	<u>64</u>	<u>107</u>	<u>4</u>	
<u>3-1</u>			<u>69.0</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>347</u>	<u>244</u>	<u>63</u>	<u>107</u>	<u>4</u>	
<u>2</u>			<u>71.4</u>	<u>0.78</u>	<u>1.2</u>	<u>1.2</u>	<u>346</u>	<u>250</u>	<u>63</u>	<u>107</u>	<u>4</u>	
<u>4-1</u>			<u>74.0</u>	<u>0.75</u>	<u>1.16</u>	<u>1.16</u>	<u>343</u>	<u>249</u>	<u>62</u>	<u>108</u>	<u>4</u>	
<u>2</u>			<u>76.3</u>	<u>0.75</u>	<u>1.16</u>	<u>1.16</u>	<u>340</u>	<u>252</u>	<u>63</u>	<u>108</u>	<u>4</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			78.7	0.92	1.42	1.42	342	247	67	109	4	
2			81.4	0.88	1.36	1.36	343	231	63	109	4	
2-1			84.1	0.88	1.36	1.36	344	237	63	109	4	
2			86.6	0.85	1.31	1.31	347	234	64	109	4	
3-1			89.2	0.82	1.26	1.26	345	237	65	109	4	
2			91.8	0.82	1.26	1.26	346	232	65	109	4	
4-1			94.4	0.75	1.16	1.16	345	237	66	109	4	
2			96.8	0.72	1.11	1.11	341	231	66	109	4	
3-1-1			99.2	0.88	1.36	1.36	347	267	78	108	4	
2			90.8	0.88	1.36	1.36	348	251	68	107	4	
2-1			4.4	0.88	1.36	1.36	348	253	68	106	4	
2			7.0	0.85	1.31	1.31	350	249	68	105	4	
3-1			9.6	0.85	1.31	1.31	349	252	69	105	4	
2			12.2	0.80	1.23	1.23	350	271	69	105	4	
4-1			14.7	0.75	1.16	1.16	349	260	70	104	4	
2			17.1	0.75	1.16	1.16	349	247	70	104	4	
4-1-1			19.5	0.85	1.31	1.31	344	256	76	102	4	
2			22.1	0.85	1.31	1.31	348	270	67	102	4	
2-1			24.7	0.85	1.31	1.31	351	267	64	102	4	
2			27.2	0.85	1.31	1.31	352	266	65	101	4	
3-1			29.8	0.80	1.23	1.23	353	265	64	101	4	
2			32.3	0.80	1.23	1.23	353	268	64	100	4	
4-1			34.8	0.78	1.2	1.2	354	264	64	101	4	
2			37.3	0.78	1.2	1.2	355	272	64	101	4	

Plant: Fla Crushed Stone
 Sample Loc.: CPT Stack (TDF)
 Control Type: Baghouse
 Sample Type: Part 4 HCL
 Date: 8-7-28-92 Run No.: 3
 Time Start: 1530 Time End: 1757
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 "Hg Stack Press.: 30.14 "Hg Ps: 28.8 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 88 °F Wind Dir.: NW Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 1019.689 ft³
 Initial Gas Meter Reading: 940.000 ft³
 Total Metered Gas Volume: 79.689 ft³
 Condensate Gain in Impingers: 158 mL
 Weight Gain in Silica Gel: 13.8 g
 Total Moisture Gain: 176.8 mL
 Silica Gel Container No.: 18
 Filter Number:

Leak Check - Meter Box
 Initial: 0.009 cfm @ 15 in. H2O
 Final: 0.006 cfm @ 6 in. H2O
 Leak Check - Pitot Tubes
 Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul A Bell
 Stack Test Observers: O2 - 10.5 % CO2 11.4 %

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.82</u>		<u>1.231</u>	<u>337.9</u>			<u>97.06</u>		
1-1-1			<u>40.0</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>350</u>	<u>257</u>	<u>80</u>	<u>97</u>	<u>6</u>	
2			<u>42.5</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>348</u>	<u>258</u>	<u>61</u>	<u>97</u>	<u>6</u>	
2-1			<u>45.1</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>346</u>	<u>255</u>	<u>62</u>	<u>97</u>	<u>6</u>	
2			<u>47.3</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>339</u>	<u>252</u>	<u>62</u>	<u>97</u>	<u>5</u>	
3-1			<u>49.6</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>345</u>	<u>260</u>	<u>63</u>	<u>97</u>	<u>5</u>	
2			<u>52.0</u>	<u>0.78</u>	<u>1.19</u>	<u>1.19</u>	<u>345</u>	<u>253</u>	<u>64</u>	<u>97</u>	<u>5</u>	
4-1			<u>54.5</u>	<u>0.70</u>	<u>1.06</u>	<u>1.06</u>	<u>339</u>	<u>257</u>	<u>64</u>	<u>97</u>	<u>5</u>	
2			<u>56.8</u>	<u>0.70</u>	<u>1.06</u>	<u>1.06</u>	<u>335</u>	<u>250</u>	<u>65</u>	<u>97</u>	<u>5</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			59.0	0.80	1.22	1.22	339	268	69	98	6	
2			61.6	0.82	1.25	1.25	339	265	67	98	6	
2-1			64.1	0.82	1.25	1.25	335	260	64	98	6	
2			66.6	0.82	1.25	1.25	334	259	63	98	6	
3-1			69.2	0.82	1.25	1.25	332	255	63	98	6	
2			71.7	0.78	1.19	1.19	333	255	64	98	6	
4-1			74.2	0.82	1.25	1.25	333	250	64	99	6	
2			76.7	0.77	1.17	1.17	336	251	63	99	6	
3-1-1			79.2	0.88	1.34	1.34	333	241	72	100	6	
2			81.7	0.82	1.25	1.25	336	235	67	100	6	
2-1			84.1	0.82	1.25	1.25	336	242	66	100	6	
2			86.8	0.85	1.29	1.29	333	243	66	100	6	
3-1			89.3	0.88	1.34	1.34	332	237	66	100	6	
2			92.0	0.88	1.34	1.34	331	240	67	100	6	
4-1			94.6	0.72	1.09	1.09	330	236	67	100	6	
2			97.1	0.72	1.09	1.09	332	242	67	100	6	
4-1-1			99.6	0.88	1.34	1.34	337	246	73	101	6	
2			102.1	0.82	1.25	1.25	339	239	68	101	6	
2-1			4.6	0.80	1.22	1.22	340	249	64	101	6	
2			7.1	0.82	1.25	1.25	340	253	64	101	6	
3-1			9.6	0.82	1.25	1.25	341	257	65	101	6	
2			12.1	0.82	1.25	1.25	341	246	65	101	6	
4-1			14.7	0.80	1.22	1.22	341	247	65	101	6	
2			17.2	0.80	1.22	1.22	344	242	66	101	6	

SAMPLING RATE CALCULATIONS

Date 7-28-92Plant Name F.C.A.Location BrooksvilleSource C.P. Stack
(TDF) ΔH = Orifice Reading (Inches H_2O) D_n = Nozzle Diameter (Inches) ΔH_e = Meter Box Constant B_w = Moisture Fraction T_m = Meter Temperature ($^{\circ}F$) T_s = Stack Temperature ($^{\circ}F$) M_s = Wet Molecular Weight of Stack Gas (From Table) ΔP = Pitot Reading (Inches H_2O)

$$\left[\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_e (D_n)^4 17741 \right] \Delta P = \Delta H$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{560}{28.0 (810)} 22680$$

$$\frac{560}{28.0 (810)} 22680$$

$$\frac{572}{28.0 (815)} 22820$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	<u>0.02469</u>	<u>0.02507</u>	<u>0.0247</u>
$\times (1 - B_w)^2 =$	<u>0.8281</u>	<u>0.8281</u>	
$\times \Delta H_e =$	<u>1.658</u>	<u>1.658</u>	
$\times (D_n)^4 =$	<u>0.0025</u>	<u>0.00252</u>	
$\times 17741 =$	<u>17741</u>	<u>17741</u>	
$\times \Delta P =$	<u>1.52</u>	<u>1.54</u>	<u>1.52</u>





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PARTICULATE LAB DATA SHEET

TEST DATE

7-28th 29-92

PLANT NAME

Florida Crushed Stone

SOURCE

Keln

	Run 1	Run 2	Run 3	Blank
Container No.	<u>KAA</u>	<u>KAB</u>	<u>KAC</u>	<u>KAD</u>
Total Volume (ml)	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
Aliquot Evaporated (ml)	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
Final Weight (g)	<u>97.8305</u>	<u>98.4190</u>	<u>96.1212</u>	<u>98.2668 J6</u>
Tare Weight (g)	<u>- 97.8042</u>	<u>- 98.3928</u>	<u>- 96.0846</u>	<u>- 98.2674</u>
Gross Weight Gained (g)	<u>0.0263</u>	<u>0.0262</u>	<u>0.0366</u>	<u>0</u>
Average Blank (g)	<u>- 0</u>	<u>- 0</u>	<u>- 0</u>	<u>- 0</u>
Net Weight (g)	<u>0.0263</u>	<u>0.0262</u>	<u>0.0366</u>	<u>0</u>
Aliquot Factor	<u>x 1</u>	<u>x 1</u>	<u>x 1</u>	<u>x 1</u>
Total Net Weight (mg)	<u>0.0263</u>	<u>0.0262</u>	<u>0.0366</u>	<u>0</u>
Container No.	<u>1B</u>	<u>2B</u>	<u>3B</u>	
Filter No.	<u>1</u>	<u>2</u>	<u>3</u>	
Final Weight (g)	<u>0.4929</u>	<u>0.5009</u>	<u>0.4994</u>	
Tare Weight (g)	<u>- 0.4666</u>	<u>- 0.4685</u>	<u>- 0.4660</u>	
Gross Weight Gained (g)	<u>0.0263</u>	<u>0.0324</u>	<u>0.0328</u>	
Average Blank (g)	<u>- 0</u>	<u>- 0</u>	<u>- 0</u>	
Total Net Weight (mg)	<u>0.0263</u>	<u>0.0324</u>	<u>0.0328</u>	

Tare Balance Check

0.0 ✓ 10.0 ✓
1.0 ✓ 50.0 ✓
5.0 ✓ 100.0 ✓
T/H 75/41

By

James D Tanner

Date

7/29/92

Final Balance Check

0.0 ✓ 10.0 ✓
1.0 ✓ 50.0 50.0008
5.0 ✓ 100.0 100.0013
T/H 74/42

By

David

Date

7-31-92

HYDROGEN CHLORIDE

GENERAL DATA

DATA FILE NAME: CPLTDF28

Company : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
 Source/Unit : CPL-STACK / HCL & PART / TDF
 Date : JULY 28, 1992 Cp : 0.840
 Stack dia. : 223.80 inch OR : Duct Length : 0.00 inch
 Oxygen Corr.: 0.0 percent Duct Width : 0.00 inch
 Std. Temp. : 68 dF

FUEL ANALYSIS DATA,
(for calculating F-Factor)

Process Wt.

Hydrogen, wt% :	0.00	Run 1 :	0.0 tons/hr
Carbon, wt% :	0.00	Run 2 :	0.0
Sulfur, wt% :	0.00	Run 3 :	0.0
Nitrogen, wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

RUN	RUN	RUN
1	2	3

Meter Temp., Tm (dF)	106.30	105.80	99.06
Stack Temp., Ts (dF)	351.60	347.20	337.90
Sq.Rt. dP	0.876	0.907	0.899
dH (in. H2O)	1.17	1.26	1.23
Meter Vol., Vm (ft3)	79.731	81.152	79.689
Meter Y	0.998	0.998	0.998
Bar. Press., Pb (in.Hg.)	30.20	30.20	30.20
Vol. H2O, Vlc (ml)	157.5	175.1	171.8
Static Press., Ps (in.H2O)	-0.88	-0.88	-0.88
Test Time (min.)	128.0	128.0	128.0
Nozzle Dia., Dn (in.)	0.224	0.224	0.224
Oxygen, O2 (%)	10.50	9.40	10.50
Carbon Dioxide, CO2 (%)	16.20	20.60	11.40
Carbon Monoxide, CO (%)	0.00	0.00	0.00

Is this Method 5 or Method 5/8 ? 5.00

5

LABORATORY RESULTS

RUN	RUN	RUN
1	2	3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH)	0.00000	0.00000	0.00000	grams
Filterable Particulate (MF)	0.00000	0.00000	0.00000	
Condensable Particulate (BHW)	0.08260	0.06190	0.04630	

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)	0.00	0.00	0.00	mg H2SO4
Sample Volume, ml	0	0	0	
Sample Aliquot, ml	0	0	0	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
Normality of BaCl				0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / HCL & PART / TDF

RUN NO.: 1
DATE : JULY 28, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -0.88 in. H2O
METER TEMP, Tm = 106.3 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 351.6 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.767 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.17 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 79.731 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.20 in.Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 157.5 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
16.20 % CO2 73.30 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots\dots = 75.097 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.414 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots\dots\dots = 0.090$; Lower
; Bws

Bws @ Saturated Conditions = Vapor Press. of H2O ; value
@ Dew Point Temp. / (Ps, in.Hg.) = 1.000 ; used.

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 118.63$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 31.01$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots\dots\dots = 29.84$

$P(stack) = Pbar + (Ps / 13.6) \dots\dots\dots = 30.14 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots\dots\dots = 59.76 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots\dots\dots = 979,514 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots\dots\dots = 584,157 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots\dots\dots = 100.26 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / HCL ~~&~~-PART / TDF

RUN NO.: 2
DATE : JULY 28, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -0.88 in. H2O
METER TEMP, Tm = 105.80 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 347.2 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.823 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.26 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 81.152 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.20 in.Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 175.1 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 9.40 % O2 0.00 % CO
20.60 % CO2 70.00 % N2

$$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.520 \text{ dscf}$$

$$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.242 \text{ scf}$$

$$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.097 \text{ ; Lower Bws value used.}$$

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

$$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 103.52$$

$$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 31.67$$

$$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 30.34$$

$$P(stack) = Pbar + (Ps / 13.6) \dots = 30.14 \text{ in. Hg}$$

$$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 61.20 \text{ ft/sec}$$

$$Qs = vs \times As \times 60 \dots = 1,003,061 \text{ acf/min}$$

$$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 596,579 \text{ dscf/min}$$

$$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 100.03 \%$$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL-STACK / HCL ~~& PART~~ / TDF

RUN NO.: 3
DATE : JULY 28, 1992

STD. TEMP, Tstd	= 68 DEG. F	STATIC PRESS., Ps	= -0.88 in. H2O
METER TEMP, Tm	= 99.06 DEG. F	PITOT COFF., Cp	= 0.840
STACK TEMP, Ts	= 337.9 DEG. F	STACK I.D.	= 223.80 inch
AVG. VEL. HEAD, dP	= 0.808 in. H2O	DUCT LENGTH	= inch
METER ORIFICE, dH	= 1.23 in. H2O	DUCT WIDTH	= inch
METER VOL., Vm	= 79.689 Cu.Ft.	STACK AREA, As	= 273.179 Sq.Ft.
METER COFF., Y	= 0.998	TEST TIME	= 128.00 min.
BAR. PRESS., Pb	= 30.20 in.Hg	NOZZLE DIA.	= 0.224 inch
COND. (Vlc)	= 171.8 ml	NOZZLE DIA., An	= 2.7E-04 Sq.Ft.

GAS ANALYSIS	= 10.50 % O2	0.00 % CO
	11.40 % CO2	78.10 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.041 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.087 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096$ | Lower
| Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 103.77$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 30.24$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.07$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.14 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 61.62 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots = 1,009,925 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 608,412 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 97.47 \%$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL-STACK / HCL ~~& PART~~ / TDF
DATE : JULY 28, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	157.5	175.1	171.8
Vm = Sample gas vol, meter cond., dacf	79.731	81.152	79.689
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.20	30.20	30.20
Pstatic = Stack static pressure, in. H2O	-0.88	-0.88	-0.88
dH = Avg meter pressure diff, in. H2O	1.17	1.26	1.23
Tm = Absolute meter temp., degrees R	566.3	565.8	559.1
Vm(std) = Sample gas vol, Std. cond., dscf	75.097	76.520	76.041
Bws = Water vapor in gas stream, fraction	0.090	0.097	0.096
MF = Moisture factor (1 - Bws)	0.910	0.903	0.904
CO2 = Carbon Dioxide, dry, volume %	16.20	20.60	11.40
O2 = Oxygen, dry, volume %	10.50	9.40	10.50
N2 = Nitrogen, dry volume %	73.30	70.00	78.10
Md = Molecular weight of stack gas, dry	31.01	31.67	30.24
Ms = Molecular weight of stack gas, wet	29.84	30.34	29.07
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8760	0.9070	0.8990
Ts = Absolute stack temp., degrees R	811.6	807.2	797.9
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	584,157	596,579	608,412
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
O = Sample time, minutes	128.00	128.00	128.00
%I = Isokinetic variation, percent	100.26	100.03	97.47

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL-STACK / HCL ~~&~~ PART / TDF
DATE : JULY 28, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	82.60	61.90	46.30
Meter Volume, standard cond., Vm(std)	75.097	76.520	76.041
Carbon Dioxide, percent	16.20	20.60	11.40
Oxygen, percent	10.50	9.40	10.50
Particulate Concentration :			
gr/scf	0.0154	0.0113	0.0085
gr/dscf	0.0170	0.0125	0.0094
gr/dscf @ 12 % CO2	0.0126	0.0073	0.0099
gr/dscf @ 0% O2	0.0339	0.0000	0.0000

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL-STACK / HCL & PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  75.097 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   7.414 ft3
Back Half Wash (BHW)       0.08260 grams      | Qs(std) 584,157 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.090
Back Half Sulfate (BHS)    mg H2SO4      | CO2      16.20 %
H2O2 Catch (SO2)           mg H2SO4      | O2       10.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0154 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0170 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0126 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0339 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 84.97 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
-----
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL-STACK / HCL & PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  76.520 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   8.242 ft3
Back Half Wash (BHW)       0.06190 grams      | Qs(std) 596,579 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.097
Back Half Sulfate (BHS)    mg H2SO4      | CO2       20.60 %
H2O2 Catch (SO2)           mg H2SO4      | O2        9.40 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
-----
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gd/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
-----
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0113 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0125 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0073 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0226 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 63.82 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

```
-----
0.015432 x (FHS + BHS) / [Vm(std) + Vw(std)] ..... gr/scf
0.015432 x (FHS + BHS) / Vm(std) ..... gr/dscf
gr/dscf x (12 / %CO2) ..... @ 12% CO2
0.00857 x Qs(std) x gr/dscf ..... lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

SULFUR DIOXIDE (SO2)

```
-----
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL-STACK / HCL & PART / TDF DATE : JULY 28, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams      | Vm(std)  76.041 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   8.087 ft3
Back Half Wash (BHW)       0.04630 grams      | Qs(std) 608,412 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.096
Back Half Sulfate (BHS)    mg H2SO4      | CO2      11.40 %
H2O2 Catch (SO2)          mg H2SO4      | O2       10.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL PARTICULATE

```
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0085 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0094 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0099 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0188 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 48.99 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm  

ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.  

ppm x (1 - Bws) ..... ppm (wet)  

8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr  

F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu  

lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

Plant: Fla. Crushed Stone
 Sample Loc.: CPI Stack (TDF)
 Control Type: Baghouse
 Sample Type: Part 4 HCL
 Date: 7-28-92 Run No.: 1
 Time Start: 0812 Time End: 1033
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 "Hg Stack Press.: 30.14 "Hg Ps: 28.9 "H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 83 °F Wind Dir.: 61 Wind Speed: 3-5
 Weather: Clear Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.1 feet
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-
 Pitot Tube: KA-ST

Material Processing Rate:
 Final Gas Meter Reading: 857.531 ft³
 Initial Gas Meter Reading: 777.800 ft³
 Total Metered Gas Volume: 79.731 ft³
 Condensate Gain in Impingers: 142. mL
 Weight Gain in Silica Gel: 15.5 g
 Total Moisture Gain: 157.5 mL
 Silica Gel Container No.: 8
 Filter Number:

Leak Check - Meter Box

Initial: 0.007 cfm @ 15 in. H₂O
 Final: 0.015 cfm @ 35 in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable Leak
 Static 3 "H₂O for 15 sec: Stable Leak



Test Conducted By: R Paul Bell

Stack Test Observers: Jason Jones FDER
02-10.52 CO₂ 16.22

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				<u>0.8755</u>		<u>1.168</u>	<u>351.6</u>			<u>106.3</u>	<u>1</u>	
1-1-1			<u>77.8</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>341</u>	<u>247</u>	<u>67</u>	<u>93</u>	<u>2</u>	
2			<u>80.3</u>	<u>0.78</u>	<u>1.19</u>	<u>1.19</u>	<u>338</u>	<u>268</u>	<u>60</u>	<u>93</u>	<u>2</u>	
2-1			<u>82.8</u>	<u>0.78</u>	<u>1.19</u>	<u>1.19</u>	<u>351</u>	<u>272</u>	<u>59</u>	<u>94</u>	<u>2</u>	
2			<u>85.1</u>	<u>0.78</u>	<u>1.19</u>	<u>1.19</u>	<u>356</u>	<u>251</u>	<u>57</u>	<u>96</u>	<u>2</u>	
3-1			<u>87.5</u>	<u>0.73</u>	<u>1.11</u>	<u>1.11</u>	<u>350</u>	<u>264</u>	<u>61</u>	<u>97</u>	<u>2</u>	
2			<u>90.0</u>	<u>0.75</u>	<u>1.14</u>	<u>1.14</u>	<u>353</u>	<u>239</u>	<u>61</u>	<u>98</u>	<u>2</u>	
4-1			<u>92.4</u>	<u>0.72</u>	<u>1.09</u>	<u>1.09</u>	<u>347</u>	<u>242</u>	<u>62</u>	<u>100</u>	<u>2</u>	
2			<u>94.7</u>	<u>0.70</u>	<u>1.06</u>	<u>1.06</u>	<u>331</u>	<u>267</u>	<u>62</u>	<u>101</u>	<u>2</u>	

WST
0817

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			97.0	0.83	1.26	1.26	343	269	68	102	2	
2			99.6	0.78	1.19	1.19	358	259	62	104	2	
2-1			802.0	0.78	1.19	1.19	355	252	61	105	2	
2			4.5	0.80	1.22	1.22	357	257	64	106	2	
3-1			7.2	0.80	1.22	1.22	356	257	64	107	2	
2			9.7	0.80	1.22	1.22	352	241	64	107	2	
4-1			12.5	0.68	1.03	1.03	346	230	65	109	2	
2			14.7	0.70	1.06	1.06	350	234	67	110	2	
3-1-1			17.1	0.82	1.25	1.25	339	258	72	110	3	
2			19.7	0.80	1.22	1.22	355	234	66	111	3	
2-1			22.3	0.80	1.22	1.22	356	226	66	111	3	
2			24.8	0.80	1.22	1.22	348	231	66	112	3	
3-1			27.7	0.78	1.19	1.19	360	246	69	112	3	
2			30.0	0.84	1.29	1.29	360	238	70	112	3	
4-1			32.7	0.73	1.11	1.11	350	231	69	111	3	
2			35.2	0.70	1.06	1.06	357	232	68	111	3	
4-1-1			37.6	0.78	1.19	1.19	343	234	71	111	3	
2			40.1	0.78	1.19	1.19	352	242	63	111	3	
2-1			42.6	0.73	1.11	1.11	355	257	63	111	3	
2			45.1	0.78	1.19	1.19	358	263	63	111	3	
3-1			47.6	0.80	1.22	1.22	356	260	64	111	3	
2			50.2	0.75	1.14	1.14	353	257	63	111	3	
4-1			52.7	0.70	1.06	1.06	351	259	63	111	3	
2			55.1	0.72	1.09	1.09	351	257	66	111	3	

Plant: Fla. Crushed Stone
 Sample Loc.: CPL Stack (TDF)
 Control Type: Bag house
 Sample Type: Part 4 HCL
 Date: 7-28-92 Run No.: 2
 Time Start: 1203 Time End: 1433
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 Hg Stack Press.: 30.14 Hg Ps: 0.88 H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 88 °F Wind Dir.: W Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0998 @ Delta H: 1.568 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.5 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.54
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 939.752 ft³
 Initial Gas Meter Reading: 858.600 ft³
 Total Metered Gas Volume: 81.152 ft³
 Condensate Gain in Impingers: 158 mL
 Weight Gain in Silica Gel: 17.1 g
 Total Moisture Gain: 175.1 mL
 Silica Gel Container No.: 17
 Filter Number:

Leak Check - Meter Box

Initial: 0.018 cfm @ 15 in. H₂O
 Final: 0.006 cfm @ 4 in. H₂O

Leak Check - Pitot Tubes

Impact 3" H₂O for 15 sec: Stable Leak
 Static 3" H₂O for 15 sec: Stable Leak



Test Conducted By: R Paul Bell

Stack Test Observers: James L. O. FDR
9.4% 20.6%

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (H _g)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				0.907		1.26	347.2			105.8		
1-1			58.6	0.80	1.23	1.23	343	260	67	107	4	
2			61.2	0.80	1.23	1.23	345	256	55	107	4	
2-1			63.8	0.82	1.26	1.26	348	257	63	107	4	
2			66.4	0.82	1.26	1.26	344	259	64	107	4	
3-1			69.0	0.82	1.26	1.26	347	244	63	107	4	
2			71.4	0.78	1.2	1.2	346	250	63	107	4	
4-1			74.0	0.75	1.16	1.16	343	249	62	108	4	
2			76.3	0.75	1.16	1.16	340	252	63	108	4	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			78.7	0.92	1.42	1.42	342	247	67	109	4	
2			81.4	0.88	1.36	1.36	343	231	63	109	4	
2-1			84.1	0.88	1.36	1.36	344	237	63	109	4	
2			86.6	0.85	1.31	1.31	347	234	64	109	4	
3-1			89.2	0.82	1.26	1.26	345	237	65	109	4	
2			91.8	0.82	1.26	1.26	346	232	65	109	4	
4-1			94.4	0.75	1.16	1.16	345	237	66	109	4	
2			96.8	0.72	1.11	1.11	341	231	66	109	4	
3-1-1			99.2	0.88	1.36	1.36	347	267	78	108	4	
2			90.8	0.88	1.36	1.36	348	251	68	107	4	
2-1			4.4	0.88	1.36	1.36	348	253	68	106	4	
2			7.0	0.85	1.31	1.31	350	249	68	105	4	
3-1			9.6	0.85	1.31	1.31	349	252	69	105	4	
2			12.2	0.80	1.23	1.23	350	271	69	105	4	
4-1			14.7	0.75	1.16	1.16	349	260	70	104	4	
2			17.1	0.75	1.16	1.16	349	247	70	104	4	
4-1-1			19.5	0.85	1.31	1.31	344	256	76	102	4	
2			22.1	0.85	1.31	1.31	348	270	67	102	4	
2-1			24.7	0.85	1.31	1.31	351	267	64	102	4	
2			27.2	0.85	1.31	1.31	352	266	65	101	4	
3-1			29.8	0.80	1.23	1.23	353	265	64	101	4	
2			32.3	0.80	1.23	1.23	353	268	64	100	4	
4-1			34.8	0.78	1.2	1.2	354	264	64	101	4	
2			37.3	0.78	1.2	1.2	355	272	64	101	4	

Plant: Fla Crushed Stone
 Sample Loc.: CPI Stack (TDF)
 Control Type: Baghouse
 Sample Type: Part 4 HCL
 Date: 8-7-28-92 Run No.: 3
 Time Start: 1530 Time End: 1757
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.20 "Hg Stack Press.: 30.14 "Hg Ps: 28.8 "H₂O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 88 °F Wind Dir.: NW Wind Speed: 3-8
 Weather: Partly Cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: KA-1
 Meter Y: 0.998 @ Delta H: 1.558 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.52
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft

Stack Dimentions

Umbilical: 100 '
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-SI

Material Processing Rate:

Final Gas Meter Reading: 1019.689 ft³
 Initial Gas Meter Reading: 940.000 ft³
 Total Metered Gas Volume: 79.689 ft³
 Condensate Gain in Impingers: 15.8 mL
 Weight Gain in Silica Gel: 13.8 g
 Total Moisture Gain: 17.8 mL
 Silica Gel Container No.: 18
 Filter Number:

Leak Check - Meter Box

Initial: 0.009 cfm @ 15 in. H₂O
 Final: 0.006 cfm @ 6 in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable Leak
 Static 3 "H₂O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bell

Stack Test Observers:

O₂ - 10.5 % CO₂ 11.4 %

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
Average:				<u>0.84</u>		<u>1.23</u>	<u>337.9</u>			<u>97.06</u>		
1-1			<u>40.0</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>350</u>	<u>257</u>	<u>80</u>	<u>97</u>	<u>6</u>	
2			<u>42.5</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>348</u>	<u>258</u>	<u>61</u>	<u>97</u>	<u>6</u>	
2-1			<u>45.1</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>346</u>	<u>255</u>	<u>62</u>	<u>97</u>	<u>6</u>	
2			<u>47.3</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>339</u>	<u>252</u>	<u>62</u>	<u>97</u>	<u>5</u>	
3-1			<u>49.6</u>	<u>0.82</u>	<u>1.25</u>	<u>1.25</u>	<u>345</u>	<u>260</u>	<u>63</u>	<u>97</u>	<u>5</u>	
2			<u>52.0</u>	<u>0.78</u>	<u>1.19</u>	<u>1.19</u>	<u>345</u>	<u>253</u>	<u>64</u>	<u>97</u>	<u>5</u>	
4-1			<u>54.5</u>	<u>0.70</u>	<u>1.06</u>	<u>1.06</u>	<u>339</u>	<u>257</u>	<u>64</u>	<u>97</u>	<u>5</u>	
2			<u>56.8</u>	<u>0.70</u>	<u>1.06</u>	<u>1.06</u>	<u>335</u>	<u>250</u>	<u>65</u>	<u>97</u>	<u>5</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H₂O)	Meter Orifice Pressure Difference (H₂O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (Hg)	Oxygen Meter Reading (% O₂)
					Calculated	Actual						
2-1-1			59.0	0.80	1.22	1.22	339	268	69	98	6	
2			61.6	0.82	1.25	1.25	339	265	67	98	6	
2-1			64.1	0.82	1.25	1.25	335	260	64	98	6	
2			66.6	0.82	1.25	1.25	334	259	63	98	6	
3-1			69.2	0.82	1.25	1.25	332	255	63	98	6	
2			71.7	0.78	1.19	1.19	333	255	64	98	6	
4-1			74.2	0.82	1.25	1.25	333	250	64	99	6	
2			76.7	0.77	1.17	1.17	336	251	63	99	6	
3-1-1			79.2	0.88	1.34	1.34	333	241	72	100	6	
2			81.7	0.82	1.25	1.25	336	235	67	100	6	
2-1			84.1	0.82	1.25	1.25	336	242	66	100	6	
2			86.8	0.85	1.29	1.29	333	243	66	100	6	
3-1			89.3	0.88	1.34	1.34	332	237	66	100	6	
2			92.0	0.88	1.34	1.34	331	240	67	100	6	
4-1			94.6	0.72	1.09	1.09	330	236	67	100	6	
2			97.1	0.72	1.09	1.09	332	242	67	100	6	
4-1-1			99.6	0.88	1.34	1.34	337	246	73	101	6	
2			102.1	0.82	1.25	1.25	339	239	68	101	6	
2-1			4.6	0.80	1.22	1.22	340	249	64	101	6	
2			7.1	0.82	1.25	1.25	340	253	64	101	6	
3-1			9.6	0.82	1.25	1.25	341	257	65	101	6	
2			12.1	0.82	1.25	1.25	341	246	65	101	6	
4-1			14.7	0.80	1.22	1.22	341	247	65	101	6	
2			17.2	0.80	1.22	1.22	344	242	66	101	6	

SAMPLING RATE CALCULATIONS

Date 7-28-92

Plant Name F C A

Location Brooksville

Source C P L Stack
(TDF)

- ΔH = Orifice Reading (Inches H_2O)
 D_n = Nozzle Diameter (Inches)
 ΔH_E = Meter Box Constant
 B_w = Moisture Fraction
 T_m = Meter Temperature ($^{\circ}F$)
 T_s = Stack Temperature ($^{\circ}F$)
 M_s = Wet Molecular Weight of Stack Gas (From Table)
 ΔP = Pitot Reading (Inches H_2O)

$$\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_E (D_n)^4 17741 \Delta P = \Delta H$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{560}{28.0 (810)} 22680$$

$$\frac{560}{28.0 (810)} 22680$$

$$\frac{572}{28.0 (815)} 22820$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	0.02469	0.02507	0.0247
$\times (1 - B_w)^2 =$	0.8281	0.8281	
$\times \Delta H_E =$	1.658	1.658	
$\times (D_n)^4 =$	0.0025	0.00252	
$\times 17741 =$	17741	17741	
$\times \Delta P =$	1.52	1.54	1.52





E N V I R O N M E N T A L L A B O R A T O R I E S , I N C .

August 13, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

Dear Mason:

Enclosed are the results of our analysis of the samples that we received July 30, 1992.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). PPB is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note that the chloride tests were performed by ESE, Inc. of Gainesville, Florida (DHRS#s 82138 and E82067).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park
Project Manager

TP/beh

Enclosure



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028

DATE: 08/13/92

DHRS #: 82282, E82001

Table 1. Ion Chromatography Data: Florida Crushed Stone

<u>PPB#</u>	<u>Station ID</u>	<u>HCL</u> <u>(total milligrams)</u>
69041	FCS-Run1	82.6
69042	FCS-Run2	61.9
69043	FCS-Run3	46.3


PROJECT MANAGER

CHAIN OF CUSTODY RECORD

Project Number

307-90-01

Project Name

CPL-FCS-TDF

Sample Location

BROOKSVILLE

HCR by ION CHROMATOGRAPHY

Sample Identification	Remarks
FCS RUN 1	HCR
FCS RUN 2	"
FCS RUN 3	"

Sampled By: (Signature)

M. Jone

Date: 7-28-92

Time: See Data Sheets

Relinquished By: (Sign)

M. Jone

Date: 7-30-92

Time: 1355

Received By: (Sign)

Inf E. Jone

Date: 7-30-92

Time: 1355

Relinquished By: (Sign)

Inf E. Jone

Date: 7-30-92

Time: 1451

Received By: (Sign)

Date: Time:

Relinquished By: (Sign)

Date: Time:

Received By Lab: (Sign)

Tom Park

Date: 7/30/92

Time: 1451

Sample Shipped VIA:

UPS

Fed Express

Bus

Shipping Bill Number:



METALS

GENERAL DATA

DATA FILE NAME: MU-METDF

Company : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
Source/Unit : CPL STACK - MULTI-METALS - TDF
Date : JULY 29, 1992 Cp : 0.840
Stack dia. : 223.80 inch OR : Duct Length : 0.00 inch
Oxygen Corr.: 0.0 percent Duct Width : 0.00 inch
Std. Temp. : 68 dF

FUEL ANALYSIS DATA,
(for calculating F-Factor)

Process Wt.

Hydrogen, wt% : 0.00 Run 1 : 0.0 tons/hr
Carbon, wt% : 0.00 Run 2 : 0.0
Sulfur, wt% : 0.00 Run 3 : 0.0
Nitrogen, wt% : 0.00
Oxygen, wt% : 0.00
Btu/lb : 0

F-Factor : dscf/MMBtu; enter this value or {F9} for result.

FIELD DATA

RUN RUN RUN
1 2 3

Meter Temp., Tm (dF) 108.00 104.00 100.06
Stack Temp., Ts (dF) 363.00 363.90 377.00
Sq.Rt. dP 0.868 0.896 0.901
dH (in. H2O) 1.17 1.24 1.25
Meter Vol., Vm (ft3) 79.815 81.833 80.369
Meter Y 0.998 0.998 0.998
Bar. Press., Pb (in.Hg.) 30.15 30.15 30.15
Vol. H2O, Vlc (ml) 166.6 174.7 172.5
Static Press., Ps (in.H2O) -0.92 -0.92 -0.92
Test Time (min.) 128.0 128.0 128.0
Nozzle Dia., Dn (in.) 0.224 0.224 0.224
Oxygen, O2 (%) 10.50 10.50 10.50
Carbon Dioxide, CO2 (%) 21.60 22.00 15.80
Carbon Monoxide, CO (%) 0.00 0.00 0.00

Is this Method 5 or Method 5/8 ?

(5 or 58) :

5

LABORATORY RESULTS

RUN RUN RUN
1 2 3

GRAVIMETRIC ANALYSIS :

Front Half Wash (FWH) 0.00000 0.00000 0.00000 grams
Filterable Particulate (MF) 0.00000 0.00000 0.00000
Condensable Particulate (BHW) 0.00000 0.00000 0.00000

SO2 ANALYSIS :

SO2 Analysis (H2O2 impingers)..... 0.00 0.00 0.00 mg H2SO4
Sample Volume, ml 0 0 0
Sample Aliquot, ml 0 0 0
Volume of Titer, ml 0.00 0.00 0.00
Volume of Titer Blank, ml 0.00 0.00 0.00
Normality of BaCl 0.0000000

LABORATORY RESULTS (Continued)

SULFATE ANALYSIS (FRONT HALF) :

Front Half Sulfate (FHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer Blank, ml	0.00	0.00	0.00	
	Normality of BaCl			0.0000000

SULFATE ANALYSIS (BACK HALF) :

Back Half Sulfate (BHS)	0.00	0.00	0.00	mg H ₂ SO ₄
Sample Volume, ml	100	100	100	
Sample Aliquot, ml	10	10	10	
Volume of Titer, ml	0.00	0.00	0.00	
Volume of Titer IPA Blank, ml	0.00	0.00	0.00	
	Normality of BaCl			0.0000000

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS - TDF

RUN NO.: 1
DATE : JULY 29, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -0.92 in. H2O
METER TEMP, Tm = 108 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 363.0 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.753 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.17 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 79.815 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.15 in.Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 166.6 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
21.60 % CO2 67.90 % N2

$$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times (Pb + (dH / 13.6)) / (Tm + 460) \dots = 74.827 \text{ dscf}$$

$$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 7.842 \text{ scf}$$

$$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.095 \text{ : Lower Bws}$$

$$Bws @ \text{Saturated Conditions} = \text{Vapor Press. of H2O @ Dew Point Temp.} / (Ps, \text{ in.Hg.}) \dots = 1.000 \text{ : value used.}$$

$$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 141.40$$

$$Md = (.44 \times \%CO2) + (.32 \times \%O2) + (.28 \times (\%N2 + \%CO)) = 31.88$$

$$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 30.56$$

$$P(stack) = Pbar + (Ps / 13.6) \dots = 30.08 \text{ in. Hg}$$

$$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 58.98 \text{ ft/sec}$$

$$Qs = vs \times As \times 60 \dots = 966,679 \text{ acf/min}$$

$$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 564,395 \text{ dscf/min}$$

$$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [Time \times P(stack) \times An \times vs \times 60] \dots = 103.40 \%$$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS - TDF

RUN NO.: 2
DATE : JULY 29, 1992

STD. TEMP, Tstd = 68 DEG. F ; STATIC PRESS., Ps = -0.92 in. H2O
METER TEMP, Tm = 104.00 DEG. F ; PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 363.9 DEG. F ; STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.803 in. H2O ; DUCT LENGTH = inch
METER ORIFICE, dH = 1.24 in. H2O ; DUCT WIDTH = inch
METER VOL., Vm = 81.833 Cu.Ft. ; STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 ; TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.15 in. Hg ; NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 174.7 ml ; NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
22.00 % CO2 67.50 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots = 77.277 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.223 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096$; Lower
; Bws

Bws @ Saturated Conditions = Vapor Press. of H2O ; value
@ Dew Point Temp. / (Ps, in. Hg.) = 1.000 ; used.

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 143.44$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [.28 \times (\%N2 + \%CO)] = 31.94$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 30.60$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.08 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460) / (Ms \times P(stack))] \dots = 60.87 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots = 997,762 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460)) \times (P(stack) / 29.92) \dots = 581,059 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) / (T(std) + 460) / 29.92] \times 100 / [\text{Time} \times P(stack) \times An \times vs \times 60] \dots = 103.72 \%$

SOURCE TEST CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKS
CPL STACK - MULTI-METALS - TDF

RUN NO.: 3
DATE : JULY 29, 1992

STD. TEMP, Tstd = 68 DEG. F : STATIC PRESS., Ps = -0.92 in. H2O
METER TEMP, Tm = 100.06 DEG. F : PITOT COFF., Cp = 0.840
STACK TEMP, Ts = 377.0 DEG. F : STACK I.D. = 223.80 inch
AVG. VEL. HEAD, dP = 0.811 in. H2O : DUCT LENGTH = inch
METER ORIFICE, dH = 1.25 in. H2O : DUCT WIDTH = inch
METER VOL., Vm = 80.369 Cu.Ft. : STACK AREA, As = 273.179 Sq.Ft.
METER COFF., Y = 0.998 : TEST TIME = 128.00 min.
BAR. PRESS., Pb = 30.15 in. Hg : NOZZLE DIA. = 0.224 inch
COND. (Vlc) = 172.5 ml : NOZZLE DIA., An = 2.7E-04 Sq.Ft.

GAS ANALYSIS = 10.50 % O2 0.00 % CO
15.80 % CO2 73.70 % N2

$Vm(std) = [T(std) + 460 / 29.92] \times Vm \times Y \times$
 $(Pb + (dH / 13.6)) / (Tm + 460) \dots = 76.430 \text{ dscf}$

$Vw(std) = (8.9148 \times 10e-5) \times (Tstd + 460) \times Vlc = 8.120 \text{ scf}$

$Bws = Vw(std) / (Vm(std) + Vw(std)) \dots = 0.096$: Lower
: Bws

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

$\%EA = (\%O2 - 0.5\%CO) / (0.264\%N2 - (\%O2 - 0.5\%CO)) \times 100 = 117.23$

$Md = (.44 \times \%CO2) + (.32 \times \%O2) + [1.28 \times (\%N2 + \%CO)] = 30.95$

$Ms = (Md \times (1 - Bws)) + (18.0 \times Bws) \dots = 29.70$

$P(stack) = Pbar + (Ps / 13.6) \dots = 30.08 \text{ in. Hg}$

$vs = 85.49 \times CP \times (Sq.Rt.dP) \times [Sq.Rt.(Ts + 460)$
 $/ (Ms \times P(stack))] \dots = 62.59 \text{ ft/sec}$

$Qs = vs \times As \times 60 \dots = 1,025,937 \text{ acf/min}$

$Qs(std) = Qs \times (1 - Bws) \times ((Tstd + 460) / (Ts + 460))$
 $\times (P(stack) / 29.92) \dots = 588,209 \text{ dscf/min}$

$I = (Ts + 460) \times [(0.002669 \times Vlc) + (Vm(std) /$
 $(T(std) + 460) / 29.92] \times 100 / [Time \times$
 $P(stack) \times An \times vs \times 60] \dots = 101.34 \%$

A. FIELD DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL STACK - MULTI-METALS - TDF
DATE : JULY 29, 1992

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	166.6	174.7	172.5
Vm = Sample gas vol, meter cond., dacf	79.815	81.833	80.369
Y = Meter calibration factor	0.9980	0.9980	0.9980
Pbar = Barometric pressure, in. Hg	30.15	30.15	30.15
Pstatic = Stack static pressure, in. H2O	-0.92	-0.92	-0.92
dH = Avg meter pressure diff, in. H2O	1.17	1.24	1.25
Tm = Absolute meter temp., degrees R	568.0	564.0	560.1
Vm(std) = Sample gas vol, Std. cond., dscf	74.827	77.277	76.430
Bws = Water vapor in gas stream, fraction	0.095	0.096	0.096
MF = Moisture factor (1 - Bws)	0.905	0.904	0.904
CO2 = Carbon Dioxide, dry, volume %	21.60	22.00	15.80
O2 = Oxygen, dry, volume %	10.50	10.50	10.50
N2 = Nitrogen, dry volume %	67.90	67.50	73.70
Md = Molecular weight of stack gas, dry	31.88	31.94	30.95
Ms = Molecular weight of stack gas, wet	30.56	30.60	29.70
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8680	0.8960	0.9006
Ts = Absolute stack temp., degrees R	823.0	823.9	837.0
A = Area of stack, ft2	273.18	273.18	273.18
Qstd = Volumetric flowrate, dscfm	564,395	581,059	588,209
An = Nozzle area, ft2	2.74E-04	2.74E-04	2.74E-04
O = Sample time, minutes	128.00	128.00	128.00
%I = Isokinetic variation, percent	103.40	103.72	101.34

B. PARTICULATE DATA SUMMARY

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
CPL STACK - MULTI-METALS - TDF
DATE : JULY 29, 1992

	RUN 1	RUN 2	RUN 3
Particulate Weight (FHW + MF + BHW), mg ...	0.00	0.00	0.00
Meter Volume, standard cond., Vm(std)	74.827	77.277	76.430
Carbon Dioxide, percent	21.60	22.00	15.80
Oxygen, percent	10.50	10.50	10.50
Particulate Concentration :			
gr/scf	0.0000	0.0000	0.0000
gr/dscf	0.0000	0.0000	0.0000
gr/dscf @ 12 % CO2	0.0000	0.0000	0.0000
gr/dscf @ 0% O2	0.0000	0.0000	0.0000

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 1
 CPL STACK - MULTI-METALS - TDF DATE : JULY 29, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FWH)      0.00000 grams      | Vm(std)  74.827 ft3
Mass Filter (MF)           0.00000 grams      | Vw(std)   7.842 ft3
Back Half Wash (BHW)       0.00000 grams      | Qs(std) 564,395 dscfm
Front Half Sulfate (FHS)    mg H2SO4      | Bws       0.095
Back Half Sulfate (BHS)    mg H2SO4      | CO2       21.60 %
H2O2 Catch (SO2)           mg H2SO4      | O2        10.50 %
*****
```

