PARTICULATE MATTER AND DIOXIN/FURAN EMISSION MEASUREMENTS

Kiln/Raw Mill/Clinker Cooler System

RINKER MATERIALS CORPORATION
Miami Cement Plant
Miami, Florida

Permit Nos. 0250014-008-AC (PSD-FL-324)

and

0250014-009-AV

Test Dates: August 4-8, 2004
Report Date: September 16, 2004
Amended: October 8, 2004

263-04-05

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

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Responsible Official Certification:

I certify that, based upon information and belief formed after reasonable inquiry, the statements and information in the attached documents are true, accurate and complete.

Ed Allsopp, Vice President, Cement Operations

Signature

Date:

263-04-05

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To the best of my knowledge, all applicable field and analytical procedures comply with the Florida Department of Environmental Protection 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

09/16/04

Date

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Table of Contents

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1.0 INTRODUCTION

Rinker Materials Corporation (Rinker) owns and operates a preheater/precalciner Portland cement plant located at 1200 N.W. 137th Avenue, Miami, Dade County, Florida. The plant is rated at a preheater feed rate of 220 tons per hour (tph) and a clinker production rate of 138 tph. Rinker is currently operating under FDEP approval to evaluate operating at a preheater feed rate of 267 tph and a clinker production rate of 162 tph.

During the period August 4-8, 2004, Koogler & Associates, Inc. of Gainesville, Florida, conducted dioxin/furan (D/F) emission measurements and particulate matter emission measurements on the kiln/raw mill/clinker cooler exhaust stack in accordance with EPA Method 23 and Method 5, respectively, (40 CFR 60, Appendix A). At Rinker the kiln, raw mill and clinker cooler are all exhausted through a common baghouse and stack. The D/F and particulate matter emission measurements were conducted with the raw mill operating and with the raw mill off-line.

The purpose of the testing was to demonstrate compliance with the D/F emission limiting Standard of the *National Emission Standards For Hazardous Air Pollutants (NESHAP) for the Portland Cement Manufacturing Industry* and to demonstrate compliance with the particulate matter emission limiting standard of Permit 0250014-009-AV. The NESHAP for the Portland cement manufacturing industry

includes Maximum Achievable Control Technology (MACT) Standards for Portland cement plants which are codified at 40 CFR 63, Subpart LLL.

The NESHAP for the Portland cement manufacturing industry was promulgated on May 14, 1999 and includes MACT standards for new and existing Portland cement plants. The Rinker Miami Cement Plant is classified as an existing facility for purposes of the Portland cement industry NESHAP, as construction commenced at the site prior to March 24, 1998. The D/F emission tests reported herein are the second set of D/F emission tests required by the NESHAP; i.e., within 30 months of the initial compliance demonstration.

Portland cement plants must meet the following dioxin/furan emission limiting standards:

- 0.4 nanograms D/F TEQ per dry standard cubic meter when the average particulate matter control device inlet temperature is 204°C (400°F) or less, corrected to 7 percent oxygen; or
- 0.2 nanograms D/F TEQ per dry standard cubic meter when the average temperature at the particulate matter control device inlet exceeds 204°C (400°F), corrected to 7 percent oxygen.

The NESHAP further requires emission measurements to be conducted while both the kiln and raw mill are operating and again with only the kiln operating (with the raw mill shut down). The clinker cooler operates at all times when the kiln operates.

The dioxin/furan emission measurements with the kiln and raw mill both operating were conducted on August 4 and 7, 2004. During the test period, the preheater feed rate averaged 246 tons per hour, the clinker production rate averaged 147 tons per hour and the baghouse inlet temperature averaged 314°F. During the test period, the dioxin/furan concentration in the stack exhausting the baghouse controlling emissions from the kiln/raw mill/clinker cooler system (all exhausting through a common baghouse and stack) averaged 0.122 nanograms D/F TEQ per dry standard cubic meter, corrected to 7 percent oxygen. The dioxin/furan emission limit established by the NESHAP is 0.4 nanograms per dry standard cubic meter, corrected 7 percent oxygen, at test conditions (baghouse inlet temperature less than 400°F).

The dioxin/furan emission measurements with the kiln only operating (the raw mill shut down) were conducted on August 5 and 8, 2004. During this test period, the feed rate to the preheater averaged 234 tons per hour, the clinker production rate averaged 140 tons per hour and the temperature at the inlet of the baghouse averaged 512°F. During this test period, the dioxin/furan stack gas concentration averaged 0.113 nanograms D/F TEQ per dry standard cubic meter, corrected to 7 percent oxygen. The NESHAP limits the dioxin/furans to 0.2 nanograms per dry standard cubic meter, corrected to 7 percent oxygen, under test conditions (baghouse inlet temperature in excess of 400°F).

The particulate matter emissions on the kiln/raw mill/cooler were conducted on August 4, 2004 with the raw mill operating and on August 5, 2004 with the raw mill down. During the test period on August 4, 2004, the preheater feed rate averaged 245 tons per hour and the clinker production rate averaged 147 tons per hour. The particulate matter emission rate averaged 9.17 pounds per hour, or 0.04 pounds per ton of feed. On August 5, 2004 (with the raw mill down), the preheater feed rate averaged 231 tons per hour and the clinker production rate averaged 138 tons per hour. The particulate matter emission rate averaged 15.09 pounds per hour, or 0.07 pounds per tons of feed. The permit limit for particulate matter (expressed as PM10) is 37.4 pounds per hour, or 0.17 pounds per ton of feed. Opacity data (COMS) for the particulate matter test periods are included in the Appendix. With the raw mill operating the opacity averaged 2.1 percent, and with the raw mill down the opacity averaged 2.9 percent.

Based on the data presented herein, it can be concluded that during the test period of August 4-8, 2004, the dioxin/furan emissions and particulate matter emissions from the kiln/raw mill/clinker cooler system of Rinker's Miami Cement Plant were well within the concentration limits established by the NESHAP for the Portland Cement Industry and Permit 0250014-009-AV.

2.0 LOCATION OF SAMPLE PORTS

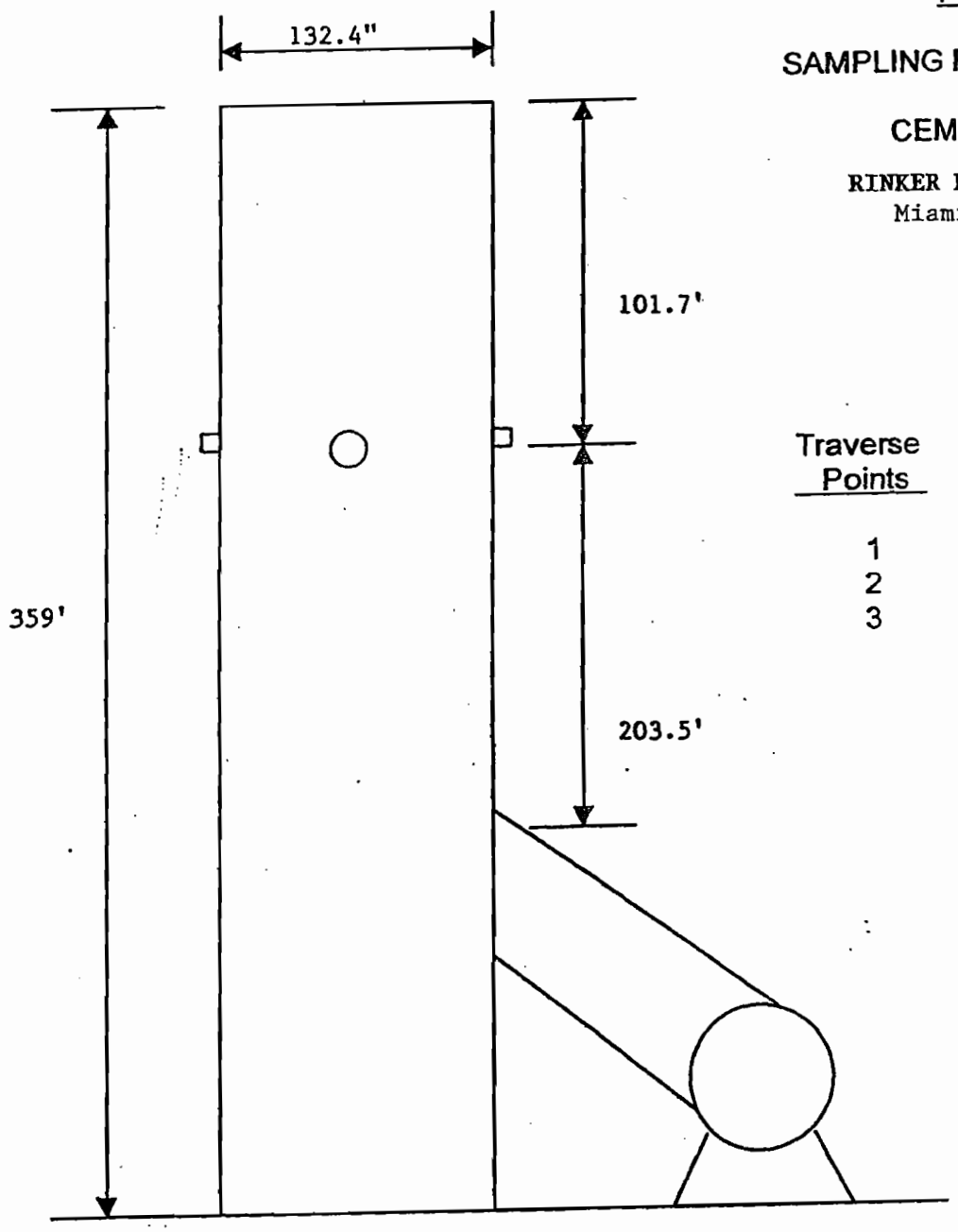
The locations of the sampling points are shown in Figure 1. Stack gas flow rate measurements and sample collection for dioxin/furan emission measurements were made through four sampling ports located 90 degrees to one another in the 136.5-inch diameter stack. The ports are located 203.5 feet (18.5 diameters) above the point where the stack gas enters the stack and 101.7 feet (9.3 diameters below the top of the stack. A total of 12 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 (40 CFR 60, Appendix A).

FIGURE 1

SAMPLING POINT LOCATIONS

CEMENT PLANT

RINKER MATERIALS CORP
Miami, Florida



Traverse Points	Distance from Inside Stack Wall
1	6.01
2	19.9
3	40.4

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3.0 FIELD AND ANALYTICAL PROCEDURES

Dioxin/furan emission measurements were made on the kiln/raw mill/clinker cooler stack in accordance with EPA Method 23. The requirements of this method were followed without exception. As required by the applicable NESHAP, the sample time of each test run was three hours and the sample volume of each test run exceeded 2.5 dry standard cubic meters (90 dry standard cubic feet). Particulate matter emission measurements were conducted in accordance with EPA Method 5, with all particulate matter presumed to be PM10.

The sampling point locations were established in accordance with EPA Method 1, the stack gas velocity measurements and stack gas moisture measurements were made in conjunction with the EPA Method 23 and Method 5 tests in accordance with EPA Methods 2 and 4. Measurements to determine the dry molecular weight of the stack gas and to correct the dioxin/furan concentration measurements to 7 percent oxygen were made in accordance with EPA Method 3. All EPA test methods are described in 40 CFR 60, Appendix A and have been adopted by reference by FDEP by Rule 62-297.401, F.A.C.

Four sample components for D/F were submitted to the laboratory for each of the three test runs under each of the two operating conditions. These components included the filter, the XAD trap, the acetone/methylene chloride equipment rinse and the toluene equipment rinse. Additionally, four components representing a

single field blank for all six test runs (three test runs under each of two operating conditions) were also submitted to the laboratory. The laboratory reported only the total mass of each of 17 dioxin/furan isomers for each of the six samples and the one field blank. QA/QC measures are documented in the laboratory report.

The dioxin/furan samples were analyzed by Alta Analytical Perspectives of Wilmington, North Carolina. The laboratory results are summarized in this volume of the test report. The complete laboratory report is available at the Koogler & Associates' office.

The analytical results reported by the laboratory include the mass of individual dioxin/furan isomers. From these masses, the mass equivalences (TEQ) of 2,3,7,8 TCDD were calculated for each of the six test runs and for the field blank. The results of the field blank are reported however the blank value was not used to correct the 2,3,7,8 TCDD TEQ mass of any of the six test runs. It should also be noted that when the mass of a dioxin/furan isomer was reported by the laboratory to be below the limit of detection, the mass was reported as zero in accordance with EPA Method 23, Section 9.9.

4.0 SUMMARY OF RESULTS

4.1 D/F - Raw Mill Operating

During the test period on August 4 and 7, 2004, with the raw mill operating, the feed rate to the preheater averaged 246 tons per hour and the clinker production averaged 147 tons per hour. During the test period, the temperature at the inlet of the baghouse controlling emissions from the common stack exhausting the kiln/raw mill/clinker cooler averaged 314°F.

The pyroprocessing system (kiln and precalciner) was fired with coal and oil. The coal firing rate to the kiln averaged 6.33 tons per hour, the oil firing rate to the kiln averaged 12 gallons per hour, and the coal firing rate to the precalciner averaged 9.36 tons per hour. The total coal feed rate of 15.69 tons per hour was equivalent to a heat input rate of approximately 392 mmBTU per hour and the oil contributed 1.7 mmBTU per hour for a total heat input of about 394 mmBTU per hour.

The stack gas flow rate from the kiln/raw mill/clinker cooler averaged 251,514 dry standard cubic feet per minute at a stack gas temperature of 306°F. The moisture content of the stack gas averaged 10.8 percent and the oxygen concentration averaged 12.5 percent. The dioxin concentration in the stack gas ranged from 0.046 to 0.182 nanograms D/F TEQ per dry standard cubic meter and averaged 0.122 nanograms D/F TEQ per dry

standard meter at 7 percent oxygen. This concentration compares with the NESHAP limit of 0.4 nanograms TEQ per dry standard cubic meter; all concentrations corrected to 7 percent oxygen. These data are summarized in Tables 1 and 2.

4.2 D/F - Raw Mill Off-Line

During the test period on August 5 and 8, 2004, with the raw mill off-line (kiln and clinker cooler only operating), the feed rate to the preheater averaged 234 tons per hour and the clinker production rate averaged 140 tons per hour. During this test period, the temperature at the inlet of the baghouse controlling emissions from the kiln and clinker cooler averaged 512°F.

The coal feed rate to the kiln averaged 5.35 tons per hour and the oil feed rate averaged 95 gallons per hour. The coal feed rate to the precalciner averaged 8.32 tons per hour. The combined coal firing rate of 13.67 tons per hour was equivalent to a heat input rate of approximately 342 mmBTU per hour and the heat input from oil averaged about 13 mmBTU per hour; resulting in a total heat input rate of 355 mmBTU per hour.

The stack gas flow rate with the raw mill down averaged 187,955 dry standard cubic feet per minute at a stack gas temperature of 456°F. The moisture of the stack gas averaged 9.7 percent and the oxygen concentration averaged 10.1 percent.

The D/F concentration of the stack gas ranged from 0.072 to 0.134 nanograms D/F TEQ per dry standard cubic meter and averaged 0.113 nanograms D/F TEQ per dry standard cubic meter at 7 percent oxygen. The NESHAP limit when the temperature at the inlet of the pollution control device exceeds 400°F is 0.2 nanograms TEQ per dry standard cubic meter; all concentrations corrected to 7 percent oxygen. These data are summarized in Tables 1 and 3.

4.3 Particulate Matter - Raw Mill Operating

Particulate matter emission measurements were conducted on August 4, 2004 with the raw mill operating. The preheater feed rate averaged 246 tons per hour and the clinker production rate averaged 147 tons per hour.

The stack gas flow rate averaged 246,934 dscfm at 286°F and 12.8 percent moisture. The particulate matter (as PM10) emission rate averaged 9.17 pounds per hour, or 0.037 pounds per ton of feed. The permit limits the PM10 emissions to 37.40 pounds per hour, or to 0.17 pounds per ton of feed. These data are summarized in Table 4. The opacity of emissions from the plant COMS averaged 2.1 percent for the test period (See Appendix).

4.4 Particulate Matter - Raw Mill Not Operating

Particulate matter emission measurements were conducted on August 5, 2004 with the raw mill not operating. The preheater feed rate averaged 231 tons per hour and the clinker production rate averaged 138 tons per hour. The stack gas flow rate averaged 195,912 dscfm at 461°F and 10.1 percent moisture. The particulate matter (as PM10) emission rate averaged 15.09 pounds per hour, or 0.065 pounds per ton of feed. The permit limits the PM10 emissions to 37.40 pounds per hour, or to 0.17 pounds per ton of feed. These data are summarized in Table 5. The opacity of emissions from the plant COMS averaged 2.9 percent (See Appendix).

4.5 Summary

Based upon the data reported herein, it can be concluded that the Rinker Miami Cement Plant was operating in compliance with all applicable D/F and PM10 emission limiting standards during the test period of August 4-8, 2004.