F-FACTOR

$10E6 \times [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)] / (Btu/lb) \times [(Tstd + 460)/528]$ dscf/MMBtu

FILTERABLE PARTICULATE

```
15.432 x (FWH + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FWH + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL PARTICULATE

```
15.432 x (FWH + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0000 gr/scf
15.432 x (FWH + MF + BHW) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. 1b/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x [20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 2
 CPL STACK - MULTI-METALS - TDF DATE : JULY 29, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams   | Vm(std)  77.277 ft3
Mass Filter (MF)           0.00000 grams   | Vw(std)   8.223 ft3
Back Half Wash (BHW)       0.00000 grams   | Qs(std) 581,059 dscfm
Front Half Sulfate (FHS)           mg H2SO4 | Bws       0.096
Back Half Sulfate (BHS)           mg H2SO4 | CO2      22.00 %
H2O2 Catch (SO2)           mg H2SO4 | O2       10.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gd/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL PARTICULATE

```
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0000 gr/scf
15.432 x (FHW + MF + BHW) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std)+ 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

EMISSION RATE CALCULATIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLERUN NO.: 3
 CPL STACK - MULTI-METALS - TDF DATE : JULY 29, 1992
 O2 CORR.: 0.0 %

STANDARD TEMP. : 68 DEG. F

```
*****
Front Half Wash (FHW)      0.00000 grams    | Vm(std)  76.430 ft3
Mass Filter (MF)           0.00000 grams    | Vw(std)   8.120 ft3
Back Half Wash (BHW)       0.00000 grams    | Qs(std) 588,209 dscfm
Front Half Sulfate (FHS)   mg H2SO4      | Bws       0.096
Back Half Sulfate (BHS)   mg H2SO4      | CO2       15.80 %
H2O2 Catch (SO2)          mg H2SO4      | O2        10.50 %
*****
```

F-FACTOR

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

FILTERABLE PARTICULATE

```
15.432 x (FHW + MF) / [Vm(std) + Vw(std)] ..... 0.0000 gr/scf
15.432 x (FHW + MF) / Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL PARTICULATE

```
15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std))] ... 0.0000 gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std) ..... 0.0000 gr/dscf
gr/dscf x (12 / %CO2) ..... 0.0000 @ 12% CO2
gr/dscf x [(21 - Oxygen Corr.) / (21 - %O2)] ..... 0.0000 @ 0% O2
0.00857 x Qs(std) x gr/dscf ..... 0.00 lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf .. lb/MMBtu
```

TOTAL SULFATE

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

SULFUR DIOXIDE (SO2)

```
1.60864 x [T(std) + 460] x (mg H2SO4) / [ 98.076 x  

Vm(std)] ..... ppm
ppm x [(20.9 - Oxygen Corr.) / (20.9 - %O2)] ..... @ O2 corr.
ppm x (1 - Bws) ..... ppm (wet)
8.223E-5 x Qs(std) x 64.062 x ppm / [T(std) + 460].. lb/hr
F-Factor x 64.062 x [1.3711E-6 / [T(std) + 460]] x  

[20.9 / (20.9 - %O2)] x ppm ..... lb/MMBtu
lb/hr / (dscfm x 60 min/hr) ..... lb/dscf
```

Plant: Fla Crushed Stone
 Sample Loc.: CP2 Stack - TDF
 Control Type: Baghouse
 Sample Type: Multi Metals
 Date: 7-29-92 Run No.: 1
 Time Start: 0851 Time End: 1112
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.15 "Hg Stack Press.: 30.08 "Hg Ps: 29.92 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: W Wind Speed: 2-3
 Weather: Clear Thermocouple Readout: KA1
 Sample Box #: KA-1 Meter Box No.: KA1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.75 in.
 Probe Heater Setting: 4 Nomograph Cf: 1.54
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft
32

Stack Dimentions

Umbilical: 100'
 Thermocouple
 Probe No.: KA-77
 Pitot Tube: KA-51

Material Processing Rate:
 Final Gas Meter Reading: 99.815 ft³
 Initial Gas Meter Reading: 20.000 ft³
 Total Metered Gas Volume: 79.815 ft³
 Condensate Gain in Impingers: 154 mL
 Weight Gain in Silica Gel: 12.6 g
 Total Moisture Gain: 116.6 mL
 Silica Gel Container No.: 28
 Filter Number:

Leak Check - Meter Box

Initial: 0.014 cfm @ 15 in. H2O
 Final: 0.010 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R Paul & Bill

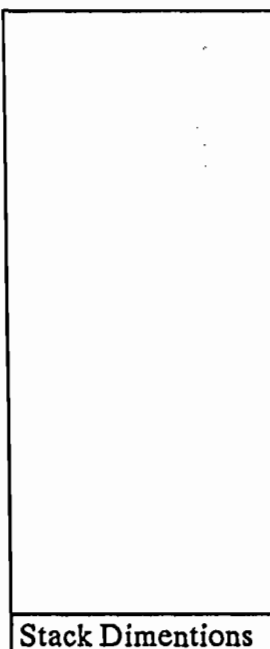
Stack Test Observers:

02 10.5% CO2 21.6 %

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity (ft/H2O)	Meter Orifice Pressure Difference (ft/H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.868</u>		<u>1.165</u>	<u>363</u>			<u>108</u>		
1-1-1			<u>20.0</u>	<u>0.80</u>	<u>1.23</u>	<u>1.30</u>	<u>353</u>	<u>254</u>	<u>72</u>	<u>99</u>	<u>4</u>	
2			<u>22.6</u>	<u>0.78</u>	<u>1.20</u>	<u>1.30</u>	<u>354</u>	<u>255</u>	<u>61</u>	<u>100</u>	<u>4</u>	
2-1-1			<u>25.1</u>	<u>0.78</u>	<u>1.20</u>	<u>1.20</u>	<u>355</u>	<u>249</u>	<u>60</u>	<u>102</u>	<u>4</u>	
2			<u>27.6</u>	<u>0.78</u>	<u>1.20</u>	<u>1.20</u>	<u>356</u>	<u>251</u>	<u>59</u>	<u>104</u>	<u>4</u>	
3-1			<u>30.0</u>	<u>0.75</u>	<u>1.16</u>	<u>1.16</u>	<u>356</u>	<u>247</u>	<u>59</u>	<u>105</u>	<u>4</u>	
2			<u>32.3</u>	<u>0.78</u>	<u>1.20</u>	<u>1.20</u>	<u>358</u>	<u>258</u>	<u>57</u>	<u>107</u>	<u>4</u>	
4-1			<u>35.0</u>	<u>0.78</u>	<u>1.20</u>	<u>1.20</u>	<u>355</u>	<u>251</u>	<u>57</u>	<u>108</u>	<u>4</u>	
2			<u>37.5</u>	<u>0.78</u>	<u>1.20</u>	<u>1.20</u>	<u>357</u>	<u>268</u>	<u>57</u>	<u>110</u>	<u>4</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			40.0	0.82	1.26	1.26	348	259	66	110	4	
2			42.6	0.80	1.23	1.23	359	239	62	110	4	
2-1			45.1	0.80	1.23	1.23	361	238	63	110	4	
2			47.8	0.80	1.23	1.23	364	238	62	111	4	
3-1			50.4	0.78	1.20	1.20	360	251	63	111	4	
2			52.9	0.75	1.16	1.16	364	247	64	111	4	
4-1			55.5	0.70	1.08	1.08	363	242	65	112	4	
2			57.9	0.70	1.08	1.08	364	247	65	112	4	
3-1-1			60.3	0.78	1.20	1.20	355	254	74	111	4	
2			62.8	0.78	1.20	1.20	369	251	65	111	4	
2-1			65.4	0.78	1.20	1.20	369	261	67	110	4	
2			67.8	0.73	1.12	1.12	365	264	60	110	4	
3-1			70.4	0.78	1.20	1.20	369	259	60	109	4	
2			72.9	0.78	1.20	1.20	371	264	58	109	4	
4-1			75.4	0.70	1.08	1.08	370	260	58	109	4	
2			77.8	0.70	1.08	1.08	372	258	57	109	4	
4-1-1			80.3	0.75	1.16	1.16	358	233	65	109	4	
2			82.8	0.75	1.16	1.16	369	252	59	109	4	
2-1			85.2	0.75	1.16	1.16	371	268	57	109	4	
2			87.7	0.70	1.08	1.08	371	258	59	109	4	
3-1			90.2	0.70	1.08	1.08	372	262	60	107	4	
2			92.6	0.72	1.19	1.19	371	261	61	107	4	
4-1			95.1	0.67	1.03	1.03	370	246	63	105	3	
2			97.5	0.70	1.08	1.08	368	246	63	104	3	

Plant: Fla Crushed Stone
 Sample Loc.: CPZ stack (TDF)
 Control Type: Baghouse
 Sample Type: Multi-Metals
 Date: 7-29-92 Run No.: 2
 Time Start: 1229 Time End: 1447
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.16 "Hg Stack Press.: 3006 "Hg Ps: 2992 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 90 °F Wind Dir.: W Wind Speed: 3-8
 Weather: Partly cloudy Thermocouple Readout: KA-1
 Sample Box #: KA1 Meter Box No.: KA1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.5 ft
 Probe Heater Setting: 4 Nomograph Cf: 1.54
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320' ft



Stack Dimentions

Umbilical: 100'
 Thermocouple 77
 Probe No.: KA-66
 Pitot Tube: KA-SI

Material Processing Rate:
 Final Gas Meter Reading: 181.942 ft³
 Initial Gas Meter Reading: 100.109 ft³
 Total Metered Gas Volume: 81.833 ft³
 Condensate Gain in Impingers: 160 mL
 Weight Gain in Silica Gel: 147 g
 Total Moisture Gain: 174.7 mL
 Silica Gel Container No.: 30
 Filter Number:

Leak Check - Meter Box

Initial: 0.011 cfm @ 15 in. H2O
 Final: 0.009 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



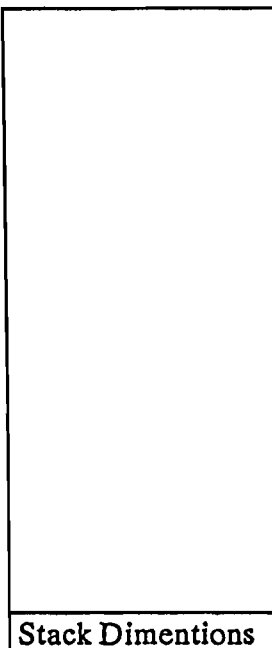
Test Conducted By: R Paul - L Bell

Stack Test Observers: 0210.52 CO2 22.9

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.896</u>		<u>1.237</u>	<u>363.9</u>			<u>104</u>		
1-1			<u>100.6</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>355</u>	<u>251</u>	<u>74</u>	<u>105</u>	<u>2</u>	
2			<u>2.8</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>358</u>	<u>250</u>	<u>60</u>	<u>105</u>	<u>2</u>	
2-1			<u>5.1</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>358</u>	<u>249</u>	<u>58</u>	<u>105</u>	<u>2</u>	
2			<u>7.9</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>359</u>	<u>249</u>	<u>60</u>	<u>105</u>	<u>2</u>	
3-1			<u>10.5</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>360</u>	<u>258</u>	<u>60</u>	<u>106</u>	<u>2</u>	
2			<u>12.9</u>	<u>0.80</u>	<u>1.23</u>	<u>1.23</u>	<u>360</u>	<u>257</u>	<u>62</u>	<u>107</u>	<u>2</u>	
4-1			<u>15.3</u>	<u>0.70</u>	<u>1.08</u>	<u>1.08</u>	<u>361</u>	<u>261</u>	<u>62</u>	<u>107</u>	<u>2</u>	
2			<u>17.7</u>	<u>0.75</u>	<u>1.16</u>	<u>1.16</u>	<u>360</u>	<u>259</u>	<u>63</u>	<u>107</u>	<u>2</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			20.4	0.90	1.39	1.39	352	260	67	106	2	
2			23.0	0.82	1.26	1.26	362	257	62	106	2	
2-1			25.6	0.80	1.23	1.23	364	253	62	106	2	
2			28.1	0.80	1.23	1.23	364	250	63	105	2	
3-1			30.7	0.80	1.23	1.23	366	254	64	105	2	
2			33.3	0.82	1.26	1.26	366	256	64	105	2	
4-1			35.9	0.82	1.26	1.26	366	255	65	105	2	
2			38.5	0.82	1.26	1.26	366	257	67	105	2	
3-1-1			41.1	0.85	1.31	1.31	360	252	71	104	2	
2			43.7	0.85	1.31	1.31	366	248	68	104	2	
2-1			46.3	0.85	1.31	1.31	367	246	67	104	2	
2			48.9	0.82	1.26	1.26	367	250	65	104	2	
3-1			51.5	0.82	1.26	1.26	366	243	65	104	2	
2			54.0	0.85	1.31	1.31	366	242	65	104	2	
4-1			56.7	0.80	1.23	1.23	365	238	66	104	2	
2			59.3	0.75	1.16	1.16	365	243	66	104	2	
4-1-1			61.7	0.80	1.23	1.23	364	247	74	102	2	
2			64.3	0.80	1.23	1.23	368	255	65	102	2	
2-1			66.8	0.85	1.31	1.31	368	249	61	102	2	
2			69.4	0.85	1.31	1.31	369	246	60	102	2	
3-1			72.1	0.80	1.23	1.23	369	253	59	102	2	
2			74.6	0.80	1.23	1.23	369	259	58	102	2	
4-1			77.2	0.70	1.08	1.08	369	251	59	102	2	
2			79.6	0.70	1.08	1.08	369	253	60	102	2	

Plant: Fla Crushed Stone
 Sample Loc.: CPL Stack (TDF)
 Control Type: Bag house
 Sample Type: multi-metals
 Date: 7-29-92 Run No.: 3
 Time Start: 1600 Time End: 1818
 Sample Time: 8 min/port 128 total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP:
 Bar. Pressure 30.15 "Hg Stack Press.: 30.08 "Hg Ps: 29.2 "H2O
 Moisture: 9 % FDA: Gas Density Factor:
 Temperature: 85 °F Wind Dir.: W Wind Speed: 3-8
 Weather: Partly cloudy Thermocouple Readout: KA-1
 Sample Box #: KA-1 Meter Box No.: 0.84 KA-1
 Meter Y: 0.998 @ Delta H: 1.658 Pitot Corr.: 0.84
 Nozzle Diameter: 0.224 in. Probe Length: 8.5 ft
 Probe Heater Setting: 4 Nomograph Cf: 154
 Stack Dimentions: 223.8 in
 Stack Area: 273.18 ft²
 Effective Stack Area: 273.18 ft²
 Stack Height: 320 ft



Stack Dimentions

Umbilical: 100'
 Thermocouple 77
 Probe No.: KA 66
 Pitot Tube: KA 51

Material Processing Rate:
 Final Gas Meter Reading: 262.569 ft³
 Initial Gas Meter Reading: 182.200 ft³
 Total Metered Gas Volume: 80.369 ft³
 Condensate Gain in Impingers: 15.8 mL
 Weight Gain in Silica Gel: 14.5 g
 Total Moisture Gain: 172.5 mL
 Silica Gel Container No.: 34
 Filter Number:

Leak Check - Meter Box

Initial: 0.009 cfm @ 15 in. H2O
 Final: 0.006 cfm @ 5 in. H2O

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable Leak
 Static 3 "H2O for 15 sec: Stable Leak



Test Conducted By: R-Paul - Bell

Stack Test Observers: 0210.570 CO2 15.8 %

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)
					Calculated	Actual						
Average:				<u>0.806</u>		<u>1.25</u>	<u>377</u>			<u>100.06</u>		
1-1			<u>82.2</u>	<u>0.85</u>	<u>1.31</u>	<u>1.31</u>	<u>361</u>	<u>269</u>	<u>72</u>	<u>97</u>	<u>5</u>	
2			<u>84.8</u>	<u>0.88</u>	<u>1.36</u>	<u>1.36</u>	<u>375</u>	<u>260</u>	<u>65</u>	<u>97</u>	<u>5</u>	
2-1			<u>87.1</u>	<u>0.88</u>	<u>1.36</u>	<u>1.36</u>	<u>377</u>	<u>255</u>	<u>64</u>	<u>97</u>	<u>5</u>	
2			<u>90.0</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>376</u>	<u>271</u>	<u>64</u>	<u>98</u>	<u>5</u>	
3-1			<u>92.5</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>376</u>	<u>263</u>	<u>64</u>	<u>98</u>	<u>5</u>	
2			<u>95.0</u>	<u>0.82</u>	<u>1.26</u>	<u>1.26</u>	<u>375</u>	<u>256</u>	<u>64</u>	<u>98</u>	<u>5</u>	
4-1			<u>97.5</u>	<u>0.75</u>	<u>1.16</u>	<u>1.16</u>	<u>376</u>	<u>252</u>	<u>64</u>	<u>98</u>	<u>4</u>	
2			<u>99.9</u>	<u>0.70</u>	<u>1.08</u>	<u>1.08</u>	<u>378</u>	<u>257</u>	<u>64</u>	<u>98</u>	<u>4</u>	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H ₂ O)	Meter Orifice Pressure Difference (H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train (in. Hg)	Oxygen Meter Reading (% O ₂)
					Calculated	Actual						
2-1-1			2.2	0.90	1.39	1.39	360	250	70	100	5	
2			4.8	0.90	1.39	1.39	377	244	64	100	5	
2-1			7.3	0.88	1.36	1.36	378	229	64	100	5	
2			9.9	0.88	1.36	1.36	377	232	64	100	5	
3-1			12.3	0.77	1.19	1.19	376	241	64	100	5	
2			14.9	0.85	1.31	1.31	376	244	65	100	5	
4-1			17.5	0.80	1.23	1.23	376	241	65	100	5	
2			20.0	0.75	1.16	1.16	376	236	65	100	5	
3-1-1			22.4	0.82	1.26	1.26	374	248	73	100	5	
2			25.0	0.92	1.42	1.42	377	261	66	100	5	
2-1			27.6	0.88	1.36	1.36	377	261	64	100	5	
2			30.2	0.82	1.26	1.26	377	260	63	101	5	
3-1			32.8	0.82	1.26	1.26	379	254	62	101	5	
2			35.3	0.80	1.23	1.23	379	267	62	101	5	
4-1			37.8	0.72	1.11	1.11	380	263	61	101	5	
2			40.3	0.72	1.11	1.11	380	258	62	101	5	
4-1-1			42.7	0.82	1.26	1.26	376	254	66	102	5	
2			45.3	0.82	1.26	1.26	383	267	64	102	5	
2-1			47.7	0.82	1.26	1.26	383	261	65	102	5	
2			50.3	0.80	1.23	1.23	382	262	66	102	5	
3-1			52.8	0.80	1.23	1.23	382	268	66	102	5	
2			55.3	0.78	1.20	1.20	381	268	67	102	5	
4-1			57.9	0.70	1.08	1.08	383	263	67	102	5	
2			60.2	0.70	1.08	1.08	384	261	69	102	5	

SAMPLING RATE CALCULATIONS

Date 7-29-92Plant Name FCILocation BrooksvilleSource CPL Stack
TDF m-m ΔH = Orifice Reading (Inches H_2O) D_n = Nozzle Diameter (Inches) ΔH_e = Meter Box Constant B_w = Moisture Fraction T_m = Meter Temperature ($^{\circ}F$) T_s = Stack Temperature ($^{\circ}F$) M_s = Wet Molecular Weight of Stack Gas (From Table) ΔP = Pitot Reading (Inches H_2O)

$$\left[\frac{T_m + 460}{M_s(T_s + 460)} (1 - B_w)^2 \Delta H_e (D_n)^4 17741 \right] \Delta P = \Delta H$$

Moisture Fraction	M_s
0.0	29.0
0.05	28.5
0.10	27.9
0.15	27.4
0.20	26.8
0.25	26.2
0.30	25.7
0.35	25.2
0.40	24.6

$$\frac{570}{28.0 (810)} 22680$$

	Run 1	Run 2	Run 3
$\frac{T_m + 460}{M_s (T_s + 460)} =$	0.0251		
$\times (1 - B_w)^2 =$	0.8281		
$\times \Delta H_e =$	1.658		
$\times (D_n)^4 =$	0.00252		
$\times 17741 =$	17741		
$\times \Delta P =$	154		



MULTI METALS WORKSHEET

RUN 1
7-29-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER #4			
2	ACETONE RINSE	100		
3	0. IN HNO ₃ RINSE	100		
4	IMP. 1-3			
	1	0	<u>112</u>	<u>112</u>
	2	100	<u>138</u>	<u>38</u>
	3	100	<u>100</u>	<u>0</u>
	SUBTOTAL		<u>350</u>	<u>150</u>
	WASH		<u>100</u>	
	TOTAL		<u>450</u> <u>-20</u>	
5A	IMP 4	0	<u>4</u>	<u>4</u>
5B	IMP 5-6	200 100	<u>105</u>	<u>5</u>
5C	HCl RINSE			
6	SILICA GEL #28	200 GMS	<u>212.6</u> GMS	<u>12.6</u> GMS
7	ACETONE BLANK	100		
8A	0. IN HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			

MULTI METALS WORKSHEET

RUN 2
7-29-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER # 5			
2	ACETONE RINSE	100		
3	0. IN HNO ₃ RINSE	100		
4	IMP. 1-3			
	1	0	<u>115</u>	<u>115</u>
	2	100	<u>135</u>	<u>35</u>
	3	100	<u>108</u>	<u>8</u>
	SUBTOTAL		<u>358</u>	<u>158</u>
	WASH		<u>100</u>	
	TOTAL		<u>458</u>	
5A	IMP 4	0		
5B	IMP 5-6	200 100	<u>102</u>	<u>2</u>
5C	HCl RINSE			
6	SILICA GEL # 30	200 GMS	<u>214.7 GMS</u>	<u>14.7 GMS</u>
7	ACETONE BLANK	100		
8A	0. IN HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			

MULTI METALS WORKSHEET

RUN 3

7-29-92

CONTAINER NUMBER	ITEM	INIT. VOL. (ML)	FINAL VOL. (ML)	GAIN
1	FILTER #6		<u>1</u>	<u> </u>
2	ACETONE RINSE	100	<u> </u>	<u> </u>
3	0.1N HNO ₃ RINSE	100	<u> </u>	<u> </u>
4	IMP. 1-3			
	1	0	<u>120</u>	<u>120</u>
	2	100	<u>140</u>	<u>40</u>
	3	100	<u>105</u>	<u>5</u>
	SUBTOTAL		<u>365</u>	<u>165</u>
	WASH		<u>100</u>	
	TOTAL		<u>465</u>	
5A	IMP 4	0	<u>0</u>	<u>0</u>
5B	IMP 5-6	200/100	<u>100</u>	<u>0</u>
5C	HCl RINSE		<u> </u>	
6	SILICA GEL #34	200 GMS	<u>213.7 GMS</u>	<u>13.7 GMS</u>
7	ACETONE BLANK	100		
8A	0.1N HNO ₃ BLANK	300		
8B	DI HNO ₃ BLANK	100		
9	5% HNO ₃ /10% H ₂ O ₂	200		
10	ACID KMNO ₄	100		
11	8N HCl BLANK	25 + 200		
12	3 FILTERS (BLANKS)			



E N V I R O N M E N T A L L A B O R A T O R I E S . I N C .

August 14, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

Dear Mason:

Enclosed are the results of our analysis of the samples that we received July 30, 1992.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). PPB is certified by the Florida DHRS (Lab Nos. 82282 and E82001).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

A handwritten signature in cursive script that reads 'Tom Park'. The signature is written in dark ink and is positioned above the printed name and title.

Tom Park
Project Manager

TP/mdl

Enclosure



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028DATE: 08/14/92DHRS #: 82282, E82001

Table 1. Metals Data: Florida Crushed Stone Project
(All results as total micrograms) (Page 1 of 2)

Station ID:	PPB#:	Arsenic	Chromium	Lead	Mercury	Zinc
Cont.1 + 2 Run 1	69047/50	1.5	9.9	22.6	5.3	6,950
Cont.1 + 2 Run 2	69048/51	1.8	9.5	11.2	6.9	6,410
Cont. 1 + 2 Run 3	69049/52	2.2	9.3	10.0	7.4	5,110
Cont. 4, Run 1	69053	<5	<3	<4	2.6	31
Cont. 4, Run 2	69054	<5	<3	<4	2.7	20
Cont. 4, Run 3	69055	<5	<3	<4	5.5	35
Cont. 5B, Run 1	69044	NR*	NR	NR	<0.1	NR
Cont. 5B, Run 2	69045	NR	NR	NR	<0.1	NR
Cont. 5B, Run 3	69046	NR	NR	NR	<0.1	NR
Cont. 7 (Acetone Blank)	69056	<1	<2	<1	<0.1	3.8

* NR = Not Requested



REPORT OF ANALYSES

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, Florida 32609

PROJECT: 87-028DATE: 08/14/92DHRS #: 82282, E82001

Table 1. Metals Data: Florida Crushed Stone Project
(All results as total micrograms) (Page 2 of 2)

Station ID:	PPB#:	Arsenic	Chromium	Lead	Mercury	Zinc
Cont.8A (0.1N HNO ₃ Blank)	69057	<1	<2	<1	<0.1	15
Cont.8B (DI H ₂ O Blank)	69058	<1	<2	<1	<0.1	6.5
Cont.9 (5%HNO ₃ + 10% H ₂ O ₂ Blank)	69059	<1	<2	1.2	<0.1	5.3
Cont.10 (KMnO ₃ Blank)	69060	<1	2.7	<1	<0.1	10


PROJECT MANAGER

CHAIN OF CUSTODY RECORD

Project Number

307-90-01

Project Name

CPL - FCS - TDF

Sample Location

BROOKSVILLE

Sample Identification	Remarks
CONT. 5B, RUN 1	MERCURY
CONT. 5B, RUN 2	"
CONT. 5B, RUN 3	"
CONT. 7, ACETONE BLANK	AR, CR, PL, Hg, EN
CONT. 8A, 0.1N HNO ₃ BLANK	"
CONT. 8B, DI WATER	"
CONT. 9, 5% HNO ₃ /10% H ₂ O ₂	"
CONT. 10, ACID KMnO ₄	"

Sampled By: (Signature) M. Jago Date: 7-29-92 Time: See data sheets

Relinquished By: (Sign) M. Jago Date: 7-30-92 Time: 1355

Received By: (Sign) Inf Jones Date: 7-30-92 Time: 1355

Relinquished By: (Sign) Inf Jones Date: 7-30-92 Time: 1458

Received By: (Sign) _____ Date: _____ Time: _____

Relinquished By: (Sign) _____ Date: _____ Time: _____

Received By Lab: (Sign) Tom Paul MAB Date: 7/30/92 Time: 1458

Sample Shipped VIA: _____ UPS _____ Fed Express _____ Bus _____

Shipping Bill Number: _____



CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name CPL-FCS-TDF
 Sample Location BROOKSVILLE, FL

* COMBINE CONT. 1, RUN 1 AND CONT. 2, RUN 1 AND
 ANALYZE. SAME FOR RUN 2+3.

Sample Identification	Remarks
CONT. 1, RUN 1* (FILTER)	ARSENIC, TOTAL CHROMIUM, LEAD, MERCURY, ZINC
CONT. 1, RUN 2 "	"
CONT. 1, RUN 3 "	"
CONT. 2, RUN 1 (PROBE WASH)	"
CONT. 2, RUN 2 "	"
CONT. 2, RUN 3 "	"
CONT. 4, RUN 1 (IMP. 1-3)	"
CONT. 4, RUN 2 "	"
CONT. 4, RUN 3 "	"

Sampled By: (Signature) M. Joyce Date: 7-29-92 Time: See data sheets
 Relinquished By: (Sign) M. Joyce Date: 7-30-92 Time: 1355
 Received By: (Sign) Inf. E Jones Date: 7-30-92 Time: 1355
 Relinquished By: (Sign) Inf. E Jones Date: 7-30-92 Time: 1450
 Received By: (Sign) _____ Date: _____ Time: _____
 Relinquished By: (Sign) _____ Date: _____ Time: _____
 Received By Lab: (Sign) Tom Park PAB Date: 9/20/92 Time: 1450

Sample Shipped VIA: UPS Fed Express Bus

Shipping Bill Number: _____



SPECIATED VOLATILE ORGANIC COMPOUNDS

<div style="border: 1px solid black; padding: 5px;"> <p>Stack Dimentions</p> </div>	
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Leak Check - Meter Box

Initial:	<u>0.00</u>	cfm @	<u>4</u>	in. H ₂ O
Final:	<u>0.00</u>	cfm @	<u>3</u>	in. H ₂ O



KOOGLER & ASSOCIATES

Stack Test Observers:

[Faint handwritten notes at the bottom of the page]

Stack Dimentions



KOOGLER & ASSOCIATES

[illegible]

<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Stack Dimentions </div>	
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Leak Check - Meter Box


Initial:	<u>0.01</u>	cfm @	<u>4</u>	in. H2O
Final:	<u>0.00</u>	cfm @	<u>2</u>	in. H2O

Leak Check - Pitoi Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 "H2O for 15 sec: Stable, Leak

offset + 0.02 @



Test Conducted By: AKH

Stack Test Observers: Jason GORRIE FDR

[illegible]

<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Stack Dimentions </div>	
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Leak Check - Meter Box

Initial:	<u>0.00</u>	cfm @	<u>3</u>	in. H2O
Final:	<u>0.00</u>	cfm @	<u>3</u>	in. H2O



KOGLER & ASSOCIATES

Stack Test Observers: James A. FDER[illegible]

Run RAM
30500 Long

Leak Check - Meter Box

Initial:	<u>0.00</u>	cfm @	<u>3</u>	in. H2O
Final:	<u>0.00</u>	cfm @	<u>3</u>	in. H2O



KOOGLER & ASSOCIATES

Stack Test Observers:

[illegible]

Stack Dimentions

Leak Check - Meter Box

Initial:	<u>0.00</u>	cfm @	<u>3</u>	in. H ₂ O
Final:	<u>0.00</u>	cfm @	<u>3</u>	in. H ₂ O



KOOGLER & ASSOCIATES

Stack Test Observers:

[illegible]

Material Processing Rate:	
Final Gas Meter Reading:	ft ³
Initial Gas Meter Reading:	ft ³
Total Metered Gas Volume:	ft ³
Condensate Gain in Impingers:	mL
Weight Gain in Silica Gel:	g
Total Moisture Gain:	mL
Silica Gel Container No.:	
Filter Number:	

Initial: 0.00 cfm @ 3 in. H₂O
Final: 0.00 cfm @ 3.5 in. H₂O

Static 3 "H2O for 15 sec: Stable, Leak



Stack Test Observers:

[illegible]

Stack Dimentions

Stack Test Observers:

[illegible]

<div style="border: 1px solid black; height: 773px; width: 373px;"></div>	<div style="border: 1px solid black; height: 87px; width: 373px;"></div>
	<div style="border: 1px solid black; height: 686px; width: 373px;"></div>

Leak Check - Meter Box

Leak Check - Pitot Tubes



KOOGLER & ASSOCIATES

Test Conducted By:

Stack Test Observers:

[illegible]


[illegible]

Leak Check – Meter Box

Initial:	<u>0.00</u>	cfm @	<u>4</u>	in. H ₂ O
Final:	<u>0.00</u>	cfm @	<u>3</u>	in. H ₂ O

Leak Check – Pitot Tubes

Impact 3" H ₂ O for 15 sec:	Stable,	Leak
Static 3" H ₂ O for 15 sec:	Stable,	Leak



KOOGLER & ASSOCIATES

[illegible]

Material Processing Rate:	
Final Gas Meter Reading:	ft ³
Initial Gas Meter Reading:	ft ³
Total Metered Gas Volume:	ft ³
Condensate Gain in Impingers:	mL
Weight Gain in Silica Gel:	g
Total Moisture Gain:	mL
Silica Gel Container No.:	
Filter Number:	

Initial: 0.00 cfm @ 3 in. H₂O
Final: 0.6d cfm @ 2 in. H₂O

Impact 3 "H2O for 15 sec:	Stable, Leak
Static 3 "H2O for 15 sec:	Stable, Leak



Stack Test Observers:

Umbilical: _____
Thermocouple
Probe No.: _____
Pitot Tube: _____

[illegible]

Stack Dimentions

Leak Check – Meter Box

Leak Check - Pitot Tubes

Impact 3 "H2O for 15 sec: Stable, Leak

Static 3 °H2O for 15 sec: Stable, Leak



Test Conducted By:

Stack Test Observers:

[illegible]

Material Processing Rate:	
Final Gas Meter Reading:	ft ³
Initial Gas Meter Reading:	ft ³
Total Metered Gas Volume:	ft ³
Condensate Gain in Impingers:	mL
Weight Gain in Silica Gel:	g
Total Moisture Gain:	mL
Silica Gel Container No.:	
Filter Number:	

Initial: 0.00 cfm @ 3 in. H₂O
Final: 0.00 cfm @ 3 in. H₂O

Static 3 "H2O for 15 sec: Stable, Leak



Stack Test Observers:

Umbilical: _____
Thermocouple
Probe No.: _____
Pitot Tube: _____

[illegible]

VOST GC/MS REPORT

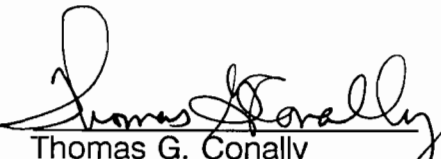
prepared for

KOOGLER AND ASSOCIATES

by

GRASEBY RTL


Barry A. Ruvio
Chemist


Thomas G. Conally
Laboratory Manager

RTL ID # 92073054

August 24, 1992

August 24, 1992

Mr. Mason Joye
Koogler and Associates
4014 N.W. 13th Street
Gainesville, FL 32609

RE: RTL ID #92073054

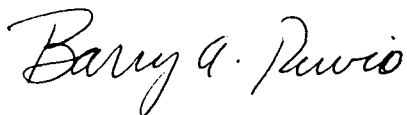
Dear Mr. Joye:

Enclosed please find the results of analysis for the samples submitted to our laboratory on 7/30/92.

If you have any questions concerning these reports, please contact me at the number listed below.

Sincerely,

GRASEBY RTL



Barry A. Ruvio
Chemist

BAR/mcg

Enclosures

INTRODUCTION

Scope:

To analyze (VOST) Tenax/Charcoal cartridges for the target compound list (TCL) and tentatively identify hexane by Desorb-Purge-Trap-Desorb Gas Chromatography/Mass Spectrometry (DPTD GC/MS).

Method Summary:

Sample cartridges are analyzed by desorb-purge-trap-desorb gas chromatography/mass spectrometry (DPTD GC/MS). Daily analytical checks are performed on cartridge blanks and reagent water. The daily GC/MS performance test required for this method is described in SW 846, Method 8240. The key Abundance Criteria for 4-Bromofluorobenzene (BFB) must be met before any samples are analyzed. All standards, blanks and samples are spiked with a known amount of BFB to maintain a constant check of system performance.

Sample Desorption:

The DPTD GC/MS procedures are those described in SW 846 Method 5040. The spiked sample cartridge is placed in the thermal desorption apparatus (Nutech 8533) and desorbed in the VOST system by heat to 200 °C for 10 minutes. Consideration is given for individual analysis of cartridges. The desorbed components then pass into the bottom of the water column, are purged from the water and collected on the internal analytical sorbent trap. After the 10-minute desorption period, the compounds are desorbed from the analytical trap into the GC/MS system.

Calculations:

All compounds detected that coincide with those of the Target Compound List (TCL) are calculated using equation #1 and response factors derived from in-house standards. All tentatively identified compounds are calculated, using equation #2 and a standard TIC response factor of one (1.0). Compounds quantified by equation #2 are qualified as being estimates.

$$\text{Eqn \#1: } [X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot RF}$$

$$\text{Eqn \#2: } [X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot 1.0}$$

Where: $[X]$ = amount of compound, ng
 $[IS]$ = amount of internal standard, ng
 A_X = response of compound
 A_{IS} = response of Internal standard
 RF = response factor

ANALYTICAL CONDITIONS

Equipment:

HP 5970 GC/MSD tuned to BFB criteria

GC Conditions:

Temp 1 : 0 °C
Time 1 : 4.0 minutes
Ramp Rate : 6.0 °C/minute
Temp 2 : 160 °C
Time 2 : 5.0 minutes

Column:

VOCOL (Supelco),
Length 60 m,
Film thickness 1.5 µm,
Internal diameter 0.75 mm,
Construction of Borosilicate glass
with fused silica ends

Mass Spectrometer Conditions:

Run Time : 25 minutes
Scan Range : 35 - 260 AMU
Scan Delay : 2.4 minutes
Ion Source Temp : 200 °C
Electron Multiplier : 2300 ± 200 EV
Separator Temp : 225 °C

Sample Chronicle:

Client	Koogler and Associates
RTL Project ID	RTL ID #92073054
Analysis Type	VOST Tenax/charcoal
Date of Collection	7/28/92
Date Received	7/30/92
Date Authorized	7/30/92
Date Analyzed	8/4/92 - 8/7/92
Date Reported	8/28/92

Narrative:

We received 16 VOST samples for analysis on 7/30/92. Because of anticipated high levels of carbon dioxide, we installed a scan delay of 2.40 minutes for all samples. The purpose of the scan delay was to prevent detector saturation and possible instrument shut-down if carbon dioxide levels became too high.

Previous data from a screen sample (see report 92072350) indicated that high levels of benzene could be contained in this group of samples. Therefore, we used a calibration range of 20 - 2000 ng for all sample runs. However, no high level benzene peaks were detected in this group of samples. In addition, no hexane was detected in any non-target peaks examined by our computerized data base search. Hexene was detected in every sample and we would be happy to provide this data if you so desire.

Sample "run 1, set 2" was received with one broken cartridge. In addition, the second cartridge cracked as it was being installed on the instrument. Both cartridges had to be transferred to new, cleaned cartridges before analysis.

Please contact us if you have questions or if you need more information. We look forward to serving your analytical needs in the future.

REFERENCES

Federal Register, 44, 69464, December 3, 1979

Protocol for the Collection and Analysis of Volatile POHCs Using VOST, EPA-600/8-84-007 available from ORD Publications, Center for Environmental Research Information, Cincinnati, Ohio 45268

NIOSH Manual of Analytical Methods, HEW Publication No. (NIOSH) 75-121, available from Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402

Supelco Bulletin 769, "Determination of Organic Vapors in the Industrial Atmosphere", 1977: Supelco, Inc., Bellefonte, PA 16823

Test Methods for Evaluation of Solid Waste, SW 846 Methods 0030, 8240, 5040, 5030

Compendium of Methods for the Determination of Toxic Organic Compounds in Air, PB87-168688, Battelle Columbus Laboratories, Columbus, Ohio

SAMPLE RESULTS

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-1

File ID: T0576

Sample ID: Field Blank

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	80
Toluene-d ₈	94
4-Bromofluorobenzene	85

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone		BQL
75-15-0	Carbon disulfide		BQL
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene		BQL
79-01-6	Trichloroethene		BQL
108-88-3	Toluene		BQL
108-90-7	Chlorobenzene		BQL
100-41-4	Ethylbenzene		BQL
1330-20-7	Xylene (total)		BQL
100-42-5	Styrene		BQL

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-2

File ID: T0577

Sample ID: Run 1 Set 1

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	81
Toluene-d ₈	74
4-Bromofluorobenzene	89

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	1,400 ^a	
75-15-0	Carbon disulfide	490	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,100	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	170	
108-90-7	Chlorobenzene	120	
100-41-4	Ethylbenzene	31	
1330-20-7	Xylene (total)	110	
100-42-5	Styrene	130	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92 ³⁰

RTL ID: 92073054-3

File ID: T0601

Sample ID: Run 1 Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	75
Toluene-d ₈	71
4-Bromofluorobenzene	72

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-84-1	Acetone	1,000 ^a	
75-15-0	Carbon disulfide	3,100 ^b	
71-55-8	1,1,1-Trichloroethane	44	
71-43-2	Benzene	970	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	72	
100-41-4	Ethylbenzene		BQL
1330-20-7	Xylene (total)		BQL
100-42-5	Styrene	42	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a,b: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92 ³⁰

RTL ID: 92073054-4

File ID: T0578

Sample ID: Run 1 Set 3

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	84
Toluene-d ₈	80
4-Bromofluorobenzene	86

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	24	
67-64-1	Acetone	1,300 ^a	
75-15-0	Carbon disulfide	590	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene		
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	170	
108-90-7	Chlorobenzene	120	
100-41-4	Ethylbenzene	32	
1330-20-7	Xylene (total)	140	
100-42-5	Styrene	110	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-5

File ID: T0583

Sample ID: Run 1 Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	83
Toluene-d ₈	75
4-Bromofluorobenzene	93

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	660 ^a	
75-15-0	Carbon disulfide	280	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,000	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	150	
108-90-7	Chlorobenzene	120	
100-41-4	Ethylbenzene	43	
1330-20-7	Xylene (total)	110	
100-42-5	Styrene	110	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 30 7/28/92

RTL ID: 92073054-6

File ID: T0584

Sample ID: Run 1 Set 5

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	84
Toluene-d ₈	77
4-Bromofluorobenzene	85

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-84-1	Acetone	1,200 ^a	
75-15-0	Carbon disulfide	350	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	1,100	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	160	
108-90-7	Chlorobenzene	130	
100-41-4	Ethylbenzene	40	
1330-20-7	Xylene (total)	110	
100-42-5	Styrene	120	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 30 7/28/92

RTL ID: 92073054-7

File ID: T0585

Sample ID: Run 2 Set 1

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	86
Toluene-d ₈	79
4-Bromofluorobenzene	86

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	390 ^a	
75-15-0	Carbon disulfide	310	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	880	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	110	
100-41-4	Ethylbenzene	32	
1330-20-7	Xylene (total)	100	
100-42-5	Styrene	99	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/28/92 ³⁰

RTL ID: 92073054-8

File ID: T0586

Sample ID: Run 2 Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	79
Toluene-d ₈	77
4-Bromofluorobenzene	82

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-84-1	Acetone	310 ^a	
75-15-0	Carbon disulfide	350	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	630	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	100	
108-90-7	Chlorobenzene	73	
100-41-4	Ethylbenzene	30	
1330-20-7	Xylene (total)	75	
100-42-5	Styrene	64	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/28/92 ³⁰

RTL ID: 92073054-9

File ID: T0587

Sample ID: Run 2 Set 3

Description: VOST pair

Surrogate Percent Recovery

1,2-Dichloroethane-d ₄	84
Toluene-d ₈	76
4-Bromofluorobenzene	83

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	340 ^a	
75-15-0	Carbon disulfide	130	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	820	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	99	
100-41-4	Ethylbenzene	24	
1330-20-7	Xylene (total)	110	
100-42-5	Styrene	91	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-10

File ID: T0588

Sample ID: Run 2 Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	83
Toluene-d ₈	78
4-Bromofluorobenzene	90

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	540 ^a 110	BQL
67-64-1	Acetone		
75-15-0	Carbon disulfide		
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	920	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene	150	
108-90-7	Chlorobenzene	120	
100-41-4	Ethylbenzene	32	
1330-20-7	Xylene (total)	140	
100-42-5	Styrene	100	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92 ³⁰

RTL ID: 92073054-11

File ID: T0595

Sample ID: Run 2 Set 5

Description: VOST pair

Surrogate Percent Recovery

1,2-Dichloroethane-d ₄	70
Toluene-d ₈	70
4-Bromofluorobenzene	79

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-84-1	Acetone	550 ^a	
75-15-0	Carbon disulfide	150	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	830	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	97	
100-41-4	Ethylbenzene	32	
1330-20-7	Xylene (total)	140	
100-42-5	Styrene	88	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 30
7/23/92

RTL ID: 92073054-12

File ID: T0596

Sample ID: Run 3 Set 1

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	74
Toluene-d ₈	71
4-Bromofluorobenzene	79

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	300 ^a	
75-15-0	Carbon disulfide	380	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	840	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	120	
108-90-7	Chlorobenzene	97	
100-41-4	Ethylbenzene	21	
1330-20-7	Xylene (total)	110	
100-42-5	Styrene	90	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 30 7/23/92

RTL ID: 92073054-13

File ID: T0597

Sample ID: Run 3 Set 2

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	73
Toluene-d ₈	69
4-Bromofluorobenzene	76

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	310 ^a	
75-15-0	Carbon disulfide	210	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	900	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	110	
100-41-4	Ethylbenzene	30	
1330-20-7	Xylene (total)	100	
100-42-5	Styrene	100	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-14

File ID: T0598

Sample ID: Run 3 Set 3

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	75
Toluene-d ₈	69
4-Bromofluorobenzene	76

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	310 ^a	
75-15-0	Carbon disulfide	200	
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	790	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	130	
108-90-7	Chlorobenzene	100	
100-41-4	Ethylbenzene	35	
1330-20-7	Xylene (total)	100	
100-42-5	Styrene	96	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 7/23/92

RTL ID: 92073054-15

File ID: T0599

Sample ID: Run 3 Set 4

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	73
Toluene-d ₈	72
4-Bromofluorobenzene	80

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane	380 ^a 80	BQL
67-84-1	Acetone		
75-15-0	Carbon disulfide		
71-55-8	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	720 120 87 35	BQL
79-01-6	Trichloroethene		
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene		
1330-20-7	Xylene (total)	95	
100-42-5	Styrene	85	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

GRASEBY RTL

Client: Koogler and Associates

Received: 30 7/23/92

RTL ID: 92073054-16

File ID: T0600

Sample ID: Run 3 Set 5

Description: VOST pair

Surrogate Percent Recovery	
1,2-Dichloroethane-d ₄	73
Toluene-d ₈	71
4-Bromofluorobenzene	81

CAS Number	Target Compound	Results (ng)	
74-83-9	Bromomethane		BQL
67-64-1	Acetone	330 ^a	
75-15-0	Carbon disulfide	140	
71-55-6	1,1,1-Trichloroethane		BQL
71-43-2	Benzene	930	
79-01-6	Trichloroethene		BQL
108-88-3	Toluene	140	
108-90-7	Chlorobenzene	110	
100-41-4	Ethylbenzene	28	
1330-20-7	Xylene (total)	100	
100-42-5	Styrene	110	

Quantitation Range (ng): 20 – 2000

BQL: Below Quantitation Limit

Tentatively Identified Compounds

Compound	Retention Time (minutes)	Results (ng)	Molecular Weight (AMU)
Hexane	---	BQL	86

a: See Endnotes

Endnotes:

- a: The reported amount for acetone is speculative. Several parameters did not meet routine QC performance standards such as, ion ratios and retention time. In view of special circumstances, ie., an apparent inability to adequately resolve several coeluting compounds, it is impossible to predict with certainty if acetone is present in this sample.
- b: This amount is beyond the established calibration range. Linearity should not be assumed for results which greatly exceed the calibration range.

CHAIN OF CUSTODY RECORD

Project Number 307-90-01
Project Name CPL-FCS-TDF
Sample Location BROOKSVILLE, FL.

VOST TRAPS ARE HIGH IN CO₂!

Sample Identification	Remarks
<u>RUN 1, SET 1</u>	<u>ACETONE, BENZENE, TOLUENE, TRICHLOROETHYLENE,</u>
<u>" 1 " 2</u>	<u>CHLOROBENZENE, ETHYL BENZENE, XYLENE, STYRENE,</u>
<u>" 1 " 3</u>	<u>BROMOETHANE, CARBON DISULFIDE, HEXANE, & 1,1,1-TRI-</u>
<u>" 1 " 4</u>	<u>CHLOROETHANE. "</u>
<u>" 1 " 5</u>	<u>"</u>
<u>RUN 2, SET 1</u>	<u>"</u>
<u>" 2, " 2</u>	<u>"</u>
<u>" 2, " 3</u>	<u>"</u>
<u>" 2, " 4</u>	<u>"</u>
<u>" 2, " 5</u>	<u>"</u>

Sampled By: (Signature) Stephen Bell Date: 7/28/92 Time: 19:00

Relinquished By: (Sign) Stephen Bell Date: 7/28/92 Time: 19:30

Received By: (Sign) Massenge Date: 7/28/92 Time: 19:30

Relinquished By: (Sign) Massenge Date: 7/29/92 Time: 0730

Received By: (Sign) _____ Date: _____ Time: _____

Relinquished By: (Sign) _____ Date: _____ Time: _____

Received By Lab: (Sign) Wayne Jones Date: 7/30/92 Time: 10:15

Sample Shipped VIA: _____ UPS ☒ Fed Express _____ Bus

Shipping Bill Number: _____



CHAIN OF CUSTODY RECORD

Project Number 307-90-01
 Project Name CPL-FCS-TDF
 Sample Location BROOKSVILLE, FL

Sample Identification	Remarks
<u>RUN 3, SET. 1</u>	<u>SAME AS RUNS 1 + 2</u>
<u>" 3, " 2</u>	<u>"</u>
<u>" 3, " 3</u>	<u>"</u>
<u>" 3, " 4</u>	<u>"</u>
<u>" 3, " 5</u>	<u>"</u>
<u>FIELD BLANK</u>	<u>"</u>
<u>LAB BLANK</u>	<u>"</u>
	<u>* Not Rec'd by Lab - client contacted 8/3/92 gmg 8/3/92</u>

Sampled By: (Signature) [Signature] Date: 7/28/92 Time: 19:00
 Relinquished By: (Sign) [Signature] Date: 7/28/92 Time: 19:30
 Received By: (Sign) [Signature] Date: 7/28/92 Time: 1930
 Relinquished By: (Sign) [Signature] Date: 7/29/92 Time: 0730
 Received By: (Sign) _____ Date: _____ Time: _____
 Relinquished By: (Sign) _____ Date: _____ Time: _____
 Received By Lab: (Sign) [Signature] Date: 7/30/92 Time: 10:15

Sample Shipped VIA: _____ UPS ☒ Fed Express _____ Bus

Shipping Bill Number: _____



CARBON MONOXIDE,
TOTAL HYDROCARBONS
AND NITROGEN OXIDES
MONITORING DATA



V057 RUN 1, net 1 start 0807 end 0851
 " net 2 start 0845 end 0905
 " net 3 " 0915 end 0935
 " net 4 " 1010 end 1030
 " net 5 " 1042 end 1107

O₂ 10.5%
 CO₂ 16.2%

Plant: CPL-FC5
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂
 Date: 7-28-92 Run No.: 1
 Time Start: 0810 Time End: 1032
 Sample Time: min/port total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP: _____
 Bar. Pressure 30.20 "Hg Stack Press.: "Hg Ps: "H₂O
 Moisture: % FDA: Gas Density Factor: _____
 Temperature: °F Wind Dir.: Wind Speed: _____
 Weather: Thermocouple Readout: _____
 Sample Box #: Meter Box No.: _____
 Meter Y: @ Delta H: Pitot Corr.: _____
 Nozzle Diameter: in. Probe Length: ft
 Probe Heater Setting: Nomograph Cf: _____
 Stack Dimentions: in
 Stack Area: ft²
 Effective Stack Area: ft²
 Stack Height: ft

Material Processing Rate: _____
 Final Gas Meter Reading: ft³
 Initial Gas Meter Reading: ft³
 Total Metered Gas Volume: ft³
 Condensate Gain in Impingers: mL
 Weight Gain in Silica Gel: 15.5 g
 Total Moisture Gain: mL
 Silica Gel Container No.: 8
 Filter Number: 1

Leak Check - Meter Box

Initial: cfm @ in. H₂O
 Final: cfm @ in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Stack Dimentions

Umbilical: _____
 Thermocouple _____
 Probe No.: _____
 Pitot Tube: _____

Test Conducted By: M. JOYE, R. PAUL,
S. BELL, T. JONES
 Stack Test Observers: B. MITCHELL, S. NECK
J. GORIE, CHAI SUN LEE

ON LINE

START RUN 1 0810

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NO _x Monitor Reading (ppm)
					Calculated	Actual									
Average:									O ₂	SO ₂	NO _x	9.62	2.0	483.9	132.9
		0715										10.5	2	409	135
		0730							7.0	158	197	10.5	2	316	130
		0745										9.0	2	64	120
		0800							7.8	139	142	8.5	2	79	120
		0815										8.5	2	189	108
		0830							6.8	168	158	9.5	2	645	130
		0846										10.5	2	314	125
		0900							6.4	184	158	7.8	2	407	120

[illegible]



VOST HAN set at 12:28 238 0.4
 set 2 " 1250 end 1310
 set 3 " 1328 end 1348 CO₂ 21.2%
 set 4 " 1415 end 1436 20.0%
 set 5 " 1446 end 1506

Plant: CPL - FCS
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂
 Date: 7-28-92 Run No.: 2
 Time Start: 1202 Time End: 1434
 Sample Time: _____ min/port _____ total min.
 Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
 Bar. Pressure 30.20 "Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
 Moisture: _____ % FDA: _____ Gas Density Factor: _____
 Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
 Weather: _____ Thermocouple Readout: _____
 Sample Box #: _____ Meter Box No.: _____
 Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
 Nozzle Diameter: _____ in. Probe Length: _____ ft
 Probe Heater Setting: _____ Nomograph Cf: _____
 Stack Dimentions: _____ in Umbilical: _____
 Stack Area: _____ ft² Thermocouple _____
 Effective Stack Area: _____ ft² Probe No.: _____
 Stack Height: _____ ft Pitot Tube: _____

Material Processing Rate: _____
 Final Gas Meter Reading: _____ ft³
 Initial Gas Meter Reading: _____ ft³
 Total Metered Gas Volume: _____ ft³
 Condensate Gain in Impingers: _____ mL
 Weight Gain in Silica Gel: 17.1 +5.5 g
 Total Moisture Gain: _____ mL
 Silica Gel Container No.: 17
 Filter Number: 2

Leak Check - Meter Box

Initial: _____ cfm @ _____ in. H₂O
 Final: _____ cfm @ _____ in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Test Conducted By: M. JOYE, R. PAUL, S. BELL,
T. JONES
 Stack Test Observers: B. MITCHELL, S. NECK,
J. GORIE, CHISUNKER, HOWARD COUCH

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NO _x Monitor Reading (ppm)
					Calculated	Actual			CO ₂	SO ₂	NO _x				
Average:												10.1		275.2	191.3
		1105							6.3	183	135	10.5	2	535	130
		1115										10.5	<2	486	140
		1130							6.6	189	172	11.0	<2	283	150
		1145										11.0	<2	304	155
RUN 2		1202							6.5	183	198	11.0	1	410	160
		1215										8.0	1	301	156
		1230							6.4	164	179	8.0	1	406	132
		1245										9.0	1	269	195



Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temp. (°F)	Sample Box Temp. (°F)	CPL	CPL	CPL	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)	
					Last Impinger Temp. (°F)	Master Temp. (°F)			Vacuum on Sample Train ("Hg)							
		1300			Calculated	Actual			0.2	50.2	NDx					
		1315							6.4	188	179	10.0	1	375	190	
		1330										10.5	1	298	165	
		1345							6.5	184	172	11.0	1	318	157	
		1400										10.5	1	321	162	
		1410							6.4	8.6	201	203	8.5	1	296	220
		1415										10.5	1	112	230	
		1430							6.5	166	205	10.0	1	130	230	
		1434										10.0	<1	171	240	
of Run 2									6.5	191	225	10.5	<1	171	250	
Zero Air													0	0	0	
	NOx	HIGH													215	
	CO	HIGH												635		
	THC	LOW											9.6			
		1450							6.6	183	181	10.5	<1	240	190	
									</							



VOST Run 3, set 1 start 1530 end 1550
 " set 2 " 1550 end 1610
 " set 3 " 1618 end 1638
 " set 4 " 1643 end 1703
 " set 5 " 1716 end 1736

O₂ 10.5%
 CO₂ 11.40%

Plant: CPL - FCS
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NOx, CO, THC, O₂
 Date: 7-28-92 Run No.: 3
 Time Start: 1530 Time End: 1800
 Sample Time: min/port total min.
 Dry Bulb: °F Wet Bulb: °F VP @ DP: _____
 Bar. Pressure "Hg Stack Press.: "Hg Ps: "H₂O
 Moisture: % FDA: _____ Gas Density Factor: _____
 Temperature: °F Wind Dir.: _____ Wind Speed: _____
 Weather: _____ Thermocouple Readout: _____
 Sample Box #: _____ Meter Box No.: _____
 Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
 Nozzle Diameter: in. Probe Length: ft
 Probe Heater Setting: _____ Nomograph Cf: _____
 Stack Dimentions: in Umbilical: _____
 Stack Area: ft² Thermocouple _____
 Effective Stack Area: ft² Probe No.: _____
 Stack Height: ft Pitot Tube: _____

Material Processing Rate: _____
 Final Gas Meter Reading: ft³
 Initial Gas Meter Reading: ft³
 Total Metered Gas Volume: ft³
 Condensate Gain in Impingers: 158 mL
 Weight Gain in Silica Gel: 13.8 g
 Total Moisture Gain: mL
 Silica Gel Container No.: 18
 Filter Number: 3

Leak Check - Meter Box

Initial: _____ cfm @ _____ in. H₂O
 Final: _____ cfm @ _____ in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Stack Dimentions

Test Conducted By: M. JOYE, R. PAUL, S. BELL
T. JONES
 Stack Test Observers: B. MITCHELL, S. NECK, J. GOR
CHI SUN LEE, HOWARD COUCH, DAVE BUFF

Start

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H2O)	Meter Orifice Pressure Difference ("H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			O2	50%	NOx				
Average:												9.8		198.5	137.3
		1500							6.4	165	190	10.5	<1	226	180
		1515										8.5	<1	150	160
Run 3		1530							6.4	192	156	9.5	<1	255	150
		1545										9.5	<1	243	135
		1600							6.3	183	154	10.0	<1	299	140
		1615										10.5	<1	320	155
		1630							6.5	175	147	10.5	<1	139	135
		1645										8.2	<1	117	130

[illegible]

		F.C.S. ^{initial}		7/28/92 ^{final}			
CO	632 - 640 - 643	650	0 ₂	20.9	20.9		
	101 97.2 99.8	99.7		0 - 0			
	30.5 28.5 - 30.3	30.7					
	0 0+9	0					
FID	298	298					
	51 - 51	50					
	9.88 - 10	10.0					
	0	0					
NOX	208	211					
	53.3 52	50.5					
	10.2	10.0					
	0	0					

	TOTAL	INCREASE
<u>RUN 3</u> 1 st IMP.	230	7130
2 nd IMP.	128	<u>28</u>
wash	170 ml	158
3 rd IMP.	100 ml	
4 th IMP.	100 ml	

1605

LOW CAL 9.88 ppm

0-100

Med Cal 61.1
0-100

HIGH CAL 298 ppm
0-1000

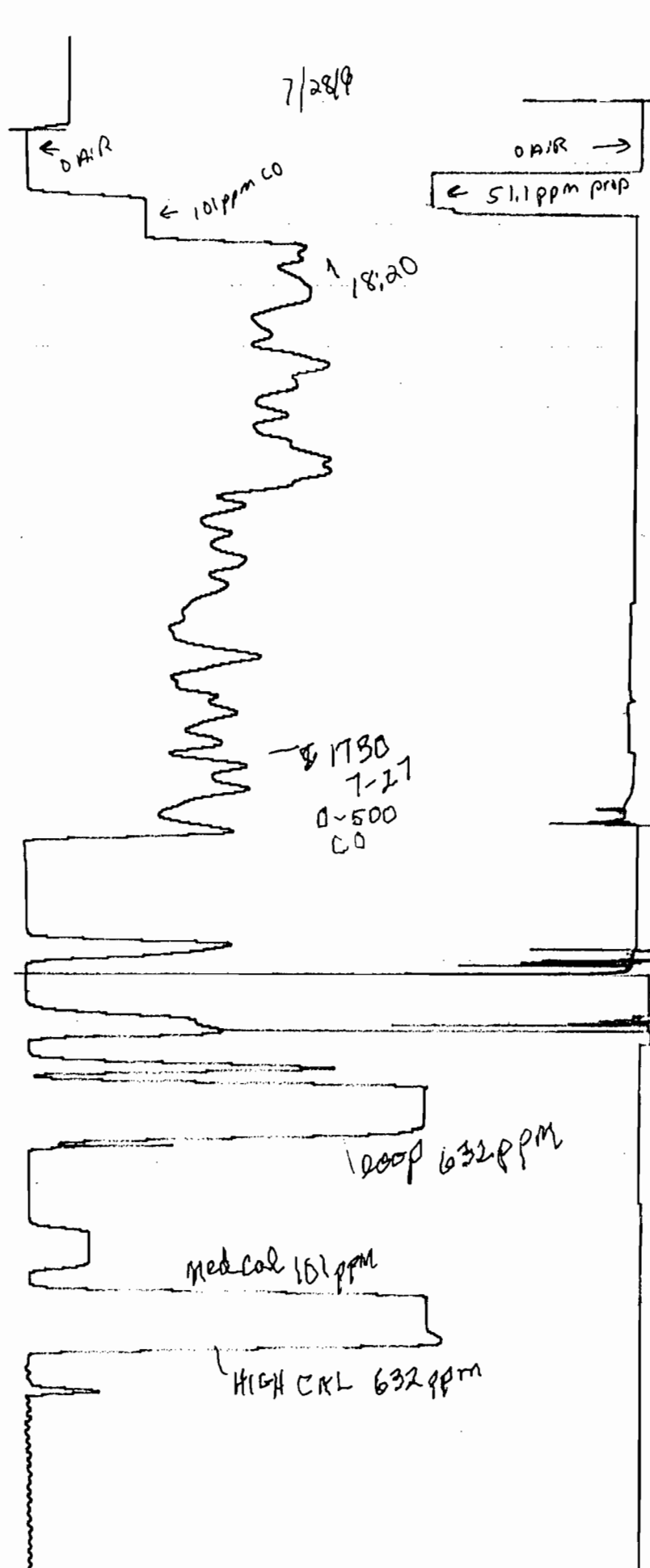
zero air
0-1000 ppm
1530
7-27-92

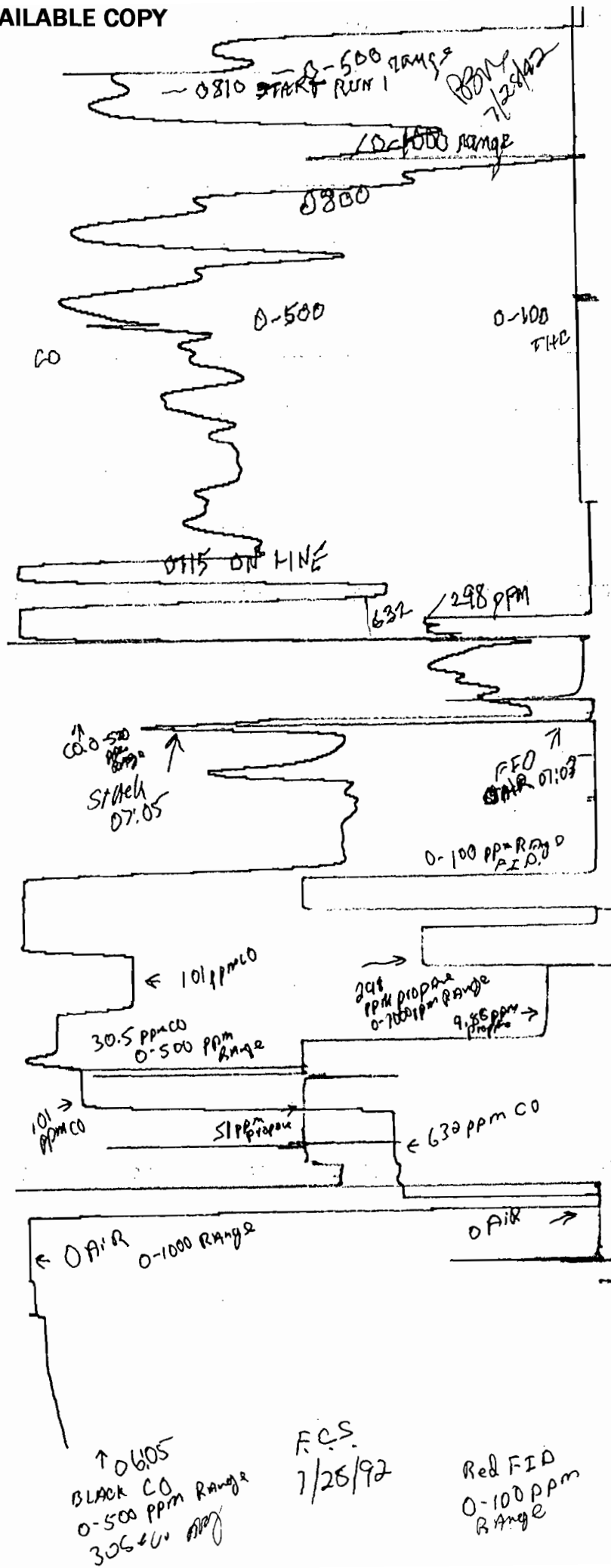
LOW CAL 36.5 ppm

Med Cal 60.3 0-100

HIGH CAL 101

1430
7-27-92 zero air
0-500 ppm range





HIGH CAL

APP.