Table 1

Dioxin / Furan Rinker Materials Miami, Florida Cement Kiln / In-line Raw Mill / Clinker Cooler									
Raw-mill Up/down	Run No.	Date	Pre-heater Feed Rate (Ton/Hr)	Clinker Production (Ton/Hr)	Stack Gas Conditions				
					Flow (dscfm)	Stack (F^o)	Moisture (%)	O_2 (%)	CO_2 (%)
up	1	4-Aug	245.6	147.4	233761	363	11.2	12.2	11.6
up	2	7-Aug	245.6	147.4	262554	260	10.6	12.7	11.2
up	3	7-Aug	245.6	147.4	258228	296	10.5	12.5	11.7
Average			245.6	147.4	251514	306	10.8	12.5	11.5
down	1	5-Aug	225.5	135.4	190162	458	9.0	9.5	16.5
down	2	5-Aug	230.1	138.1	191746	457	9.5	10.7	16.7
down	3	8-Aug	245.6	147.4	181957	451	10.7	10.0	17.5
Average			233.7	140.3	187955	455	9.7	10.1	16.9

Dioxin / Furan Rinker Materials Miami, Florida Cement Kiln / In-line Raw Mill / Clinker Cooler						
Run No.	Bag House Inlet (F^o)	Sample Volume (dscf)	Sample Volume (dscm)	D/F TEQ (ng)	D/F TEQ (ng/dscm)	D/F TEQ @ 7% O_2 (ng/dscm)
up-R1	312	124.6	3.53	0.308	0.087	0.139
up-R2	317	128.5	3.64	0.098	0.027	0.045
up-R3	314	132.4	3.75	0.412	0.110	0.182
average	314	128.5	3.64	0.273	0.075	0.122
down-R1	513	125.0	3.54	0.386	0.109	0.133
down-R2	508	131.3	3.72	0.365	0.098	0.134
down-R3	515	129.2	3.66	0.206	0.056	0.072
average	512	128.5	3.64	0.319	0.088	0.113

MACT Standard Baghouse Inlet Temperature Greater Than > 400 F^o >(0.2 ng/dscm)

MACT Standard Baghouse Inlet Temperature Less Than < 400 F^o >(0.4 ng/dscm)

Table 2

Dioxin / Furan Sample Mass Data
Rinker Materials
Miami, Florida
Cement Kiln / In-line Raw Mill /Clinker cooler

Raw Mill Operating

Analyte	TEQ	Sample Mass (1) Run 1 Lab pg	Run 1 Lab (2)	Run 1 TEQ (3)	Run 2 Lab pg	Run 2 Lab (2)	Run 2 TEQ (3)	Run 3 Lab pg	Run 3 Lab (2)	Run 3 TEQ (3)	Field Blank Lab pg
2378 - TCDD	1	20	0.020	0.020	5.16	0.005	0.005	26.3	0.026	0.026	(1.82)
12378 - PeCDD	0.5	29.7	0.030	0.015	10.9	0.011	0.005	36.3	0.036	0.018	(2.52)
123478 - HxCDD	0.1	7.62	0.008	0.001	0	0.000	0.000	7.43	0.007	0.001	(2.48)
123678 - HxCDD	0.1	6.35	0.006	0.001	0	0.000	0.000	7.59	0.008	0.001	(2.57)
123789 - HxCDD	0.1	0	0.000	0.000	0	0.000	0.000	5.03	0.005	0.001	(2.81)
1234678 - HpCDD	0.01	10.1	0.010	0.000	5.04	0.005	0.000	8.31	0.008	0.000	(3.89)
OCDD	0.001	24	0.024	0.000	14.5	0.015	0.000	12.8	0.013	0.000	(<10)
2378 - TCDF	0.1	347	0.347	0.035	69.2	0.069	0.007	509	0.509	0.051	1.37
12378 - PeCDF	0.05	272	0.272	0.014	81.5	0.082	0.004	354	0.354	0.018	(2.15)
23478 - PeCDF	0.5	381	0.381	0.191	122	0.122	0.061	515	0.515	0.258	(1.96)
123478 - HxCDF	0.1	133	0.133	0.013	62.9	0.063	0.006	164	0.164	0.016	(0.689)
123678 - HxCDF	0.1	120	0.120	0.012	57.4	0.057	0.006	147	0.147	0.015	(0.581)
234678 - HxCDF	0.1	55.4	0.055	0.006	25.8	0.026	0.003	65.9	0.066	0.007	(0.634)
123789 - HxCDF	0.1	9.95	0.010	0.001	6.04	0.006	0.001	13.7	0.014	0.001	(1.05)
1234678 - HpCDF	0.01	54.2	0.054	0.001	32.4	0.032	0.000	70.3	0.070	0.001	(0.793)
1234789 - HpCDF	0.01	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	(1.38)
OCDF	0.001	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	(5.13)
Total TEQ (ng)				0.308			0.098			0.412	0.0001

(1) Sample masses reported by laboratory to be BDL(x.xx) are reported to be zero(0) per EPA Method 23, Sect. 9.9
(2) Sample mass reported by laboratory in (ng)
(3) TEQ sample mass

Table 3

Dioxin / Furan Sample Mass Data
Rinker Materials
Miami, Florida
Cement Kiln / In-line Raw Mill /Clinker cooler

Raw Mill Not Operating

Analyte	TEQ	Sample Mass (1) Run 1 Lab pg	Run 1 Lab (2)	Run 1 TEQ (3)	Run 2 Lab pg	Run 2 Lab (2)	Run 2 TEQ (3)	Run 3 Lab pg	Run 3 Lab (2)	Run 3 TEQ (3)	Field Blank Lab pg
2378 - TCDD	1	31.5	0.032	0.032	33.8	0.034	0.034	24	0.024	0.024	(1.82)
12378 - PeCDD	0.5	59.5	0.060	0.030	60.2	0.060	0.030	47.5	0.048	0.024	(2.52)
123478 - HxCDD	0.1	17.8	0.018	0.002	18.1	0.018	0.002	15.1	0.015	0.002	(2.48)
123678 - HxCDD	0.1	17.7	0.018	0.002	15.6	0.016	0.002	17.2	0.017	0.002	(2.57)
123789 - HxCDD	0.1	11	0.011	0.001	9.73	0.010	0.001	10.1	0.010	0.001	(2.81)
1234678 - HpCDD	0.01	24.7	0.025	0.000	20.2	0.020	0.000	19.3	0.019	0.000	(3.89)
OCDD	0.001	35.5	0.036	0.000	26.1	0.026	0.000	26.7	0.027	0.000	(<10)
2378 - TCDF	0.1	363	0.363	0.036	365	0.365	0.037	167	0.167	0.017	1.37
12378 - PeCDF	0.05	294	0.294	0.015	279	0.279	0.014	128	0.128	0.006	(2.15)
23478 - PeCDF	0.5	450	0.450	0.225	409	0.409	0.205	209	0.209	0.105	(1.96)
123478 - HxCDF	0.1	177	0.177	0.018	166	0.166	0.017	105	0.105	0.011	(0.689)
123678 - HxCDF	0.1	153	0.153	0.015	148	0.148	0.015	89.3	0.089	0.009	(0.581)
234678 - HxCDF	0.1	78	0.078	0.008	73.9	0.074	0.007	48.4	0.048	0.005	(0.634)
123789 - HxCDF	0.1	16.6	0.017	0.002	16	0.016	0.002	11.3	0.011	0.001	(1.05)
1234678 - HpCDF	0.01	86.5	0.087	0.001	84.4	0.084	0.001	61.1	0.061	0.001	(0.793)
1234789 - HpCDF	0.01	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	(1.38)
OCDF	0.001	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	(5.13)
Total TEQ (ng)				0.386			0.365			0.206	0.0001

(1) Sample masses reported by laboratory to be BDL(x.xx) are reported to be zero(0) per EPA Method 23, Sect. 9.9
(2) Sample mass reported by laboratory in (ng)
(3) TEQ sample mass

Table 4

Summary of Source Particulate Matter Emission Test Data

Rinker Materials

Cement Kiln, Mill Up

August 4, 2004

Run No.	Process Weight Rate (tons/hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (F)	Stack Gas Moisture (%)	Particulate Matter		
					Conc. (gr/dscf)	Emission Rate (lbs/hr)	lb/ton feed
1	245.5	262,915	291	11.9	0.0044	9.87	0.040
2	245.6	255,618	301	12.6	0.0042	9.20	0.037
3	245.4	222,270	267	13.9	0.0044	8.43	0.034
Average	245.5	246,934	286	12.8	0.0043	9.17	0.037

Table 5

Summary of Source Particulate Matter Emission Test Data

Rinker Materials

Cement Kiln, Mill Down

August 5, 2004

Run No.	Process Weight Rate (tons/hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (F)	Stack Gas Moisture (%)	Particulate Matter		
					Conc. (gr/dscf)	Emission Rate (lbs/hr)	lb/ton feed
1	245.6	195,528	453	10.1	0.0087	14.57	0.059
2	245.6	193,468	466	10.0	0.0087	14.39	0.059
3	200.7	198,739	464	10.2	0.0096	16.30	0.081
Average	230.6	195,912	461	10.1	0.0090	15.09	0.067

Appendix

Raw Mill Operating

Dioxin/Furans Calculations

Field and Laboratory Data Sheets

Particulate Matter Calculations

Field and Laboratory Data Sheets

Raw Mill Down

Dioxin/Furans Calculations

Field and Laboratory Data Sheets

Particulate Matter Calculations

Field and Laboratory Data Sheets

Summary of Laboratory Data for Dioxins and Furans

Plant Operating Data

Baghouse Temperature Data

Opacity Data

Equipment Calibrations

Project Participants

Raw Mill Operating

Dioxin/Furans Calculations

SUMMARY OF SOURCE EMISSION TEST DATA

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill Up)
Date: August 4 and 7, 2004

Run No.	Process Weight Rate (Tons/hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (F)	Stack Gas Moisture (%)
1		233,761	363	11.2
2		262,554	260	10.6
3		258,228	296	10.5
Average	0.0	251,514	306	10.8

GENERAL DATA

Plant	:	Rinker Materials			
Source/Unit	:	Cement Kiln-Raw Mill Operating (Mill Up)			
Date	:	August 4, 2004	Cp	0.840	
Stack dia.	:	136.50 inch OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0 percent	Duct Width	0.00	inch
CO2 Corr.	:	0.0 percent	Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U F Process Wt.

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

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	101	104	95
Stack Temp., Ts (F)	363	260	296
Sq.Rt. dP	0.96	1.01	1.01
dH (in. H2O)	1.46	1.70	2.73
Meter Vol.,Vm (ft3)	132.000	138.800	138.981
Vol. H2O, Vlc (ml)	333.9	324.2	329.0
Meter Y	1.000	0.988	1.000
Bar. Press.,Pb (in.Hg.)	29.88	29.79	29.79
Static Press.,Ps (in.H2O)	-1.00	-0.71	-0.71
Test Time (min.)	180.0	176.0	180.0
Nozzle Dia.,Dn (in.)	0.231	0.233	0.233
Oxygen, O2 (%)	12.2	12.7	12.5
Carbon Dioxide, CO2 (%)	11.6	11.2	11.7
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? l = lb/hr g = gr/dscf : grams

Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T

Allowable Particulate Matter Concentration .....: 0

LABORATORY RESULTS	RUN 1	RUN 2	RUN 3
	grams	grams	grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.00000	0.00000	0.00000
Filterable Sample (MF)	0.00000	0.00000	0.00000
Condensible Sample (BHW)	0.00000	0.00000	0.00000

A. FIELD DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln-Raw Mill Operating (Mill Up)
Date: August 4, 2004

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	333.9	324.2	329.0
Vm = Sample gas vol, meter cond., acf	132.000	138.800	138.981
Y = Meter calibration factor	1.0000	0.9880	1.0000
Pbar = Barometric pressure, in. Hg	29.88	29.79	29.79
Pstatic = Stack static pressure, in. H2O	-1.00	-0.71	-0.71
dH = Avg meter pressure diff, in. H2O	1.46	1.70	2.73
Tm = Absolute meter temp., degrees R	560.8	563.5	555.5
Vm(std) = Sample gas vol, Std. cond., dscf	124.571	128.473	132.417
Bws = Water vapor in gas stream, fraction	0.112	0.106	0.105
MF = Moisture factor (1 - Bws)	0.888	0.894	0.895
CO2 = Carbon Dioxide, dry, volume %	11.60	11.20	11.70
O2 = Oxygen, dry, volume %	12.20	12.70	12.50
N2 = Nitrogen, dry volume %	76.20	76.10	75.80
Md = Molecular weight of stack gas, dry	30.34	30.30	30.37
Ms = Molecular weight of stack gas, wet	28.96	28.99	29.08
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.9637	1.0073	1.0146
Ts = Absolute stack temp., degrees R	823.4	720.1	755.6
A = Area of stack, ft2	101.62	101.62	101.62
Qstd = Volumetric flowrate, dscfm	233,761	262,554	258,228
An = Nozzle area, ft2	2.91E-04	2.96E-04	2.96E-04
0 = Sample time, minutes	180.00	176.00	180.00
%I = Isokinetic variation, percent	103.38	95.43	97.78

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill ! RUN NO.: 1
Date: August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS.,Ps =	-1.00	in. H2O
METER TEMP, Tm =	100.75	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	363.4	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD,dP =	0.929	in. H2O	DUCT LENGTH =		inch
METER ORIFICE,dH=	1.46	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	132.000	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000		TEST TIME =	180.00	min.
BAR. PRESS., Pb =	29.88	in.Hg	NOZZLE DIA. =	0.231	inch
COND.(Vlc) =	333.9	ml	NOZZLE DIA., An =	2.9E-04	Sq.Ft.
GAS ANALYSIS =	12.20	% O2	0.00	% CO	
	11.60	% CO2	76.20	% N2	

Vm(std) = { (T(std) + 460) / 29.92 } x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 124.571 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.717 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.112 ! 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)) x 100 = 154.10

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.34

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.96

P(stack) = Pbar + (Ps / 13.6) ..... = 29.81 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 67.59 ft/sec

Qs = vs x As x 60 ..... = 412,108 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 233,761 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 103.38 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill) RUN NO.: 2
Date : August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS.,Ps =	-0.71	in. H2O
METER TEMP, Tm =	103.50	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	260.1	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD,dP =	1.015	in. H2O	DUCT LENGTH =		inch
METER ORIFICE,dH=	1.70	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	138.800	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	0.988		TEST TIME =	176.00	min.
BAR. PRESS., Pb =	29.79	in.Hg	NOZZLE DIA. =	0.233	inch
COND.(Vlc) =	324.2	ml	NOZZLE DIA., An =	3.0E-04	Sq.Ft.

GAS ANALYSIS =	12.70	% O2	0.00	% CO
	11.20	% CO2	76.10	% N2

Vm(std) = { (T(std) + 460) / 29.92 } x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 128.473 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.260 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.106 | 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)) x 100 = 171.84

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.30

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.99

P(stack) = Pbar + (Ps / 13.6) ..... = 29.74 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 66.10 ft/sec

Qs = vs x As x 60 ..... = 403,059 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 262,554 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 95.43 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill ! RUN NO.: 3
Date : August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS.,Ps =	-0.71	in. H2O
METER TEMP, Tm =	95.47	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	295.6	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD,dP =	1.029	in. H2O	DUCT LENGTH =		inch
METER ORIFICE,dH=	2.73	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	138.981	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000		TEST TIME =	180.00	min.
BAR. PRESS., Pb =	29.79	in.Hg	NOZZLE DIA. =	0.233	inch
COND.(Vlc) =	329.0	ml	NOZZLE DIA., An =	3.0E-04	Sq.Ft.
GAS ANALYSIS =	12.50	% O2	0.00	% CO	
	11.70	% CO2	75.80	% N2	

Vm(std) = [(T(std) + 460) / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 132.417 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.486 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.105 | 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)) x 100 = 166.42

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.37

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 29.08

P(stack) = Pbar + (Ps / 13.6) ..... = 29.74 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 68.11 ft/sec

Qs = vs x As x 60 ..... = 415,276 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 258,228 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 97.78 %

Field and Laboratory Data Sheets

Multiple Methods Data Sheet

Plant: Rinker - Miami FL
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: DIF
Date: 8-4-04 Run No.: 1
Time Start: 1230 Time End: 1706
Sample Time: 15x3x4 min/point 180 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.88 "Hg Stack Press: 29.81 "Hg Ps: -1.0 "H_2O
Moisture: 12 % FDA: Gas Density Factor:
Temperature: 85 °F Wind Direction: N Wind Speed: 3-6
Weather: Partly Cldy Thermocouple Readout: KAL-6
Sample Box No.: KA-6 Meter Box No.: KAL-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.231 inches Probe Length: 4 Glass feet
Probe Heater Setting: 250°F Nomograph Cf: 1.57
Stack Dimensions: 13.65 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ft

Raw mill up

Stack Dimensions

Umbilical: KAL-100
Thermocouple Probe No.: KAL-55
Pitot Tube: KA-55 I

Material Processing Rate:
Final Gas Meter Reading: 897.600 ft³
Initial Gas Meter Reading: 765.600 ft³
Total Metered Gas Volume: 132.000 ft³
Condensate Gain in Impingers: 312 mL
Weight Gain in Silica Gel: ~~28~~ 21.1 g
Total Moisture Gain mL
Silica Gel Container No.: X
Filter Number:

Leak Check - Meter Box:
Initial: 0.008 cfm @ 15 inches Hg
Final: 0.003 cfm @ 7 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: Stable, Leak
Static 3 "H^20 for 15 sec: Stable, Leak
Test Conducted By: R Paul - C Bell
O_2 12.270 % CO_2 11.6 %
Stack Test Observers:

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O) Calculated	Meter Orifice Pressure Difference (H_2O) Actual	Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading~~ (% O_2)
Average												
1-1-1			65.6	1.1	1.73	1.73	300	232	72	91	5	66
2			69.7	1.05	1.65	1.65	298	236	66	92	5	66
3			73.3	1.05	1.65	1.65	297	241	65	93	5	64
2-1			76.7	0.96	1.51	1.51	300	240	71	92	5	69
2			80.3	0.91	1.43	1.43	297	267	66	92	5	66
3			83.8	0.96	1.51	1.51	293	252	65	93	6	66
3-1			87.5	0.74	1.16	1.16	283	259	65	95	5	65
2			90.8	0.74	1.16	1.16	280	247	64	95	5	65

1244
V
1417

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		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						
3-3			941	0.72	1.13	1.13	279	254	64	96	5	65
~~2-2-1~~			97.2	0.99	1.55	1.55	291	265	66	96	6	67
2			801.0	1.05	1.65	1.65	291	250	63	97	6	64
3			4.6	1.05	1.65	1.65	290	248	64	98	6	65
2-1			8.2	0.95	1.49	1.49	288	247	64	98	6	63
2			11.9	0.95	1.49	1.49	287	260	65	99	6	63
3			15.6	0.95	1.49	1.49	288	256	65	99	6	64
3-1			19.2	0.79	1.24	1.24	281	262	65	99	6	64
2			22.6	0.82	1.39	1.39	284	260	65	100	6	61
3			26.1	0.82	1.39	1.39	286	250	63	100	6	62
3-1-1			29.6	1.05	1.79	1.79	298	249	65	101	6	64
2			33.5	1.05	1.79	1.79	300	252	61	103	6	62
3			37.4	1.05	1.79	1.79	302	248	60	104	6	59
2-1			41.3	0.96	1.63	1.63	299	255	59	105	6	60
2			45.3	0.96	1.63	1.63	301	258	58	106	6	61
3			49.2	1.0	1.7	1.7	300	254	58	106	7	62
3-1			53.2	0.84	1.43	1.43	296	252	59	107	6	63
2			56.8	0.84	1.43	1.43	295	245	60	107	6	63
3			60.0	0.84	1.43	1.43	293	249	61	107	6	64
4-1-1			63.3	1.0	1.7	1.7	296	244	63	106	7	63
2			67.2	1.0	1.7	1.7	298	243	60	106	7	64

CF = 1.7

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			71.2	1.0	1.7	1.7	297	248	60	107	7	63
2-1			75.2	1.0	1.7	1.7	297	254	59	107	7	62
2			79.2	0.96	1.63	1.63	298	247	57	108	7	63
3			83.0	0.96	1.63	1.63	298	248	56	108	7	64
3-1			87.0	0.81	1.38	1.38	294	246	57	108	6	65
2			90.5	0.81	1.38	1.38	298	246	57	108	6	65
3			94.0	0.81	1.38	1.38	300	253	58	108	6	65

[redacted]ulti[redacted]e Metho[redacted]s Data Sheet

Plant: Renbar - Mason, TX
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-7-09 Run No.: ~~00~~ 2
Time Start: 0834 Time End: 1137
Sample Time: 3X5X3X4 min/point 176 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.79 Hg Stack Press: 29.74 "Hg Ps: 0.71 "H_2O
Moisture: 15 % FDA: Gas Density Factor:
Temperature: 85 °F Wind Direction: E Wind Speed: 3-5
Weather: Cloudy Thermocouple Readout: KAK-6
Sample Box No.: KAK-6 Meter Box No.: KAK-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.233 inches Probe Length: 4 feet
Probe Heater Setting: 250°F Nomograph Cf: 1.67
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: ft

Raw mill up

Stack Dimensions

Material Processing Rate:
Final Gas Meter Reading: 547.500 ft^3
Initial Gas Meter Reading: 408.700 ft^3
Total Metered Gas Volume: 138.800 ft^3
Condensate Gain in Impingers: 295 mL
Weight Gain in Silica Gel: 29.2 ~~30.1~~ g
Total Moisture Gain mL
Silica Gel Container No.: 22
Filter Number:

Leak Check - Meter Box:
Initial: 0.006 cfm @ 15 inches Hg
Final: 0.002 cfm @ 10 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: Stable, Leak
Static 3 "H^20 for 15 sec: Stable, Leak
Test Conducted By: R Paul-A West

Umbilical: KAK-100
Thermocouple
Probe No.: KAK-55
Pitot Tube: KASST
O_2 12.7 % CO_2 11.2 %
Stack Test Observers:

Traverse

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O) Calculated	Meter Orifice Pressure Difference (H_2O) Actual	Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading~~ (~~% O_2~~)
Average												
1-1-1			8.7	1.1	1.84	1.84	287	262	62	89	6	62
2			12.9	1.1	1.84	1.84	289	262	63	91	6	62
3			16.7	1.1	1.84	1.84	291	264	63	93	6	61
2-1			20.7	1.0	1.67	1.67	291	262	63	94	7	59
2			24.6	1.05	1.75	1.75	291	267	64	95	7	55
3			28.6	1.05	1.75	1.75	292	260	63	96	7	58
3-1			32.6	0.89	1.49	1.49	292	261	62	98	6	55
2			36.2	0.89	1.49	1.49	287	257	61	99	6	56

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			39.9	0.89	1.49	1.49	287	252	60	100	6	57
2-1-1			43.4	1.1	1.84	1.84	292	262	62	100	7	60
2			47.6	1.1	1.84	1.84	292	259	60	102	7	58
3			51.6	1.1	1.84	1.84	292	260	59	103	7	57
2-1			55.7	1.1	1.84	1.84	294	259	58	104	7	58
2			59.9	1.1	1.84	1.84	292	254	57	105	7	59
3			63.9	1.05	1.75	1.75	289	261	57	106	7	59
3-1			68.0	0.83	1.39	1.39	289	256	56	107	7	59
2			71.6	0.88	1.5	1.5	283	258	56	108	7	59
3			75.3	0.88	1.5	1.5	283	255	57	108	7	60
3-1-1			79.0	1.05	1.75	1.75	291	263	59	108	7	59
2			83.0	1.1	1.84	1.84	291	263	58	109	7	59
3			87.2	1.1	1.84	1.84	291	246	58	109	7	58
2-1			91.3	1.0	1.67	1.67	287	269	59	108	7	60
2			95.3	1.0	1.67	1.67	287	254	59	108	7	58
3			99.2	1.0	1.67	1.67	286	259	59	107	7	59
3-1			503.1	0.88	1.47	1.47	290	261	58	107	7	56
2			6.8	0.91	1.52	1.52	289	260	57	107	7	58
3			10.5	0.91	1.52	1.52	291	266	57	107	7	55
4-1-1			14.2	1.1	1.84	1.84	296	268	61	106	7	58
2			18.3	1.1	1.84	1.84	297	261	55	107	7	60

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			22.4	1.1	1.84	1.84	299	265	55	107	8	58
2-1			26.6	1.05	1.75	1.75	297	262	56	108	8	58
2			30.6	1.05	1.75	1.75	297	259	56	108	8	61
3			34.6	1.05	1.75	1.75	296	255	56	108	8	58
3-1			38.6	1.05	1.75	1.75	296	261	56	108	8	61
2			42.6	1.05	1.75	1.75	296	263	56	109	8	59
3			~~46.6~~	~~0.85~~								

Multiple Methods Data Sheet

Plant: Renbu - Miami, FL
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-7-04 Run No.: 3
Time Start: 1212 Time End: 1642
Sample Time: 3X5X3X4 min/point _____ Total Minutes
Dry Bulb: _____ °F Wet Bulb: _____ °F VP@DP: _____
Bar. Pressure: 29.79 "Hg Stack Press: 29.74 "Hg Ps: -0.71 "H_2O
Moisture: 15 % FDA: _____ Gas Density Factor: _____
Temperature: 88 °F Wind Direction: W Wind Speed: 3-5
Weather: Cloudy Thermocouple Readout: KAK-6
Sample Box No.: KAK-6 Meter Box No.: KAK-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.233 inches Probe Length: 4 feet
Probe Heater Setting: 250°F Nomograph Cf: 1.67
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: _____ ft

Raw mill up

Stack Dimensions

Umbilical: KAK-100
Thermocouple
Probe No.: KAK-55
Pitot Tube: KAK-SST

Material Processing Rate: _____
Final Gas Meter Reading: 688.808 ft^3
Initial Gas Meter Reading: 547.800 ft^3
Total Metered Gas Volume: 141.008 ft^3
Condensate Gain in Impingers: 317 mL
Weight Gain in Silica Gel: 25.4 26.8 g
Total Moisture Gain _____ mL
Silica Gel Container No.: 102
Filter Number: _____

Leak Check - Meter Box:
Initial: 0.009 cfm @ 15 inches Hg
Final: _____ cfm @ _____ inches Hg

Leak Check - Pitot Tubes
Impact 3 "$H^2$0 for 15 sec. Stable, Leak
Static 3 "$H^2$0 for 15 sec. Stable, Leak
Test Conducted By: R Paul - A West
O_2 12.5 % CO_2 11.7 %
Stack Test Observers: _____

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading (% O_2)~~
					Calculated	Actual						
Average												
1-1-1			47.8	1.1	1.84	1.84	290	231	73	99	6	69
2			50.0	1.1	1.84	1.84	290	236	64	98	6	64
3			54.0	1.1	1.84	1.84	284	244	62	98	6	63
2-1			57.7	1.1	1.84	1.84	282	247	61	98	6	59
2			61.3	1.05	1.75	1.75	276	235	60	98	7	60
3			65.1	1.05	1.75	1.75	275	255	60	99	7	61
3-1			69.1	0.93	1.55	1.55	271	259	60	99	7	62
2			72.9	0.93	1.55	1.55	274	261	60	99	7	62

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ENVIRONMENTAL SERVICES

Drop

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			76.7	0.93	1.55	1.55	276	257	60	99	7	61
2-1			80.4	1.1	1.84	1.84	289	266	67	89	8	68
2			84.3	1.1	1.84	1.84	286	260	61	91	8	64
3			88.3	1.1	1.84	1.84	287	263	61	93	8	64
2-1			92.4	1.1	1.84	1.84	288	257	60	94	9	63
2			96.6	1.1	1.91	1.91	288	256	61	95	9	64
3			600.8	1.1	1.91	1.91	287	254	60	96	9	63
3-1			5.0	0.85	1.48	1.48	285	252	60	97	8	63
2			8.8	0.85	1.48	1.48	284	255	60	98	8	64
3			12.5	0.85	1.48	1.48	282	260	60	99	8	63
3-1-1			16.2	1.1	1.92	1.92	290	259	62	100	9	65
2			20.4	1.05	1.83	1.83	348	259	60	~~100~~ 90	9	616
3			24.4	1.05	1.83	1.83	334	260	59	90	9	61
2-1			28.4	1.1	1.91	1.91	323	253	61	90	9	63
2			32.5	1.1	1.91	1.91	315	252	61	91	9	62
3			36.7	1.1	1.91	1.91	312	254	61	91	9	60
3-1			40.9	0.90	1.57	1.57	302	252	61	92	8	61
2			44.7	0.95	1.65	1.65	300	257	61	93	8	61
3			48.5	0.95	1.65	1.65	298	260	61	93	8	60
4-1-1			52.4	1.2	2.09	2.09	305	261	63	94	10	62
2			56.5	1.1	1.91	1.91	304	253	61	94		61

V
1252
1425
C.F.=
1.74
Stopp
1320
1320
1616

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			60.7	1.1	1.91	1.91	305	251	58	95	10	59
2-1			65.0	1.1	1.91	1.91	304	252	57	96	10	62
2			69.1	1.1	1.91	1.91	303	260	57	97	10	60
3			73.4	1.1	1.91	1.91	303	260	57	97	10	61
3-1			77.6	0.90	1.57	1.57	303	263	57	98	8	60
2			81.3	0.90	1.57	1.57	300	259	58	98	8	60
3			85.1	0.90	1.57	1.57	297	254	58	98	8	60

Sampling Rate Calculations

Plant Name: Rinker Date: 8-4-04

Location: Miami Source: Cement Kiln D/F RM4

ΔH	=	Orifice Reading (Inches H_20)
Dn	=	Nozzle Diameter (Inches)
ΔH@	=	Meter Box Constant
Bw	=	Moisture Fraction
Tm	=	Meter Temperature (°F)
Ts	=	Stack Temperature (°F)
Ms	=	Wet Molecular Weight of Stack Gas (from Table)
ΔP	=	Pitot Reading (Inches H_20)

$$\left[\frac{Tm + 460}{MS(Ts=460)} (1 - Bw)^2 \; \Delta H@ \; (Dn)^4 \; 17741\right] \Delta P = \Delta H$$

558 / 28.2 (900) 25384

555 / 27.4 (760) 20824

560 / 27.7 (750) 20775

560 / 28.2 (910) 25662

Moisture Fraction	MS
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

		Run No. 1		Run No. 2		Run No. 3
$\frac{Tm + 460}{MS(Ts+460)}$	=	0.02665	0.0269	0.02199		0.02182
x $(1 - Bw)^2$	=	0.7225		0.8464		0.8464
x ΔH@	=	1.61		1.61		1.61
x $(Dn)^4$	=	0.00284		0.00285	0.0048	0.00478
x 17741	=	17741		17741		17741
x ΔP	=	1.57	1.7	1.51	2.54	2.5

KAForms: Sampling Rate Calculations
jhm,05/01/01

Sampling Rate Calculations

Plant Name: Rinker Date: 8-7-04

Location: Miami Source: Cement Kiln D/F RM 4

ΔH	=	Orifice Reading (Inches H_20)
Dn	=	Nozzle Diameter (Inches)
ΔH@	=	Meter Box Constant
Bw	=	Moisture Fraction
Tm	=	Meter Temperature (°F)
Ts	=	Stack Temperature (°F)
Ms	=	Wet Molecular Weight of Stack Gas (from Table)
ΔP	=	Pitot Reading (Inches H_20)

$$\left[\frac{Tm + 460}{MS(Ts=460)} (1 - Bw)^2 \; \Delta H@ \; (Dn)^4 \; 17741\right] \Delta P = \Delta H$$

Moisture Fraction	MS
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

$\frac{554}{27.4 (750) \; 20550}$

$\frac{556}{27.7 (750) \; 20775}$

	Run No. 1		Run No. 2		Run No. 3
$\frac{Tm + 460}{MS(Ts+460)}$ =	0.0270	0.02670			
x $(1 - Bw)^2$ =	0.7225	0.7744			
x ΔH@ =	1.61				
x $(Dn)^4$ =	0.00294				
x 17741 =	17741				
x ΔP =	1.67	1.74			

KAForms: Sampling Rate Calculations
jhm,05/01/01

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
R1 - MU - C1	Cont. 1 (Filter)
R1 - MU - C2	Cont. 2 (Acetone/Methylene Chloride)
R1 - MU - C3	Cont. 3 (Toluene Rinse)
R1 - MU - C4	Trap (Solid Sorbent)

Sampled by:	R. PAUL	08/04/04	
	Signature	Date	Time
Relinquished by:	R. PAUL	08/04/04	
	Signature	Date	Time
Received by:	N. LOFGREN	08/09/04	
	Signature	Date	Time
Relinquished by:	N. LOFGREN	08/09/04	
	Signature	Date	Time

Laboratory:

Received by:			
	Signature	Date	Time

Sample Shipped Via: O UPS ☒ Federal Express O Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
RZ-MU-C1	Cont. 1 (Filter)
RZ-MU-C2	Cont. 2 (Acetone/Methylene Chloride)
RZ-MU-C3	Cont. 3 (Toluene Rinse)
RZ-MU-C4	Trap (Solid Sorbent)

Sampled by:	R. PAUL	08/07/04	
	Signature	Date	Time
Relinquished by:	R. PAUL	08/07/04	
	Signature	Date	Time
Received by:	N. LOFGREN	08/09/04	
	Signature	Date	Time
Relinquished by:	N. LOFGREN	08/09/04	
	Signature	Date	Time

Laboratory:

Received by:			
	Signature	Date	Time

Sample Shipped Via: O UPS ☒ Federal Express O Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
R3 - MV - C1	Cont. 1 (Filter)
R3 - MV - C2	Cont. 2 (Acetone/Methylene Chloride)
R3 - MV - C3	Cont. 3 (Toluene Rinse)
R3 - MV - C4	Trap (Solid Sorbent)

Sampled by:	R. PAUL	08/07/04	
	Signature	Date	Time
Relinquished by:	R. PAUL	08/07/04	
	Signature	Date	Time
Received by:	N. LOFGREN	08/09/04	
	Signature	Date	Time
Relinquished by:	N. LOFGREN	08/09/04	
	Signature	Date	Time

Laboratory:

Received by:			
	Signature	Date	Time

Sample Shipped Via: ○ UPS ☒ Federal Express ○ Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami Source: Kiln/RM/Cooler

Sample Identification	Remarks
Audit	D/F Audit Sample
	Data to be included w/
	Rinker, Miami D/F samples
	recieved by ALTA on Tues 8-10-04
	Please send results of Audit
	Sample to Ray Gordon*
	* See Address
	in enclosed
	letter

Sampled by: _____ _____ _____

Signature Date Time

Relinquished by: S Clotier 8-12-04 _____

Signature Date Time

Received by: _____ _____ _____

Signature Date Time

Relinquished by: _____ _____ _____

Signature Date Time

Laboratory:

Received by: _____ _____ _____

Signature Date Time

Sample Shipped Via: ○ UPS ☒ Federal Express ○ Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Particulate Matter Calculations

GENERAL DATA

Plant	:	Rinker Materials				
Source/Unit	:	Cement Kiln, Mill Up				
Date	:	August 4, 2004		Cp	0.840	
Stack dia.	:	136.50 inch	OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0 percent		Duct Width	0.00	inch
CO2 Corr.	:	0.0 percent		Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)
F Factor = F, Fuel Use = U - F Process Wt.