Zero Air

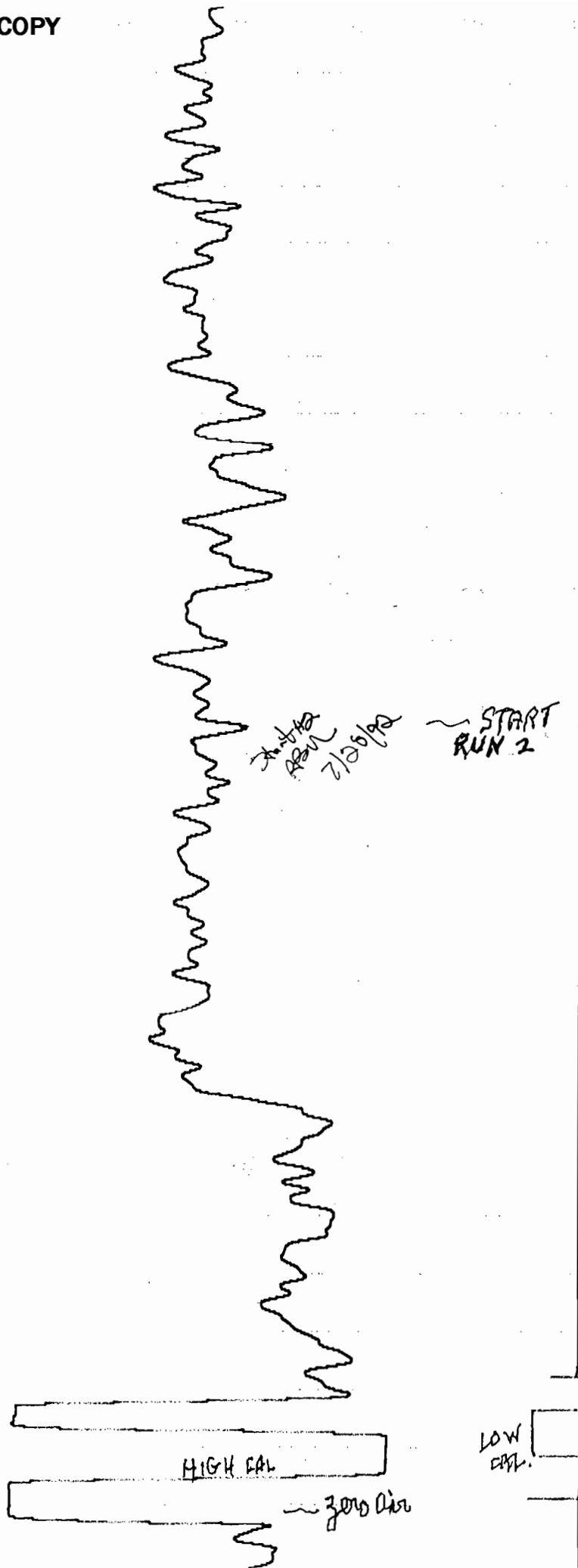
END RUN 1
1032

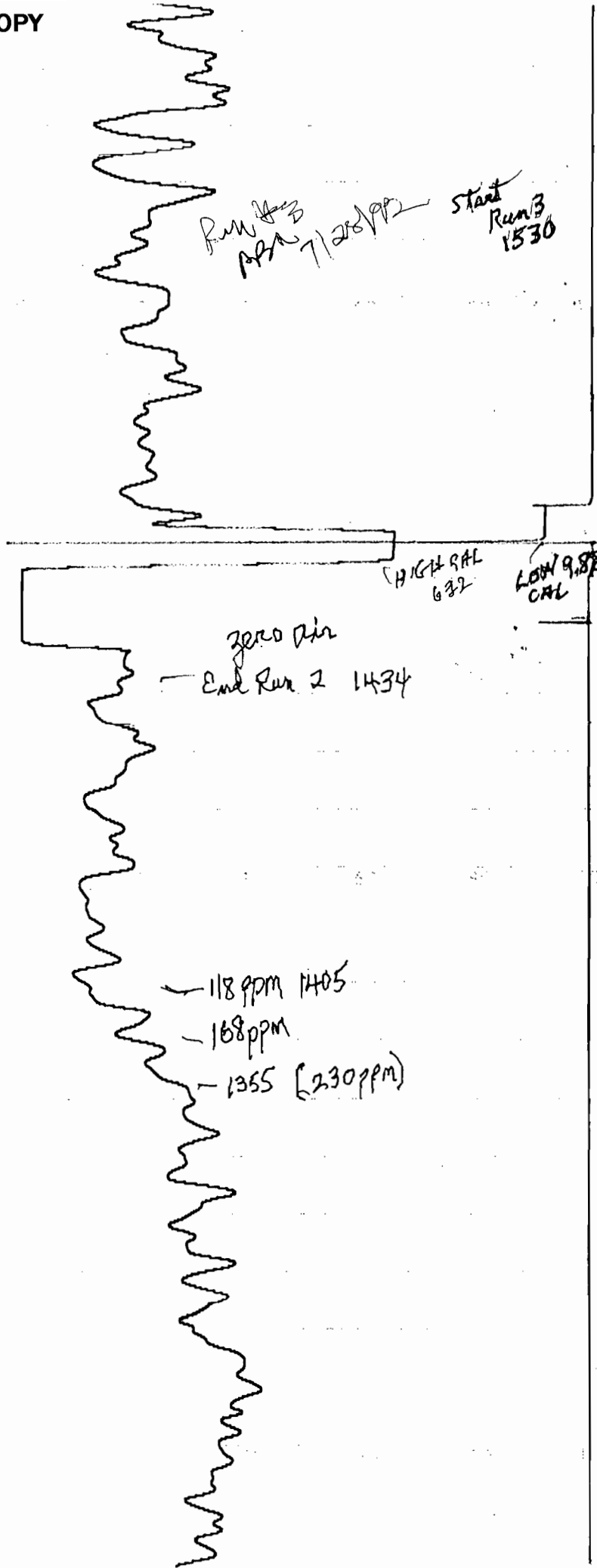
0-1000 range

0810 - 0-500 range
START RUN 1

BBM
7/25/62

10-1000 range





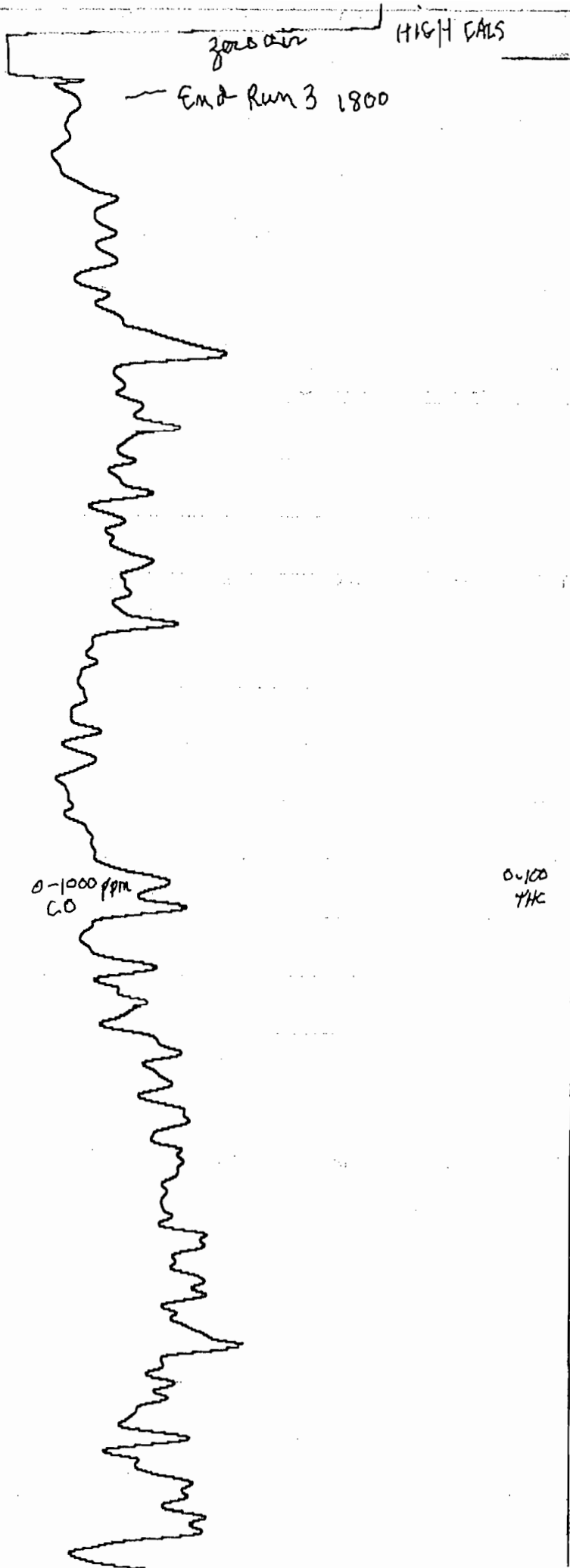
zone air

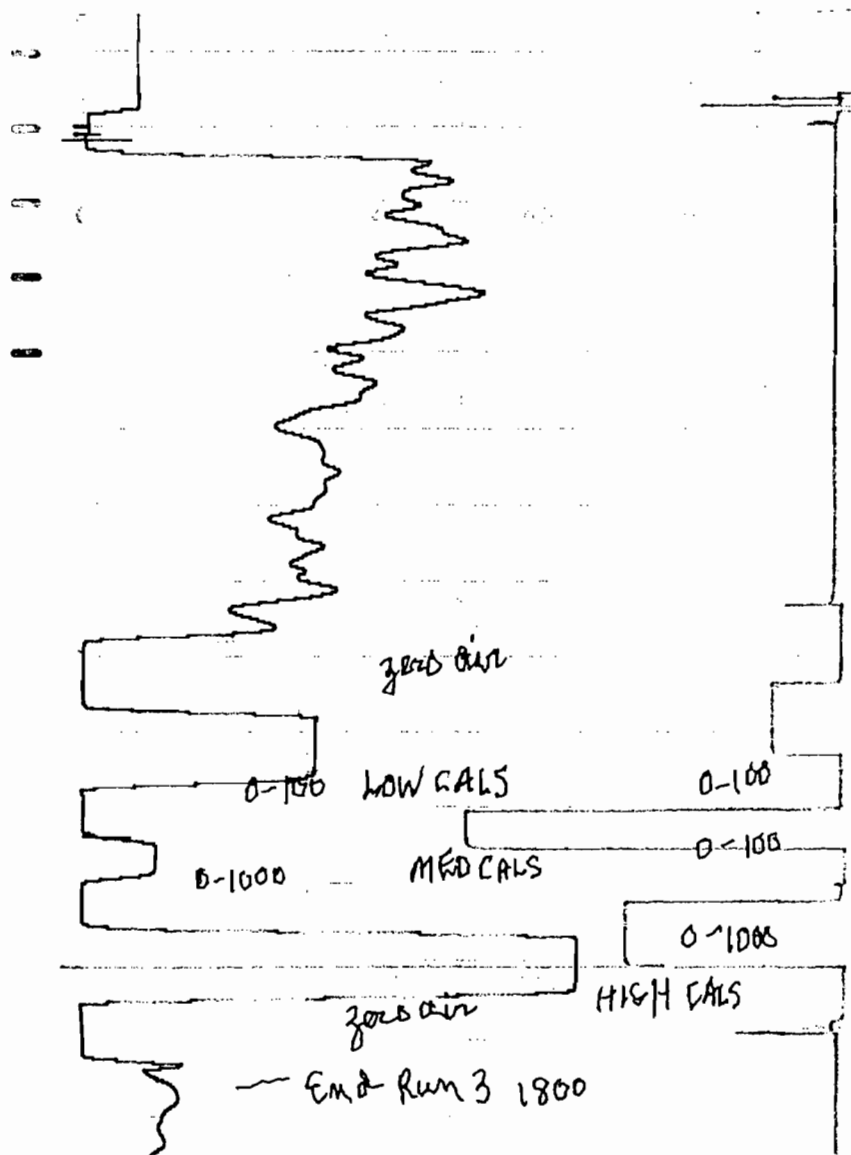
HIGH CALS

End Run 3 1800

0-1000 ppm
CO

0-100
THC





0 10 20 30 40 50 60 70 80 90

0

NOx

100

200

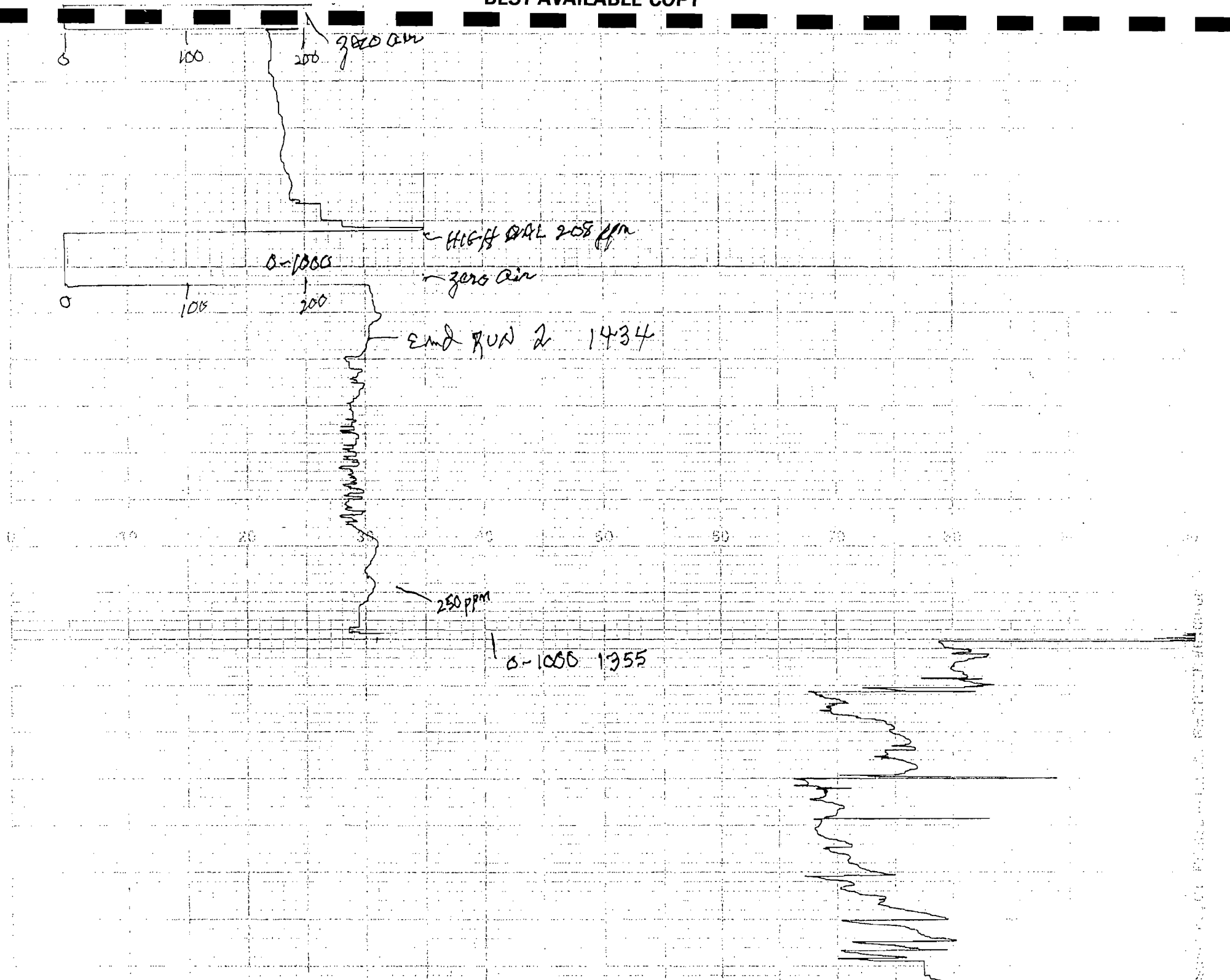
0-1000 PPM

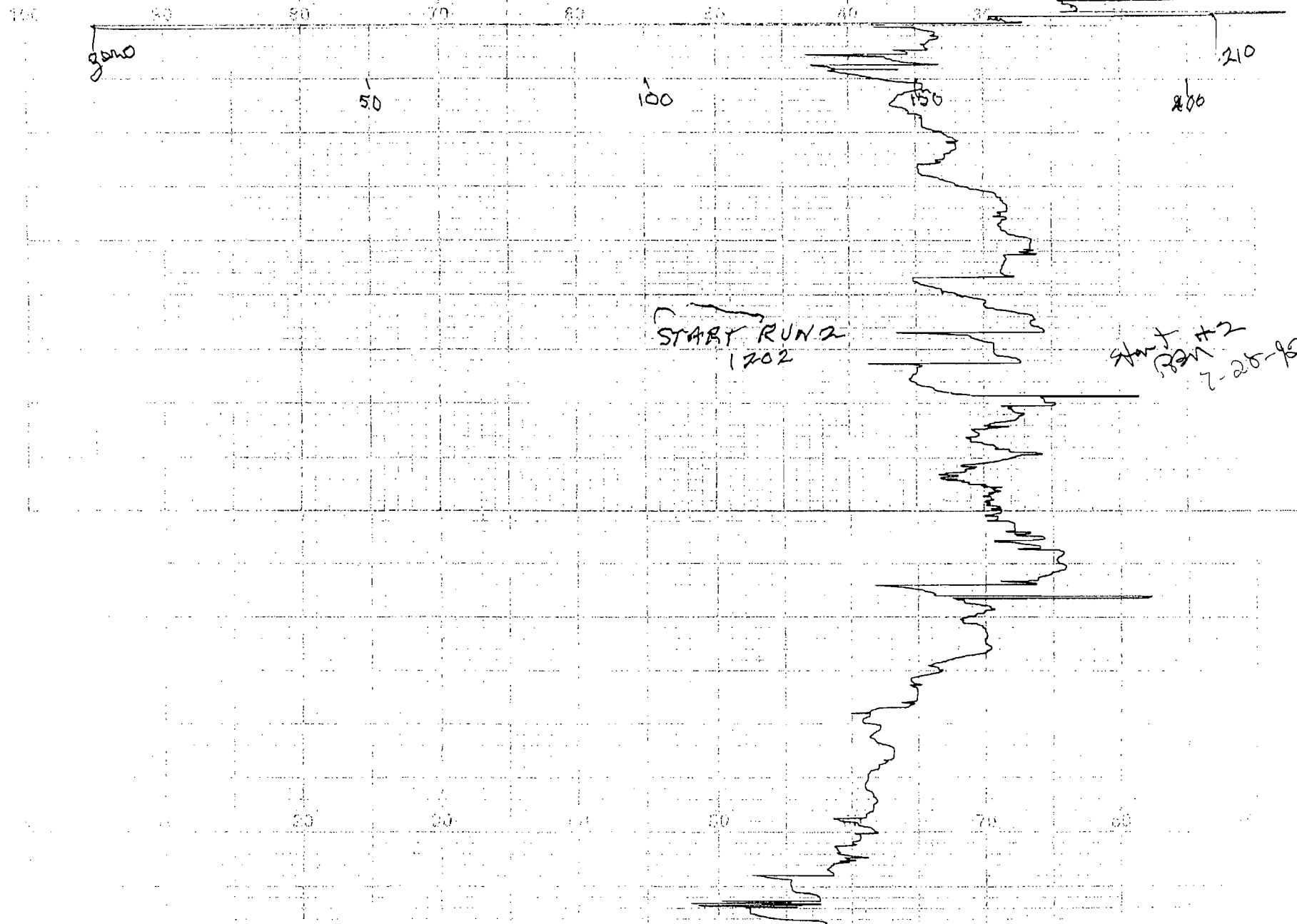
100 90 80 70 60 50 40 30 20 10 0

Run #3
PPM 20
12/2/92

Start Run 3 1/2 30

ON STACK GAS





genv air

END RUN 1 1032

10 20 30 40 50 60 70 80 90 100

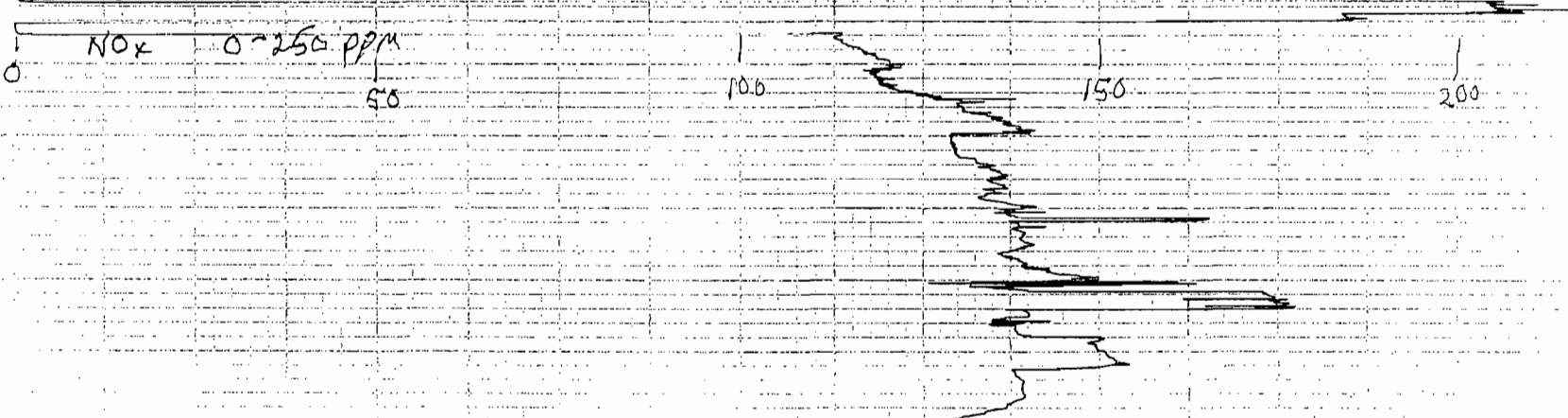
10 20 30 40 50 60 70 80 90 100

ORIGINAL AND REPRODUCED FROM COPY

0 10 20 30 40 50 60 70 80 90 100

0810 START RUN 1 *BAH 17 2892*

0800



↑ 37pph
0710S

← 20.2 ppm NOx

← 53.3 ppm NOx

20.6 ppm NOx

100 20 30 40 50 60 70 80

P.C.S.
7/26/97

↑ 0605

Blue
NOx

0-250 PPM
Range

0-AIR

208 PPM NOx →

234

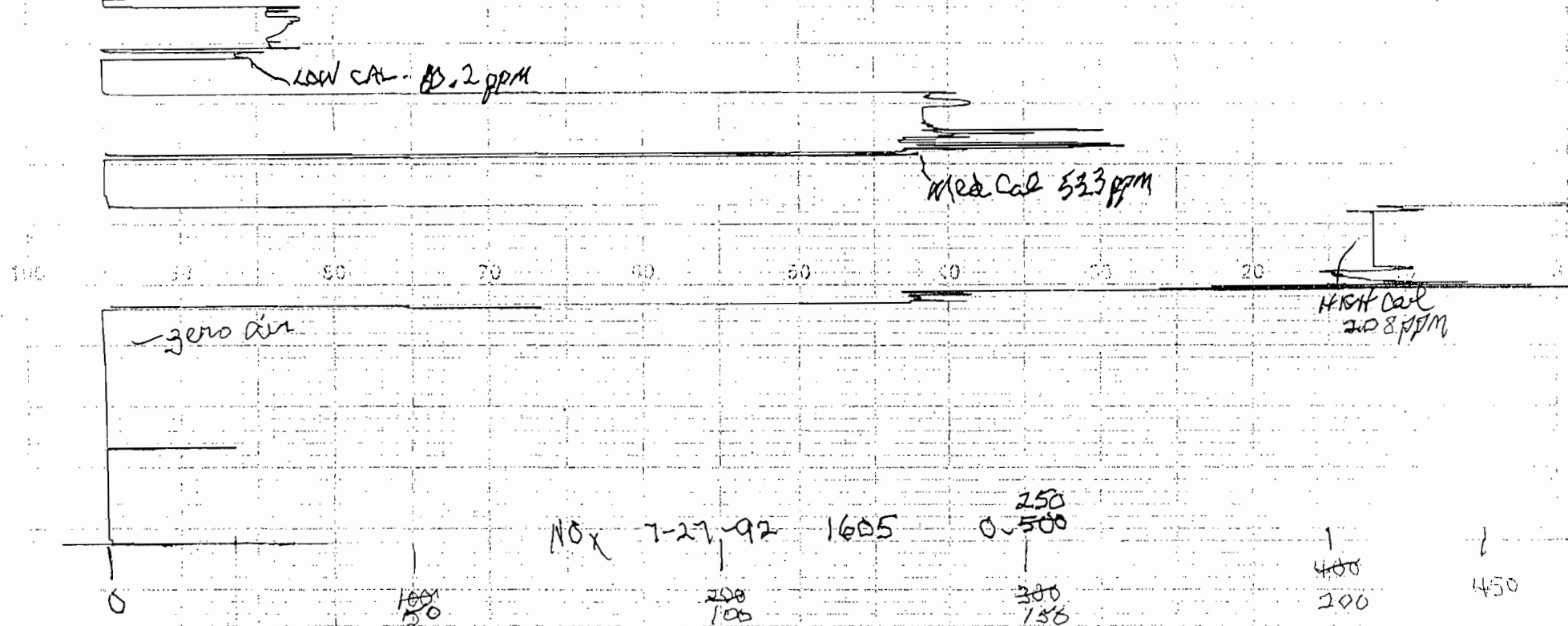
↑ 18.20

1730

7-27

0-250

NO_x





SO₂ Run 1, Set 1 Start 1300 End 1500
" Set 2 " 1000 " 1020

O₂

CO₂

Plant: CPL-FCS-TDF
Sample Loc.: BROOKSVILLE
Control Type: BAGHOUSE
Sample Type: NO_x, CO, THC, O₂
Date: 7-29-92 Run No.: 1
Time Start: 0851 Time End: 1112
Sample Time: _____ min/port _____ total min.
Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
Bar. Pressure 30.15 "Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
Moisture: _____ % FDA: _____ Gas Density Factor: _____
Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
Weather: _____ Thermocouple Readout: _____
Sample Box #: _____ Meter Box No.: _____
Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
Nozzle Diameter: _____ in. Probe Length: _____ ft
Probe Heater Setting: _____ Nomograph Cf: _____
Stack Dimentions: _____ in Umbilical: _____
Stack Area: _____ ft² Thermocouple _____
Effective Stack Area: _____ ft² Probe No.: _____
Stack Height: _____ ft Pitot Tube: _____

Material Processing Rate: _____
Final Gas Meter Reading: _____ ft³
Initial Gas Meter Reading: _____ ft³
Total Metered Gas Volume: _____ ft³
Condensate Gain in Impingers: 154 mL
Weight Gain in Silica Gel: 12.6 g
Total Moisture Gain: 166.6 mL
Silica Gel Container No.: 28
Filter Number: 4

Leak Check - Meter Box

Initial: _____ cfm @ _____ in. H₂O
Final: _____ cfm @ _____ in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
Static 3 "H₂O for 15 sec: Stable, Leak

Test Conducted By: M. JOYE, R. PAUL, S. BELL,
Y. JONES
Stack Test Observers: B. MITCHELL, D. BUFF,
J. GORIE, S. JANEPLAK

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (*H2O)	Meter Orifice Pressure Difference (*H2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train (°Hg)	Oxygen Meter Reading (% O2)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NOx Monitor Reading (ppm)
					Calculated	Actual			6.2	50.2	NOx				
Average:												9.3			
		0655										8.5	0	381	170
		0705										8.0	0	359	160
		0720							6.9	115	198	9.0	0	369	160
		0740										10.5	0	365	200
		0750							6.7	196	196	11.0	0	254	210
		0800										11.0	0	126	215
		0815							6.5	178	185	7.5	0	108	198
		0830							6.4	194	137	7.5	0	139	130

[illegible]



502 Run 2, set 1, start 1250, end 1250
 " 2, set 2, start 1300, end 1320

Plant: CPL-FCS-TDF
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂
 Date: 7-29-95 Run No.: 2
 Time Start: 1228 Time End: 1447
 Sample Time: _____ min/port _____ total min.
 Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
 Bar. Pressure 30.15 "Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
 Moisture: _____ % FDA: _____ Gas Density Factor: _____
 Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
 Weather: _____ Thermocouple Readout: _____
 Sample Box #: _____ Meter Box No.: _____
 Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
 Nozzle Diameter: _____ in. Probe Length: _____ ft
 Probe Heater Setting: _____ Nomograph Cf: _____
 Stack Dimentions: _____ in Umbilical: _____
 Stack Area: _____ ft² Thermocouple _____
 Effective Stack Area: _____ ft² Probe No.: _____
 Stack Height: _____ ft Pitot Tube: _____

Stack Dimentions

Material Processing Rate: _____
 Final Gas Meter Reading: _____ ft³
 Initial Gas Meter Reading: _____ ft³
 Total Metered Gas Volume: _____ ft³
 Condensate Gain in Impingers: _____ mL
 • Weight Gain in Silica Gel: _____ g
 Total Moisture Gain: _____ mL
 Silica Gel Container No.: 30
 Filter Number: 5
 Leak Check - Meter Box
 Initial: _____ cfm @ _____ in. H₂O
 Final: _____ cfm @ _____ in. H₂O
 Leak Check - Pitot Tubes
 Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Test Conducted By: M. JOYE, R. PAUL, S. BELL,
T. JONES
 Stack Test Observers: B. MITCHELL, D. BUFF,
J. GORIE, S. SHEPLAK, HOWARD COUCH

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temperature (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NO _x Monitor Reading (ppm)
					Calculated	Actual									
Average:												9.8			
		1215							6.4	168	171	11.0	0.7	179	175
		1235										7.5	0.8	111	180
		1245										7.5	0.8	159	175
		1300							6.5	165	193	8.5	0.8	127	200
		1315										10.0	0.8	121	175
		1330							6.4	122	210	10.5	0.8	172	260
		1345							6.3	122	206	10.5	0.8	162	195
		1400							6.1	122	197	10.5	0.8	179	130

[illegible]



SO₂ Run 3, set 1 at 1600 and 1625 On
 113, set 2 " 1636 and 1657
 113, set 3 " 1707 and 1727 CO₂

Plant: CPL-FCS-TDF
 Sample Loc.: BROOKSVILLE
 Control Type: BAGHOUSE
 Sample Type: NO_x, CO, THC, O₂
 Date: 7-29-92 Run No.: 3
 Time Start: 1600 Time End: 1817
 Sample Time: _____ min/port _____ total min.
 Dry Bulb: _____ °F Wet Bulb: _____ °F VP @ DP: _____
 Bar. Pressure _____ "Hg Stack Press.: _____ "Hg Ps: _____ "H₂O
 Moisture: _____ % FDA: _____ Gas Density Factor: _____
 Temperature: _____ °F Wind Dir.: _____ Wind Speed: _____
 Weather: _____ Thermocouple Readout: _____
 Sample Box #: _____ Meter Box No.: _____
 Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
 Nozzle Diameter: _____ in. Probe Length: _____ ft
 Probe Heater Setting: _____ Nomograph Cf: _____
 Stack Dimentions: _____ in Umbilical: _____
 Stack Area: _____ ft² Thermocouple _____
 Effective Stack Area: _____ ft² Probe No.: _____
 Stack Height: _____ ft Pitot Tube: _____

Material Processing Rate: _____
 Final Gas Meter Reading: _____ ft³
 Initial Gas Meter Reading: _____ ft³
 Total Metered Gas Volume: _____ ft³
 Condensate Gain in Impingers: _____ mL
 Weight Gain in Silica Gel: _____ g
 Total Moisture Gain: _____ mL
 Silica Gel Container No.: 30 34
 Filter Number: 5 6

Leak Check - Meter Box

Initial: _____ cfm @ _____ in. H₂O
 Final: _____ cfm @ _____ in. H₂O

Leak Check - Pitot Tubes

Impact 3 "H₂O for 15 sec: Stable, Leak
 Static 3 "H₂O for 15 sec: Stable, Leak

Test Conducted By: M. JOYE, R. PAUL, S. BELL
T. JONES
 Stack Test Observers: D. BUEFF, B. MITCHELL

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft ³)	Stack Velocity Head ("H ₂ O)	Meter Orifice Pressure Difference ("H ₂ O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	CPL Last Impinger Temperature (°F)	CPL Meter Temperature (°F)	CPL Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O ₂)	Flame Ionization Detector Reading (ppm)	CO Monitor Reading (ppm)	NO _x Monitor Reading (ppm)
					Calculated	Actual			SO ₂	SO ₂	NO _x				
Average:												9.5			
		1545							6.2	106	180	10.5	1.0	164	175
		1600							6.1	149	170	10.5	1.2	159	185
		1615							5.9	149	147	10.5	1.2	131	160
		1630							5.9	122	180	8.0	1.2	160	170
		1645							6.1	150	188	9.2	1.2	182	180
		1700							5.9	181	194	10.0	1.0	264	180
		1715							6.3	163	199	10.0	0.9	226	195
		1730							✓	✓	199	8.0	1.0	251	190

Start Run 3

[illegible]

FCS - CPL

Ch. Spd. 100m/HR

7-29-92

Initial Cal

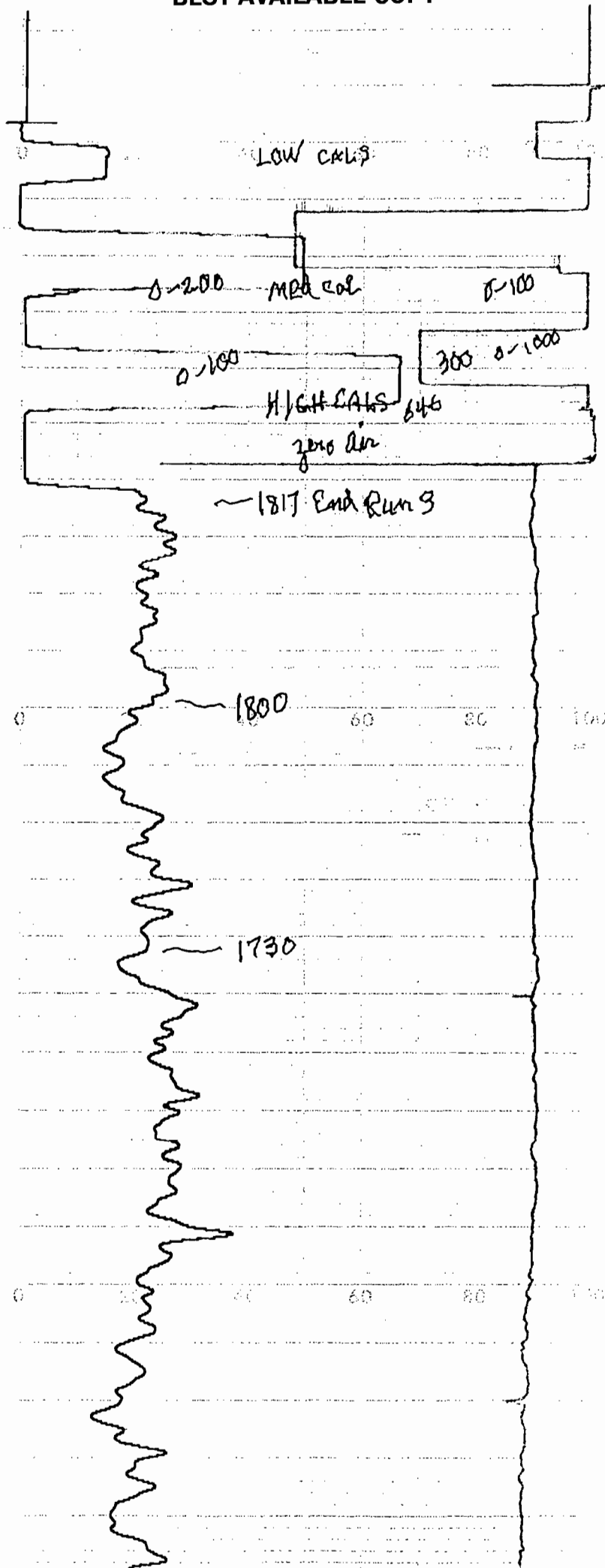
Final Cal.