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

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1
F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	90	97	93
Stack Temp., Ts (F)	291	301	267
Sq.Rt. dP	1.04	1.03	0.89
dH (in. H2O)	2.40	2.13	1.59
Meter Vol., Vm (ft3)	53.291	52.862	44.411
Vol. H2O, Vlc (ml)	147.8	154.3	145.5
Meter Y	1.000	1.000	1.000
Bar. Press., Pb (in.Hg.)	29.90	29.90	29.90
Static Press., Ps (in.H2O)	-1.00	-1.00	-1.00
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia., Dn (in.)	0.252	0.252	0.252
Oxygen, O2 (%)	12.9	11.5	11.0
Carbon Dioxide, CO2 (%)	10.0	13.2	14.0
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? l = lb/hr g = gr/dscf : grams
Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T
Allowable Particulate Matter Concentration .....: 0

LABORATORY RESULTS	RUN 1 grams	RUN 2 grams	RUN 3 grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.00520	0.00360	0.00550
Filterable Sample (MF)	0.00940	0.01010	0.00670
Condensible Sample (BHW)	0.00000	0.00000	0.00000

A. FIELD DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln, Mill Up
Date: August 4, 2004

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	147.8	154.3	145.5
Vm = Sample gas vol, meter cond., acf	53.291	52.862	44.411
Y = Meter calibration factor	1.0000	1.0000	1.0000
Pbar = Barometric pressure, in. Hg	29.90	29.90	29.90
Pstatic = Stack static pressure, in. H2O	-1.00	-1.00	-1.00
dH = Avg meter pressure diff, in. H2O	2.40	2.13	1.59
Tm = Absolute meter temp., degrees R	550.0	557.1	553.2
Vm(std) = Sample gas vol, Std. cond., dscf	51.427	50.330	42.528
Bws = Water vapor in gas stream, fraction	0.119	0.126	0.139
MF = Moisture factor (1 - Bws)	0.881	0.874	0.861
CO2 = Carbon Dioxide, dry, volume %	10.00	13.20	14.00
O2 = Oxygen, dry, volume %	12.90	11.50	11.00
N2 = Nitrogen, dry volume %	77.10	75.30	75.00
Md = Molecular weight of stack gas, dry	30.12	30.57	30.68
Ms = Molecular weight of stack gas, wet	28.67	28.99	28.92
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	1.0380	1.0291	0.8865
Ts = Absolute stack temp., degrees R	751.1	760.5	726.7
A = Area of stack, ft2	101.62	101.62	101.62
Qstd = Volumetric flowrate, dscfm	262,915	255,618	222,270
An = Nozzle area, ft2	3.46E-04	3.46E-04	3.46E-04
0 = Sample time, minutes	60.00	60.00	60.00
%I = Isokinetic variation, percent	95.66	96.29	93.57

B. PARTICULATE DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln, Mill Up
Date: August 4, 2004

	RUN 1	RUN 2	RUN 3
Sample Weight (FHW + MF + BHW), mg	14.60	13.70	12.20
Meter Volume, standard cond., Vm(std)	51.427	50.330	42.528
Carbon Dioxide, percent	10.00	13.20	14.00
Oxygen, percent	12.90	11.50	11.00
Sample Concentration :			
gr/scf	0.0039	0.0037	0.0038
gr/dscf	0.0044	0.0042	0.0044
gr/dscf @ 0 % CO2	0.0053	0.0038	0.0038
gr/dscf @ 0 % O2	0.0114	0.0093	0.0093
ppm * MW (dry gas).....	241.0	231.0	243.5
ppm * MW @ 0% CO2	0.0	0.0	0.0
ppm * MW @ 0% O2	629.5	513.7	514.0

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up RUN NO.: 1
Date: August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS., Ps =	-1.00	in. H2O
METER TEMP, Tm =	90	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	291.1	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD, dP =	1.077	in. H2O	DUCT LENGTH =		inch
METER ORIFICE, dH=	2.40	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	53.291	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000		TEST TIME =	60.00	min.
BAR. PRESS., Pb =	29.90	in.Hg	NOZZLE DIA. =	0.252	inch
COND. (Vlc) =	147.8	ml	NOZZLE DIA., An =	3.5E-04	Sq.Ft.

GAS ANALYSIS =	12.90	% O2	0.00	% CO
	10.00	% CO2	77.10	% N2

Vm(std) = [(T(std) + 460) / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 51.427 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 6.957 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.119 | 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)) x 100 = 173.05

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.12

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.67

P(stack) = Pbar + (Ps / 13.6) ..... = 29.83 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 69.85 ft/sec

Qs = vs x As x 60 ..... = 425,924 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 262,915 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 95.66 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up RUN NO.: 2
Date : August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS., Ps =	-1.00	in. H2O
METER TEMP, Tm =	97.08	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	300.5	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD, dP =	1.059	in. H2O	DUCT LENGTH =		inch
METER ORIFICE, dH=	2.13	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	52.862	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000		TEST TIME =	60.00	min.
BAR. PRESS., Pb =	29.90	in.Hg	NOZZLE DIA. =	0.252	inch
COND. (Vlc) =	154.3	ml	NOZZLE DIA., An =	3.5E-04	Sq.Ft.
GAS ANALYSIS =	11.50	% O2	0.00	% CO	
	13.20	% CO2	75.30	% N2	

Vm(std) = { (T(std) + 460) / 29.92 } x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 50.330 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 7.263 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.126 | 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)) x 100 = 137.24

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.57

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.99

P(stack) = Pbar + (Ps / 13.6) ..... = 29.83 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 69.31 ft/sec

Qs = vs x As x 60 ..... = 422,627 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 255,618 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 96.29 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up RUN NO.: 3
Date : August 4, 2004

STD.TEMP, Tstd =	68	F	STATIC PRESS., Ps =	-1.00	in. H2O
METER TEMP, Tm =	93.17	F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	266.7	F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD, dP =	0.786	in. H2O	DUCT LENGTH =		inch
METER ORIFICE, dH=	1.59	in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	44.411	Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000		TEST TIME =	60.00	min.
BAR. PRESS., Pb =	29.90	in.Hg	NOZZLE DIA. =	0.252	inch
COND. (Vlc) =	145.5	ml	NOZZLE DIA., An =	3.5E-04	Sq.Ft.
GAS ANALYSIS =	11.00	% O2	0.00	% CO	
	14.00	% CO2	75.00	% N2	

Vm(std) = [(T(std) + 460) / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 42.528 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 6.849 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.139 | 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)) x 100 = 125.00

Md = (.44 x %CO2) + (.32 x %O2) + [.28 x (%N2 + %CO)] = 30.68

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.92

P(stack) = Pbar + (Ps / 13.6) ..... = 29.83 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 58.43 ft/sec

Qs = vs x As x 60 ..... = 356,277 acf/min

Qs(std) = Qs x (1-Bws) x ((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 222,270 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92) x 100 / [Time x P(stack) x An x vs x 60] ..... = 93.57 %

EMISSION RATE CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up
Date: August 4, 2004 RUN NO.: 1
STANDARD TEMP. : 68 F

Front Half Wash (FHW)	0.00520	grams	Vm(std)	51.427	ft3
Mass Filter (MF)	0.00940	grams	Vw(std)	6.957	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	262,915	dscfm
Vm(std) SO2		dscf	Bws	0.119	
CO2 CORR. 0.0 %			CO2	10.00	%
O2 CORR.: 0.0 %			O2	12.90	%

F-FACTOR

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

FUEL USE

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr
Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0039	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0044	gr/dscf
gr/dscf x (12 / %CO2)	0.0053	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0114	@ 0% O2
0.00857 x Qs(std) x gr/dscf	9.87	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq)	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 10.0 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 12.9% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 10.0 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 10.0% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

EMISSION RATE CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up
Date: August 4, 2004 RUN NO.: 2
STANDARD TEMP. : 68 F

Front Half Wash (FHW)	0.00360	grams	Vm(std)	50.330	ft3
Mass Filter (MF)	0.01010	grams	Vw(std)	7.263	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	255,618	dscfm
Vm(std) SO2		dscf	Bws	0.126	
CO2 CORR. 0.0 %			CO2	13.20	%
O2 CORR.: 0.0 %			O2	11.50	%

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

FUEL USE

-

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr

Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0037	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0042	gr/dscf
gr/dscf x (12 / %CO2)	0.0038	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0093	@ 0% O2
0.00857 x Qs(std) x gr/dscf	9.20	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 10.0 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 10.0% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 13.2 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 13.2% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

EMISSION RATE CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln, Mill Up
Date: August 4, 2004 RUN NO.: 3
STANDARD TEMP. : 68 F

Front Half Wash (FHW)	0.00550	grams	Vm(std)	42.528	ft3
Mass Filter (MF)	0.00670	grams	Vw(std)	6.849	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	222,270	dscfm
Vm(std) SO2		dscf	Bws	0.139	
CO2 CORR. 0.0 %			CO2	14.00	%
O2 CORR.: 0.0 %			O2	11.00	%

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

FUEL USE

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr
Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0038	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0044	gr/dscf
gr/dscf x (12 / %CO2)	0.0038	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0093	@ 0% O2
0.00857 x Qs(std) x gr/dscf	8.43	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 10.0 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 10.0% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 14.0 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 14.0% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

Field and Laboratory Data Sheets

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Multiple Methods Data Sheet

Plant: Rinker Materials
Sample Location: Miami, Fl
Control Type: Baghouse
Sample Type: P.M
Date: 8-4-04 Run No.: 1
Time Start: 12:10 Time End: 15:00
Sample Time: 25/3/4 min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP: -1'
Bar. Pressure: 29.90 "Hg Stack Press: "Hg Ps: -1' "H_2O
Moisture: % FDA: Gas Density Factor:
Temperature: 90°F Wind Direction: Wind Speed:
Weather: scatt Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.52 Pitot Corr.: 0.84
Nozzle Diameter: 0.252 inches Probe Length: 6 55 feet
Probe Heater Setting: Nomograph Cf: 2.22
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ~300' ft

Stack Dimensions

mill up

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA-55II

Material Processing Rate:
Final Gas Meter Reading: 764,491 ft³
Initial Gas Meter Reading: 711.200 ft³
Total Metered Gas Volume: 53,291 ft³
Condensate Gain in Impingers: 141 mL
Weight Gain in Silica Gel: 6.8 g
Total Moisture Gain mL
Silica Gel Container No.: ?
Filter Number:

Leak Check - Meter Box:
Initial: 0.015 cfm @ 13 inches Hg
Final: .005 cfm @ 5 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: Stable, Leak
Static 3 "H^20 for 15 sec: Stable, Leak
Test Conducted By: G. Haven, A West
O_2 % CO_2 10% %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)	
					Calculated	Actual							
Average:													
1-1			711.2	1.2	2.6	2.6	302	240	63	91	5		
1-2			715.2	1.0	2.2	2.2	300	247	59	90	4		12:4 ∨
1-3			720.0	.9	1.9	1.9	290	227	60	90	3		
2-1			724.1	1.3	2.8	2.8	298	247	67	90	5		14:2 ∧
2-2			728.8	1.2	2.6	2.6	294	250	59	90	5		
2-3			733.5	1.2	2.6	2.6	293	261	60	90	5		
3-1			738.2	1.2	2.6	2.6	291	274	55	89	5		
3-2			742.8	1.1	2.4	2.4	290	265	46	89	4		

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
			747.4	1.1	2.4	2.4	289	260	48	89	4	
			752.2	.84	1.8	1.8	277	260	49	90	4	
			756.1	1.1	2.4	2.4	288	264	49	91	4	
			760.4	.85	1.8	1.8	281	270	50	91	4	

Multiple Methods Data Sheet

Plant: Rinker, Materials
Sample Location: Miami, FL
Control Type: Baghouse
Sample Type: P.M
Date: 8.4.04 Run No.: 2
Time Start: 4:15 Time End: 5:30
Sample Time: 25/3/4 min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: "Hg Stack Press: "Hg Ps: "H_2O
Moisture: % FDA: Gas Density Factor:
Temperature: °F Wind Direction: Wind Speed:
Weather: Scatt Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.52 Pitot Corr.: 0.84
Nozzle Diameter: 0.252 inches Probe Length: 6'55 feet
Probe Heater Setting: Nomograph Cf: 2.0
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ≥ 300' ft

Stack Dimensions: mill up

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA-55II

Material Processing Rate:
Final Gas Meter Reading: 817.846 ft³
Initial Gas Meter Reading: 764.984 ft³
Total Metered Gas Volume: 52.862 ft³
Condensate Gain in Impingers: 144 mL
Weight Gain in Silica Gel: 10.3 g
Total Moisture Gain mL
Silica Gel Container No.: 33
Filter Number:

Leak Check - Meter Box:
Initial: .008 cfm @ 11 inches Hg
Final: .009 cfm @ 5 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^2O for 15 sec: (Stable), Leak
Static 3 "H^2O for 15 sec: (Stable), Leak
Test Conducted By: G. Haven, A. West
O_2 % CO_2 %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)
					Calculated	Actual						
Average:												
1.1			764.9	1.2	2.4	2.4	291	265	57	94	4	
1-2			769.6	1.1	2.2	2.2	295	256	48	94	4	
1-3			774.1	.91	1.8	1.8	290	257	51	95	4	
2-1			778.1	1.2	2.4	2.4	296	267	52	96	4	
2-2			782.8	1.1	2.2	2.2	298	259	49	97	4	
2.3			787.4	1.1	2.2	2.2	300	259	48	98	4	
3.1			792.8	1.1	2.2	2.2	301	257	54	98	4	
3.2			796.3	1.0	2.0	2.0	306	262	51	98	4	

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3-3			800.6	.84	1.6	1.6	299	255	47	98	AW ~~4~~ 3	
4-1			804.6	1.2	2.4	2.4	311	257	54	99	4	
4-2			809.2	1.1	2.2	2.2	310	266	51	99	4	
4-3			813.7	.90	1.8	1.8	309	251	53	99	3	

Multiple Methods Data Sheet

Plant: Rinker Materials
Sample Location: Miami, FL
Control Type: Baghouse
Sample Type: P.M
Date: 8.4.04 Run No.: 3
Time Start: 5:50 Time End: 6:58
Sample Time: 25/3/4 min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: "Hg Stack Press: "Hg Ps: "H_2O
Moisture: % FDA: Gas Density Factor:
Temperature: °F Wind Direction: Wind Speed:
Weather: scatt Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.52 Pitot Corr.: 0.84
Nozzle Diameter: 0.252 inches Probe Length: 6' 55 feet
Probe Heater Setting: Nomograph Cf: 2.0
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: 3 300' ft

Stack Dimensions: mill up

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA55 II

Material Processing Rate:
Final Gas Meter Reading: 882.612 ft^3
Initial Gas Meter Reading: 818.201 ft^3
Total Metered Gas Volume: 44.411 ft^3
Condensate Gain in Impingers: 136 mL
Weight Gain in Silica Gel: 9.5 g
Total Moisture Gain mL
Silica Gel Container No.: 11-Z
Filter Number:

Leak Check - Meter Box:
Initial: .010 cfm @ 11 inches Hg
Final: .000 cfm @ 5 inches Hg

Leak Check - Pitot Tubes
Impact 3 "$H^2$0 for 15 sec: ~~Stable~~, Leak
Static 3 "$H^2$0 for 15 sec: ~~Stable~~, Leak
Test Conducted By: A. West C.J. Bell
O_2 % CO_2 %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)
					Calculated	Actual						
Average:												
1-1			818.2	1.1	2.2	~~300~~ 2.2	300	262	55	98	3	
1-2			822.1	1.1	2.2	2.2	304	266	50	97	3	
1-3			825.9	.61	1.2	1.2	288	228	51	95	3	
2-1			829.3	.95	1.9	1.9	282	230	56	94	4	
2-2			833.3	.82	1.6	1.6	271	245	50	93	4	
2-3			837.4	.55	1.1	1.1	260	235	51	93	4	
3-1			841.1	.82	1.1	1.1	257	250	53	92	4	
3-2			844.6	.82	1.1	1.1	257	260	47	92	4	

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Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3-3			848.3	.61	1.2	1.2	246	250	52	91	4	
4-1			851.7	.88	1.7	1.7	248	262	51	91	4	
4-2			855.6	.75	1.5	1.5	249	253	54	91	3	
4-3			859.3	.55	1.1	1.1	238	262	55	91		

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ENVIRONMENTAL SERVICES

Particulate Lab Data Sheet

Test Date: 08/04/05

Plant Name: Rinker Miami

Source: K. In, Mill UP

	Run No. 1	Run No. 2	Run No. 3	Blank
Container No.	115	802	704	55
Total Volume (ml)	200	200	200	200
Aliquot Evaporated (ml)	200	200	200	200
Final Weight (g)	111.0383	98.9970	116.0193	116.7621
Tare Weight (g)	111.0331	98.9934	116.0138	116.7626
Gross Weight Gained (g)	.0052	.0036	.0055	-.0005
Average Blank (g)	—	—	—	—
Net Weight (g)	.0052	.0036	.0055	-.0005
Aliquot Factor	x 1	x 1	x 1	x 1
Total Net Weight (mg)	5.2	3.6	5.5	-.5

Container No.	1L	2L	3L	4M
Filter No.	3586	3587	3588	3593
Final Weight (g)	.4221	.4239	.4200	.4099
Tare Weight (g)	.4127	.4138	.4133	.4097
Gross Weight Gained	.0094	.0101	.0067	.0002
Average Blank (g)	—	—	—	—
Total Net Weight (mg)	9.4	10.1	6.7	.2

Tare Balance Check

0.0 0.0000 10.0 10.0000
1.0 1.0006 50.0 50.0006
5.0 5.0004 100.0 100.0010
T/H 77/48

Corey Bell
Signature

8/10/04
Date

Final Balance Check

0.0 0 10.0 10.0002
1.0 1.0000 50.0 50.0005
5.0 5.0002 100.0 100.0009
T/H 80/48

Signature

8/11/04
Date

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ENVIRONMENTAL SERVICES

Raw Mill Down

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ENVIRONMENTAL SERVICES

Dioxin/Furans Calculations

SUMMARY OF SOURCE EMISSION TEST DATA

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Not-Operating (Mill Down)
Date: August 5 and 8, 2004

Run No.	Process Weight Rate (Tons/hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (F)	Stack Gas Moisture (%)
1		190,162	458	9.0
2		191,746	457	9.5
3		181,957	451	10.7
Average	0.0	187,955	455	9.7

GENERAL DATA

Plant	:	Rinker Materials				
Source/Unit	:	Cement Kiln-Raw Mill Operating (Mill Up)				
Date	:	August 4 and 7, 2004		Cp	0.840	
Stack dia.	:	136.50 inch	OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0 percent		Duct Width	0.00	inch
CO2 Corr.	:	0.0 percent		Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U F Process Wt.