CO	632	646	647
	101	99.2	98.5
	30.5	30.2	28.7 29.6
	0	0	0

FID	298	300	300
	51	51	51
	9.88	10.0	10.
	0	0	0

NO _x	208	210	215
	53.3	53.5	52
	10.2	10.3	10.0
	0	0	0

O ₂	20.9	20.9
----------------	------	------



* 3
R26
2/27/02
RUN 3 START
1600

BACK ON LINE

LOW CAL. 40 20W 80 100
MED. CAL. 0110
zero air

End Run 2 1447

BEST AVAILABLE COPY

0 20 40 60 80 100

0 20 40 60 80 100

START RUN 2 1228

*2
RAN 7/29/92

EXH RUN 1
11/17

0 20 40 60 80 100

-1008

0 20 40 60 80 100

4 3 2 1

0-1000
60

0-10 PPM
TMC

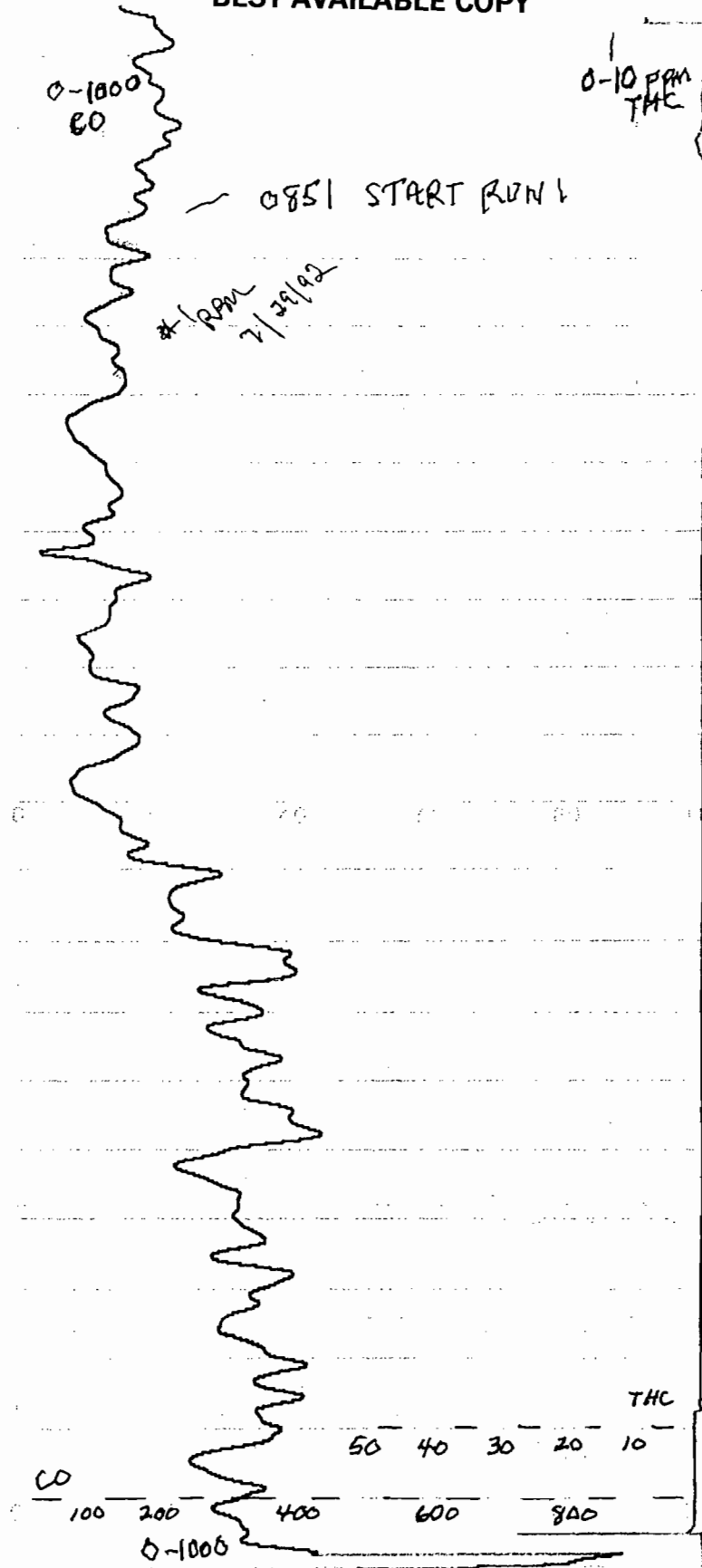
BEST AVAILABLE COPY

0-1000
CO

0-10 PPM
THC

0851 START RUN 1

#1 PPM
7/29/92



CO

100 200

400

600

800

0-1000

50

40

30

20

10

THC

CO

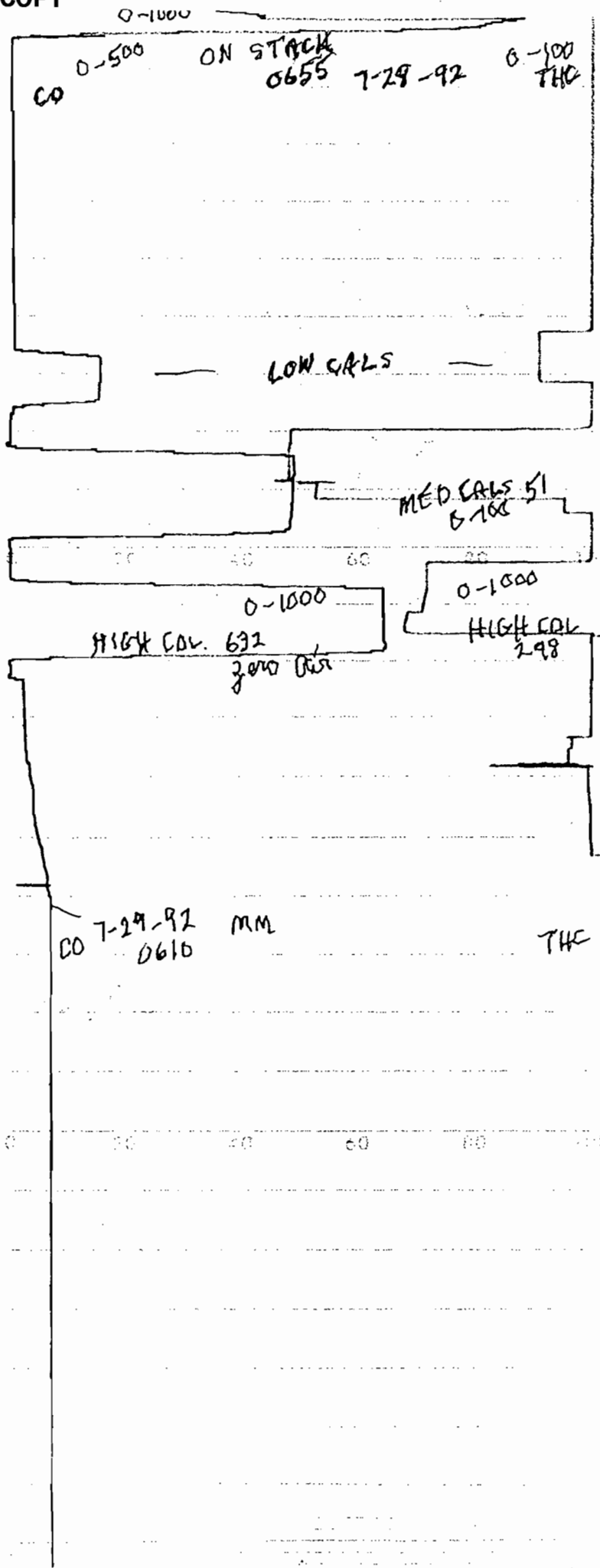
0-500

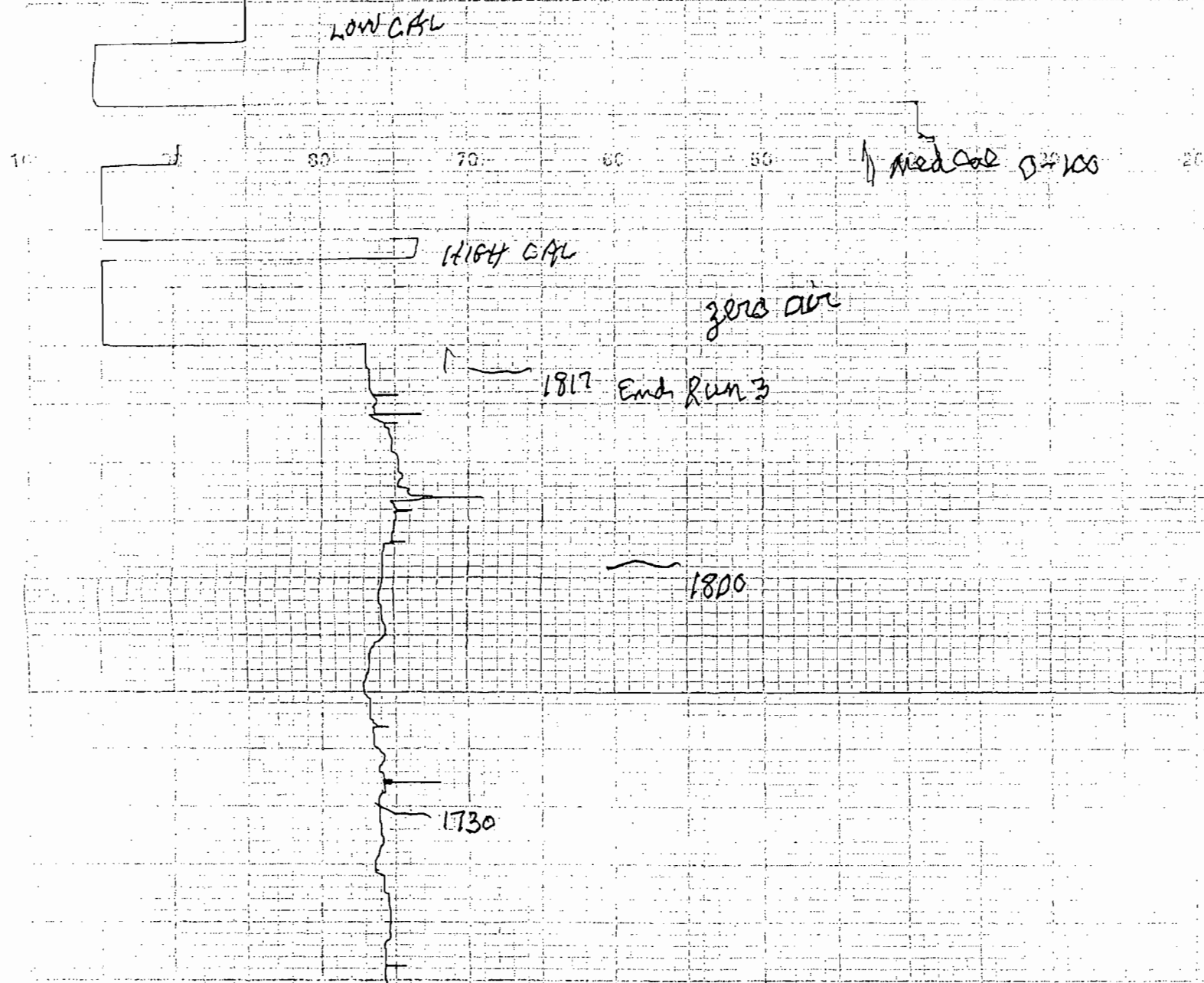
ON STACK

0655

7-29-92

0-100
THC





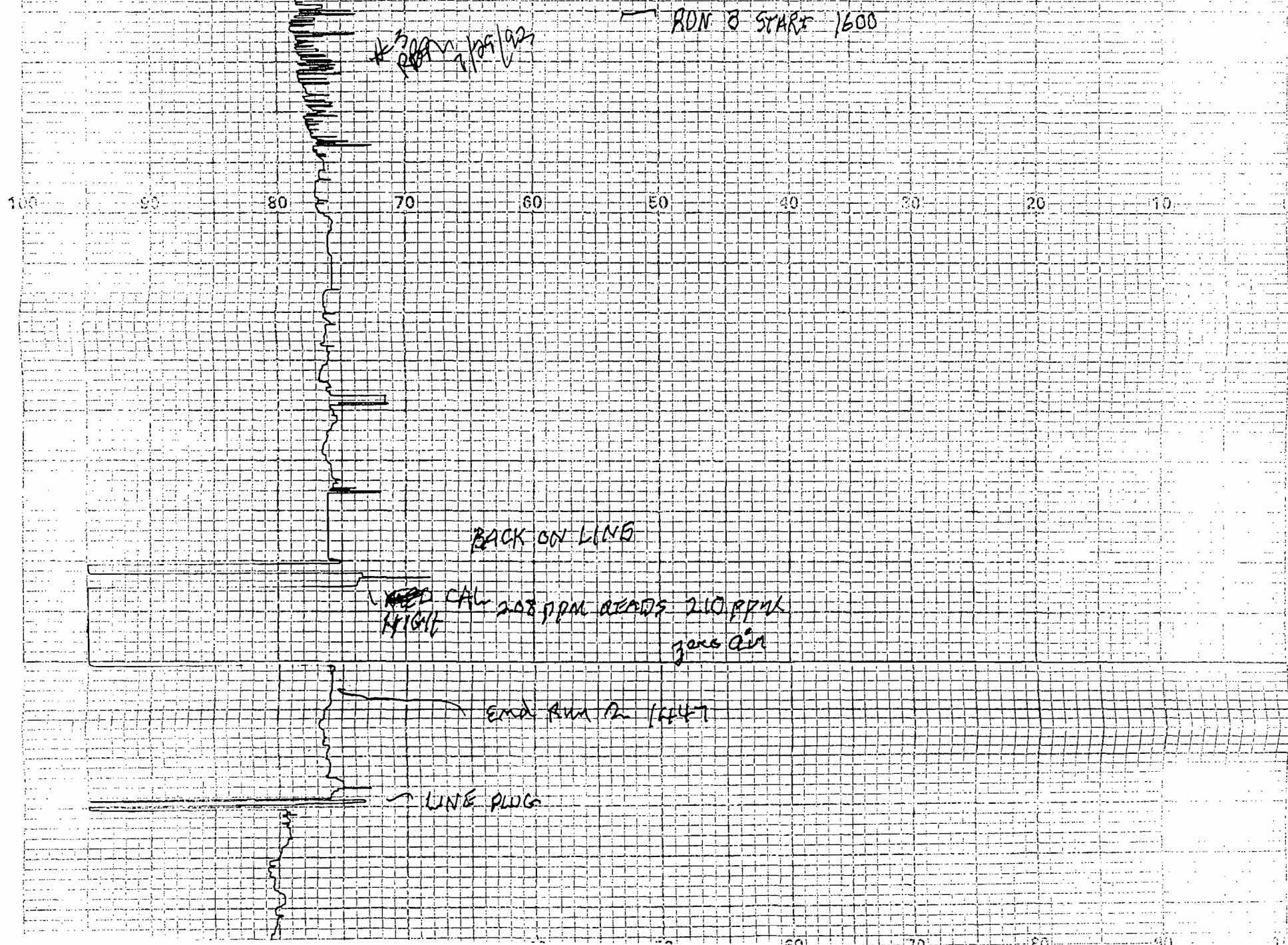
0 10 20 30 40 50 60 70 80 90 100

100 90 80 70 60 50 40 30 20 10 0



#300
RBT 7/25/92

RON B STARE 1600



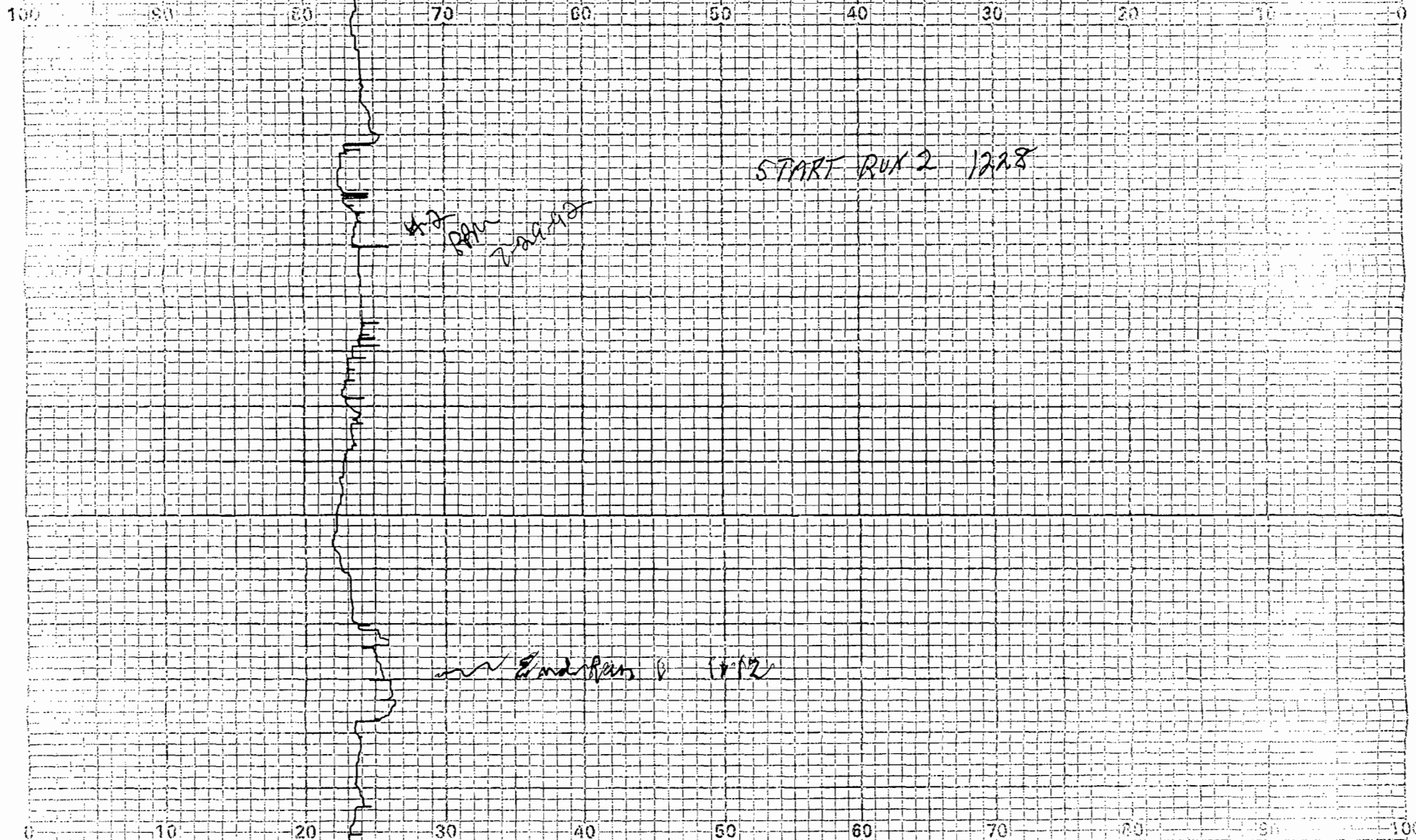
END RUN IN 1947

LINE PLUG

LINE PLUG

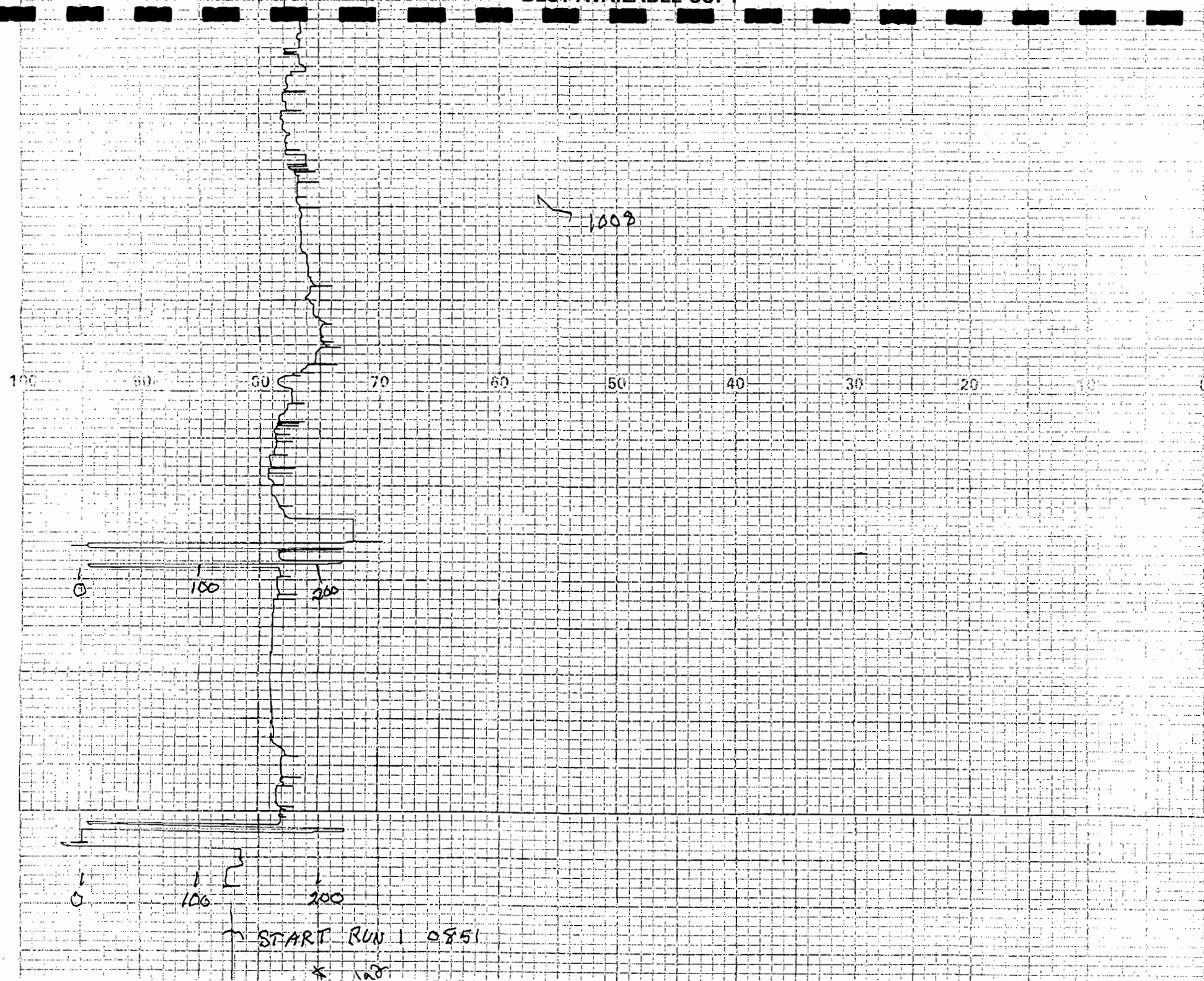
200 PPM
205 @ 1315

1300



End Run 1 (112)

1008

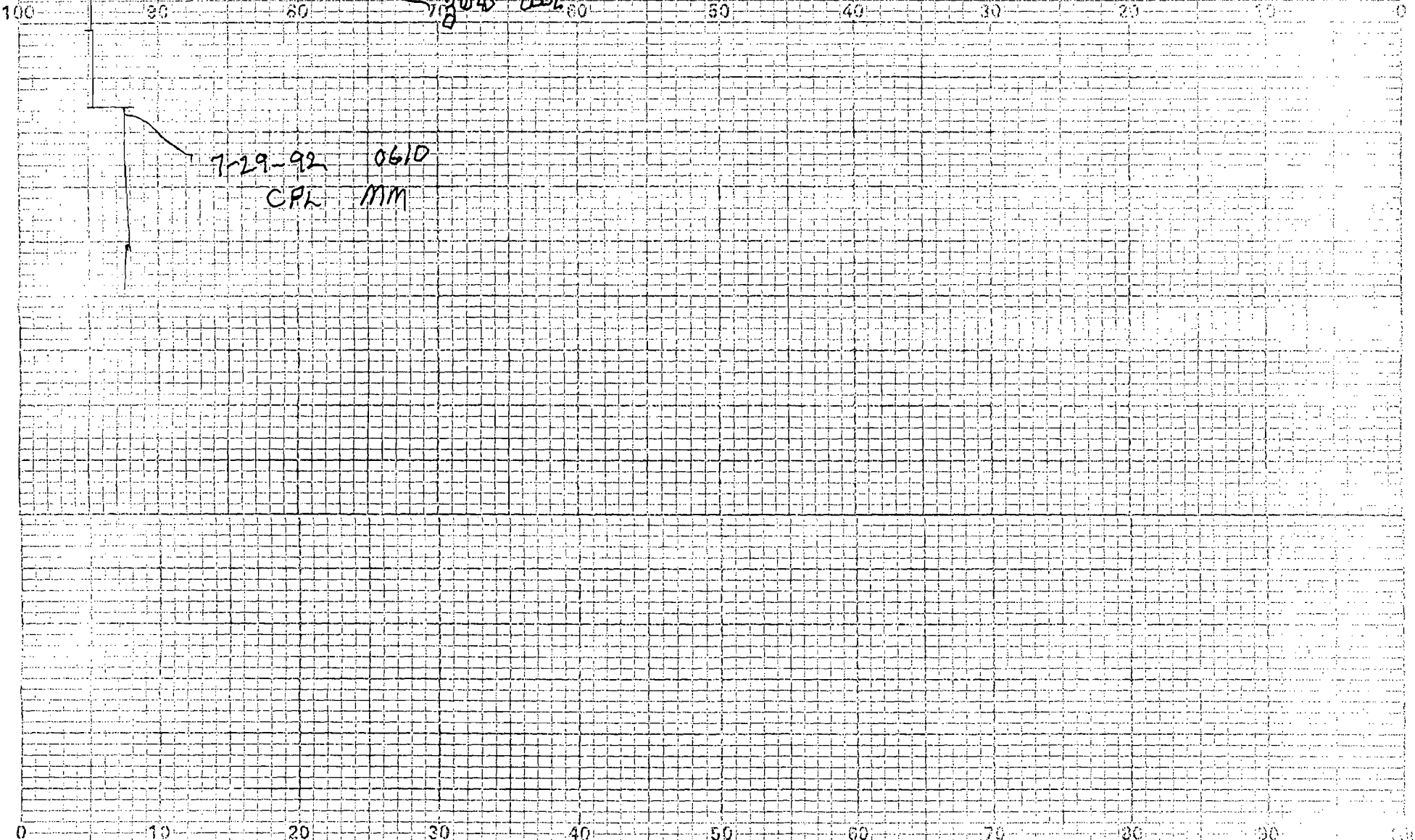


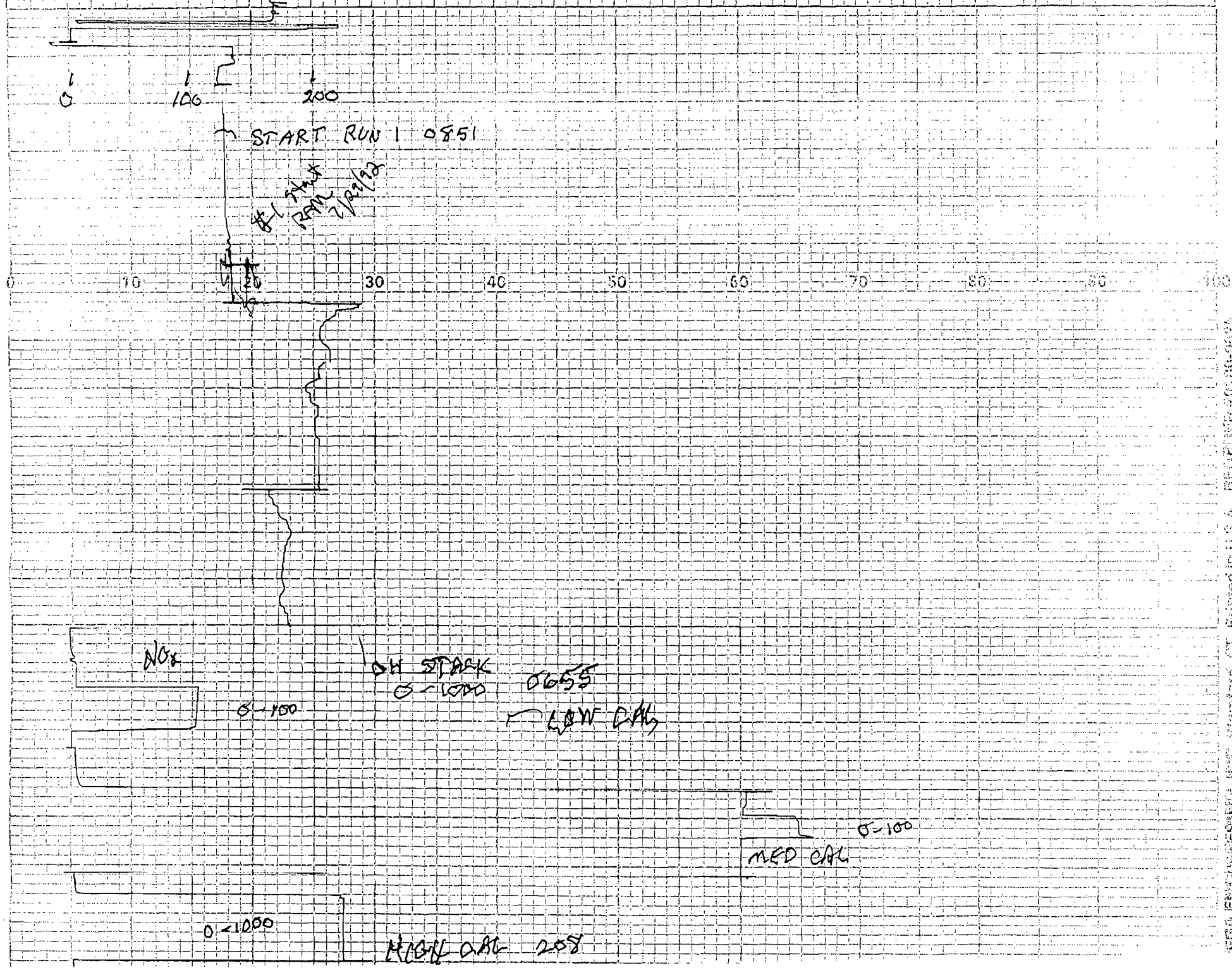
0-1000

RCN ARE 258

zero air

7-29-92 0610
CPL MM





VISIBLE EMISSIONS

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1030-1100

MINUTES /	SECONDS	5	15	30	45
	----- OPACITY (%) -----				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	5
7	5	5	0	0	0
8	5	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	5	0
19	0	0	0	5	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	5	5
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	5	5	5	5	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.5 %

MAXIMUM OPACITY: 5 %

STATE OF FLORIDA
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THIS CERTIFICATE EXPIRES Dec 2, 1992

Michael R. Clark
CERTIFICATE OFFICER

Treg Jones
OBSERVER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1030-1100

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.2
7	0.4	0.6	0.6	0.6
8	0.8	0.8	0.8	0.8
9	0.8	0.8	0.8	0.8
10	0.8	0.8	0.8	0.8
11	0.8	0.8	0.8	0.8
12	0.8	0.8	0.8	0.6
13	0.4	0.2	0.2	0.2
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.2	0.2
19	0.2	0.2	0.4	0.4
20	0.4	0.4	0.4	0.4
21	0.4	0.4	0.4	0.4
22	0.4	0.4	0.4	0.4
23	0.4	0.4	0.4	0.4
24	0.4	0.4	0.4	0.6
25	0.6	0.6	0.4	0.4
26	0.4	0.4	0.4	0.4
27	0.4	0.4	0.4	0.4
28	0.6	0.8	1.0	1.0
29	1.0	1.0	1.0	1.0
30	1.0	1.0	0.8	0.6

HIGHEST SIX-MINUTE ROLLING AVERAGE: 1.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1101-1130

MINUTES /	SECONDS /	5	15	30	45
	----- OPACITY (%) -----				
1		0	0	0	0
2		0	0	0	0
3		0	0	0	0
4		0	0	0	0
5		0	0	0	0
6		0	0	0	5
7		0	0	0	0
8		0	0	0	0
9		0	0	0	0
10		0	0	0	0
11		0	0	0	0
12		0	0	0	0
13		0	0	0	0
14		0	0	0	0
15		0	0	0	0
16		0	0	0	0
17		0	0	0	0
18		0	0	0	0
19		0	0	0	0
20		0	0	0	0
21		0	5	0	0
22		5	0	0	0
23		0	0	0	0
24		0	0	0	0
25		0	0	0	0
26		0	0	0	0
27		0	0	0	0
28		0	0	0	0
29		0	5	5	5
30		0	0	0	0

AVERAGE OPACITY: 0.3 %

MAXIMUM OPACITY: 5 %

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CERTIFICATE OFFICER

Treg Jones
BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1101-1130

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.2
7	0.2	0.2	0.2	0.2
8	0.2	0.2	0.2	0.2
9	0.2	0.2	0.2	0.2
10	0.2	0.2	0.2	0.2
11	0.2	0.2	0.2	0.2
12	0.2	0.2	0.2	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.2	0.2	0.2
22	0.4	0.4	0.4	0.4
23	0.4	0.4	0.4	0.4
24	0.4	0.4	0.4	0.4
25	0.4	0.4	0.4	0.4
26	0.4	0.4	0.4	0.4
27	0.4	0.2	0.2	0.2
28	0.0	0.0	0.0	0.0
29	0.0	0.2	0.4	0.6
30	0.6	0.6	0.6	0.6

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.6 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1435-1505

MINUTES /	SECONDS	OPACITY (%)			
	5	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1435-1505

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1506-1535

MINUTES /	SECONDS /	5	15	30	45
	OPACITY (%)				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	5	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 5 %

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Michael R. Clark Treg Jones
CERTIFICATE OFFICER BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 28, 1992
TIME : 1506-1535

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.2	0.2	0.2	0.2
26	0.2	0.2	0.2	0.2
27	0.2	0.2	0.2	0.2
28	0.2	0.2	0.2	0.2
29	0.2	0.2	0.2	0.2
30	0.2	0.2	0.2	0.2

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.2 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1130-1200

		SECONDS / 5	15	30	45
		----- OPACITY (%) -----			
MINUTES /	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0
	5	0	0	0	0
	6	0	0	0	0
	7	0	0	0	0
	8	0	0	0	0
	9	0	0	0	0
	10	0	0	0	0
	11	0	0	0	0
	12	0	0	0	0
	13	0	0	0	0
	14	0	0	0	0
	15	0	0	0	0
	16	0	0	0	0
	17	0	0	0	0
	18	0	0	0	0
	19	0	0	0	0
	20	0	0	0	0
	21	0	0	0	0
	22	0	0	0	0
	23	0	0	0	0
	24	0	0	0	0
	25	0	0	0	0
	26	0	0	0	0
	27	5	5	0	0
	28	0	0	0	0
	29	0	0	0	0
	30	0	0	0	0

AVERAGE OPACITY: 0.1 %

MAXIMUM OPACITY: 5 %

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CERTIFICATE OFFICER

Treg Jones

BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1130-1200

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.2	0.4	0.4	0.4
28	0.4	0.4	0.4	0.4
29	0.4	0.4	0.4	0.4
30	0.4	0.4	0.4	0.4

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.4 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE : CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1201-1230

MINUTES /	SECONDS	OPACITY (%)			
	/ 5	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

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KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1201-1230

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1511-1540

MINUTES /	SECONDS	5	15	30	45
	----- OPACITY (%) -----				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

TREG JONES

_____, has completed the
STATE OF FLORIDA visible emissions evaluation training and is a qualified
observer of visible emissions as specified by EPA reference method 9.