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

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	101	104	95
Stack Temp., Ts (F)	363	260	296
Sq.Rt. dP	0.96	1.01	1.01
dH (in. H2O)	1.46	1.70	2.73
Meter Vol.,Vm (ft3)	132.000	138.800	138.981
Vol. H2O, Vlc (ml)	333.9	324.2	329.0
Meter Y	1.000	0.988	1.000
Bar. Press.,Pb (in.Hg.)	29.88	29.79	29.79
Static Press.,Ps (in.H2O)	-1.00	-0.71	-0.71
Test Time (min.)	180.0	176.0	180.0
Nozzle Dia.,Dn (in.)	0.231	0.233	0.233
Oxygen, O2 (%)	12.2	12.7	12.5
Carbon Dioxide, CO2 (%)	11.6	11.2	11.7
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? 1 = lb/hr g = gr/dscf : grams

Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T

Allowable Particulate Matter Concentration : 0

LABORATORY RESULTS	RUN 1 grams	RUN 2 grams	RUN 3 grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.00000	0.00000	0.00000
Filterable Sample (MF)	0.00000	0.00000	0.00000
Condensible Sample (BHW)	0.00000	0.00000	0.00000

A. FIELD DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln-Raw Mill Operating (Mill Up)
Date: August 4 and 7, 2004

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	333.9	324.2	329.0
Vm = Sample gas vol, meter cond., acf	132.000	138.800	138.981
Y = Meter calibration factor	1.0000	0.9880	1.0000
Pbar = Barometric pressure, in. Hg	29.88	29.79	29.79
Pstatic = Stack static pressure, in. H2O	-1.00	-0.71	-0.71
dH = Avg meter pressure diff, in. H2O	1.46	1.70	2.73
Tm = Absolute meter temp., degrees R	560.8	563.5	555.5
Vm(std) = Sample gas vol, Std. cond., dscf	124.571	128.473	132.417
Bws = Water vapor in gas stream, fraction	0.112	0.106	0.105
MF = Moisture factor (1 - Bws)	0.888	0.894	0.895
CO2 = Carbon Dioxide, dry, volume %	11.60	11.20	11.70
O2 = Oxygen, dry, volume %	12.20	12.70	12.50
N2 = Nitrogen, dry volume %	76.20	76.10	75.80
Md = Molecular weight of stack gas, dry	30.34	30.30	30.37
Ms = Molecular weight of stack gas, wet	28.96	28.99	29.08
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.9637	1.0073	1.0146
Ts = Absolute stack temp., degrees R	823.4	720.1	755.6
A = Area of stack, ft2	101.62	101.62	101.62
Qstd = Volumetric flowrate, dscfm	233,761	262,554	258,228
An = Nozzle area, ft2	2.91E-04	2.96E-04	2.96E-04
0 = Sample time, minutes	180.00	176.00	180.00
%I = Isokinetic variation, percent	103.38	95.43	97.78

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill 1 RUN NO.: 1
Date: August 4 and 7, 2004

STD.TEMP, Tstd =	68 F	STATIC PRESS.,Ps =	-1.00	in. H2O
METER TEMP, Tm =	100.75 F	PITOT COFF., Cp =	0.840	
STACK TEMP, Ts =	363.4 F	STACK I.D. =	136.50	inch
AVG.VEL.HEAD,dP =	0.929 in. H2O	DUCT LENGTH =		inch
METER ORIFICE,dH=	1.46 in. H2O	DUCT WIDTH =		inch
METER VOL., Vm =	132.000 Cu.Ft.	STACK AREA, As =	101.623	Sq.Ft.
METER COFF., Y =	1.000	TEST TIME =	180.00	min.
BAR. PRESS., Pb =	29.88 in.Hg	NOZZLE DIA. =	0.231	inch
COND.(Vlc) =	333.9 ml	NOZZLE DIA., An =	2.9E-04	Sq.Ft.
GAS ANALYSIS =	12.20 % O2	0.00 % CO		
	11.60 % CO2	76.20 % N2		

Vm(std) = [(T(std) + 460) / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm + 460)..... = 124.571 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.717 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.112 | 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)) x 100 = 154.10

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 30.34

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.96

P(stack) = Pbar + (Ps / 13.6) ..... = 29.81 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460)
/ (Ms x P(stack))] ..... = 67.59 ft/sec

Qs = vs x As x 60 ..... = 412,108 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460))
x (P(stack)/29.92) ..... = 233,761 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) /
(T(std) + 460) / 29.92] x 100 / [Time x
P(stack) x An x vs x 60] ..... = 103.38 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill 1 RUN NO.: 2
Date : August 4 and 7, 2004

STD.TEMP, Tstd	=	68	F	STATIC PRESS., Ps	=	-0.71	in. H2O
METER TEMP, Tm	=	103.50	F	PITOT COFF., Cp	=	0.840	
STACK TEMP, Ts	=	260.1	F	STACK I.D.	=	136.50	inch
AVG.VEL.HEAD, dP	=	1.015	in. H2O	DUCT LENGTH	=		inch
METER ORIFICE, dH	=	1.70	in. H2O	DUCT WIDTH	=		inch
METER VOL., Vm	=	138.800	Cu.Ft.	STACK AREA, As	=	101.623	Sq.Ft.
METER COFF., Y	=	0.988		TEST TIME	=	176.00	min.
BAR. PRESS., Pb	=	29.79	in.Hg	NOZZLE DIA.	=	0.233	inch
COND. (Vlc)	=	324.2	ml	NOZZLE DIA., An	=	3.0E-04	Sq.Ft.

GAS ANALYSIS	=	12.70	% O2	0.00	% CO
		11.20	% CO2	76.10	% N2

Vm(std) = { (T(std) + 460) / 29.92 } x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 128.473 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.260 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.106 | 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)) x 100 = 171.84

Md = (.44 x %CO2) + (.32 x %O2) + [.28 x (%N2 + %CO)] = 30.30

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.99

P(stack) = Pbar + (Ps / 13.6) ..... = 29.74 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x P(stack))] ..... = 66.10 ft/sec

Qs = vs x As x 60 ..... = 403,059 acf/min

Qs(std) = Qs x (1-Bws) x ((Tstd + 460)/(Ts + 460)) x (P(stack)/29.92) ..... = 262,554 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) / (T(std) + 460) / 29.92] x 100 / [Time x P(stack) x An x vs x 60] ..... = 95.43 %

SOURCE TEST CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Raw Mill Operating (Mill ! RUN NO.: 3
Date : August 4 and 7, 2004

STD.TEMP, Tstd	=	68	F	STATIC PRESS., Ps	=	-0.71	in. H2O
METER TEMP, Tm	=	95.47	F	PITOT COFF., Cp	=	0.840	
STACK TEMP, Ts	=	295.6	F	STACK I.D.	=	136.50	inch
AVG.VEL.HEAD, dP	=	1.029	in. H2O	DUCT LENGTH	=		inch
METER ORIFICE, dH	=	2.73	in. H2O	DUCT WIDTH	=		inch
METER VOL., Vm	=	138.981	Cu.Ft.	STACK AREA, As	=	101.623	Sq.Ft.
METER COFF., Y	=	1.000		TEST TIME	=	180.00	min.
BAR. PRESS., Pb	=	29.79	in.Hg	NOZZLE DIA.	=	0.233	inch
COND. (Vlc)	=	329.0	ml	NOZZLE DIA., An	=	3.0E-04	Sq.Ft.

GAS ANALYSIS	=	12.50	% O2	0.00	% CO	
		11.70	% CO2	75.80	% N2	

Vm(std) = { (T(std) + 460) / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm + 460)..... = 132.417 dscf

Vw(std) = (8.9148 x 10e-5) x (Tstd + 460) x Vlc = 15.486 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.105 | 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)) x 100 = 166.42

Md = (.44 x %CO2) + (.32 x %O2) + [.28 x (%N2 + %CO)] = 30.37

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 29.08

P(stack) = Pbar + (Ps / 13.6) ..... = 29.74 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460)
/ (Ms x P(stack))] ..... = 68.11 ft/sec

Qs = vs x As x 60 ..... = 415,276 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460))
x (P(stack)/29.92) ..... = 258,228 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std) /
(T(std) + 460) / 29.92] x 100 / [Time x
P(stack) x An x vs x 60] ..... = 97.78 %

Field and Laboratory Data Sheets

Multiple Methods Data Sheet

Plant: Rinker - Miami, FL
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-5-04 Run No.: 1
Time Start: 0814 Time End: 1125
Sample Time: 15 X 3 X 4 min/point 175 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.88 "Hg Stack Press: 29.81 "Hg Ps: -0.9 "H_2O
Moisture: 8 % FDA: Gas Density Factor:
Temperature: 80 °F Wind Direction: Vari Wind Speed: 2-3
Weather: Cloudy Thermocouple Readout: KAR-6
Sample Box No.: KAR-6 Meter Box No.: KAR-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.263 inches Probe Length: ~~6~~ feet
Probe Heater Setting: 250°F Nomograph Cf: ~~0.5~~ 2.5
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: ft

Raw mill Down

Stack Dimensions

Umbilical: KAR-100
Thermocouple
Probe No.: KAR-55
Pitot Tube: KA-SSI

Material Processing Rate:
Final Gas Meter Reading: 1033.512 ft^3
Initial Gas Meter Reading: 898.400 ft^3
Total Metered Gas Volume: 135.112 ft^3
Condensate Gain in Impingers: 240 mL
Weight Gain in Silica Gel: 22.3 23.9 g
Total Moisture Gain mL
Silica Gel Container No.: 101
Filter Number: —

Leak Check - Meter Box:
Initial: 0.004 cfm @ 15 inches Hg
Final: 0.003 cfm @ 9 inches Hg

Leak Check - Pitot Tubes
Impact 3 "$H^2$0 for 15 sec: Stable / Leak
Static 3 "$H^2$0 for 15 sec: Stable / Leak
Test Conducted By: R Paul & C Bell
O_2 9.5 % CO_2 16.5 %
Stack Test Observers:

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading~~ (% O_2)
					Calculated	Actual						
Average:												
1-1-1			98.4	0.72	1.8	1.8	445	249	69	91	5	69
2			902.4	0.72	1.8	1.8	450	249	66	92	5	66
3			6.3	0.68	1.72	1.72	446	250	66	94	5	64
2-1			10.0	0.68	1.72	1.72	449	245	65	95	6	64
2			13.8	0.70	1.77	1.77	452	249	64	96	6	65
3			17.6	0.68	1.72	1.72	452	245	63	98	6	64
3-1			21.6	0.58	1.46	1.46	447	245	62	99	6	64
2			25.2	0.58	1.46	1.46	447	245	62	100		65

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Trip

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			28.7	0.60	1.52	1.52	449	247	63	101	6	64
2-1-1			32.3	0.76	1.9	1.9	464	242	66	101	7	67
2			36.4	0.73	1.83	1.83	464	248	65	103	7	64
3			40.4	0.73	1.83	1.83	465	243	65	103	7	65
2-1			44.5	0.66	1.65	1.65	459	248	65	104	7	64
2			48.3	0.68	1.7	1.7	461	243	65	105	7	65
3			52.2	0.72	1.8	1.8	462	246	64	105	7	65
3-1			56.2	0.64	1.6	1.6	453	250	64	105	7	65
2			59.9	0.57	1.43	1.43	454	245	64	106	6	65
3			63.6	0.57	1.43	1.43	453	242	64	107	6	63
3-1-1			67.2	0.76	1.9	1.9	468	245	64	107	7	66
2			71.2	0.74	1.85	1.85	469	245	62	108	7	66
3			75.3	0.74	1.85	1.85	468	243	63	109	7	66
2-1			79.4	0.65	1.63	1.63	461	242	63	110	7	66
2			83.2	0.65	1.63	1.63	463	244	65	111	7	66
3			87.1	0.69	1.73	1.73	464	243	66	111	7	65
3-1			91.1	0.59	1.48	1.48	455	243	65	111	7	64
2			94.7	0.59	1.48	1.48	455	243	64	111	7	64
3			98.3	0.59	1.48	1.48	455	245	64	111	7	64
4-1-1			1001.9	0.72	1.8	1.8	467	242	67	111	8	66
2			5.9	0.75	1.88	1.88	469	245	66	111	8	66

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			10.0	0.76	1.9	1.9	471	245	64	112	8	65
2-1			14.2	0.69	1.73	1.73	462	246	65	112	8	65
2			18.2	0.69	1.73	1.73	463	247	66	112	8	65
3			22.2	0.69	1.73	1.73	462	249	66	112	8	64
3-1			26.2	0.62	1.55	1.55	451	245	65	111	7	64
2			30.0	0.58	1.45	1.45	452	239	66	111	7	65
3												

Multiple Methods Data Sheet

Plant: Rinker-Miami FL
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-5-04 Run No.: 2
Time Start: 1445 Time End: 2006
Sample Time: 3x5x3x4 min/point 180 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.88 "Hg Stack Press: 29.81 "Hg Ps: -0.9 "H_2O
Moisture: 8 % FDA: Gas Density Factor:
Temperature: °F Wind Direction: NW Wind Speed: 3-5
Weather: Cloudy Thermocouple Readout: KAK-6
Sample Box No.: KAK-6 Meter Box No.: KAK-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.263 inches Probe Length: 4 Glass feet
Probe Heater Setting: 250°F Nomograph Cf: 2.5
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ft

Raw Mill Down

Stack Dimensions

Umbilical: KAK-100
Thermocouple
Probe No.: KAK-55
Pitot Tube: KAR-551

Material Processing Rate:
Final Gas Meter Reading: 173.769 ft³
Initial Gas Meter Reading: 34.000 ft³
Total Metered Gas Volume: 139.769 ft³
Condensate Gain in Impingers: 242 mL
Weight Gain in Silica Gel: 21.6 ~~23.4~~ g
Total Moisture Gain mL
Silica Gel Container No.: 10Z
Filter Number:

Leak Check - Meter Box:
Initial: 0.008 cfm @ 15 inches Hg
Final: 0.004 cfm @ 8 inches Hg

Leak Check - Pitot Tubes
Impact 3 "$H^2$0 for 15 sec: Stable / Leak
Static 3 "$H^2$0 for 15 sec: Stable / Leak
Test Conducted By: K Paul
O_2 10.7 % CO_2 16.7 %
Stack Test Observers:

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O) Calculated	Meter Orifice Pressure Difference (H_2O) Actual	Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading (% O_2)~~
Average:												
1-H			34.0	0.73	1.83	1.83	460	252	71	91	5	69
2			38.0	0.73	1.83	1.83	462	248	66	92	5	67
3			41.9	0.76	1.9	1.9	464	249	66	93	6	67
2-1			45.8	0.70	1.75	1.75	463	247	65	94	6	67
2			49.7	0.73	1.83	1.83	465	247	66	95	6	66
3			53.6	0.73	1.83	1.83	466	245	65	96	6	66
3-1			57.6	0.63	1.58	1.58	456	246	65	96	6	66
2			61.3	0.63	1.58	1.58	458	245	64	97	6	65

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Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		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						
3			65.0	0.65	1.63	1.63	459	245	64	97	6	65
2-1-1			68.7	0.86	2.15	2.15	463	253	67	94	7	62
2			73.1	0.83	2.1	2.1	466	251	61	95	7	61
3			77.3	0.83	2.1	2.1	468	250	63	95	7	61
2-1			81.6	0.80	2.0	2.0	465	248	64	96	7	62
2			85.7	0.78	1.95	1.95	466	246	63	97	7	60
3			89.9	0.83	2.1	2.1	467	249	62	97	7	59
3-1			94.2	0.67	1.68	1.68	459	246	61	97	7	60
2			98.1	0.62	1.55	1.55	456	253	63	97	6	60
3			101.6	0.51	1.28	1.28	417	258	67	90	6	63
3-1-1			5.0	0.71	1.78	1.78	448	249	68	91	7	66
2			8.9	0.73	1.83	1.83	454	252	64	92	7	63
3			12.8	0.73	1.83	1.83	456	247	63	93	7	63
2-1			16.8	0.68	1.7	1.7	450	247	63	94	7	63
2			20.7	0.68	1.7	1.7	452	245	62	95	7	62
3			24.5	0.71	1.78	1.78	455	246	62	96	7	63
3-1			28.5	0.57	1.43	1.43	444	246	62	97	7	63
2			32.0	0.57	1.43	1.43	445	249	62	99	7	62
3			35.6	0.57	1.43	1.43	443	252	62	99	7	62
4-1-1			39.1	0.74	1.85	1.85	460	244	66	101	8	65
2			43.1	0.74	1.85	1.85	462	244	64	101	8	63

153
164
164
183

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ENVIRONMENTAL SERVICES

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			472	0.72	1.8	1.8	461	244	62	102	8	60
2-1			512	0.70	1.75	1.75	459	246	61	103	8	63
2			552	0.70	1.75	1.75	461	248	62	103	8	62
3			592	0.70	1.75	1.75	462	244	62	104	8	60
3-1			631	0.54	1.35	1.35	464	246	62	105	7	61
2			666	0.58	1.45	1.45	453	243	63	105	7	61
3			702	0.58	1.45	1.45	451	246	63	105	7	62

[redacted] Multiple [redacted]ethods Data [redacted]heet

Plant: Renber - Miami, FL
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-8-04 Run No.: 3
Time Start: 0749 Time End: 1059
Sample Time: 3x5x3x4 min/point 180 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.92 "Hg Stack Press: 29.86 "Hg Ps: "H_2O
Moisture: 8 % FDA: Gas Density Factor: 0.88
Temperature: 82 °F Wind Direction: S Wind Speed: 5-8
Weather: Clear Thermocouple Readout: KAK-6
Sample Box No.: KAK-6 Meter Box No.: KAK-6
Meter Y: 0.988 @ Delta H: 1.61 Pitot Corr.: 0.84
Nozzle Diameter: 0.263 inches Probe Length: 4 Glass feet
Probe Heater Setting: 250°F Nomograph Cf: 2.65
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ft

Raw mill Down

Stack Dimensions

Umbilical: KAK-100
Thermocouple Probe No.: KAK-55
Pitot Tube: KA-551

Material Processing Rate:
Final Gas Meter Reading: 828.081 ft³
Initial Gas Meter Reading: 689.100 ft³
Total Metered Gas Volume: 138.981 ft³
Condensate Gain in Impingers: 306 mL
Weight Gain in Silica Gel: 13.0 24.6 g
Total Moisture Gain mL
Silica Gel Container No.: 2
Filter Number: —

Leak Check - Meter Box:
Initial: 0.005 cfm @ 15 inches Hg
Final: 0.003 cfm @ 10 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: (Stable) Leak
Static 3 "H^20 for 15 sec: (Stable) Leak
Test Conducted By: K Paul - AWest
O_2 10.0 % CO_2 17.5 %
Stack Test Observers:

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	~~Oxygen Meter Reading (% O_2)~~
Average					Calculated	Actual						
1-1-1			89.1	0.73	1.93	1.93	426	244	10	87	5	65
2			93.3	0.73	1.93	1.93	433	253	64	88	5	61
3			97.3	0.75	1.99	1.99	438	248	65	90	6	62
2-1			101.4	0.67	1.78	1.78	435	252	64	91	6	60
2			5.3	0.67	1.78	1.78	439	249	63	93	6	62
3			9.2	0.69	1.83	1.83	440	251	63	94	6	60
3-1			13.3	0.57	1.51	1.51	434	246	63	95	6	61
2			17.0	0.55	1.46	1.46	434	254	63	96	6	62

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ENVIRONMENTAL SERVICES

Trip

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			20.6	0.52	1.38	1.38	435	252	64	97	5	63
2-1-1			24.0	0.69	1.83	1.83	452	243	66	98	7	65
2			28.0	0.69	1.83	1.83	454	254	63	99	7	61
3			32.0	0.69	1.83	1.83	455	251	64	100	7	62
2-1			36.0	0.65	1.72	1.72	452	248	62	102	7	63
2			39.9	0.65	1.72	1.72	453	248	62	103	7	60
3			43.8	0.63	1.67	1.67	454	249	63	104	7	63
3-1			47.6	0.56	1.48	1.48	448	251	63	105	6	60
2			51.3	0.56	1.48	1.48	447	247	64	106	6	62
3			54.9	0.56	1.48	1.48	445	246	64	106	6	61
3-1-1			58.5	0.70	1.86	1.86	460	241	65	106	7	63
2			62.5	0.70	1.86	1.86	460	248	61	107	7	62
3			66.6	0.70	1.86	1.86	461	241	62	108	7	61
2-1			70.6	0.64	1.7	1.7	456	251	62	108	7	61
2			74.5	0.64	1.7	1.7	456	244	63	109	7	60
3			78.5	0.67	1.76	1.76	455	243	63	109	7	59
3-1			82.5	0.53	1.38	1.38	448	242	64	110	6	59
2			86.0	0.52	1.38	1.38	446	243	64	110	6	59
3			89.6	0.52	1.38	1.38	448	241	62	110	6	60
4-1-1			93.1	0.70	1.86	1.86	467	246	64	110	7	63
2			97.2	0.70	1.86	1.86	469	244	61	110	7	59

Trap

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3			801.3	0.72	1.91	1.91	470	256	61	111	7	60
2-1			5.5	0.64	1.72	1.72	470	248	62	111	7	58
2			9.4	0.65	1.72	1.72	464	246	63	112	7	60
3			13.4	0.65	1.72	1.72	464	249	62	112	7	58
3-1			17.3	0.53	1.40	1.40	457	244	63	111	7	59
2			21.0	0.53	1.40	1.40	453	242	63	111	7	56
3			24.5	0.53	1.40	1.40	452	248	63	111	7	60

Multiple Methods Data Sheet

Plant: Rinker - Miami, Fla.
Sample Location: Cement Kiln
Control Type: Baghouse
Sample Type: D/F
Date: 8-8-04 Run No.: Blank
Time Start: 1137 Time End: _____
Sample Time: _____ min/point _____ Total Minutes
Dry Bulb: _____ °F Wet Bulb: _____ °F VP@DP: _____
Bar. Pressure: _____ "Hg Stack Press: _____ "Hg Ps: _____ "H_20
Moisture: _____ % FDA: _____ Gas Density Factor: _____
Temperature: _____ °F Wind Direction: _____ Wind Speed: _____
Weather: _____ Thermocouple Readout: _____
Sample Box No.: _____ Meter Box No.: _____
Meter Y: _____ @ Delta H: _____ Pitot Corr.: _____
Nozzle Diameter: _____ inches Probe Length: _____ feet
Probe Heater Setting: _____ Nomograph Cf: _____
Stack Dimensions: _____ inches
Stack Area: _____ ft^2
Effective Stack Area: _____ ft^2
Stack Height: _____ ft

D/F
Blank

Stack Dimensions

Umbilical: _____
Thermocouple
Probe No.: _____
Pitot Tube: _____

Material Processing Rate: _____
Final Gas Meter Reading: 828,300 ft^3
Initial Gas Meter Reading: 828,300 ft^3
Total Metered Gas Volume: _____ ft^3
Condensate Gain in Impingers: 0 mL
Weight Gain in Silica Gel: 1.8 g
Total Moisture Gain _____ mL
Silica Gel Container No.: 2
Filter Number: —

Leak Check - Meter Box:
Initial: _____ cfm @ _____ inches Hg
Final: _____ cfm @ _____ inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: Stable, Leak
Static 3 "H^20 for 15 sec: Stable, Leak
Test Conducted By: R Paul - AWest
O_2 _____ % CO_2 _____ %
Stack Test Observers: _____

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)
					Calculated	Actual						
Average:												

Sampling Rate Calculations

Plant Name: Rinker Date: 8-8-04

Location: Miami Source: Cement Kiln D/F RMD

ΔH	=	Orifice Reading (Inches H_20)
Dn	=	Nozzle Diameter (Inches)
ΔH@	=	Meter Box Constant
Bw	=	Moisture Fraction
Tm	=	Meter Temperature (°F)
Ts	=	Stack Temperature (°F)
Ms	=	Wet Molecular Weight of Stack Gas (from Table)
ΔP	=	Pitot Reading (Inches H_20)

$$\left[\frac{Tm + 460}{MS(Ts=460)} (1 - Bw)^2 \; \Delta H@ \; (Dn)^4 \; 17741\right] \Delta P = \Delta H$$

$$\frac{555}{28.2\ (860)}\ 2425\ 2'$$

Moisture Fraction	MS
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

		Run No. 1		Run No. 2		Run No. 3
$\frac{Tm + 460}{MS(Ts+460)}$	=	0.02288				
x $(1 - Bw)^2$	=	0.8464				
x ΔH@	=	1.61				
x $(Dn)^4$	=	0.00478				
x 17741	=	17741				
x ΔP	=	2.65				

KAForms: Sampling Rate Calculations
jhm,05/01/01

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
R1-MD-C1	Cont. 1 (Filter)
R1-MD-C2	Cont. 2 (Acetone/Methylene Chloride)
R1-MD-C3	Cont. 3 (Toluene Rinse)
R1-MD-C4	Trap (Solid Sorbent)

Sampled by: R. PAUL 08/04/04

Signature Date Time

Relinquished by: R. PAUL 08/04/04

Signature Date Time

Received by: N. LOFGREN 08/09/04

Signature Date Time

Relinquished by: N. LOFGREN 08/09/04

Signature Date Time

Laboratory:

Received by:

Signature Date Time

Sample Shipped Via: ○ UPS ☒ Federal Express ○ Other

Shipping Bill Number:

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
R2 - MD - C1	Cont. 1 (Filter)
R2 - MD - C2	Cont. 2 (Acetone/Methylene Chloride)
R2 - MD - C3	Cont. 3 (Toluene Rinse)
R2 - MD - C4	Trap (Solid Sorbent)

Sampled by:	R. PAUL	08/05/04	
	Signature	Date	Time
Relinquished by:	R. PAUL	08/05/04	
	Signature	Date	Time
Received by:	N. LOFGREN	08/09/04	
	Signature	Date	Time
Relinquished by:	N. LOFGREN	08/09/04	
	Signature	Date	Time

Laboratory:

Received by:			
	Signature	Date	Time

Sample Shipped Via: ○ UPS ☒ Federal Express ○ Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
R3 - MD - C1	Cont. 1 (Filter)
R3 - MD - C2	Cont. 2 (Acetone/Methylene Chloride)
R3 - MD - C3	Cont. 3 (Toluene Rinse)
R3 - MD - C4	Trap (Solid Sorbent)

Sampled by:	R. PAUL	08/08/04	
	Signature	Date	Time
Relinquished by:	R. PAUL	08/08/04	
	Signature	Date	Time
Received by:	N. LOFGREN	08/09/04	
	Signature	Date	Time
Relinquished by:	N. LOFGREN	08/09/04	
	Signature	Date	Time

Laboratory:

Received by:			
	Signature	Date	Time

Sample Shipped Via: ○ UPS ⊗ Federal Express ○ Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Chain of Custody

Plant Name: Rinker Project Number: 263-04-05

Location: Miami, FL Source: Kiln

Sample Identification	Remarks
RB - MB - C1	Cont. 1 (Filter)
RB - MB - C2	Cont. 2 (Acetone/Methylene Chloride)
RB - MB - C3	Cont. 3 (Toluene Rinse)
RB - MB - C4	Trap (Solid Sorbent)

BLANK

Sampled by: R. PAUL 08/08/04 _____
Signature Date Time

Relinquished by: R. PAUL 08/08/04 _____
Signature Date Time

Received by: N. LOFGREN 08/09/04 _____
Signature Date Time

Relinquished by: N. LOFGREN 08/09/04 _____
Signature Date Time

Laboratory:

Received by: _____ _____ _____
Signature Date Time

Sample Shipped Via: ○ UPS ⊗ Federal Express ○ Other

Shipping Bill Number: _____

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Particulate Matter Calculations

GENERAL DATA

Plant	:	Rinker Materials				
Source/Unit	:	Cement Kiln-Mill Down				
Date	:	August 5, 2004		Cp	0.840	
Stack dia.	:	136.50 inch	OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0 percent		Duct Width	0.00	inch
CO2 Corr.	:	0.0 percent		Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U F Process Wt.

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

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	92	100	89
Stack Temp., Ts (F)	453	466	464
Sq.Rt. dP	0.85	0.85	0.87
dH (in. H2O)	1.42	1.52	1.60
Meter Vol.,Vm (ft3)	42.334	44.355	44.072
Vol. H2O, Vlc (ml)	96.5	98.3	102.0
Meter Y	1.000	1.000	1.000
Bar. Press.,Pb (in.Hg.)	29.80	29.80	29.80
Static Press.,Ps (in.H2O)	-0.90	-0.90	-0.90
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia.,Dn (in.)	0.252	0.252	0.252
Oxygen, O2 (%)	9.5	10.7	10.0
Carbon Dioxide, CO2 (%)	16.5	16.7	16.3
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? l = lb/hr g = gr/dscf : grams

Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T

Allowable Particulate Matter Concentration .....: 0

LABORATORY RESULTS	RUN 1	RUN 2	RUN 3
	grams	grams	grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.00900	0.00850	0.01030
Filterable Sample (MF)	0.01380	0.01500	0.01600
Condensible Sample (BHW)	0.00000	0.00000	0.00000

A. FIELD DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln-Mill Down
Date: August 5, 2004

	RUN 1	RUN 2	RUN 3
Vlc = Vol water collected in train, ml	96.5	98.3	102.0
Vm = Sample gas vol, meter cond., acf	42.334	44.355	44.072
Y = Meter calibration factor	1.0000	1.0000	1.0000
Pbar = Barometric pressure, in. Hg	29.80	29.80	29.80
Pstatic = Stack static pressure, in. H2O	-0.90	-0.90	-0.90
dH = Avg meter pressure diff, in. H2O	1.42	1.52	1.60
Tm = Absolute meter temp., degrees R	551.9	560.4	548.7
Vm(std) = Sample gas vol, Std. cond., dscf	40.479	41.778	42.408
Bws = Water vapor in gas stream, fraction	0.101	0.100	0.102
MF = Moisture factor (1 - Bws)	0.899	0.900	0.898
CO2 = Carbon Dioxide, dry, volume %	16.50	16.70	16.30
O2 = Oxygen, dry, volume %	9.50	10.70	10.00
N2 = Nitrogen, dry volume %	74.00	72.60	73.70
Md = Molecular weight of stack gas, dry	31.02	31.10	31.01
Ms = Molecular weight of stack gas, wet	29.71	29.79	29.69
Cp = Pitot tube coefficient	0.84	0.84	0.84
Sq.Rt. dP = Avg. square root of each dP	0.8499	0.8471	0.8695
Ts = Absolute stack temp., degrees R	912.8	925.9	923.7
A = Area of stack, ft2	101.62	101.62	101.62
Qstd = Volumetric flowrate, dscfm	195,528	193,468	198,739
An = Nozzle area, ft2	3.46E-04	3.46E-04	3.46E-04
0 = Sample time, minutes	60.00	60.00	60.00
%I = Isokinetic variation, percent	101.24	105.60	104.35

B. PARTICULATE DATA SUMMARY

Plant: Rinker Materials
Source/Unit: Cement Kiln-Mill Down
Date: August 5, 2004

	RUN 1	RUN 2	RUN 3
Sample Weight (FHW + MF + BHW), mg	22.80	23.50	26.30
Meter Volume, standard cond., Vm(std)	40.479	41.778	42.408
Carbon Dioxide, percent	16.50	16.70	16.30
Oxygen, percent	9.50	10.70	10.00
Sample Concentration :			
gr/scf	0.0078	0.0078	0.0086
gr/dscf	0.0087	0.0087	0.0096
gr/dscf @ 0 % CO2	0.0063	0.0062	0.0070
gr/dscf @ 0 % O2	0.0159	0.0178	0.0184
ppm * MW (dry gas).....	478.1	477.4	526.4
ppm * MW @ 0% CO2	0.0	0.0	0.0
ppm * MW @ 0% O2	876.5	978.3	1009.3

EMISSION RATE CALCULATIONS

Plant :	Rinker Materials				
Source/Unit :	Cement Kiln-Mill Down				
Date:	August 5, 2004		RUN NO.:	1	
STANDARD TEMP. :	68 F				

Front Half Wash (FHW)	0.00900	grams	Vm(std)	40.479	ft3
Mass Filter (MF)	0.01380	grams	Vw(std)	4.542	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	195,528	dscfm
Vm(std) SO2		dscf	Bws	0.101	
CO2 CORR. 0.0 %			CO2	16.50	%
O2 CORR.: 0.0 %			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

FUEL USE

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr

Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0078	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0087	gr/dscf
gr/dscf x (12 / %CO2)	0.0063	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0159	@ 0% O2
0.00857 x Qs(std) x gr/dscf	14.57	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq)	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 16.5 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 9.5% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 16.5 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 16.5% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

EMISSION RATE CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Mill Down
Date: August 5, 2004 RUN NO.: 2
STANDARD TEMP. : 68 F

Front Half Wash (FHW)	0.00850	grams	Vm(std)	41.778	ft3
Mass Filter (MF)	0.01500	grams	Vw(std)	4.627	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	193,468	dscfm
Vm(std) SO2		dscf	Bws	0.100	
CO2 CORR. 0.0 %			CO2	16.70	%
O2 CORR.: 0.0 %			O2	10.70	%

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

FUEL USE

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr

Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0078	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0087	gr/dscf
gr/dscf x (12 / %CO2)	0.0062	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0178	@ 0% O2
0.00857 x Qs(std) x gr/dscf	14.39	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 16.5 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 16.5% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 16.7 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 16.7% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

EMISSION RATE CALCULATIONS

Plant : Rinker Materials
Source/Unit : Cement Kiln-Mill Down
Date: August 5, 2004 RUN NO.: 3
STANDARD TEMP. : 68 F

Front Half Wash (FHW)	0.01030	grams	Vm(std)	42.408	ft3
Mass Filter (MF)	0.01600	grams	Vw(std)	4.801	ft3
Back Half Wash (BHW)	0.00000	grams	Qs(std)	198,739	dscfm
Vm(std) SO2		dscf	Bws	0.102	
CO2 CORR. 0.0 %			CO2	16.30	%
O2 CORR.: 0.0 %			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

FUEL USE

Use Rate (gal/ton) * Process Wt. (ton/hr) ..... gal/hr
Heat Input = (Process Weight (ton/hr) x Heating .... MMBtu/hr
Value (Btu/gal) x Fuel Use Rate (gal/ton) / 1E6

TOTAL PARTICULATE

15.432 x (FHW + MF + BHW) / [(Vm(std) + Vw(std)] ...	0.0086	gr/scf
15.432 x (FHW + MF + BHW) / (Vm(std)	0.0096	gr/dscf
gr/dscf x (12 / %CO2)	0.0070	@ 0% CO2
gr/dscf x [(20.9 - Oxygen corr.) / (20.9 - %O2)]	0.0184	@ 0% O2
0.00857 x Qs(std) x gr/dscf	16.30	lb/hr
F-Fac x 1.4286E-4 x [20.9 / (20.9-%O2)] x gr/dscf ..		lb/MMBtu
Particulate (lb/hr) / Heat Input (MMBtu/hr)		lb/MMBtu

TOTAL ACID MIST

[1.0811E-4 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb Acid Mist
[Acid Mist (lb) / Vm std (ft^3)] x Qs std x 60 ...	lb/hr
[Acid Mist (lb) / Vm std (ft^3)] x F-Factor	lb/MMBtu