THIS CERTIFICATE EXPIRES Dec 2, 1992

Michael R. Clark
CERTIFICATE OFFICER

Treg Jones
BEARER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1511-1540

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SUMMARY OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1541-1611

MINUTES /	SECONDS	5	15	30	45
	OPACITY (%)				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0

AVERAGE OPACITY: 0.0 %

MAXIMUM OPACITY: 0 %

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

TREG JONES

has completed the
STATE OF FLORIDA visible emissions evaluation training and is a qualified
observer of visible emissions as specified by EPA reference method 9.

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Michael R. Clark
CERTIFICATE OFFICER

Treg Jones
OBSERVER'S SIGNATURE

KOOGLER AND ASSOCIATES, ENVIRONMENTAL SERVICES
SIX-MINUTE AVERAGES OF VISIBLE EMISSIONS

PLANT : FLORIDA CRUSHED STONE / BROOKSVILLE, FLA.
SOURCE: CPL STACK / TDF
DATE : JULY 29, 1992
TIME : 1541-1611

MINUTES	--- SIX-MINUTE ROLLING AVERAGES ---			
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	0.0
7	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0

HIGHEST SIX-MINUTE ROLLING AVERAGE: 0.0 %

Best Available Copy

CONTINUED ON VEO FORM NUMBER End #1 1 05 2



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

Visible Emission Observation Form

SOURCE NAME FLORIDA CRUSHED STONE CO.			OBSERVATION DATE 28 JULY 92		START TIME 1030	END TIME 1130
ADDRESS P.O. BOX 1508 / 10311 CEMENT PLANT RD.			COMMENTS			
HERNANDO COUNTY						
CITY BROOKVILLE	STATE FL.	ZIP 34601				
PHONE	SOURCE ID NUMBER AC 37-118614 + AO 37-188508					
PROCESS EQUIPMENT CEMENT - POWER LINE	OPERATING MODE *					
CONTROL EQUIPMENT BAGHOUSE	OPERATING MODE 72% DEMAND					
DESCRIBE EMISSION POINT START TOP OF STACK STOP TOP OF STACK						
HEIGHT ABOVE GROUND LEVEL START 300' STOP 300'						
HEIGHT RELATIVE TO OBSERVER START 300' STOP 300'						
DISTANCE FROM OBSERVER START 1000' STOP 1000'						
DIRECTION FROM OBSERVER START NW STOP NW						
DESCRIBE EMISSIONS START CLEAR STOP						
EMISSION COLOR START CLEAR STOP CLEAR						
PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>						
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>						
IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>						
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 30' ABOVE STACK STOP 30' ABOVE STACK						
DESCRIBE BACKGROUND START SKY / CLOUDS STOP SKY / CLOUDS						
BACKGROUND COLOR START GREY / STOP GREY						
SKY CONDITIONS START SCATT. STOP SCATT.						
WIND SPEED START 5-7 STOP 5-7						
WIND DIRECTION START WEST STOP WEST						
AMBIENT TEMP. START 91° STOP 92°						
WET BULB TEMP. 85°						
RH, percent						
Source Layout Sketch 						
Draw North Arrow						
COMMENTS * CEMENT - 123 TPH						
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE						
TITLE						
DATE						
OBSERVER'S NAME (PRINT) TREG E. JONES						
OBSERVER'S SIGNATURE 			DATE 28 JULY 92			
ORGANIZATION KOOGLER & ASSOC.						
CERTIFIED BY						
DATE						



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

CONTINUED ON VEO FORM NUMBER *Env #1*

2 OF 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME		END TIME	
FLORIDA CRUSHED STONE CO.			28 JULY 92				1030		1130	
ADDRESS			SEC	0	15	30	45	COMMENTS		
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN							
HERNANDO COUNTY			1	0	0	0	0			
CITY	STATE	ZIP	2	0	0	0	0			
BROOKSVILLE	FL.	34601	3	0	0	0	0			
PHONE	SOURCE ID NUMBER		4	0	0	0	0			
	AC 37-118474 1		5	0	0	0	0			
	AO 37-108508		6	0	0	0	5			
PROCESS EQUIPMENT		OPERATING MODE		7	0	0	0	0		
C-P-L PLANT				8	0	0	0	0		
CONTROL EQUIPMENT		OPERATING MODE		9	0	0	0	0		
BAGHOUSE		72% DEMAND		10	0	0	0	0		
DESCRIBE EMISSION POINT			11	0	0	0	0			
START TOP OF STACK STOP TOP OF STACK			12	0	0	0	0			
HEIGHT ABOVE GROUND LEVEL		HEIGHT RELATIVE TO OBSERVER		13	0	0	0	0		
START 300' STOP 300'		START 300' STOP 300'		14	0	0	0	0		
DISTANCE FROM OBSERVER		DIRECTION FROM OBSERVER		15	0	0	0	0		
START 1000' STOP 1000'		START NW STOP NW		16	0	0	0	0		
DESCRIBE EMISSIONS			17	0	0	0	0			
START STOP			18	0	0	0	0			
EMISSION COLOR		PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>		19	0	0	0	0		
START CLEAR STOP CLEAR		FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>		20	0	0	0	0		
WATER DROPLETS PRESENT:		IF WATER DROPLET PLUME:		21	0	0	0	0		
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>		ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>		22	0	0	0	0		
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			23	0	0	0	0			
START 30' ABOVE STACK STOP 30' ABOVE STACK			24	0	0	0	0			
DESCRIBE BACKGROUND			25	0	0	0	0			
START SKY/CLOUDS STOP SKY/CLOUDS			26	0	0	0	0			
BACKGROUND COLOR		SKY CONDITIONS		27	0	0	0	0		
LT BLUE LT BLUE		START SCATT. STOP SCATT.		28	0	0	0	0		
START GREY STOP GREY		WIND SPEED		29	0	5	5	5		
LIGHT GUST		WIND DIRECTION		30	0	0	0	0		
START 5-7 STOP 5-7		START WEST STOP WEST								
AMBIENT TEMP.		WET BULB TEMP.								
START 91° STOP 92°		85°								
RH. percent										
Source Layout Sketch			Draw North Arrow							
<p>X Emission Point</p> <p>Sun & Wind →</p> <p>Plume and Stack ←</p> <p>Observers Position</p> <p>140°</p> <p>Sun Location Line</p>										
COMMENTS			OBSERVER'S NAME (PRINT)							
			TREG E. JONES							
			OBSERVER'S SIGNATURE						DATE	
			<i>Treg E. Jones</i>						28 JULY 92	
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS			ORGANIZATION							
SIGNATURE			Koogler & Assoc.							
TITLE			CERTIFIED BY						DATE	

CONTINUED ON VEO FORM NUMBER *Run # 2*

1 of 2



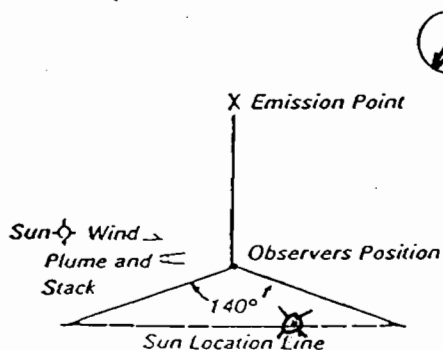
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			28 JULY 92				1435	1535
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. Box 1508/10311 CEMENT PLANT RD.			MIN					
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	A027-1183508		5	0	0	0	0	
PROCESS EQUIPMENT	PLANT	OPERATING MODE	6	0	0	0	0	
CEMENT - POWER - LINE		*	7	0	0	0	0	
CONTROL EQUIPMENT	OPERATING MODE		8	0	0	0	0	
BAGHOUSE	70% DEMAND		9	0	0	0	0	
DESCRIBE EMISSION POINT			10	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER			12	0	0	0	0	
START 300' STOP 300' START 250' STOP 250'			13	0	0	0	0	
DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER			14	0	0	0	0	
START 1000' STOP 1000' START SE STOP SE			15	0	0	0	0	
DESCRIBE EMISSIONS			16	0	0	0	0	
START STOP			17	0	0	0	0	
EMISSION COLOR	PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>		18	0	0	0	0	
START CLEAR STOP CLEAR	FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>		19	0	0	0	0	
WATER DROPLETS PRESENT:	IF WATER DROPLET PLUME:		20	0	0	0	0	
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>	ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>		21	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			22	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			23	0	0	0	0	
DESCRIBE BACKGROUND			24	0	0	0	0	
START SKY / CLOUDS STOP SKY			25	0	0	0	0	
BACKGROUND COLOR	SKY CONDITIONS		26	0	0	0	0	
START BLUE / BLUE STOP BLUE	START SCAT. STOP SCAT.		27	0	0	0	0	
WIND SPEED	WIND DIRECTION		28	0	0	0	0	
START 5-7 STOP 10	START SW STOP SW		29	0	0	0	0	
AMBIENT TEMP.	WET BULB TEMP.	RH. percent	30	0	0	0	0	
START 95° STOP 95°	89°							

Source Layout Sketch

Draw North Arrow



COMMENTS

* CEMENT - 128 TPH

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

DATE

28 JULY 92

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

DATE



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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CONTINUED ON VEO FORM NUMBER *Rev # 2*

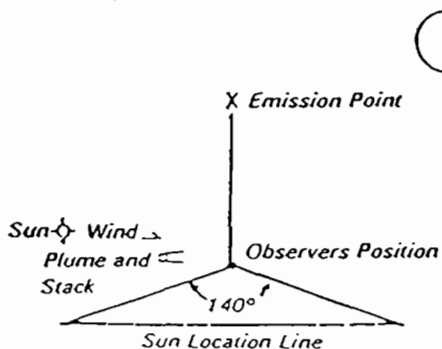
2 02 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE		START TIME	END TIME
FLORIDA CRUSHED STONE CO.			28 July 92		1435	1535
ADDRESS			SEC	0	15	30
P.O. Box 1508/10311 CEMENT PLANT RD			MIN	45	COMMENTS	
HERNANDO COUNTY			1	0	0	0
CITY	STATE	ZIP	2	0	0	0
BROOKSVILLE	FL.	34601	3	0	0	0
PHONE	SOURCE ID NUMBER		4	0	0	0
	AC 27-118474 & AO 27-182508		5	0	0	0
PROCESS EQUIPMENT	OPERATING MODE		6	0	0	0
C-P-L PLANT	*		7	0	0	0
CONTROL EQUIPMENT	OPERATING MODE		8	0	0	0
BAGHOUSE	70% DEMAND		9	0	0	0
DESCRIBE EMISSION POINT			10	0	0	0
START TOP OF STACK STOP TOP OF STACK			11	0	0	0
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER		12	0	0	0
START 300' STOP 300'	START 250' STOP 250'		13	0	0	0
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER		14	0	0	0
START 1000' STOP 1000'	START SE STOP SE		15	0	0	0
DESCRIBE EMISSIONS			16	0	0	0
START	STOP		17	0	0	0
EMISSION COLOR	PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/>		18	0	0	0
START CLEAR STOP CLEAR	FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>		19	0	0	0
WATER DROPLETS PRESENT:	IF WATER DROPLET PLUME:		20	0	0	0
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>	ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>		21	0	0	0
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			22	0	0	0
START 30' ABOVE STACK STOP 30' ABOVE STACK			23	0	0	0
DESCRIBE BACKGROUND			24	0	0	0
START SKY/CLOUDS STOP SKY			25	5	0	0
BACKGROUND COLOR	LT.	SKY CONDITIONS	26	0	0	0
START BLUE STOP BLUE	START SCATT. STOP SCATT.		27	0	0	0
WIND SPEED	WIND DIRECTION		28	0	0	0
START 5-7 STOP 10	START SWL STOP SWL		29	0	0	0
AMBIENT TEMP.	WET BULB TEMP.	RH. percent	30	0	0	0
START 95° STOP 95°	89°					

Source Layout Sketch

Draw North Arrow



COMMENTS

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E Jones

DATE

28 July 92

ORGANIZATION

KooGler & Assoc.

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SIGNATURE

TITLE

DATE

CERTIFIED BY

DATE

CONTINUED ON VEO FORM NUMBER Run #1

1

of

2



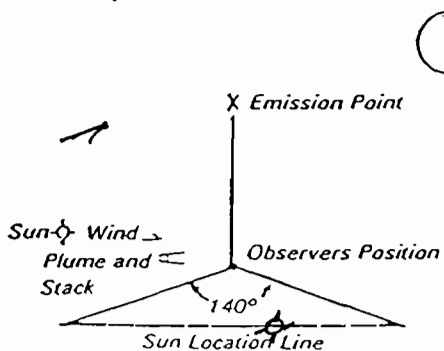
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			29 JULY 92				1130	1230
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN					
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	AC 27-118674 #		5	0	0	0	0	
	AO 27-188528		6	0	0	0	0	
PROCESS EQUIPMENT PLANT		OPERATING MODE	7	0	0	0	0	
CEMENT - POWER - LINE		*	8	0	0	0	0	
CONTROL EQUIPMENT		OPERATING MODE	9	0	0	0	0	
BAGHOUSE		71% ^{SPEED} REMAINS	10	0	0	0	0	
DESCRIBE EMISSION POINT			11	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			12	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL			13	0	0	0	0	
START 300' STOP 300'			14	0	0	0	0	
HEIGHT RELATIVE TO OBSERVER			15	0	0	0	0	
START 300' STOP 300'			16	0	0	0	0	
DISTANCE FROM OBSERVER			17	0	0	0	0	
START 1000' STOP 1000'			18	0	0	0	0	
DIRECTION FROM OBSERVER			19	0	0	0	0	
START NW STOP NW			20	0	0	0	0	
DESCRIBE EMISSIONS			21	0	0	0	0	
START STOP			22	0	0	0	0	
EMISSION COLOR			23	0	0	0	0	
START CLEAR STOP CLEAR			24	0	0	0	0	
PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>			25	0	0	0	0	
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>			26	0	0	0	0	
IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>			27	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			28	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			29	0	0	0	0	
DESCRIBE BACKGROUND			30	0	0	0	0	
START CLOUDS STOP CLOUDS								
BACKGROUND COLOR								
START GREY STOP BLUE								
SKY CONDITIONS								
START SCATT. STOP SCATT								
WIND SPEED								
START 5-7 STOP 10-12								
WIND DIRECTION								
START SW STOP SSW								
AMBIENT TEMP.								
START 94° STOP 95°								
WET BULB TEMP.								
RH. percent								

Source Layout Sketch

Draw North Arrow



COMMENTS

* CEMENT - 126 TPH

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E. Jones

DATE

29 JULY 92

ORGANIZATION

KOOGLER & ASSOC.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE

TITLE

DATE

CERTIFIED BY

DATE



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

CONTINUED ON VEO FORM NUMBER *Env#1*

2 9 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME		END TIME	
FLORIDA CRUSHED STONE CO.			29 JULY 92				1130		1230	
ADDRESS			SEC	0	15	30	45	COMMENTS		
P.O. Box 1528 / 10311 CEMENT PLANT RD			MIN							
HERNANDO COUNTY			1	0	0	0	0			
CITY	STATE	ZIP	2	0	0	0	0			
BROOKSVILLE	FL.	34601	3	0	0	0	0			
PHONE	SOURCE ID NUMBER		4	0	0	0	0			
	AC 27-118614		5	0	0	0	0			
PROCESS EQUIPMENT		OPERATING MODE	6	0	0	0	0			
C-P-L PLANT		*	7	0	0	0	0			
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	0			
BAGHOUSE		71% DEMAND	9	0	0	0	0			
DESCRIBE EMISSION POINT			10	0	0	0	0			
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0			
HEIGHT ABOVE GROUND LEVEL			12	0	0	0	0			
START 300' STOP 300'			13	0	0	0	0			
DISTANCE FROM OBSERVER			14	0	0	0	0			
START 1000' STOP 1000'			15	0	0	0	0			
DIRECTION FROM OBSERVER			16	0	0	0	0			
START NW STOP NW			17	0	0	0	0			
DESCRIBE EMISSIONS			18	0	0	0	0			
START STOP			19	0	0	0	0			
EMISSION COLOR			20	0	0	0	0			
START CLEAR STOP CLEAR			21	0	0	0	0			
WATER DROPLETS PRESENT:			22	0	0	0	0			
NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>			23	0	0	0	0			
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			24	0	0	0	0			
START 30' ABOVE STACK STOP 30' ABOVE STACK			25	0	0	0	0			
DESCRIBE BACKGROUND			26	0	0	0	0			
SKY W/ MOVING CLOUDS STOP CLOUDS			27	0	0	0	0			
BACKGROUND COLOR			28	0	0	0	0			
START BLUE STOP BLUE			29	0	0	0	0			
WIND SPEED			30	0	0	0	0			
START 5-7 W/ GUST STOP 10-12										
WIND DIRECTION										
START SW STOP SW										
AMBIENT TEMP.										
START 94° STOP 95°										
WET BULB TEMP.										
RH, percent										
Source Layout Sketch										
Draw North Arrow										
COMMENTS										
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS			OBSERVER'S NAME (PRINT)							
SIGNATURE			TREG E. JONES							
TITLE			OBSERVER'S SIGNATURE				DATE			
DATE			TREG E. Jones				29 JULY 92			
			ORGANIZATION							
			KOOGLER & ASSOC.							
			CERTIFIED BY				DATE			



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

CONTINUED ON VEO FORM NUMBER *Env#2*

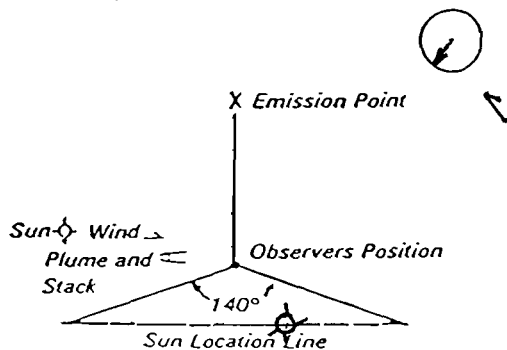
1 of 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			29 JULY 92				1511	1611
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. BOX 1508 / 10311 CEMENT PLANT RD.			MIN					
HERLANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	AC 57-118614 & AD 57-183528		5	0	0	0	0	
PROCESS EQUIPMENT PLANT		OPERATING MODE	6	0	0	0	0	
CEMENT - POWER - LINE		*	7	0	0	0	0	
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	0	
BAGHOUSE		71% SPEED	9	0	0	0	0	
DESCRIBE EMISSION POINT			10	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL			12	0	0	0	0	
START 300' STOP 300'			13	0	0	0	0	
HEIGHT RELATIVE TO OBSERVER			14	0	0	0	0	
START 250' STOP 250'			15	0	0	0	0	
DISTANCE FROM OBSERVER			16	0	0	0	0	
START 1000' STOP 1000'			17	0	0	0	0	
DIRECTION FROM OBSERVER			18	0	0	0	0	
START SE STOP SE			19	0	0	0	0	
DESCRIBE EMISSIONS			20	0	0	0	0	
START STOP			21	0	0	0	0	
EMISSION COLOR			22	0	0	0	0	
START CLEAR STOP CLEAR			23	0	0	0	0	
PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>			24	0	0	0	0	
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>			25	0	0	0	0	
IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>			26	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			27	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			28	0	0	0	0	
DESCRIBE BACKGROUND			29	0	0	0	0	
START SKY ^W /HIGH CLOUDS STOP SKY ^W /HIGH CLOUDS			30	0	0	0	0	
BACKGROUND COLOR								
LT BLUE LT BLUE SKY CONDITIONS								
START WHITE STOP WHITE START SCATT. STOP SCATT.								
WIND SPEED								
START 5-7 STOP 5-7 WIND DIRECTION								
START W STOP W								
AMBIENT TEMP.								
START 95° STOP 95° WET BULB TEMP. RH, percent								

Source Layout Sketch

Draw North Arrow



COMMENTS

* CEMENT - 130 TPD

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE

TITLE

DATE

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E. Jones

DATE

29 JULY 92

ORGANIZATION

KOOGLER & ASSOC.

CERTIFIED BY

DATE



ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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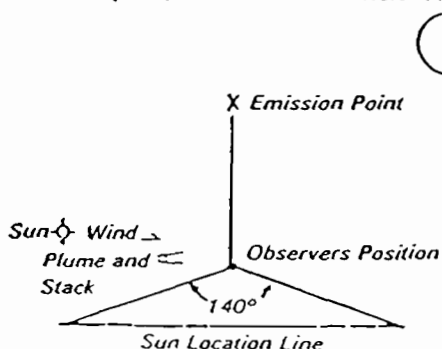
CONTINUED ON VEO FORM NUMBER Run # 2 2 OF 2

Visible Emission Observation Form

SOURCE NAME			OBSERVATION DATE				START TIME	END TIME
FLORIDA CRUSHED STONE CO.			29 July 92				1511	1611
ADDRESS			SEC	0	15	30	45	COMMENTS
P.O. Box 1508 / 10311 CEMENT PLANT RD.			MIN					
HERNANDO COUNTY			1	0	0	0	0	
CITY	STATE	ZIP	2	0	0	0	0	
BROOKSVILLE	FL.	34601	3	0	0	0	0	
PHONE	SOURCE ID NUMBER		4	0	0	0	0	
	AC 27-118674 & AO 27-183508		5	0	0	0	0	
PROCESS EQUIPMENT		OPERATING MODE	6	0	0	0	0	
C-P-L Plant			7	0	0	0	0	
CONTROL EQUIPMENT		OPERATING MODE	8	0	0	0	0	
BAGHOUSE		71 % SPEED DEMAND	9	0	0	0	0	
DESCRIBE EMISSION POINT			10	0	0	0	0	
START TOP OF STACK STOP TOP OF STACK			11	0	0	0	0	
HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER			12	0	0	0	0	
START 300' STOP 300' START 250' STOP 250'			13	0	0	0	0	
DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER			14	0	0	0	0	
START 1000' STOP 1000' START SE STOP SE			15	0	0	0	0	
DESCRIBE EMISSIONS			16	0	0	0	0	
START STOP			17	0	0	0	0	
EMISSION COLOR PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/>			18	0	0	0	0	
START CLEAR STOP CLEAR			19	0	0	0	0	
WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/>			20	0	0	0	0	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED			21	0	0	0	0	
START 30' ABOVE STACK STOP 30' ABOVE STACK			22	0	0	0	0	
DESCRIBE BACKGROUND			23	0	0	0	0	
START SKY W/ HIGH CLOUDS STOP SKY W/ HIGH CLOUDS			24	0	0	0	0	
BACKGROUND COLOR SKY CONDITIONS			25	0	0	0	0	
START LT. BLUE STOP LT. BLUE			26	0	0	0	0	
START WHITE STOP WHITE			27	0	0	0	0	
WIND SPEED WIND DIRECTION			28	0	0	0	0	
START 5-7 STOP 5-7 START W STOP W			29	0	0	0	0	
AMBIENT TEMP. WET BULB TEMP. RH, percent			30	0	0	0	0	
START 95° STOP 95°								

Source Layout Sketch

Draw North Arrow



COMMENTS

OBSERVER'S NAME (PRINT)

TREG E. JONES

OBSERVER'S SIGNATURE

Treg E. Jones

DATE

29 July 92

ORGANIZATION

KOOGLER & ASSOC.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE

TITLE

DATE

CERTIFIED BY

DATE

PLANT INFORMATION



TIRE TESTING

DATE: JULY 28, 1992 TDF TEST

		KILN FEED (TPH)	CLINKER (TPH)	
TIME	COAL (TPH)	SET POINT	SET POINT	TIRES (TPH)
8 AM	7.5	120	78	1.33
9	7.2	117.8	76.6	"
10	7.8	115.4	75	"
11	8.0	116.4	75.6	"
12 PM	7.5	117.3	76.3	"
1	7.5	117.8	76.6	"
2	7.5	118.8	77.2	"
3	7.2	119.1	77.4	"
4	7.6	116.9	75.9	"
5	7.5	117.3	76.3	"
6	7.4	117.8	76.6	"
7	7.4	117.8	76.6	"
8	7.4	117.8	76.6	"
9	7.1	115.9	75.3	"
10	7.5	115.4	75	"
11	7.2	115.4	75	"
12 AM	7.2	116.4	75.6	"
1	7.2	115.4	75	"
2	6.9	114.4	74.3	"
3	6.7	112.8	73.3	"
4	7.4	112.8	73.3	"
5	7.1	112.8	73.3	"
6	7.2	112.8	73.3	"
7	7.2	113.9	74	"
8 AM	7.3	116.4	75.6	1.33
ACT.24 HR/AVG.	7.37	115.6	75.2	1.30
NOTES:				

TIRE TESTING

DATE: JULY 29, 1992 TDF TEST

TIME	COAL (TPH)	KILN FEED (TPH) SET POINT	CLINKER (TPH) SET POINT	TIRES (TPH)
8 AM	7.48	120	78	1.33
9	7.0	116.4	75.6	"
10	6.7	113.9	74	"
11	7.1	114.4	74.3	"
12 PM	7.2	117.3	76.3	"
1	7.4	118.8	77.2	"
2	7.4	119.6	77.7	"
3	7.4	120	78	"
4	7.4	120	78	"
5	6.9	120	78	"
6	6.9	120	78	"
7	6.9	120	78	"
8	6.9	120	78	"
9	—	—	—	"
10	6.9	115.4	75	"
11	—	—	—	"
12 AM	7	110	71.5	"
1	—	—	—	"
2	6.9	112.8	73.3	"
3	—	—	—	"
4	6.7	115.4	75	"
5	—	—	—	"
6	7.1	112.8	73.3	"
7	—	—	—	"
8 AM	6.7	112.8	73.3	1.33
ACT.24 HR/AVG.	6.96	115.7	75.2	1.31
NOTES:				

RUSHED STONE CONTROL REPORT

SiO₂
At Fe (C₃S) ~ CAO - (~ Al₂O₃ + ~ Fe₂O₃ + ~ SO₃ + ~ MgO)

DATE 7-28-92 KF# 5595

COAL

TIME	FINISH MILL CONTROL															SHIFT:	H2O	+ 50	SULFUR	-200	
	SILO NO.	FREE CaO	LOSS	SURF AREA	% SO ₃	325	FLOW	PUMP FLOW	SP.G. G.A.		CAO	MGO	K ₂ O	C ₃ S	C ₂ S	C ₃ A	1st				
																	2nd				
7AM	1		1.6	3600	2.77	95.7					64.8	.77	.45	56.8	17.9	6.2	2nd	1.41	.24	.748	88.7
9AM	1		1.8	3670	2.94	95.4					64.5	.79	.52	54.9	19.4	6.3	3rd				
11AM	1		1.8	3710	2.91	95.6					64.3	.79	.53	53.7	22.3	6.2					
2PM				3600																	
4PM																					
6PM																					
8PM																					
10PM			1.7	4190	3.01	92.7		—	—		64.0	.79	.53	52.1	21.9	6.2					
12AM	2		—	4200	3.12	—	2020	.356	1.038	—	64.0	.79	.53	51.9	21.9	6.1					
1AM	2		1.7	3760	3.02	92.0	—	.33	—		64.0	.79	.55	52.4	21.5	6.1					
3AM	2		1.6	3720	2.86	96.8	—	.33	—		64.1	.79	.54	52.8	21.3	6.2					
5AM	2		1.5	3760	2.93	92.2	—	.33	—		64.1	.80	.54	52.8	21.3	6.2					
AVG.																					

MIXMEN NOTES:

MIXMEN
NOTES:

CLINKER CONTROL

TIME	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	SO ₃	SIM	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	L.S.F.	TOTAL	SILO	K ₂ O	CL.	TEMP.
7 AM	21.3	5.21	4.18	65.3	.88	.68	2.3	60.8	15.3	6.7	12.7	94.3	98.2	HQ	.56	.010	
9 AM	21.4	5.16	4.13	65.4	.87	.89	2.3	60.6	15.7	6.7	12.6	94.2	98.7	HQ	.70	.000	
11 AM	21.6	5.03	4.21	65.2	.87	.89	2.3	59.3	17.1	6.2	12.2	93.4	92.7	HQ	.66	.000	
1 PM	21.4	5.16	4.19	65.9	.87	.48	2.3	63.8	13.1	6.6	12.8	95.3	92.4	HQ	.43	.000	
3 PM	21.4	5.20	4.23	65.5	.86	.76	2.3	61.4	15.0	6.6	12.9	94.5	98.6	HQ	.60	.003	
5 PM	21.5	5.00	3.96	65.9	.82	.85	2.4	63.2	14.0	6.6	12.1	94.9	98.9	HQ	.64	.006	
7 PM	21.3	5.20	4.24	66.0	.87	.58	2.3	64.3	12.6	6.6	12.9	95.6	98.9	HQ	.53	.008	
9 PM	21.1	5.27	4.25	66.2	.87	.59	2.2	65.8	10.9	6.7	13.1	96.4	98.9	HQ	.51	.003	
11 PM	21.1	5.30	4.19	66.3	.85	.65	2.2	66.4	10.4	7.0	12.8	96.7	98.9	HQ	.44	.002	
1 AM	21.2	5.08	4.19	66.1	.82	.95	2.3	65.0	11.8	6.4	12.8	95.9	99.1	HQ	.57	.002	
3 AM	21.2	5.15	4.17	65.9	.82	1.08	2.3	63.7	12.7	6.6	12.7	95.5	99.0	HQ	.54	.008	
5 AM	21.2	5.22	4.30	66.2	.80	.61	2.2	65.6	11.2	6.6	13.1	96.2	98.8	HQ	.38	.013	
AVG.																	

CLINKER

TIME
% F. LIME

7AM	.31
9AM	.22
11AM	1.02
1PM	.19
3PM	.09
5PM	.43
7PM	.36
9PM	.23
11PM	.23
1AM	.18
3AM	.32
5AM	.35

KILN FEED

SHIFT	SO ₃	+70	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	TOTAL	L.S.F.	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	CL.
1st AM	.38 .36	.92	13.6 13.9	3.21 3.10	2.43 2.42	43.2 43.1	.47	76.8 76.2	99.2 97.5	73 70	—	6.77 6.34	—	.092 .095
2nd AM	.32 .32	1.08	13.4 13.7	3.33 3.27	2.43 2.43	43.2 43.2	.46	76.8 76.2	100.1 99.6	73 73	—	7.26 6.40	—	.095 .099
3rd AM	.34 .42	.82	14.0 12.9	3.30 3.27	2.45 2.38	42.9 44.7	.50 .48	76.8 76.8	106.6 106.6	64 86	—	7.37 7.4	—	.095 .108

BLAINE

1	2
3650	3950
3750	4050

CONTROL TESTS

QUALITY CONTROL TECHNICIANS

AC

Rich

P.L.

TARGETS

[illegible]

RUSHED STONE CONTROL REPORT

DATE 7-29-92 KF# 8493

COAL

TIME	FINISH MILL CONTROL															SHIFT:	H2O	+ 50	SULFUR	-200	
	SILO NO.	FREE C=O	LOSS	SURF AREA	% SO ₃	325	FLOW	PUMP FLOW	SP.G. G.A.		CAO	MGO	K ₂ O	C ₃ S	C ₂ S	C ₃ A	1st				
3AM	2		1.6	3910	2.67	97.0					64.1	.80	.51	53.0	21.2	6.2	2nd	1.372	.22	.774	87.6
9AM	2		1.6	3960	2.84	97.5					64.0	.81	.54	51.9	22.1	6.2	3rd	1.36	.25	.770	84.2
11AM					↓ @	10:45															
12PM																					
2PM																					
4PM																					
6PM																					
8PM																					
10PM																					
11AM	1		1.3	3970	2.95	97.1	8100	.38	1.038		63.9	.80	.55	51.2	22.7	6.1					
2AM	1		1.6	3740	2.95	96.3	—	.35	—		63.9	.80	.54	51.7	22.2	6.2					
4AM	1		1.7	3730	2.83	96.1	—	.35	—		64.1	.80	.53	52.8	21.3	6.1					
6AM	1		1.5	3800	2.87	96.5	—	.35	—		64.1	.79	.51	53.5	20.6	6.1					
AVG.																					
MIXMEN NOTES: RM ↓ 11:50 AM Reclaimer RM ↓ 2:05 AM																					

MIXMEN
NOTES:

RM ↓ 11:50 AM Reclaimer

RM ↓ 2:05 AM

CLINKER CONTROL

TIME	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	SO ₃	S/M	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	L.S.F.	TOTAL	SILO	K ₂ O	CL.	TEMP.
7AM	21.0	5.31	4.38	66.4	.90	.59	2.2	67.3	9.4	6.7	13.3	97.1	99.0	HQ	.40	.002	
9AM	21.2	5.15	4.28	66.7	.88	.82	2.3	68.9	9.8	6.4	13.0	97.3	98.8	HQ	.32	.004	
11AM	20.9	5.33	4.14	66.1	.91	.76	2.2	66.4	10.0	7.1	12.6	96.9	98.9	HQ	.161	.002	
1PM	20.8	5.34	4.39	65.3	.90	1.23	2.1	61.9	13.1	6.7	13.4	95.3	98.7	HQ	.66	.002	
3PM	21.0	5.37	4.59	65.9	.90	.46	2.1	64.8	11.3	6.47	14.0	96.1	98.7	HQ	.39	.001	
5	20.8	5.51	4.76	66.1	.91	.34	2.0	66.5	9.40	6.55	14.5	97.0	98.9	HQ	.34	.002	
7	21.0	5.25	4.50	65.5	.87	1.21	2.15	61.9	13.5	6.30	13.7	95.0	99.0	HQ	.68	.004	
9	21.1	5.19	4.31	66.2	.87	.83	2.22	66.0	10.7	6.47	13.1	96.4	99.1	HQ	.57	.003	
11PM	21.1	5.11	4.49	66.2	.83	.82	2.2	65.6	11.1	6.0	13.7	96.1	99.1	HQ	.44	.006	
1AM	21.0	5.07	4.15	66.5	.83	.92	2.3	68.5	8.7	6.4	12.6	97.4	99.1	HQ	.50	.010	
3AM	21.1	5.16	4.42	67.1	.86	.30	2.2	71.3	6.6	6.2	13.5	98.3	99.1	HQ	.20	.002	
5AM	21.0	5.03	4.43	66.6	.82	.95	2.2	68.4	8.7	5.8	13.5	97.2	99.5	HQ	.50	.011	
AVG.																	

CLINKER

TIME	% F. LIME
7AM	.13
9AM	.13
11AM	.15
12PM	.11
2PM	.12
3PM	.12
6PM	.25
8PM	.23
10PM	.30
12AM	.42
2AM	.83
4AM	.22
6AM	.63
AVG.	

KILN FEED

SHIFT	SO ₃	+70	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MGO	TOTAL	L.S.F.	C ₃ S	C ₂ S	C ₃ A	C ₄ AF	CL.
8AM 1st	.39	.91	13.7	3.50	2.53	43.2	.50	76.0	98.0	64	—	71.64	—	.030
	.41		13.4	3.25	2.40	43.7	.47	77.3	101.7	78	—	7.00	—	.105
5PM 2nd	.37	.73	13.6	3.23	2.43	43.3	.48	77.0	99.6	74	—	—	—	.076
	.32		14.1	3.36	2.64	43.5	.48	77.5	101.1	67	—	—	—	.096
11PM 3rd	.39	.81	13.5	3.34	2.30	44.2	.47	77.4	102.5	80	74	7.4	—	.102
	.39		13.9	3.27	2.33	44.0	.47	77.4	99.4	80	74	—	—	.102
AVG.														

BLAINE

1	2
3650	3950
3750	4050

TIME	RAW MILL FEEDERS										CONTROL TESTS										
					C ₃ A	S/R	SO ₃	SiO ₂	Al ₂ O ₃	AVG.	Fe ₂ O ₃	AVG.	CAO	C ₃ S	AVG	CL.	+70	SILO	TPH	T.T.	HRS
7AM					8.1	1.9	.43	12.9	3.91	—	3.01	—	43.8	77	—	.095	1.2	2	150	150	1
8AM					10.4	2.0	.42	12.4	4.36	4.11	1.96	2.46	44.4	84	80	.101	.87	2	150	300	2
9AM					11.5	2.0	.41	12.4	4.56	4.28	1.84	2.25	44.2	81	80	.103	1.0	2	150	450	3
10AM					11.1	2.1	.36	16.2	4.08	4.22	2.43	2.35	42.2	27	67	.095	.89	2	150	600	4
11AM					5.9	2.5	.38	14.0	3.74	3.24	3.35	2.82	43.2	61	77	.083	1.3	1	150	2250	15
12PM	14.0 14.4	3.30 3.31	2.28 2.42	73 66	6.1	2.6	.39	16.0	3.20	3.24	1.59	2.74	43.6	58	75	.091	1.3	1	150	2400	16
1PM					10.5	2.4	.39	15.5	2.95	3.97	1.41	2.39	44.0	61	66	.096	.75	2	150	750	5
2PM					9.8	2.5	.41	12.3	2.71	3.76	1.84	2.30	45.6	110	73	.101	.93	2	150	900	6
3PM					8.95	2.46	.40	10.9	2.46	3.57	1.39	2.31	46.3	132	81	.103	.89	2	150	1050	7
4PM					8.94	2.44	.45	11.6	2.47	3.43	1.62	2.35	45.9	120	85	.111	.92	2	150	1200	8
5PM					7.89	2.44	.50	16.4	3.34	3.42	3.29	2.45	40.4	32	79	.107	1.4	2	150	1350	9
6PM	13.5 13.6	3.46 3.45	2.50 2.47	77 76	7.58	2.45	.51	15.2	3.06	3.38	1.97	2.50	43.4	56	77	.103	1.2	2	150	1500	10
7PM					5.11	2.22	.48	13.2	3.09	—	2.88	—	44.4	85	—	.096	1.0	1	150	150	1
8PM					6.74	2.56	.47	10.4	2.92	3.01	1.36	2.12	45.8	108	97	.096	1.3	1	150	300	2
9PM					8.56	2.54	.45	13.3	3.91	3.31	1.44	1.89	44.2	78	91	.080	1.4	1	150	450	3
10PM					10.2	2.38	.40	14.9	5.32	3.81	2.46	2.03	41.5	25	75	.044	2.2	1	150	600	4
11PM					9.5	2.2	.32	13.8	4.37	3.92	4.27	2.48	42.0	47	69	.065	1.7	1	150	750	5
12AM	13.2 13.2	3.24 3.71	2.70 2.60	81 84	8.3	2.0	.27	13.3	3.75	3.89	5.06	2.91	42.5	61	68	.060	1.4	1	150	900	6
1AM																					
2AM																					
3AM					8.6	2.0	.54	12.5	4.10	3.92	2.51	2.85	44.1	82	70	.113	.60	1	150	1050	7
4AM					9.0	2.0	.46	13.6	4.38	3.98	2.37	2.79	43.5	63	69	.101	1.0	1	150	1200	8
5AM					8.3	2.1	.21	12.3	2.00	3.76	2.22	2.73	46.1	119	75	.074	.80	1	150		

1st 20

2nd 4/12

3rd 122

[illegible]

Best Available Copy



FLORIDA CRUSHED STONE COMPANY

CEMENT / POWER / LIME PLANT

AUGUST 4, 1992

Mr. C.S. Lee, Air Compliance Engineer
Florida Department of Environmental
Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Dear Mr. Lee:

TDF Testing started at 8:00 AM on July 23, 1992 and stopped at 11:15 PM on July 30, 1992, due to a Kiln outage for full silos. Tentatively, TDF Testing will resume on August 8, 1992.

BAS/4NC

7-21	8.73	-0-	1206	78.4	
7-22	8.48	-0-	119.6	76.7	
<u>DATE</u>	<u>Kiln Op. HRS.</u>	<u>COAL AVG. TPH</u>	<u>TDF AVG. TPH</u>	<u>KILN FEED AVG. TPH</u>	<u>CLK. PROD. AVG. TPH</u>
7-23	24.0	8.54	.87	119.6	77.7
7-24	24.0	8.31	1.01	108.9	70.8
7-25	24.0	8.48	.63	114.3	74.3
7-26	24.0	8.07	1.08	117.9	76.6
7-27	24.0	7.64	1.30	117.5	76.4
7-28	24.0	7.37	1.30	115.6	75.2
7-29	24.0	6.96	1.31	115.7	75.2
7-30	14.6	6.75	1.33	115.6	75.2

If you have any questions, please give me a call.

Sincerely,

A handwritten signature in cursive script that reads "Charles E. Allen".

Charles E. Allen
Cement Plant Manager

CEA:sf

Best Available Copy



FLORIDA CRUSHED STONE COMPANY
CEMENT / POWER / LIME PLANT

AUGUST 14, 1992

Mr. C.S. Lee, Air Compliance Engineer
Florida Department of Environmental
Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Dear Mr. Lee:

Kiln start-up occurred on August 8, 1992 with TDF firing
resuming on August 10, 1992.

<u>DATE</u>	<u>KILN OPER. HOURS</u>	<u>COAL AVG.TPH</u>	<u>TDF AVG.TPH</u>	<u>KILN FEED AVG.TPH</u>	<u>CIKR. PROD. AVG.TPH</u>
8-8	17.8	8.47	-0-	115.4	75
8-9	24.0	8.48	-0-	120	78
8-10	24.0	7.66	.70	120	78
8-11	24.0	7.70	.73	119.3	77.6
8-12	20.4	7.37	.89	115.6	75.2
8-13	24.0	7.5	1.25	118.6	77.1

If you have any questions, please give me a call.

Sincerely,

Charles E. Allen
Cement Plant Manager

CEA:sf



FLORIDA CRUSHED STONE COMPANY
CEMENT / POWER / LIME PLANT

AUGUST 24, 1992

Mr. C.S. Lee, Air Compliance Engineer
Florida Department of Environmental
Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Dear Mr. Lee:

Kiln operations for the last seven (7) days.

<u>DATE</u>	<u>KILN OPER. HOURS</u>	<u>COAL AVG.TPH</u>	<u>TDF AVG.TPH</u>	<u>KILN FEED AVG.TPH</u>	<u>CLKR. PROD. AVG.TPH</u>
8-14	20.8	7.54	1.09	117.2	74.2
8-15	24.0	6.7	1.25	118.7	77.2
8-16	24.0	7.06	1.31	117.1	76.1
8-17	24.0	7.67	1.21	118.2	76.9
8-18	24.0	7.47	1.25	119.0	77.4
8-19	24.0	7.05	1.30	118.2	76.8
8-20	24.0	7.8	1.30	119.0	77.3

If you have any questions, please give me a call.

Sincerely,

Charles E. Allen
Cement Plant Manager

CEA:sf



FLORIDA CRUSHED STONE COMPANY
CEMENT / POWER / LIME PLANT

August 31, 1992

Mr. C. S. Lee, Air Compliance Engineer
Florida Department of Environmental
Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Dear Mr. Lee:

Kiln operations for the last seven (7) days were as follows:

<u>DATE</u>	<u>KILN OPER HOURS</u>	<u>COAL AVG.TPH</u>	<u>TDF AVG.TPH</u>	<u>KILN FEED AVG.TPH</u>	<u>CKR PROD AVG.TPH</u>
8-21	24.0	8.9	1.04	117.7	76.5
8-22	24.0	9.1	.97	117.0	76.0
8-23*	24.0	10.25	.92(5 HRS)	120.2	78.1
8-24*	24.0	8.9	.96(11.8 HRS)	119.3	77.5
8-25	24.0	6.5	1.1	115.6	75.2
8-26	24.0	6.0	1.31	115.5	75.1
8-27	24.0	6.9	1.21	115.3	74.9

* On 8-23 tires were fed for only five hours.

* On 8-24 tires were fed for eleven and eight tenths hours.

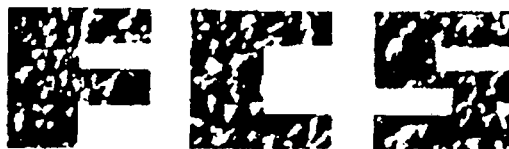
If you have any questions, please give me a call.

Sincerely,

Charles E. Allen
Cement Plant Manager

CEA:sf

Best Available Copy



FLORIDA CRUSHED STONE COMPANY
CEMENT / POWER / LIME PLANT

September 8, 1992

Mr. C. S. Lee, Air Compliance Engineer
Florida Department of Environmental
Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Dear Mr. Lee:

The Kiln was shut down on August 31, 1992 due to inventory levels. Projected start up is September 10, 1992.

<u>DATE</u>	<u>KILN OPER HOURS</u>	<u>COAL AVG.TPH</u>	<u>TDF AVG.TPH</u>	<u>KILN FEED AVG.TPH</u>	<u>CLKR PROD AVG.TPH</u>
8-28	24.0	7.02	1.28	115.5	75.1
8-29	24.0	7.31	1.32	115.9	75.3
8-30	24.0	7.06	1.26	117.2	76.2
8-31*	15.3	7.52	1.33	118.0	76.7

* On 8-31 tires were fed for only fourteen hours.

If you have any questions, please give me a call.

Sincerely,

A handwritten signature in cursive script that reads 'Charles E. Allen'.

Charles E. Allen
Cement Plant Manager

CEA:sf

TDF: 10:00 - 11:00

~ 110 lbs/hr

9:00, 10:00, 11:00, 2:00, 4:00, 5:00

PRINT OUTS

#1 Run: 8:10 - 10:22 p.m.

#2 Run: 12:02 - 2:34 p.m.

(1:22) p.m.

#3 Run: 3:30 - 6:00 p.m.

(4:5) p.m.

7-28-92

Mine Plant

	#1	#2	#3
coal feed rate (t/hr)	26,000	22,000	24,000
limestone " " (TPH)	20.0	20.0	20.0

Power Plant

coal feed rate (t/hr)	96,000	97,000	97,000
load (MW)	110.6	111.0	110.7

Grunt Plant

coal feed rate (TPH)	7.2	7.5	7.5
TDF " " (TPH)	1.33	1.33	1.33
PH lit " " (TPH)	125.0	122.5	123.0
elicker prod. rate (TPH)	75	75.8	76.9

Boilerhouse

inlet Temp (°F)	409.5	397.0	405.0
fan speed (%)	72.0	72.0	70.0
fan current (amps)	3217	3193	3111
ΔP (in-H ₂ O)	7.3	7.6	7.5

Grunt Plant Fan

inlet Temp (°F)	772	762	762
fan current (amps)	116.8	115.9	121.1
damper setting (%)	54.8	54.8	54.8
O ₂ (%)	4.45	4.19	4.64
CO (ppm)	209.1	184.4	139.3

Pre-Heater

Exit gas Temp (°F)	797	798	788
internal gas Temp (°F)	1516	1517	1516
raw mill Temp (°F)	1322	1321	1294

Kiln Inlet

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
Gas Temp (°F)	1510✓ 1599✓	1604.5	1613✓ 1607✓	1610	1626✓ 1598✓	1612
Draft (in-H ₂ O)	0.58✓ 0.76✓	0.67	0.70✓ 0.75✓	0.73	0.67✓ 0.81✓	0.74
O ₂ (%)	1.72✓ 0.69✓	0.98	1.54✓ 1.47✓	1.51	0.87✓ 1.20✓	1.035
combustibles (%)	0.08✓ 0.04✓	0.095	0.06✓ 0.04✓	0.05	0.06✓ 0.02✓	0.04

Stack

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
O ₂ (%)	6.32✓ 6.33✓	6.33✓	6.32✓ 6.32✓	6.32	6.33✓ 6.33✓	6.33
NO _x (ppm)	148.8✓ 129.6✓	139.2	179.6✓ 148.9✓	164.0	147.3✓ 159.1✓	153.2
Opacity (%)	4.7✓ 3.3✓	4.0	3.7✓ 4.2✓	4.0	4.9✓ 3.8✓	4.35
velocity head stack test						

PRINT OUTS

0, 10:00, 1:00, 2:00, 4:00, 5:00

7-29-92

#1 Run: 8:51 - 11:12 a.m.

Data 2

(4:10) a.m.

#2 Run: 12:28 - 2:47

(1:2) p.m.

#3 Run: 4:00 -

(4:5) p.m.

lime Plant

coal feed rate (lbs/hr)

limestone " " (TPH)

Power Plant

coal feed rate (lbs/hr)

load (MW)

Cement Plant

coal feed rate (TPH)

TOP " " (TPH)

PH ~~with~~ " " (TPH)

clinker prod. rate (TPH)
(to be calc)

Bag house

inlet Temp. (°F)

fan speed (%)

fan current (amps)

ΔP (in-H₂O)

ement Plant Fan

inlet Temp. (°F)

fan current (amps)

damper setting (%)

O₂ (%)

CO (ppm)

Heater

exit gas Temp (°F)

internal gas Temp (°F)

raw mill Temp (°F)

#1	#2	#3	#4	#5
27,000	26,000	27,000	27,000	27,000
29,000	27,000	27,000	27,000	27,000
21.0	22.0	22.0	20.0	20.0
20.0	20.0	20.0	20.0	20.0
96,000	93,000	96,000	96,000	96,000
95,000	97,000	96,000	96,000	96,000
109	109.5	111.5	111.5	111.5
111	108.7	110.7	110.7	111.1
7.0	7.4	7.4	7.4	7.4
6.7	7.4	6.9	6.9	7.15
1.33	1.33	1.33	1.33	1.33
1.33	1.33	1.33	1.33	1.33
122	127	130	130	130
117	129	130	130	130
75.6	77.2	78	78	78
74.0	77.7	77.45	78	78
403.3	395.4	410.4	410.4	411.9
407.3	393.3	413.6	413.6	411.9
71	71	71	71	71
71	71	71	71	71
3110	3124	3166.5	3104.0	3087.5
3108	3149	3166.5	3077.0	3087.5
7.6	7.8	7.45	7.9	7.75
7.7	7.65	7.8	7.9	7.75
752	773	766	757	761
755	759	766	765	761
115.4	118.6	118.6	114.7	117.15
113.3	114.6	118.6	115.6	117.15
54.8	54.8	54.8	54.8	54.85
54.8	54.8	54.8	54.8	54.85
3.50	4.1	4.3	3.8	4.01
3.71	4.2	4.3	4.15	4.01
439.1	263.0	241.0	298.2	302.1
310.4	219.0	241.0	306.0	302.1
774	818	809	793	792
774	800	809	791	792
1514	1519	1519	1519	1519.5
1518	1519	1519	1520	1519.5
1331	1392	1388.5	1372	1381
1250	1385	1388.5	1390	1381

7-29-92
(Data cont.)

Inlet

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
gas Temp (°F)	1674✓ 1599✓	1646.5	1603✓ 1605✓	1601	1639✓ 1598✓	1618.5
draft (in. H ₂ O)	0.60✓ 0.48✓	0.54	0.79✓ 0.91✓	0.80	0.83✓ 0.88✓	0.855
O ₂ (%)	1.54✓ 1.52✓	1.53	1.31✓ 1.21✓	1.26	1.21✓ 1.25✓	1.23
combustibles (%)	0.49✓ 0.33✓	0.41	0.35✓ 0.38✓	0.365	0.30✓ 0.26✓	0.28

Stack

O ₂ (%)	6.32✓ 6.13✓	6.225	6.43✓ 6.07✓	6.25	6.08✓ 6.10✓	6.09
NO _x (ppm)	173.0✓ 183.1✓	188.05	192.4✓ 150.5✓	171.65	169.6✓ 175.5✓	172.05
Opacity (%)	2.7✓ 2.8✓	2.75	2.3✓ 2.7✓	2.45	4.0✓ 3.5✓	3.75
velocity head (stack test)						

COAL AND TDF ANALYSES

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

August 20, 1992

PLEASE ADDRESS ALL CORRESPONDENCE TO:
 16130 VAN DRUNEN RD., P.O. BOX 127
 SOUTH HOLLAND, IL 60473
 TELEPHONE: (708) 331-2900
 FAX: (708) 333-3060

KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
 Koogler & Associates

Kind of sample

reported to us Coal

Sample ID: Coal, Cement Plant

Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 28, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38355

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	6.26	xxxxx
% Carbon	71.53	76.31
% Hydrogen	4.79	5.11
% Nitrogen	1.43	1.53
% Sulfur	0.74	0.79
% Ash	8.85	9.44
% Oxygen(diff)	6.40	6.82
	100.00	100.00
% Chlorine	0.09	0.10

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

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16130 VAN DRUNEN RD., P.O. BOX 127
SOUTH HOLLAND, IL 60473
TELEPHONE: (708) 331-2900
FAX: (708) 333-3060KOOGLER & ASSOCIATES
Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.**Sample identification by**
Koogler & AssociatesKind of sample
reported to us CoalSample ID: Coal, Cement Plant
Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 28, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38355

Page 2 of 2

Dry Basis, ug/gArsenic, As 3
Mercury, Hg 0.05Ignited Basis, ug/gLead, Pb 86
Chromium, Cr 82
Zinc, Zn 87

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

August 20, 1992

PLEASE ADDRESS ALL CORRESPONDENCE TO:
 16130 VAN DRUNEN RD., P.O. BOX 127
 SOUTH HOLLAND, IL 60473
 TELEPHONE: (708) 331-2900
 FAX: (708) 333-3060

KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
 Koogler & Associates

Kind of sample
 reported to us Coal

Sample ID: Coal, Power & Lime Plants
 Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 28, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38356

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	6.76	xxxxxx
% Carbon	71.86	77.07
% Hydrogen	4.73	5.07
% Nitrogen	1.43	1.53
% Sulfur	0.77	0.83
% Ash	8.27	8.87
% Oxygen(diff)	6.18	6.63
	100.00	100.00
% Chlorine	0.11	0.12

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

August 20, 1992

KOOGLER & ASSOCIATES
Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., P.O. BOX 127
SOUTH HOLLAND, IL 60473
TELEPHONE: (708) 331-2900
FAX: (708) 333-3060

Sample identification by
Koogler & Associates

Kind of sample
reported to us Coal

Sample ID: Coal, Power & Lime Plants
Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

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Date sampled July 28, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38356**Page 2 of 2****Dry Basis, ug/g**

Arsenic, As	3
Mercury, Hg	0.18

Ignited Basis, ug/g

Lead, Pb	92
Chromium, Cr	78
Zinc, Zn	95

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgamation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

Member of the SGS Group (Société Générale de Surveillance)

August 20, 1992

PLEASE ADDRESS ALL CORRESPONDENCE TO:
 16130 VAN DRUNEN RD., P.O. BOX 127
 SOUTH HOLLAND, IL 60473
 TELEPHONE: (708) 331-2900
 FAX: (708) 333-3060

KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
 Koogler & Associates

Kind of sample
 reported to us Coal

Sample ID: Coal, Cement Plant

Date: 7/29/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 29, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38357

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	7.09	xxxxxx
% Carbon	69.20	74.48
% Hydrogen	4.66	5.02
% Nitrogen	1.46	1.57
% Sulfur	0.69	0.74
% Ash	9.61	10.34
% Oxygen(diff)	7.29	7.85
	100.00	100.00
% Chlorine	0.09	0.10

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

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Sample identification by
Koogler & Associates

Kind of sample
reported to us Coal

Sample ID: Coal, Cement Plant

Date: 7/29/92

Sample taken at -----

Project No: 307-90-01

Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 29, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38357

Page 2 of 2

Dry Basis, ug/g

Arsenic, As	1
Mercury, Hg	0.10

Ignited Basis, ug/g

Lead, Pb	98
Chromium, Cr	72
Zinc, Zn	102

Method: Arsenic per Graphite Furnace Atomic Absorption.
Mercury per Double Gold Amalgamation, Cold Vapor
Atomic Absorption.
Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

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 FAX: (708) 333-3060

KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us TDF

Sample ID: TDF
Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 28, 1992

Metal Content is 8.84%

Date received August 6, 1992

P.O. No. 080592

Analysis Report No. 71-38359

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	1.07	xxxxx
% Carbon	66.42	67.14
% Hydrogen	6.70	6.77
% Nitrogen	0.66	0.67
% Sulfur	0.98	0.99
% Ash	19.73	19.94
% Oxygen(diff)	4.44	4.49
	100.00	100.00
% Chlorine	0.06	0.06

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

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Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us TDF

Sample ID: TDF
Date: 7/28/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS
Location: Brooksville, FL

Date sampled July 28, 1992

Metal Content is 8.84%

Date received August 6, 1992

P.O. No. 080592

Analysis Report No. 71-38359

Page 2 of 2

As Received

MINERAL ANALYSIS, UG/G

Chromium, Cr	2.0
Lead, Pb	10.0
Zinc, Zn	319.0

Methods: Chromium, Lead and Zinc; Ash digested with
Aqua-regia then analyzed by Atomic Absorption.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1818 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

Member of the SGS Group (Société Générale de Surveillance)

September 3, 1992

KOOGLER & ASSOCIATES
Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

PLEASE ADDRESS ALL CORRESPONDENCE TO:
18130 VAN DRUNEN RD., P.O. BOX 127
SOUTH HOLLAND, IL 60473
TELEPHONE: (708) 331-2900
FAX: (708) 333-3060

Sample identification by
Koogler & Associates

Kind of sample
reported to us TDF

Sample taken at -----

Sample taken by Koogler & Associates

Date sampled July 28, 1992

Date received August 6, 1992

Sample ID: TDF
Date: 7/28/92
Project No: 307-90-01
Project Name: CPL-FCS
Location: Brooksville, FL

Metal Content is 8.84%

P.O. No. 080592

Analysis Report No. 71-38359

Page 1 of 1

TRACE ELEMENT ANALYSIS

<u>Element</u>	<u>Dry Basis, ug/g</u>
Arsenic, As	1
Mercury, Hg	0.03

Method: Arsenic; Graphite Furnace Atomic Absorption
Mercury; Double Gold Amalgamation, Cold Vapor
Atomic Absorption.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

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KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
 Koogler & Associates

Kind of sample
 reported to us Coal

Sample ID: Coal, Power & Lime Plants

Date: 7/29/92

Sample taken at -----

Project No: 307-90-01

Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 29, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38358

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	5.90	xxxxxx
% Carbon	71.32	75.79
% Hydrogen	4.81	5.11
% Nitrogen	1.44	1.53
% Sulfur	0.69	0.73
% Ash	8.80	9.35
% Oxygen(diff)	7.04	7.49
	100.00	100.00
% Chlorine	0.09	0.10

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

**COMMERCIAL TESTING & ENGINEERING CO.**

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TELEPHONE: (708) 331-2900
FAX: (708) 333-3060KOOGLER & ASSOCIATES
Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.Sample identification by
Koogler & AssociatesKind of sample
reported to us CoalSample ID: Coal, Power & Lime Plants
Date: 7/29/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS

Location: Brooksville, FL

Date sampled July 29, 1992

P.O. No. 080592

Date received August 6, 1992

Analysis Report No. 71-38358

Page 2 of 2

Dry Basis, ug/gArsenic, As 1
Mercury, Hg 0.08Ignited Basis, ug/gLead, Pb 88
Chromium, Cr 70
Zinc, Zn 84

Method: Arsenic per Graphite Furnace Atomic Absorption.

Mercury per Double Gold Amalgamation, Cold Vapor
Atomic Absorption.Lead, Chromium and Zinc per Aqua-regia Digestion of
the ash followed by Atomic Absorption Analysis.Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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COMMERCIAL TESTING & ENGINEERING CO.

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 FAX: (708) 333-3060

KOOGLER & ASSOCIATES
 Environmental Services
 4014 NW Thirteenth Street
 Gainesville, FL 32609
 ATTN: N. Mason Joye, Jr.

Sample identification by
 Koogler & Associates

Kind of sample
 reported to us TDF

Sample ID: TDF
 Date: 7/29/92

Sample taken at -----

Project No: 307-90-01
 Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 29, 1992

Metal Content is 21.04%

Date received August 6, 1992

P.O. No. 080592

Analysis Report No. 71-38360

Page 1 of 2

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	0.76	xxxxxx
% Carbon	65.51	66.01
% Hydrogen	6.17	6.22
% Nitrogen	0.51	0.51
% Sulfur	1.23	1.24
% Ash	24.18	24.37
% Oxygen(diff)	<u>1.64</u>	<u>1.65</u>
	100.00	100.00
 % Chlorine	 0.03	 0.03

Respectfully submitted,
 COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory



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Environmental Services
4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us TDF

Sample ID: TDF
Date: 7/29/92

Sample taken at -----

Project No: 307-90-01

Sample taken by Koogler & Associates

Project Name: CPL-FCS
Location: Brooksville, FL

Date sampled July 29, 1992

Metal Content is 21.04%

Date received August 6, 1992

P.O. No. 080592

Analysis Report No. 71-38360

Page 2 of 2

As Received

MINERAL ANALYSIS, UG/G

Chromium, Cr	4.0
Lead, Pb	17.0
Zinc, Zn	712.0

Methods: Chromium, Lead and Zinc; Ash digested with
Aqua-regia then analyzed by Atomic Absorption.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

Best Available Copy

**COMMERCIAL TESTING & ENGINEERING CO.**

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Member of the SGS Group (Société Générale de Surveillance)

September 3, 1992

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4014 NW Thirteenth Street
Gainesville, FL 32609
ATTN: N. Mason Joye, Jr.

Sample identification by
Koogler & Associates

Kind of sample
reported to us TDF

Sample ID: TDF
Date: 7/29/92

Sample taken at -----

Project No: 307-90-01
Project Name: CPL-FCS

Sample taken by Koogler & Associates

Location: Brooksville, FL

Date sampled July 29, 1992

Metal Content is 21.04%

Date received August 6, 1992

P.O. No. 080592

Analysis Report No. 71-38360

Page 1 of 1

TRACE ELEMENT ANALYSIS

<u>Element</u>	<u>Dry Basis, ug/g</u>
Arsenic, As	<1
Mercury, Hg	0.04

Method: Arsenic; Graphite Furnace Atomic Absorption
Mercury; Double Gold Amalgamation, Cold Vapor
Atomic Absorption.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

EQUIPMENT CALIBRATIONS

NOZZLE CALIBRATION

DATE 7-28-92
PLANT NAME Fla. Crushed Stone
LOCATION Brooksville Fla
SOURCE CPZ Stack TDF

Measurement No.

Inside Diameter (inches)

1

0.224

2

0.225

3

0.223

Average

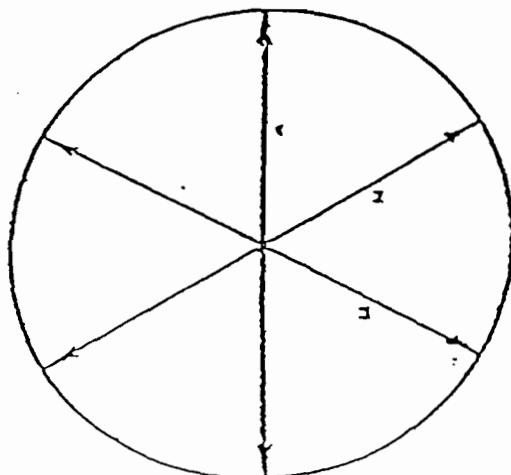
0.224

Area of Nozzle

0.000274 ft²

Calibrated by:

RC Paul



Nozzle X-Section



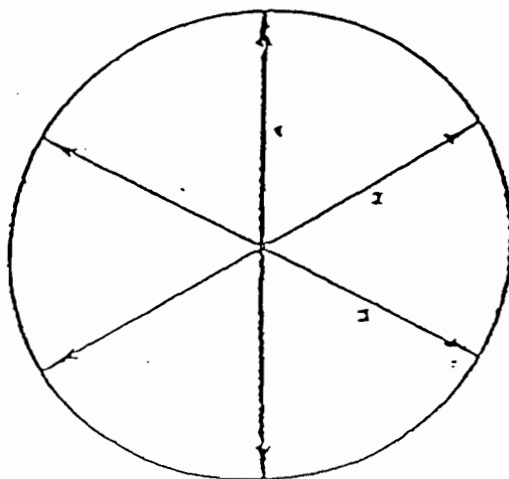
NOZZLE CALIBRATION

DATE 7-29-92
PLANT NAME Fla Crushed Stone
LOCATION Brooksville Fla
SOURCE CPL Stack TDF m-m

<u>Measurement No.</u>	<u>Inside Diameter (inches)</u>
<u>1</u>	<u>0.224</u>
<u>2</u>	<u>0.223</u>
<u>3</u>	<u>0.225</u>

Average 0.224
Area of Nozzle 0.000274 ft²

Calibrated by: RC Paul



Nozzle X-Section



PITOT TUBE CALIBRATION MEASUREMENTS

PITOT TUBE IDENTIFICATION NO. KA-SI

DATE CALIBRATED 11-11-91

PITOT TUBE ASSEMBLY LEVEL ? ☒ YES ☐ NO

PITOT TUBE OPENINGS DAMAGED ? ☐ YES (EXPLAIN BELOW) ☒ NO

$\alpha_1 = 2.5^\circ$ ($< 10^\circ$) $\alpha_2 = 2.0^\circ$ ($< 10^\circ$)

$\beta_1 = 1.5^\circ$ ($< 5^\circ$) $\beta_2 = 2.0^\circ$ ($< 5^\circ$)

$\gamma = 2.0^\circ$, $\theta = 1.5^\circ$, $A = 0.934$ IN. = (PA+PB)

$Z = A \sin \gamma = 0.0326$ IN. (< 0.125 IN.)

$W = A \sin \theta = 0.0245$ IN. (< 0.031 IN.)

$P_A = 0.464$ IN. $P_B = 0.470$ IN.

$D_t = 0.374$ IN. (≥ 0.1875 IN. ≤ 0.3750 IN.)

COMMENTS: Pitot tubes looked OK on test day

CALIBRATION REQUIRED? ☐ YES ☒ NO

CALIBRATED BY: RC Paul

PTCMFORM 1/8/87



POST TEST THERMOCOUPLE
CALIBRATION

DATE 7-28-92

PLANT NAME Fla Crushed Stone

LOCATION Brooksville, Fla

SOURCE CPL Stack (TDF)

Thermocouple Readout # KA-1

Umbilical Cord # 100'

Switch Box # KA-1

Thermocouple # KA-66

Average Stack Temperature °F 346

*Observed Mercury in Glass (ASTM) °F 334

Observed Thermocouple Reading °F 339

Percent Difference $\frac{(ASTM + 460) - (Thermo + 460)}{(ASTM + 460)} \times 100 = \underline{0.76\%}$

Tolerance $\leq 1.5\%$

* Observed temperature must be within ten percent of the average stack temperature.

RC Paul

Signature



POST TEST THERMOCOUPLE
CALIBRATION

DATE 7-29-92
PLANT NAME Fla Crushed Stone
LOCATION Brooksville, Fla
SOURCE CPI Stack - TDF

Thermocouple Readout # KA-1
Umbilical Cord # 100'
Switch Box # KA-1
Thermocouple # KA-77
Average Stack Temperature °F 368
*Observed Mercury in Glass (ASTM) °F 373
Observed Thermocouple Reading °F 377

Percent Difference $\frac{(ASTM + 460) - (Thermo + 460)}{(ASTM + 460)} \times 100 = \underline{0.48\%}$

Tolerance $\leq 1.5\%$

* Observed temperature must be within ten percent of the average stack temperature.

Signature



Best Available Copy

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES ANNUAL THERMOCOUPLE CALIBRATIONS

Umbilical Cord No. 100FT TC No. KA 64	BOX 1						BOX 2					
	STACK		BOX		IMP		STACK		BOX		IMP	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
Ice Bath	35	35	34	34	34	34	35	35	35	34	35	35
Ambient	72	72	72	72	72	72	73	72	73	72	72	72
212°	212	213	213	214	212	213	213	214	213	213	214	214
400°	451	451	451	451	450	450	449	449	448	448	448	448

Thermocouple Readout No. KA-2	UMBILICAL CORD NO. 100						UMBILICAL CORD NO. 200					
	STACK		BOX		IMP		STACK		BOX		IMP	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
Ice Bath	36	35	35	34	35	34	35	34	35	34	35	34
Ambient	72	73	72	73	72	73	73	73	73	73	73	73
212°	212	213	213	214	214	214	212	213	214	214	213	214
400°	452	452	450	450	428	428	451	451	451	451	450	450

Thermocouple Probe No.	TEMPERATURE							
	ICE BATH		AMBIENT		212°		400°	
	TC	ASTM	TC	ASTM	TC	ASTM	TC	ASTM
KA-64	35	35	72	72	212	213	419	419
KA-61	35	34	73	73	214	214	419	419
KA-12	35	34	73	73	215	214	418	418
KA-63	35	35	73	73	213	213	420	420
KA-62	35	34	73	73	213	212	421	422
KA-65	35	34	72	73	215	214	422	422
KA-77	34	34	72	72	213	212	400	400
KA-70	35	34	73	73	213	213	410	412
KA-50	35	35	72	73	214	214	428	428
KA-108	35	35	72	73	215	214	408	409
KA-109	35	35	72	72	215	215	412	412

1 Thermocouple reading (°F)
2 American Society of Testing Materials
Mercury in glass thermometer (°F)

Signature Stephen Bell
Date 10-7-91

POST-TEST DRY GAS METER CALIBRATION FORM

Date: 8-4-92

Meter Box No.: KA1

Plant: Fla Crushed Stone (TDF)

Barometric Pressure, P_b = 30.00 In Hg

Test Meter No.: KA1

Pretest Y : 0.998

Orifice Manometer Selling, (ΔH) In. H ₂ O	Gas Volume		Dry Gas Meter Temperature				Time (θ), Min.	Vacuum Selling In. Hg.	Y_1	$\frac{Y_T P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6}) (t_T + 460)}$
	Test Meter (V_T), Ft.	Dry Gas Meter (V_d), Ft.	Test Meter (t_T), °F	Inlet (t_{d1}), °F	Outlet (t_{d0}), °F	Average (t_d), °F				
1.2	7.698	7.625	83			83	12	6"	1.006	
1.2	7.660	7.603	83			84	12	6"	1.006	
1.2	6.381	6.351	83			85	10	6"	1.005	
									1.0057	

^a If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

V_T = Gas volume passing through the test meter, ft³.

V_d = Gas volume passing through the dry gas meter, ft³.

t_T = Temperature of the gas in the test meter, °F.

t_{d1} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d0} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d1} and t_{d0} , °F.

ΔH = Pressure differential across orifice, In. H₂O

Y_1 = Ratio of accuracy of test meter to dry gas meter for each run.

Y = Average ratio of accuracy of test meter to dry gas meter for all three runs;
tolerance = pretest $Y \pm 0.05Y$.

P_b = Barometric pressure, In. Hg.

θ = Time of calibration run, min.