SULFUR DIOXIDE (SO2)

[7.061E-5 x (Vt - Vtb) x N x Vsol] / Vol(aloq) .	lb SO2
[SO2 (lb) / Vm std (ft^3)] x Qs std (ft^3/min) x 60 ...	lb/hr
[SO2 (lb) / Vm std (ft^3)] x F	lb/MMBtu
[Mass SO2 (lb) x 385 / 64E+6 (ft^3/lb)] / Vm (std)	ppm
ppm x 0.0 % Corr. / 16.5 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 16.5% O2 Stack)	ppm @ 0% O2
SO2 (lb/hr / Heat Input)	lb/MMBtu

HYDROGEN CHLORIDE DATA SUMMARY

[Mass HCl(mg) x 385 x 1E6] / [453600 x 36.5 x Vm(std)]..	ppm
ppm x 0.0 % Corr. / 16.3 % CO2 in Stack	ppm @ 0% CO2
ppm x (20.9% - 0.0% O2 Corr)/(20.9% - 16.3% O2 Stack)	ppm @ 0% O2
[Mass HCl(mg) x 60 x Qs / (Vm(std) x 453,600)].....	lb/hr

Field and Laboratory Data Sheets

Multiple Methods Data Sheet

Plant: Rinker Materials
Sample Location: Miami Fl
Control Type: Baghouse
Sample Type: P.M.
Date: 8-5-04 Run No.: 1
Time Start: 8:14 Time End: 9:20
Sample Time: ~~8:14~~ min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.80 "Hg Stack Press: "Hg Ps: "H_2O
Moisture: % FDA: Gas Density Factor:
Temperature: °F Wind Direction: Wind Speed:
Weather: Over cast Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.52 Pitot Corr.: 0.84
Nozzle Diameter: 0.252 inches Probe Length: 6' 5S feet
Probe Heater Setting: Nomograph Cf: ~~AV 350~~ 1.96
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: ~~3~~ 300' ft

Stack Dimensions

Mill Down

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA 55 II

Material Processing Rate:
Final Gas Meter Reading: 906.634 ft^3
Initial Gas Meter Reading: 864.300 ft^3
Total Metered Gas Volume: 42.334 ft^3
Condensate Gain in Impingers: 86 mL
Weight Gain in Silica Gel: 10.5 g
Total Moisture Gain mL
Silica Gel Container No.: 20
Filter Number:

Leak Check - Meter Box:
Initial: .010 cfm @ 10 inches Hg
Final: .010 cfm @ 5 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: ~~Stable~~, Leak
Static 3 "H^20 for 15 sec: ~~Stable~~, Leak
Test Conducted By: G. Haven, A West
O_2 % CO_2 %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)
					Calculated	Actual						
Average												
1-1			864.3	.85	1.6	1.6	448	265	55	88	3	
1-2			868.0	.75	1.4	1.4	447	267	53	88	3	
1-3			871.6	.61	1.1	1.1	434	268	52	89	3	
2-1			875.0	.85	1.6	1.6	449	249	56	90	3	
2-2			878.5	.76	1.4	1.4	454	249	55	90	3	
2-3			882.2	.61	1.1	1.1	492	247	56	92	3	
3-1		*	885.4	.85	1.6	1.6	453	248	58	97	3	
3-2			889.2	.76	1.4	1.4	459	247	50	93	3	

Mill Down

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3-3			892.9	.55	1.0	1.0	456	247	50	94	2	
4-1			896.2	.85	1.6	1.6	469	245	54	90	3	
4-2			899.7	.71	1.3	1.3	466	257	50	96	3	
4-3			903.3	.57	1.1	1.1	456	248	51	96	3	

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Multiple Methods Data Sheet

Plant: Rinker Materials
Sample Location: Miami, FL
Control Type: Baghouse
Sample Type: P.M
Date: 8.5.04 Run No.: 2
Time Start: 9.55 Time End: 11:00
Sample Time: 25/3/4 min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: 29.80 "Hg Stack Press: 29.73 "Hg Ps: -.9 "H_2O
Moisture: % FDA: Gas Density Factor:
Temperature: °F Wind Direction: Wind Speed:
Weather: Overcast Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.54 Pitot Corr.: 0.84
Nozzle Diameter: inches Probe Length: 6' 5S feet
Probe Heater Setting: Nomograph Cf: 2.1
Stack Dimensions: ~~4W~~ 136.5 inches
Stack Area: 101.62 ft^2
Effective Stack Area: 101.62 ft^2
Stack Height: 3/ 300' ft

Mill DOWN

Stack Dimensions

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA 55 II

Material Processing Rate:
Final Gas Meter Reading: 951.214 ft^3
Initial Gas Meter Reading: 906.859 ft^3
Total Metered Gas Volume: ft^3
Condensate Gain in Impingers: 88 mL
Weight Gain in Silica Gel: 10.3 g
Total Moisture Gain mL
Silica Gel Container No.: X1
Filter Number:

Leak Check - Meter Box:
Initial: .000 cfm @ 11 inches Hg
Final: .005 cfm @ 4 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: ~~Stable~~, Leak
Static 3 "H^20 for 15 sec: ~~Stable~~, Leak
Test Conducted By: A. West, C.J. Bell
O_2 % CO_2 %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_2O)	Meter Orifice Pressure Difference (H_2O)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)
					Calculated	Actual						
Average:												
1-1			906.8	.87	1.8	1.8	470	249	53	97	4	
1-2			910.8	.73	1.5	1.5	468	264	42	97	4	
1-3			914.7	.55	1.1	1.1	454	247	45	98	3	
2-1			917.9	.81	1.7	1.7	470	252	52	101	4	
2-2			921.8	.81	1.7	1.7	475	252	48	101	4	
2-3			925.7	.57	1.1	1.1	458	254	46	101	3	
3-1			929.0	.82	1.7	1.7	462	252	51	101	4	
3-2			932.8	.82	1.7	1.7	471	259	49	101	4	

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Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3-3			936.8	.59	1.2	1.2	455	250	50	102	4	
4-1			940.3	.62	1.7	1.7	473	253	51	102	4	
4-2			943.1	.72	1.5	1.5	473	253	51	102	4	
4-3			947.9	.56	1.1	1.1	462	250	51	102	3	

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Multiple Methods Data Sheet

Plant: Rinker Materials
Sample Location: Miami FL
Control Type: Baghouse
Sample Type: P.M.
Date: 8-5-04 Run No.: 3
Time Start: ~~2/3/4~~ 11:15 Time End: 4:35
Sample Time: 2/3/4 min/point 60 Total Minutes
Dry Bulb: °F Wet Bulb: °F VP@DP:
Bar. Pressure: "Hg Stack Press: "Hg Ps: "H_20
Moisture: % FDA: Gas Density Factor:
Temperature: °F Wind Direction: Wind Speed:
Weather: over cast Thermocouple Readout: KA-2
Sample Box No.: KA-2 Meter Box No.: KA-2
Meter Y: 1.000 @ Delta H: 1.54 Pitot Corr.: 0.84
Nozzle Diameter: inches Probe Length: 6'55 feet
Probe Heater Setting: Nomograph Cf: 2.1
Stack Dimensions: 136.5 inches
Stack Area: 101.62 ft²
Effective Stack Area: 101.62 ft²
Stack Height: ~~3~~ 300' ft

Stack Dimensions: mill down

Umbilical: KA-200
Thermocouple
Probe No.: KA-72
Pitot Tube: KA 55 ~~IV~~

Material Processing Rate:
Final Gas Meter Reading: 995.531 ft³
Initial Gas Meter Reading: 951.459 ft³
Total Metered Gas Volume: 44.072 ft³
Condensate Gain in Impingers: 92 mL
Weight Gain in Silica Gel: 10 g
Total Moisture Gain mL
Silica Gel Container No.: 26
Filter Number:

Leak Check - Meter Box:
Initial: .000 cfm @ 11 inches Hg
Final: .008 cfm @ 5 inches Hg

Leak Check - Pitot Tubes
Impact 3 "H^20 for 15 sec: ~~Stable~~, Leak
Static 3 "H^20 for 15 sec: ~~Stable~~, Leak
Test Conducted By: A. West G Haven, C.J. Bell
O_2 % CO_2 %
Stack Test Observers:

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		Stack Gas Temperature (°F)	Sample Box Temperature (°F)	Last Impinger Temperature (°F)	Meter Temp. (°F)	Vacuum on Sample Train ("Hg)	Oxygen Meter Reading (% O_2)	
					Calculated	Actual							
Average													
1-1		951.4 → ~~.82~~		AW 1.82	1.7	1.7	476	255	53	98	4		
1-2		10	955.2	.75	1.5	1.5	460	258	49	88	4		@ 11:19
1-3		15	958.8	.59	1.2	1.2	445	246	46	88	3		
2-1		20	962.2	.82	1.7	AW ~~1.7~~ 1.7	468	267	50	89	4		Started Back @ 2.43
2-2		25	965.7	.82	1.7	1.7	469	253	49	89	4		
2-3		30	969.5	.65	1.3	1.3	460	253	51	89	4		
3-1		35	973.0	.85	1.7	1.7	474	252	55	90	4		
3-2		40	976.8	.82	1.7	1.7	467	244	50	88	4		

@ 3:50
@ 4:07

Port and Traverse Point No.	Distance from Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head (H_20)	Meter Orifice Pressure Difference (H_20)		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						
3-3		45	980.1	.58	1.2	1.2	457	256	54	90	4	
4-1			983.8	.91	1.9	1.9	471	250	50	85	4	
4-2			987.9	.86	1.8	1.8	467	250	47	85	4	
4-3			991.1	.65	1.3	1.3	450	240	47	85	4	

Particulate Lab Data Sheet

Test Date: 08/05/04

Plant Name: Rinker, Miami

Source: Kiln, Raw mill down

	Run No. 1	Run No. 2	Run No. 3	Blank
Container No.	888	355	105	55
Total Volume (ml)	200	200	200	200
Aliquot Evaporated (ml)	200	200	200	200
Final Weight (g)	110.0333	95.3445	108.6112	116.7621
Tare Weight (g)	110.0243	95.3360	108.6009	116.7621
Gross Weight Gained (g)	.009	.0085	.0103	-.0005
Average Blank (g)	—	—	—	—
Net Weight (g)	.009	.0085	.0103	-.0005
Aliquot Factor	x 1	x 1	x 1	x 1
Total Net Weight (mg)	9.0	8.5	10.3	-.5

Container No.	1M	2M	3M	4M
Filter No.	3491	3490	3482	3593
Final Weight (g)	.4243	.4216	.4188	.4099
Tare Weight (g)	.4105	.4066	.4028	.4097
Gross Weight Gained	0.0138	0.015	0.016	.0002
Average Blank (g)	—	—	—	—
Total Net Weight (mg)	13.8	15.0	16.0	.2

Tare Balance Check

0.0 0.0000 10.0 10.0001
1.0 1.0001 50.0 50.0006
5.0 5.0001 100.0 100.0011
T/H 72/48

Signature

8/10/04
Date

Final Balance Check

0.0 0 10.0 10.0002
1.0 1.0000 50.0 50.0005
5.0 5.0002 100.0 100.0004
T/H 80/48

Signature

8/11/04
Date

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Summary of Laboratory Data for Dioxins and Furans

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

19 August 2004

Steve Cloutier
Koogler & Associates
4014 N.W. 13th Street
Gainesville, FL 32609

Ph.: 352-377-5822
Fax: 352-377-7158
Email: scloutier@kooglerassociates.com

Subject: Certificate of Results

Dear Steve;

Attached to this narrative are the analytical results you requested on the samples submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, the QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. A brief description of the report's components is provided on the next page.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	263-04-05
AAP Project No.	P4426
Analytical Protocol	Method 23
No. Samples Submitted	7
No. Samples Analyzed	7
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	10-Aug-2004
Condition Received	good
Temperature upon Receipt (C)	12-14
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

QC Annotations:

1. An "A" data qualifier is used for analytes with a concentration below the reporting limit.

2. The new ratio – [Ra] -- for 2,3,7,8-TCDD following the 37Cl4-2,3,7,8-TCDD correction is shown between squared brackets in the DL column.

Alta Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please, do not hesitate to contact us. We wanted to thank you for choosing Alta Analytical Perspectives as part of your analytical support team.

Sincerely,

Amy J. Boehm
Project Manager

P4426 - TEQ

Project ID: 263-04-05

Sample Summary Part 1

ALTA ANALYTICAL PERSPECTIVES

Method 23

Analyte	0_2457_MB001	Blank	Run 1 - Mill Up	Run 2 - Mill Up	Run 3 - Mill Up	Run 1 - Mill Down	Run 2 - Mill Down	Run 3 - Mill Down
	pg	pg	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.72)	(1.82)	20	5.16	26.3	31.5	33.8	24
1,2,3,7,8-PeCDD	(1.84)	(2.52)	[29.7]	[10.9]	[36.3]	[59.5]	60.2	47.5
1,2,3,4,7,8-HxCDD	(2.38)	(2.48)	7.62	(<5)	[7.43]	17.8	18.1	15.1
1,2,3,6,7,8-HxCDD	(2.42)	(2.57)	6.35	(<5)	7.59	17.7	15.6	17.2
1,2,3,7,8,9-HxCDD	(2.67)	(2.81)	(<5)	(2.27)	5.03	11	9.73	10.1
1,2,3,4,6,7,8-HpCDD	(4.86)	(3.89)	10.1	5.04	8.31	24.7	20.2	19.3
OCDD	(6.25)	(<10)	24	14.5	12.8	35.5	26.1	26.7
2,3,7,8-TCDF	(1.21)	1.37	347	69.2	509	363	365	167
1,2,3,7,8-PeCDF	(1.73)	(2.15)	272	81.5	354	294	279	128
2,3,4,7,8-PeCDF	(1.68)	(1.96)	381	122	515	450	409	209
1,2,3,4,7,8-HxCDF	(1.39)	(0.689)	133	62.9	164	177	166	105
1,2,3,6,7,8-HxCDF	(1.12)	(0.581)	120	57.4	147	153	148	89.3
2,3,4,6,7,8-HxCDF	(1.26)	(0.634)	55.4	25.8	65.9	78	73.9	48.4
1,2,3,7,8,9-HxCDF	(2.13)	(1.05)	[9.95]	6.04	13.7	16.6	16	11.3
1,2,3,4,6,7,8-HpCDF	(1.75)	(0.793)	54.2	32.4	70.3	86.5	84.4	61.1
1,2,3,4,7,8,9-HpCDF	(2.91)	(1.38)	(1.88)	(1.04)	(2.02)	(1.72)	(2.74)	(2.02)
OCDF	(5.71)	(5.13)	(4.48)	(10.4)	(9.54)	(10.7)	(8.68)	(6.8)
ITEF TEQ (ND=0; EMPC=0)	**0.00**	**0.137**	**292**	**93.0**	**394**	**356**	**365**	**206**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00**	**0.137**	**307**	**98.4**	**413**	**386**	**365**	**206**
ITEF TEQ (ND=DL/2; EMPC=0)	**2.57**	**2.80**	**292**	**93.6**	**394**	**356**	**365**	**206**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**2.57**	**2.80**	**308**	**99.0**	**413**	**386**	**365**	**206**
ITEF TEQ (ND=DL; EMPC=EMPC)	**5.13**	**5.46**	**308**	**99.7**	**413**	**386**	**365**	**206**
Checkcode	0087	4237	5322	2268	5500	5503	4729	2944

( ) = DL
[ ] = EMPC

Reviewer CQ
Date 18 Aug 04

Sample ID: Blank

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_001	Date Extracted:	10 Aug 04
Date Collected:	08 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	ND	1.82			92.3	109	
1,2,3,7,8-PeCDD	ND	2.52			90.1	108	
1,2,3,4,7,8-HxCDD	ND	2.48			92.6	108	
1,2,3,6,7,8-HxCDD	ND	2.57			93.4	108	
1,2,3,7,8,9-HxCDD	ND	2.81			95.8	108	
1,2,3,4,6,7,8-HpCDD	ND	3.89			94.9	104	
OCDD	ND	<10			93.7	104	
2,3,7,8-TCDF	1.37			A	95	109	
1,2,3,7,8-PeCDF	ND	2.15			95.1	120	
2,3,4,7,8-PeCDF	ND	1.96			97.7	120	
1,2,3,4,7,8-HxCDF	ND	0.689			93.8	108	
1,2,3,6,7,8-HxCDF	ND	0.581			97.4	108	
2,3,4,6,7,8-HxCDF	ND	0.634			95	108	
1,2,3,7,8,9-HxCDF	ND	1.05			87.4	108	
1,2,3,4,6,7,8-HpCDF	ND	0.793			92.2	104	
1,2,3,4,7,8,9-HpCDF	ND	1.38			85.6	104	
OCDF	ND	5.13			93.1	104	
Totals & TEQs							
TCDDs	2.65						
PeCDDs	ND		3.52				
HxCDDs	2.76						
HpCDDs	ND	3.89					
TCDFs	48.8		57.8				
PeCDFs	7.18		11.1				
HxCDFs	ND		1.34				
HpCDFs	ND	1.05					
Total PCDD/Fs	**68.4**		**86.3**				
TEQ (ND=0	**0.137**		**0.137**	**ITEF**			
TEQ (ND=DL/2	**2.80**		**2.80**	**ITEF**			

ALTA ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington
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USA

Tel: 910 794-1613
Fax: 910 794-3919
e-mail: yt@ultratrace.com
web: www.ultratrace.com