METER CALIBRATION FORM

GAS METER METHOD

DATE: 6-11-92

METER BOX NO: KA-1

BAROMETRIC PRESSURE: 29.89

TEST Δ HD	ORI- FACE Δ HD	TEST GAS METER VOLUME			DRY GAS METER VOLUME			TEMP OF TEST METER °F	TEMP OF DRY METER °F	RUN TIME MINUTES
		FINAL	INITIAL	ACTUAL FT ³	FINAL	INITIAL	ACTUAL FT ³			
22	.50	680.796	675.302	5.494	101.013	95.482	5.531	82	86	13
23	1.0	712.603	705.307	7.296	133.088	125.693	7.385	82	89	12.5
23	1.6	675.302	667.934	7.368	95.482	88.103	7.379	81	85	10
26	2.5	705.307	696.098	9.209	125.693	116.389	9.304	82	88	10
30	3.5	696.098	680.796	15.302	116.389	101.013	15.376	82	86	14

GAS METER THERMOMETER CALIBRATION

N.B.S. MERCURY °F	METER BOX °F
32	34
44	46
75	75
92	93
101	102

SIGNATURE: RC Paul

DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. KA-1 BAROMETRIC PRESS. 29.89 IN. HG.
 DATE 6/11/92 PERFORMED BY ROC

	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5
VACUUM ("Hg)	0.0	0.0	0.0	0.0	0.0
dHw ("H2O)	-0.22	-0.23	-0.23	-0.26	-0.30
dHd ("H2O)	0.50	1.00	1.60	2.50	3.50
INITIAL WTM	675.302	705.307	667.934	696.098	680.796
FINAL WTM	680.796	712.603	675.302	705.307	696.098
INITIAL DGM	95.48	125.69	88.10	116.39	101.01
FINAL DGM	101.01	133.08	95.48	125.69	116.39
TEMP. WTM (F)	82.00	82.00	81.00	82.00	82.00
TEMP. DGM (F)	86.00	89.00	85.00	88.00	86.00
TEST TIME (MIN.)	13.00	12.50	10.00	10.00	14.00

NET VOLUME WTM	5.494	7.296	7.368	9.209	15.302
NET VOLUME DGM	5.531	7.385	7.379	9.304	15.376
Y	1.000	0.999	1.003	0.995	0.995
dH@	1.597	1.666	1.679	1.676	1.672

AVERAGE Y = 0.998

ACCEPTABLE Y RANGE = 0.978 TO 1.018

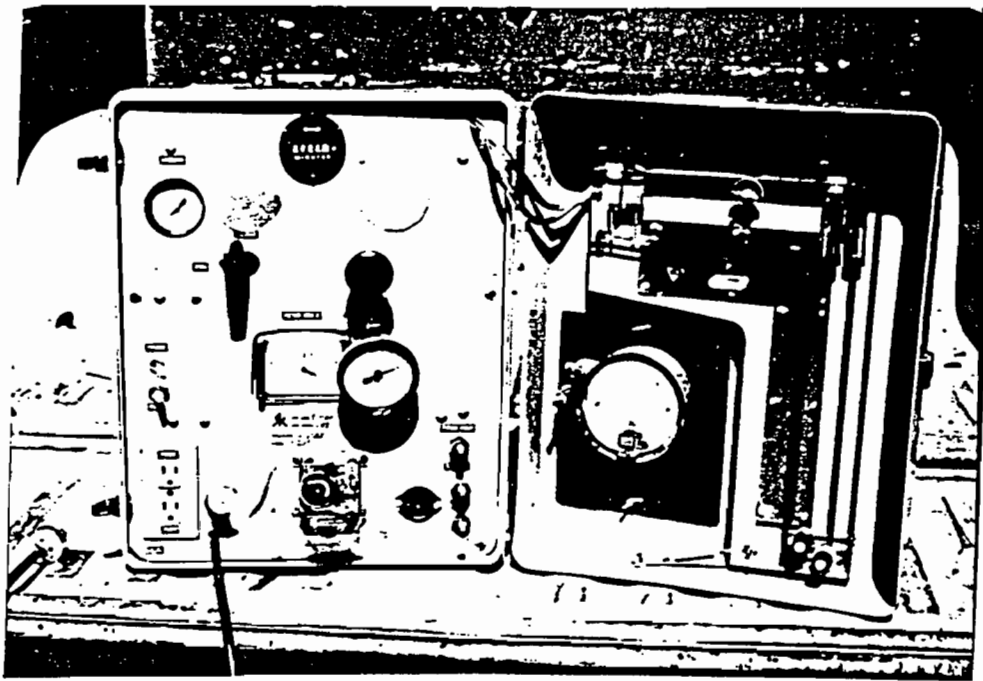
AVERAGE dH@ = 1.658

$Y = (V_w (P_b - (dH_w / 13.6)) \times (T_d + 460)) / (V_d (P_b + (dH_d / 13.6)) \times (T_w + 460))$

$dH@ = 0.0317 \times dH_d / (P_b (T_d + 460)) \times ((T_w + 460) \times \text{time}) / V_w)^{.2}$

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

SOURCE SAMPLING EQUIPMENT



METER BOX

Equipment used in Source Sampling is either manufactured by or assembled by Koogler & Associates. The guidelines followed are A.P.T.D. 0581, Details of Isokinetic Source Sampling Equipment, and A.P.T.D. 0576, Maintenance, Calibration and Operation of Isokinetic Source Sampling Equipment.

CALIBRATION GAS CERTIFICATES

NOx

NEW GAS



ALPHAGAZ

LaPorte, Texas 77571 • (713) 474-8400

Customer : TAMPA OXYGEN
P.O. Number : 26573
AGZ Document: #1393450
Lot/Item No.: #
Valve Type: CGA 660
Cert. Date : 07-02-1992

Cylinder # AL 2549

Component mole ppm

Sulfur Dioxide 753. ppm
Nitric Oxide 810. ppm
Nitrogen Dioxide <0.5 ppm
NITROGEN Balance

Re-certify: 07-02-1993

OLD GAS



SPECIALTY
GASES
DIVISION

2445 SOUTH ST., P.O. BOX 5548
LONG BEACH, GA 90805
TEL: (214) 492-5300

SAMPLE # 166.5 Serial # FFL-ED
Concentration 16876 CAL 9077
of reference 1437 ± 155 in AL2
952 ± 10 in N2

CYL# CC73790 CGA: 660

PRES: 3000 psi VOL: 142 CF

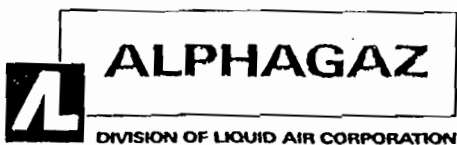
ASSAY DATE 17-May-90 EXP. DATE 17-Nov-90

Analytical Method: per Section 3.0.4 procedure G1

COMPONENT	REQUESTED	ANALYZED
Sulfur Dioxide	800 ppm	870 ppm
Nitric Oxide	800 ppm	835 ppm
T NOx	800 ppm	840 ppm
Nitrogen Dioxide		
Carbon Monoxide		
Carbon Dioxide		
Oxygen		
Propane		

Nitrogen Bal Bal

SIGNED



CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992		Cylinder No. CC68401		Protocol No. 1		
Order Number 1286130		Expiration date 10/9/93		Procedure No. G-1		
P.O. Number G503		Cylinder pressure 2000 psig		Section No. 2.0.7		
COMPONENT			CONCENTRATION		GAS ANALYZER EMPLOYED	
Nitric oxide			10.2 ppm		Manufacturer	Thermo Env. Inst.
Nitrogen			Balance Gas		Model Number	10AR
REFERENCE STANDARD EMPLOYED FOR ANALYSIS					Serial Number	30323-237
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER	Last Calibrated	3/6/92	
Nitric oxide	19.4 ppm	FF28622	2629a	Analytical Principle	Chemiluminescent	

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	7.76 volts	4.10 volts	0.00 volts	7.76 volts	4.10 volts
0.01	7.74	4.08	0.00	7.75	4.09
0.00	7.74	4.08	0.00	7.74	4.09
Mean Analytical Result: 10.2 ppm			Mean Analytical Result: 10.2 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC73656	Protocol No. 1	
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1	
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7	
COMPONENT		CONCENTRATION	
Nitric oxide		53.3 ppm	
Nitrogen		Balance Gas	
REFERENCE STANDARD EMPLOYED FOR ANALYSIS		GAS ANALYZER EMPLOYED	
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Nitric oxide	97.1 ppm	CAL-12829	1684b
Serial Number		30323-237	
Last Calibrated		3/6/92	
Analytical Principle		Chemiluminescent	

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	9.71 volts	5.33 volts	0.00 volts	9.71 volts	5.33 volts
0.00	9.68	5.31	0.00	9.71	5.33
0.01	9.67	5.31	0.00	9.70	5.32
Mean Analytical Result: 53.3 ppm			Mean Analytical Result: 53.3 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	



CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992		Cylinder No. CC73658		Protocol No. 1	
Order Number 1286130		Expiration date 10/9/93		Procedure No. G-1	
P.O. Number G503		Cylinder pressure 2000 psig		Section No. 2.0.7	
COMPONENT			CONCENTRATION	GAS ANALYZER EMPLOYED	
Nitric oxide			208 ppm	Manufacturer	Thermo Env. Inst.
Nitrogen			Balance Gas	Model Number	10AR
REFERENCE STANDARD EMPLOYED FOR ANALYSIS				Serial Number	30323-237
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER	Last Calibrated	3/6/92
Nitric oxide	250 ppm	CLM-764	1685b	Analytical Principle	Chemiluminescent

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.00 volts	10.00 volts	8.32 volts	0.00 volts	10.00 volts	8.30 volts
0.01	10.02	8.34	0.00	9.98	8.29
0.00	10.03	8.36	0.00	9.97	8.28
Mean Analytical Result: 208 ppm			Mean Analytical Result: 208 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

31-May-91
GATOR OXYGEN

P.O. #: G281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER # AL530

COMPONENT:

NITRIC OXIDE
Total NO_x
NITROGEN

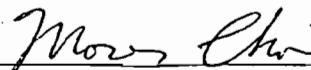
MEAN CONCENTRATION:

195 +/- 11 ppm
196 ppm
BALANCE

Cylinder pressure:
Expiration date:

1800 psi
30-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Nitric Oxide was determined by direct comparison with NBS SRM 1686b, Sample No.:42-02-H, S/N CLM000829, 490 +/- 5 ppm Nitric Oxide in Nitrogen, dated May 14, 1990. The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone. S/N 00100508, 0-1000 ppm range. The last multipoint calibration was done on May 24, 1991.



Authorized signature



31-May-91
GATOR OXYGEN

P.O.#: 6281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER # CC82137

COMPONENT:	MEAN CONCENTRATION:
NITRIC OXIDE	58.3 +/- 1.5 ppm
Total NOx	60.6 ppm
NITROGEN	BALANCE
Cylinder pressure:	1800 psig
Expiration date:	29-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Nitric Oxide was determined by direct comparison with NIST SRM 1684b, Sample No.:44-12-M, S/N: CAL-12775, 94.6 +/- 1.1 ppm Nitric Oxide in Nitrogen, Exp. date May 14, 1992. The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone. S/N 00100508, 0-100 ppm range. The last multipoint calibration was done on May 24, 1991.



Authorized signature



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

31-May-91
GATOR OXYGEN

P.O.#: 6281
GAINESVILLE, FL

CERTIFICATION OF CYLINDER #AL-1962

COMPONENT:

MEAN CONCENTRATION:


NITRIC OXIDE
Total NOx
NITROGEN

9.84 +/-0.32 ppm
10.61 ppm
BALANCE

Cylinder pressure:
Expiration date:

1800 psig
28-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Nitric Oxide was determined by direct comparison with NBS SRM 2628a, Sample No.:49-49-B, S/N CAL-9902, 9.55 +/- 0.16 ppm Nitric Oxide in Nitrogen, dated April 10, 1987. The analysis was performed on a Beckman 951A chemiluminescent-type analyzer measuring the reaction of Nitric Oxide with Ozone. S/N 00100508, 0-25 ppm range. The last multipoint calibration was done on May 24, 1991.



Analyst

CO

Best Available Copy

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-17617 CYLINDER #: CC82385 CYL. PRESSURE: 2000 PSIG
 EXPIRATION DATE: 11/19/92 BATCH#: _____ LAST ANALYSIS DATE: 5/19/92
 CUSTOMER: ALPHAGAS P.O. # G21711978
 METHOD: EPA PROTOCOL # 3.0.4. G-1

STANDARD:

SN #: 1681 _____
 CYL. #: CLM313 _____
 CONC. 872 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN NDIR _____
 MODEL #: 865 _____
 SERIAL #: 0103409 _____
 LAST CAL.: 4/1/92 _____

COMPONENT: CO
 MEAN CONC: 632 PPM

REPLICATE CONC.
 DATE: 5/12/92 DATE: 5/19/92
630 PPM 630 PPM
633 PPM 631 PPM
635 PPM 630 PPM

COMPONENT: _____
 MEAN CONC: _____

REPLICATE CONC.
 DATE: _____ DATE: _____

COMPONENT: _____
 MEAN CONC: _____

COMPONENT: _____
 MEAN CONC: _____

DATE: _____ DATE: _____

BALANCE GAS NITROGEN

Best Available Copy

REPLICATE DATA

DATE: 5-12-92

E 0 R 432.5 C 280.5

R 433 Z 0 C 282

Z 0 C 283 R 433

COMPONENT: CO

DATE: 5/19/92

E 0 R 438.5 C 284.2

R 439 Z 0 C 285

Z 0 C 284.5 R 439
REPLICATE DATA

DATE: _____

E R C

R E C

E C R

COMPONENT: _____

DATE: _____

E R C

R E C

E C R
REPLICATE DATA

DATE: _____

E R C

R E C

E C R

COMPONENT _____

DATE: _____

E R C

R E C

E C R

E=ZERO C=CANDIDATE R=REFERENCE

ANALYST: John Davis

APPROVED BY: _____

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 9 April 1992	Cylinder No. CC110717	Protocol No. 1	
Order Number 1286130	Expiration date 10/9/93	Procedure No. G-1	
P.O. Number G503	Cylinder pressure 2000 psig	Section No. 2.0.7	
COMPONENT		CONCENTRATION	
Carbon monoxide	30.5 ppm	GAS ANALYZER EMPLOYED	
Nitrogen	Balance Gas	Manufacturer	Siemens
		Model Number	Ultramat 5E
REFERENCE STANDARD EMPLOYED FOR ANALYSIS		Serial Number	A03-542
COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Carbon monoxide	24.08 ppm	FF-30390	2635a
		Last Calibrated	2/25/92
		Analytical Principle	NDIR

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 4/2/92			SECOND ANALYSIS DATE: 4/9/92		
Zero	Reference	Mixture	Zero	Reference	Mixture
0.0 ppm	24.1 ppm	30.6 ppm	0.0 ppm	24.1 ppm	30.5 ppm
0.0	24.1	30.7	0.0	24.1	30.4
0.0	24.2	30.7	0.1	24.3	30.7
Mean Analytical Result: 30.6 ppm			Mean Analytical Result: 30.4 ppm		

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
A.S. Cristoforo	A.S. Cristoforo	



DIVISION OF LIQUID AIR CORPORATION

Box 5548
45 South St.

Mar-91
FOR OXYGEN

Phone (213)492-5340
Long Beach, CA 90805

P.O. # G-206
GAINESVILLE, FL.

CERTIFICATION OF CYLINDER #cc-58064

COMPONENT:

Carbon Monoxide
NITROGEN

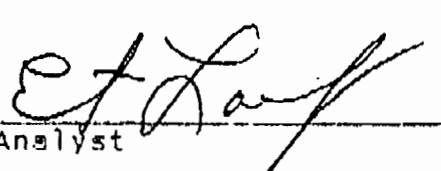
MEAN CONCENTRATION:

102.6 +/- 2.66 ppm
Balance

Cylinder pressure
Expiration date

1900 psi
18-Sep-92

This mixture was prepared and analyzed following EPA Revised
Traceability Protocol No.1, Section 3.0.4, Procedure G1.
The concentration of the Carbon Monoxide was determined by direct
comparison with NBS SRM 1679b, Sample No.:3-45-F, S/N FF-19983, 95.4 +/-
1.0 ppm Carbon Monoxide in Nitrogen, dated Jan. 22, 1988. The analysis
was performed on a Bendix 6501-5CA NDIR, S/N Y01229-8, 0-250 ppm
range. The last multipoint calibration was done on MARCH 12, 1991.


Analyst

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

EPA PROTOCOL NO.1 DATA SHEET COMPONENT: CARBON MONOXIDE 0-250ppm

NBS SRM 1679b:3-45-F, FF-19983, 95.4 +/- 0.9ppm CO in N2

	TRIAD #1	TRIAD #2	TRIAD #3	TRIAD #4	TRIAD #5	TRIAD #6
DATE	03/12/91	03/12/91	03/12/91	03/19/91	03/19/91	03/19/91
	VDC	VDC	VDC	VDC	VDC	VDC
FF-19983	0.9420	0.9420	0.9420	0.9300	0.9350	0.9340
ZERO	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
C-58064	1.0100	1.0110	1.0110	1.0050	1.0060	1.0050

EPA PROTOCOL NO.1 WORK SHEET COMPONENT: CARBON MONOXIDE 28.6-124p

NBS SRM 1679b:3-45-F, FF-19983, 95.4 +/- 0.9ppm CO in N2

	TRIAD #1	TRIAD #2	TRIAD #3	TRIAD #4	TRIAD #5	TRIAD #6
DATE	03/12/91	03/12/91	03/12/91	03/19/91	03/19/91	03/19/91
	VDC	VDC	VDC	VDC	VDC	VDC
F-19983	0.9420	0.9420	0.9420	0.9300	0.9350	0.9340
ERO	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
CC-58064	1.0100	1.0110	1.0110	1.0050	1.0060	1.0050
ASSAY:	102.29	102.40	102.40	103.10	102.65	102.66

VALID	VALID	VALID	VALID	VALID	VALID
TRIADS 1,2,3 MEAN:	102.36	TRIADS 4,5,6 MEAN:	102.80		
CARBON MONOXIDE		CONCENTRATION IN ppm:	102.6		

VARIABILITY	VDC	PPM x PPM
ZERO :	0.0002	0.0025
SRM :	0.0036	0.8100
SRMd :	0.0002	0.0025
MIXd :	0.0002	0.0025
LINEARITY :	0.0100	6.2500
TOLERANCE	SQRT SUM :	2.7 ppm



ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

BIG THREE / ALPHAGAZ

P.O. Box 6139
Lakewood, CA 90714

Phone (213) 492-5340
FAX (213) 492-5349

06-May-91
GATOR OXYGEN

P.O.: G-206
GAINESVILLE, FL

CERTIFICATION OF CYLINDER #CC68301

COMPONENT:

MEAN CONCENTRATION:

Carbon Monoxide
Nitrogen

51.14 +/- 14 ppm
Balance

Cylinder pressure
Expiration date:

2000 psi
02-Nov-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, Procedure G1. The concentration of the Carbon Monoxide was determined by direct comparison with SRM 1681b, S/N CLM-000341, Sample I-49-G, 968 +/- 9 ppm Carbon Monoxide in Nitrogen, dated Jan. 10, 1989. The analysis was performed on a Bendix 6501-5CA NDIR, S/N Y01229-8, 0-1000 ppm range & a calibration range of 290-1258 ppm. The last multipoint calibration was done on April 26, 1991.

Moses Choi
Analyst

**ALPHAGAZ**

DIVISION OF LIQUID AIR CORPORATION

EPA PROTOCOL NO.1 DATA SHEET COMPONENT: CARBON MONOXIDE 0-1000ppm
NIST SRM 1681b CLM-000341 I-49-G 968 +/- 9 ppm CO in N2
DATE 104/29/91 104/29/91 104/29/91 105/06/91 105/06/91 105/06/91 :
: VDC : VDC : VDC : VDC : VDC : VDC :
CLM-000341 : 0.3020 : 0.3030 : 0.3030 : 0.3030 : 0.3030 : 0.3030 :
ZERO : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 :
CC68301 : 0.1420 : 0.1420 : 0.1420 : 0.1430 : 0.1420 : 0.1430 :

EPA PROTOCOL NO.1 WORK SHEET COMPONENT: CARBON MONOXIDE 290.4 to 1258
NIST SRM 1681b CLM-000341 I-49-G 968 +/- 9 ppm CO in N2
DATE 104/29/91 104/29/91 104/29/91 105/06/91 105/06/91 105/06/91 :
: VDC : VDC : VDC : VDC : VDC : VDC :
CLM-000341 : 0.3020 : 0.3030 : 0.3030 : 0.3030 : 0.3030 : 0.3030 :
ZERO : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 : -0.0370 :
CC68301 : 0.1420 : 0.1420 : 0.1420 : 0.1430 : 0.1420 : 0.1430 :
ASSAY: 511.13 509.62 509.62 512.47 509.62 512.47
VALID VALID VALID VALID VALID VALID
TRIADS 4,5,6 MEAN: 510.1 TRIADS 4,5,6 MEAN: 511.5
CARBON MONOXIDE CONCENTRATION IN ppm: 511

VARIABILITY VDC PPM x PPM
ZERO : 0.0005 0.2500
SRM : 0.0090 81.0000
SRMd : 0.0010 1.0000
MIXd : 0.0010 1.0000
LINEARITY : 0.0100 100.0000
TOLERANCE SQRT SUM : 14 ppm

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16601 CYLINDER #: CC68392 CYL. PRESSURE: 2000 PSIG
EXPIRATION DATE: 10/6/93 BATCH#: _____ LAST ANALYSIS DATE: 4/6/92
CUSTOMER: ALPHAGAS P.O.# _____
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1679 _____
CYL. #: FF28138 _____
CONC. 102 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN NDIR _____
MODEL #: 865 _____
SERIAL #: 0103409 _____
LAST CAL.: 1/2/92 _____

COMPONENT CO
MEAN CONC: 101 PPM

<u>REPLICATE CONC.</u>	
DATE: <u>3/20/92</u>	DATE: <u>4/6/92</u>
<u>102 PPM</u>	<u>102 PPM</u>
<u>100 PPM</u>	<u>101 PPM</u>
<u>101 PPM</u>	<u>101 PPM</u>

COMPONENT _____
MEAN CONC: _____

<u>REPLICATE CONC.</u>	
DATE: _____	DATE: _____
_____	_____
_____	_____

COMPONENT _____
MEAN CONC: _____

BALANCE GAS NITROGEN

REPLICATE DATA

DATE: 3/20/92

Z 0 R 441.5 C 442.5

R 442 Z 0 C 433.3

Z 0 C 437.7 R 442

COMPONENT: CO

DATE 4/6/92

Z 0 R 464 C 463.5

R 464.5 Z 0 C 460

Z 0 C 460.4 R 465

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Tommy Allison

APPROVED BY: _____

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

PROPANE

NATIONAL SPECIALTY GASES

630 UNITED DRIVE

DURHAM, NC 27713

(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16604 CYLINDER #: 110706 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 9/20/93 BATCH#: _____ LAST ANALYSIS DATE: 3/20/92

CUSTOMER: ALPHAGAZ

P.O. # _____

METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1666

CYL. #: FF28723

CONC. 9.83 PPM

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 1/2/92

COMPONENT C3H8

MEAN CONC: 9.88 PPM

REPLICATE CONC.

DATE: 3/20/92 DATE _____

9.88 PPM

9.88 PPM

9.89 PPM

COMPONENT
MEAN CONC.

COMPONENT _____

MEAN CONC: _____

DATE: _____

REPLICATE CONC.

DATE: _____

BALANCE GAS AIR

REPLICATE DATA

DATE: 3/20/92

Z 0 R 370 C 372

R 371 Z 0 C 373

Z 0 C 373.3 R 371

COMPONENT: C3H8

DATE _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Daniel Cox

APPROVED BY: _____

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16605 CYLINDER #: CC108167 CYL. PRESSURE: 2000 PSIG
EXPIRATION DATE: 9/20/93 BATCH#: _____ LAST ANALYSIS DATE: 3/20/92
CUSTOMER: ALPHAGAS P.O.# _____
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1669B _____
CYL. #: CLM812 _____
CONC. 464 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN THC _____
MODEL #: 400 _____
SERIAL #: 1003052 _____
LAST CAL.: 1/2/92 _____

COMPONENT C3H8
MEAN CONC: 298 PPM

REPLICATE CONC.
DATE: 3/20/92 DATE: _____
297 PPM _____
298 PPM _____
298 PPM _____

COMPONENT
MEAN CONC.

COMPONENT _____
MEAN CONC: _____ DATE: _____
REPLICATE CONC.
DATE: _____

BALANCE GAS AIR

REPLICATE DATA

DATE: 3/20/92

Z 0 R 333 C 213

R 332 Z 0 C 213

Z 0 C 213 R 332

REPLICATE DATA

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: C3H8

DATE _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: David Gx

APPROVED BY: _____

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DURHAM, NC 27713
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CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16601 CYLINDER #: CC68392 CYL. PRESSURE: 2000 PSIG
EXPIRATION DATE: 10/6/93 BATCH#: _____ LAST ANALYSIS DATE: 4/6/92
CUSTOMER: ALPHAGAZ P.O.# _____
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1679 _____
CYL. #: FF28138 _____
CONC. 102 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN NDIR _____
MODEL #: 865 _____
SERIAL #: 0103409 _____
LAST CAL.: 1/2/92 _____

COMPONENT CO
MEAN CONC: 101 PPM

REPLICATE CONC.
DATE: 3/20/92 DATE 4/6/92
102 PPM 102 PPM
100 PPM 101 PPM
101 PPM 101 PPM

COMPONENT _____
MEAN CONC: _____

REPLICATE CONC.
DATE: _____ DATE: _____

COMPONENT _____
MEAN CONC: _____

BALANCE GAS NITROGEN

REPLICATE DATA

COMPONENT: CO

DATE: 3/20/92

DATE 4/6/92

Z 0 R 441.5 C 442.5

Z 0 R 464 C 463.5

R 442 Z 0 C 433.3

R 464.5 Z 0 C 460

Z 0 C 437.7 R 442

Z 0 C 460.4 R 465

REPLICATE DATA

COMPONENT:

DATE:

DATE:

Z R C

Z R C

R Z C

R Z C

Z C R

Z C R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Tommy Allison

APPROVED BY:

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DURHAM, NC 27713
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CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16071 CYLINDER #: CC88622 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 8/19/93 BATCH#: _____ LAST ANALYSIS DATE: 2/19/92

CUSTOMER: ALPHAGAZ P.O.# GZ1524-978
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1666B _____

CYL. #: FF19120 _____

CONC. 9.40 PPM _____

INSTRUMENT:

COMPONENT: BECKMAN THC _____

MODEL #: 400 _____

SERIAL #: 1003052 _____

LAST CAL.: 1/2/92 _____

COMPONENT C3H8
MEAN CONC: 10.1 PPM

REPLICATE CONC.
DATE: 2/19/92 DATE: _____
10.1 PPM _____
10.1 PPM _____
10.1 PPM _____

COMPONENT _____
MEAN CONC: _____

REPLICATE CONC.
DATE: _____ DATE: _____

COMPONENT _____
MEAN CONC. _____

BALANCE GAS AIR

REPLICATE DATA

DATE: 2/19/92

Z 0 R 395 C 423

R 395 Z 0 C 423.5

Z 0 C 421 R 393

COMPONENT: C3H8

DATE _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

REPLICATE DATA

DATE: _____

Z - R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

COMPONENT: _____

DATE: _____

Z _____ R _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: Davis

APPROVED BY: _____

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NATIONAL SPECIALTY GASES

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DURHAM, NC 27713
(919) 544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-16070 CYLINDER #: CC102452 CYL. PRESSURE: 2000 PSIG

EXPIRATION DATE: 8/19/93 BATCH#: _____ LAST ANALYSIS DATE: 2/19/92

CUSTOMER: ALPHAGAZ

P.O. # GZ1524-978
METHOD: EPA PROTOCOL # 2.0.7. G-1

STANDARD:

SRM #: 1667B

CYL. #: FF27001

CONC. 47.3 PPM

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 1/2/92

COMPONENT C3H8

MEAN CONC: 51.1 PPM

REPLICATE CONC.

DATE: 2/19/92 DATE: _____

51.1 PPM

51.1 PPM

51.2 PPM

COMPONENT _____

MEAN CONC: _____

REPLICATE CONC.

DATE: _____ DATE: _____

COMPONENT _____

MEAN CONC. _____

BALANCE GAS AIR

REPLICATE DATA

COMPONENT: C3H8

DATE: 2/19/92

DATE: _____

Z 0 R 421 C 454

Z _____ R _____ C _____

R 421 Z 0 C 454.5

R _____ Z _____ C _____

Z 0 C 455.5 R 421

Z _____ C _____ R _____

REPLICATE DATA

COMPONENT: _____

DATE: _____

DATE: _____

Z - R _____ C _____

Z _____ R _____ C _____

R _____ Z _____ C _____

R _____ Z _____ C _____

Z _____ C _____ R _____

Z _____ C _____ R _____

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: *Davis*

APPROVED BY: _____

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, NATIONAL SPECIALTY GASES SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

PROJECT PARTICIPANTS



PROJECT PARTICIPANTS

John B. Koogler, Ph.D., P.E.

Project Advisor

N. Mason Joye, Jr.

Project Supervisor

Rodney Paul

Field Test Crew

Stephen Bell

Field Test Crew

Treg Jones

Field Test Crew



P 062 921 990



**Receipt for
Certified Mail**

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, June 1991

Sent to	
Mr. Charles Hetrick	
County Administrator	
HCRCC	
P.O. State and ZIP Code	
20 N. Main Street, Rm. 460	
Brooksville, FL 34601	
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date mailed: 8/18/92	
PSD-FL-091C	
trans. of test support data	

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☒ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Charles Hetrick, Cnty Admin
Hernando County BCC
20 N. Main Street, Rm. 460
Brooksville, FL 34601

4a. Article Number

P 062 921 990

4b. Service Type

- | | |
|---|---|
| <input type="checkbox"/> Registered | <input type="checkbox"/> Insured |
| <input checked="" type="checkbox"/> Certified | <input type="checkbox"/> COD |
| <input type="checkbox"/> Express Mail | <input type="checkbox"/> Return Receipt for Merchandise |

7. Date of Delivery

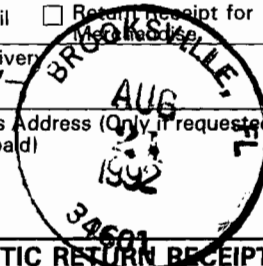
8/21/92

5. Signature (Addressee)

R. A. Bang

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)





File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

August 18, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles B. Hetrick
County Administrator
Hernando County Board of County Commissioners
20 N. Main Street, Room 460
Brooksville, Florida 34601

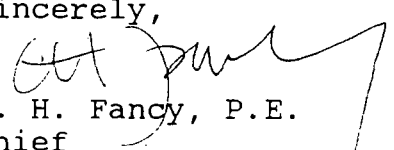
Dear Mr. Hetrick:

Re: Transmittal of Data Generated During the TDF Tests
Florida Crushed Stone Company
PSD-FL-091C

The Department has recently received data from the Florida Crushed Stone Company (FCSC) that was generated during their recent performance tests conducted July 28-29, 1992, while firing whole tires as a supplement to coal in their cement kiln. There are some corrections to the original data that have been made, which were supplied by the operation supervisors at FCSC during the tests; however, the corrected values are supported by the data sheets provided by FCSC and are attached. As soon as the actual test results are received, they will be immediately distributed for evaluation.

If there are any questions, please call Mr. Bruce Mitchell at (904)488-1344 or write to me at the above address.

Sincerely,


C. H. Fancy, P.E.
Chief
Bureau of Air Regulation


CHF/BM/rbm

Attachments

cc: C. Lee, SWD
J. Koogler, Ph.D., P.E., K&A
D. Buff, P.E., KBN
J. Harper, EPA
C. Shaver, NPS
K. Liles, HCBCC w/o Attachments
L. Jennings, HCBCC w/o Attachments
C. Allen, FCSC w/o Attachments

Reading File

Bruce Mitchell

} 8-18-92  Paper

Printed with Soy Based Inks

7-29-92

Data 2

#1 Run: 8:51 - 11:12 a.m.

(9:10) a.m.

#2 Run: 12:28 - 2:47 p.m.

(1:2) p.m.

#3 Run: 4:00 - 6:17 p.m.

(4:5) p.m.

Lime Plant

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
coal feed rate (lb/hr)	27,000	28,000	26,000	26,500	27,000	27,000
lime stone " " (TPH)	29,000	22.0	27,000	21.0	27,000	27,000
	24.0		22.0		20.0	
	20.0		20.0		20.0	

Power Plant

coal feed rate (lb/hr)	96,000	95,500	93,000	95,000	96,000	96,000
	95,000		97,000		96,000	
load (MW)	109	110	109.5	109.1	111.5	111.1
	111		108.7		110.7	

Cement Plant

coal feed rate (TPH)	7.0	6.85	7.4	7.4	7.4	7.15
	6.7		7.4		6.9	
TOP " " (TPH)	1.33	1.33	1.33	1.33	1.33	1.33
	1.33		1.33		1.33	
kiln " " (TPH)	122	119.5	127	128	130	130
	117		129		130	
clinker prod. rate (TPH)	75.6	74.8	77.2	77.45	78	78
(to be calc.)	74.0		77.7		78	

Baghouse

inlet Temp. (°F)	403.3	408.3	395.4	394.35	410.4	411.9
	407.3		393.3		413.0	
fan speed (%)	71	71	71	71	71	71
	71		71		71	
fan current (amps)	3140	3124	3154	3166.5	3104.0	3087.5
	3108		3179		3071.0	
ΔP (in-H ₂ O)	7.6	7.65	7.1	7.45	7.16	7.75
	7.7		7.8		7.9	

Cement Plant Fan

inlet Temp. (°F)	752	753.5	773	766	757	761
	755		759		765	
fan current (amps)	115.4	114.35	118.6	118.6	118.7	117.15
	113.3		118.6		115.6	
damper setting (%)	54.8	54.8	54.8	54.8	54.8	54.85
	54.8		54.8		54.9	
O ₂ (%)	3.50	3.605	4.40	4.30	3.87	4.01
	3.71		4.20		4.15	
CO (ppm)	439.1	374.75	263.0	241.0	298.2	302.1
	310.4		219.0		306.0	

Pre-Heater

exit gas Temp (°F)	774	774	818	809	793	792
	774		800		791	
internal gas Temp (°F)	1514	1516	1519	1519	1519	1519.5
	1518		1519		1520	
raw mill Temp (°F)	1331	1290.5	1392	1388.5	1372	1381
	1250		1385		1390	

7-24-92
(Data cont.)

Kiln Inlet

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
gas Temp (°F)	1694 1599	1646.5	1603 1605	1604	1639 1598	1618.5
draft (in. H ₂ O)	0.60 0.48	0.54	0.79 0.91	0.80	0.83 0.88	0.855
O ₂ (%)	11.54 1.52	1.53	1.31 1.21	1.26	1.21 1.25	1.23
combustibles (%)	0.49 0.33	0.41	0.35 0.38	0.365	0.30 0.26	0.28

Stack

O ₂ (%)	6.32 6.13	6.225	6.43 6.07	6.25	6.08 6.10	6.09
NO _x (ppm)	193.0 183.1	188.05	192.8 150.8	171.65	168.6 175.5	172.05
Opacity (%)	2.7 2.8	2.75	2.2 2.7	2.45	4.0 3.5	3.75
velocity head (stack test)						

TDF: truck tires
~ 110 lbs/tire

7-28-92
#1 Run: 8:10 - 10:22 a.m. (9:15) a.m.
#2 Run: 12:02 - 2:34 p.m. (1:22) p.m.
#3 Run: 3:30 - 6:00 p.m. (4:15) p.m.

Lime Plant

	#1	#2	#3
coal feed rate (#/hr)	26,000	22,000	24,000
limestone " " (TPH)	20.0	20.0	21.0

Power Plant

coal feed rate (#/hr)	96,000	97,000	98,000
load (MW)	111.4	111.7	110.8

Cement Plant

coal feed rate (TPH)	7.2	7.5	7.5
TDF " " (TPH)	1.33	1.33	1.33
kila " " (TPH)	125.0	127.0	126.0
clinker prod. rate (TPH)	75.8	77.2	76.9

Baghouse

inlet Temp (°F)	397.05	402.35	389.5
fan speed (%)	72.0	70.0	70.0
fan current (amps)	3193	3110.5	3095.5
ΔP (in-H ₂ O)	7.55	7.5	7.45

Cement Plant Fan

inlet Temp (°F)	768	760	763
fan current (amps)	115.85	121.1	117.3
damper setting (%)	54.8	54.8	54.85
O ₂ (%)	4.28	4.64	4.14
CO (ppm)	184.35	139.25	220.75

Pre-Heater

Exit gas Temp (°F)	798	784	785
internal gas Temp (°F)	1517	1516.5	1517
raw mill Temp (°F)	1331	1312	1319.5

7-28-92
(Data cont.)

Kiln Inlet

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
Gas Temp (°F)	1610 1599 0.58	1604.5	1613 1607 0.70	1610	1626 1598 0.67	1612
Draft (in-H ₂ O)	0.76 1.12	0.67	0.75 1.54	0.73	0.81 0.87	0.74
O ₂ (%)	0.61 0.03	0.91	1.47 0.06	1.51	1.20 0.06	1.035
combustibles (%)	0.04	0.035	0.04	0.05	0.02	0.04

Stack

	#1	\bar{x}	#2	\bar{x}	#3	\bar{x}
O ₂ (%)	6.32 6.33	6.33	6.32 6.32	6.32	6.33 6.33	6.33
NO _x (ppm)	148.8 129.6	139.2	179.6 148.4	164	147.3 159.1	153.2
Opacity (%)	4.7 3.3	4.0	3.7 4.2	4.0	4.9 3.8	4.35
velocity head stack test						