Checkcode: 4237 ✓

Reviewer CQ

Date 18 Aug 04

Sample ID: Run 1 - Mill Up — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_002	Date Extracted:	10 Aug 04
Date Collected:	04 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	20	[Ra=0.84]			87.2	104	
1,2,3,7,8-PeCDD	EMPC		29.7	A	87.2	99.6	
1,2,3,4,7,8-HxCDD	7.62			A	85.2	99.6	
1,2,3,6,7,8-HxCDD	6.35			A	85.2	99.6	
1,2,3,7,8,9-HxCDD	ND	<5			87.2	99.6	
1,2,3,4,6,7,8-HpCDD	10.1			A	89.4	100	
OCDD	24			A	91.3	100	
2,3,7,8-TCDF	347				89.2	104	
1,2,3,7,8-PeCDF	272				89.7	118	
2,3,4,7,8-PeCDF	381				86.7	118	
1,2,3,4,7,8-HxCDF	133				89	104	
1,2,3,6,7,8-HxCDF	120				88.6	104	
2,3,4,6,7,8-HxCDF	55.4				87.7	104	
1,2,3,7,8,9-HxCDF	EMPC		9.95	A	80.6	104	
1,2,3,4,6,7,8-HpCDF	54.2				85.7	100	
1,2,3,4,7,8,9-HpCDF	ND	1.88			85	100	
OCDF	ND	4.48			89.5	100	
Totals & TEQs							
TCDDs	819						
PeCDDs	484		514				
HxCDDs	114		117				
HpCDDs	25.6						
TCDFs	19,500						
PeCDFs	8,060						
HxCDFs	1,380		1,390				
HpCDFs	67.1						
Total PCDD/Fs	**30,500**		**30,600**				
TEQ (ND=0	**292**		**307**	**ITEF**			
TEQ (ND=DL/2	**292**		**308**	**ITEF**			

ALTA ANALYTICAL PERSPECTIVES

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Checkcode: 5322 ✓

Reviewer Co

Date 18 Aug 04

Sample ID: Run 2 - Mill Up

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_003	Date Extracted:	10 Aug 04
Date Collected:	07 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	5.16	[Ra=0.722]		A	82	99.3	
1,2,3,7,8-PeCDD	EMPC		10.9	A	84.2	94.9	
1,2,3,4,7,8-HxCDD	ND	<5			80.9	94.9	
1,2,3,6,7,8-HxCDD	ND	<5			80.7	94.9	
1,2,3,7,8,9-HxCDD	ND	2.27			82.7	94.9	
1,2,3,4,6,7,8-HpCDD	5.04			A	86.7	98.1	
OCDD	14.5			A	89.4	98.1	
2,3,7,8-TCDF	69.2				85.1	99.3	
1,2,3,7,8-PeCDF	81.5				87.1	108	
2,3,4,7,8-PeCDF	122				85.9	108	
1,2,3,4,7,8-HxCDF	62.9				82.8	97.5	
1,2,3,6,7,8-HxCDF	57.4				84	97.5	
2,3,4,6,7,8-HxCDF	25.8			A	83.5	97.5	
1,2,3,7,8,9-HxCDF	6.04			A	76.9	97.5	
1,2,3,4,6,7,8-HpCDF	32.4			A	81	98.1	
1,2,3,4,7,8,9-HpCDF	ND	1.04			81.4	98.1	
OCDF	ND	10.4			86.7	98.1	
Totals & TEQs							
TCDDs	202		208				
PeCDDs	171		182				
HxCDDs	58.4						
HpCDDs	14.4						
TCDFs	3,930						
PeCDFs	2,330						
HxCDFs	621		629				
HpCDFs	40.4						
Total PCDD/Fs	**7,390**		**7,420**				
TEQ (ND=0	**93.0**		**98.4**	**ITEF**			
TEQ (ND=DL/2	**93.6**		**99.0**	**ITEF**			

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Checkcode: 2268 ✓

Reviewer Ce

Date 18 Aug 04

Sample ID: Run 3 - Mill Up

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_004	Date Extracted:	10 Aug 04
Date Collected:	07 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	26.3	[Ra=0.791]			78.5	97.7	
1,2,3,7,8-PeCDD	EMPC		36.3	A	80.2	93.8	
1,2,3,4,7,8-HxCDD	EMPC		7.43	A	84.2	93.8	
1,2,3,6,7,8-HxCDD	7.59			A	81.8	93.8	
1,2,3,7,8,9-HxCDD	5.03			A	83.5	93.8	
1,2,3,4,6,7,8-HpCDD	8.31			A	88.8	92.5	
OCDD	12.8			A	89.9	92.5	
2,3,7,8-TCDF	509				83.4	97.7	
1,2,3,7,8-PeCDF	354				85.6	100	
2,3,4,7,8-PeCDF	515				83.9	100	
1,2,3,4,7,8-HxCDF	164				84.9	93.2	
1,2,3,6,7,8-HxCDF	147				86.7	93.2	
2,3,4,6,7,8-HxCDF	65.9				84.6	93.2	
1,2,3,7,8,9-HxCDF	13.7			A	79.4	93.2	
1,2,3,4,6,7,8-HpCDF	70.3				85.3	92.5	
1,2,3,4,7,8,9-HpCDF	ND	2.02			82.8	92.5	
OCDF	ND	9.54			88.5	92.5	
Totals & TEQs							
TCDDs	1,230						
PeCDDs	678		715				
HxCDDs	131		144				
HpCDDs	22.8						
TCDFs	29,100						
PeCDFs	11,000						
HxCDFs	1,750						
HpCDFs	88.6						
Total PCDD/Fs	**44,000**		**44,000**				
TEQ (ND=0	**394**		**413**	**ITEF**			
TEQ (ND=DL/2	**394**		**413**	**ITEF**			

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Checkcode: 5500 /

Reviewer CC

Date 18 Aug 04

Sample ID: Run 1 - Mill Down

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_005	Date Extracted:	10 Aug 04
Date Collected:	05 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	31.5	[Ra=0.768]			79.1	99.4	
1,2,3,7,8-PeCDD	EMPC		59.5		79.6	92.9	
1,2,3,4,7,8-HxCDD	17.8			A	75.8	92.9	
1,2,3,6,7,8-HxCDD	17.7			A	78.2	92.9	
1,2,3,7,8,9-HxCDD	11			A	79.7	92.9	
1,2,3,4,6,7,8-HpCDD	24.7			A	82.6	97.4	
OCDD	35.5			A	76.7	97.4	
2,3,7,8-TCDF	363				81.6	99.4	
1,2,3,7,8-PeCDF	294				74.3	108	
2,3,4,7,8-PeCDF	450				78.2	108	
1,2,3,4,7,8-HxCDF	177				79	95.7	
1,2,3,6,7,8-HxCDF	153				80.5	95.7	
2,3,4,6,7,8-HxCDF	78				78.7	95.7	
1,2,3,7,8,9-HxCDF	16.6			A	74.3	95.7	
1,2,3,4,6,7,8-HpCDF	86.5				79.1	97.4	
1,2,3,4,7,8,9-HpCDF	ND	1.72			78.5	97.4	
OCDF	ND	10.7			80.1	97.4	
Totals & TEQs							
TCDDs	3,150		3,160				
PeCDDs	1,200		1,250				
HxCDDs	338						
HpCDDs	59.1						
TCDFs	19,200						
PeCDFs	8,380						
HxCDFs	1,760						
HpCDFs	105						
Total PCDD/Fs	**34,200**		**34,300**				
TEQ (ND=0	**356**		**386**	**ITEF**			
TEQ (ND=DL/2	**356**		**386**	**ITEF**			

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Reviewer CL

Date 18 Aug 04

Sample ID: Run 2 - Mill Down — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_006	Date Extracted:	10 Aug 04
Date Collected:	05 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	33.8	[Ra=0.794]			88.9	101	
1,2,3,7,8-PeCDD	60.2				94	90.6	
1,2,3,4,7,8-HxCDD	18.1			A	83.5	90.6	
1,2,3,6,7,8-HxCDD	15.6			A	82.9	90.6	
1,2,3,7,8,9-HxCDD	9.73			A	85.3	90.6	
1,2,3,4,6,7,8-HpCDD	20.2			A	90	97.9	
OCDD	26.1			A	86.9	97.9	
2,3,7,8-TCDF	365				90.4	101	
1,2,3,7,8-PeCDF	279				83.6	111	
2,3,4,7,8-PeCDF	409				86.3	111	
1,2,3,4,7,8-HxCDF	166				86.1	100	
1,2,3,6,7,8-HxCDF	148				86	100	
2,3,4,6,7,8-HxCDF	73.9				84.5	100	
1,2,3,7,8,9-HxCDF	16			A	80.5	100	
1,2,3,4,6,7,8-HpCDF	84.4				85.6	97.9	
1,2,3,4,7,8,9-HpCDF	ND	2.74			84.1	97.9	
OCDF	ND	8.68			86.4	97.9	
Totals & TEQs							
TCDDs	3,910						
PeCDDs	1,320						
HxCDDs	299		321				
HpCDDs	49.9						
TCDFs	25,100						
PeCDFs	8,320						
HxCDFs	1,720						
HpCDFs	106						
Total PCDD/Fs	**40,800**		**40,900**				
TEQ (ND=0	**365**		**365**	**ITEF**			
TEQ (ND=DL/2	**365**		**365**	**ITEF**			

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Reviewer CO
Date 18 Aug 04

Sample ID: Run 3 - Mill Down

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Koogler & Associates	Matrix:	Air	Project No.:	P4426	Date Received:	10 Aug 04
Project ID:	263-04-05	Weight/Volume:	1	Sample ID:	P4426_2457_007	Date Extracted:	10 Aug 04
Date Collected:	08 Aug 04			QC Batch No.:	2457	Date Analyzed:	12 Aug 04

Analyte	Conc.	DL	EMPC	Qualifier	Recoveries		
	pg	pg	pg		ES	SS	
2,3,7,8-TCDD	24	[Ra=0.797]			82.7	98	
1,2,3,7,8-PeCDD	47.5			A	82.8	94.9	
1,2,3,4,7,8-HxCDD	15.1			A	81.6	94.9	
1,2,3,6,7,8-HxCDD	17.2			A	81.6	94.9	
1,2,3,7,8,9-HxCDD	10.1			A	85.3	94.9	
1,2,3,4,6,7,8-HpCDD	19.3			A	91.3	96.6	
OCDD	26.7			A	95	96.6	
2,3,7,8-TCDF	167				88.7	98	
1,2,3,7,8-PeCDF	128				86.5	109	
2,3,4,7,8-PeCDF	209				84.3	109	
1,2,3,4,7,8-HxCDF	105				84.2	99.6	
1,2,3,6,7,8-HxCDF	89.3				82.9	99.6	
2,3,4,6,7,8-HxCDF	48.4			A	86.6	99.6	
1,2,3,7,8,9-HxCDF	11.3			A	80.3	99.6	
1,2,3,4,6,7,8-HpCDF	61.1				88.1	96.6	
1,2,3,4,7,8,9-HpCDF	ND	2.02			86.6	96.6	
OCDF	ND	6.8			95.9	96.6	
Totals & TEQs							
TCDDs	2,410						
PeCDDs	1,080						
HxCDDs	275		282				
HpCDDs	47.4						
TCDFs	10,600						
PeCDFs	3,700						
HxCDFs	1000						
HpCDFs	66.9		75.3				
Total PCDD/Fs	**19,200**		**19,200**				
TEQ (ND=0	**206**		**206**	**ITEF**			
TEQ (ND=DL/2	**206**		**206**	**ITEF**			

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Reviewer CL

Date 18 Aug 04

Sampling Module Request Form

AAP Project #: P4302

Type & Quantity of Sampling Modules

Qty. XAD: 7
Resin Batch No.: 846

Qty. PUF: N/A
PUF Batch No.: /

Filter Size: 90mm
Qty Filters: 9
Filter Batch#: 05062004

Ind. Petri Dishes?: YES

Jars and/or Bottles: N/A

Client Specific Instructions

HOLD AT FEDEX LOCATION

Following sample recovery, please return this form with the field samples to:

2714 Exchange Drive
Wilmington, NC 28405
Ph.: 910-794-1613
Fax: 910-794-3919

Please be aware of your trap batch #

QC begins when we prep your traps. The Method Blank and a BCS_3 are prepared simultaneously with the trap and are properly stored until the trap batch returns for analysis.

We recommend keeping trap batches together and if a set of traps is to be split into multiple project, please let us know so we can prepare extra Method Blanks/BCS_3

Thank you.

CLIENT INFORMATION

Company/Org.: KOOGLER
Contact: John Koogler
Client Project ID:
Client PO #:

Date of Request: 02 JULY 2004

Arrival Date: 09 JULY 2004

Ship To:
Koogler & Associates
4014 NW 13th Street
Gainesville, FL 32609

Ph.: 352-377-5822
Fax: 352-377-7158

ALL PROJECTS ARE SHIPPED PRIORITY OVERNIGHT VIA FEDEX

Spike Profile

* # 0F MB / BCS_3 NEEDED: 1 0F EACH*

Vol. PCDD/F: 40 µL

Solution ID: 122403E-CS/SS ; 1.6-4 ng
Vial ID: SIL3-38-3 Expiration: 06/09/06

Vol. HR_PAH: 80 µL (40 ng)

Solution ID: N/A ; 0.5 ng/ µL
Vial ID: Expiration:

Vol. HR_PCB: 40 µL (4 ng)

Solution ID: N/A ; 0.1 ng/ µL
Vial ID: Expiration:

Initial Below

Prep By: JA
Spike By: JM
Witness: JA Date: 7-8-04

ADDITIONAL NOTES

D/Fs ONLY
5 DAY TAT

Airway Bill #:

Date Shipped:

AAP Invoice #

AAP Rental Traps: (Y) / N
Qty: 7

Plant Operating Data

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

			AAGLOGS Kiln												Raw Mill	
	0.6003		461-KL1_ONTIME		431-RW1-FZ1		481-RW1-FZ1	481-BU1-FZ1	451-RW1-FZ1	461-2K1-AZ3	461-2K1-AZ1	461-2K1-AZ2	441-2K1-AZ3	441-2K1-AZ1	441-2K1-AZ2	421-BF1-TZ4	421-BF1-TZ5
			kiln run time	Kiln run Hours	kiln feed flow rate	Clinker Rate	pulv. coal to kiln	oil to kiln	pulv. coal to calciner	kiln O2	kiln CO	kiln NO	pre heater O2	pre heater CO	pre heater NO	MAIN BAGHOUSE INLET TEMPERATURE MIXING	MAIN BAGHOUSE INLET TEMPERATURE MIXING
4-Aug-04	0:00:00	1:00:00	13739.7	1.0	250.6	150.4	6.6	0.0	8.8	1.2	312.1	633.4	5.0	717.4	325.2	255.0	235.8
4-Aug-04	1:00:00	2:00:00	13740.7	1.0	250.4	150.3	6.6	0.0	8.9	1.0	279.6	551.4	3.8	779.2	349.9	263.1	241.2
4-Aug-04	2:00:00	3:00:00	13741.7	1.0	250.4	150.3	6.5	0.0	9.0	0.8	458.8	507.5	3.3	801.1	357.0	303.2	289.2
4-Aug-04	3:00:00	4:00:00	13742.7	1.0	250.4	150.3	6.6	0.0	9.1	1.7	162.8	621.4	3.5	740.6	380.8	248.4	233.7
4-Aug-04	4:00:00	5:00:00	13743.6	1.0	250.4	150.3	6.7	0.2	9.0	1.2	164.7	802.7	3.5	740.5	398.4	254.9	236.3
4-Aug-04	5:00:00	6:00:00	13744.6	1.0	250.4	150.3	6.6	0.0	9.6	1.2	159.0	1877.7	3.0	693.6	543.1	268.4	243.7
4-Aug-04	6:00:00	7:00:00	13745.6	1.0	250.5	150.4	6.4	0.1	9.9	1.8	156.2	2015.8	2.9	684.6	573.4	283.5	252.2
4-Aug-04	7:00:00	8:00:00	13746.6	1.0	248.3	149.0	6.5	0.2	9.9	1.4	158.7	1924.3	2.7	702.8	548.4	290.3	254.7
4-Aug-04	8:00:00	9:00:00	13747.6	1.0	245.6	147.4	6.6	0.1	9.9	0.8	175.6	1858.5	2.7	695.0	525.5	295.6	254.5
4-Aug-04	9:00:00	10:00:00	13748.6	1.0	245.6	147.4	6.5	0.0	9.8	0.3	241.7	1360.2	2.6	738.6	466.2	295.9	253.9
4-Aug-04	10:00:00	11:00:00	13749.6	1.0	245.6	147.4	6.4	0.1	9.7	0.2	308.6	1385.7	2.8	721.0	472.6	298.4	256.1
4-Aug-04	11:00:00	12:00:00	13750.6	1.0	245.6	147.4	6.2	0.2	9.7	0.2	359.7	1542.7	2.3	787.9	473.6	328.9	268.8
4-Aug-04	12:00:00	13:00:00	13751.6	1.0	245.5	147.4	6.1	0.4	9.7	0.8	163.7	1940.2	2.7	718.7	513.7	404.2	328.8
4-Aug-04	13:00:00	14:00:00	13752.6	1.0	245.5	147.4	6.2	0.4	9.7	0.5	210.5	1753.5	2.6	758.6	499.4	382.4	368.5
4-Aug-04	14:00:00	15:00:00	13753.6	1.0	245.6	147.4	6.3	0.4	9.5	0.2	218.2	1670.4	2.3	818.9	476.5	337.1	283.0
4-Aug-04	15:00:00	16:00:00	13754.6	1.0	245.6	147.4	6.3	0.5	9.5	0.0	354.1	1124.3	2.3	831.4	452.5	358.4	273.4
4-Aug-04	16:00:00	17:00:00	13755.6	1.0	245.6	147.4	6.4	0.4	9.5	0.1	309.9	1286.1	2.3	866.9	438.6	367.9	273.1
4-Aug-04	17:00:00	18:00:00	13756.6	1.0	245.6	147.4	6.4	0.5	9.3	0.1	225.3	1424.7	2.4	814.9	457.5	378.3	278.7
4-Aug-04	18:00:00	19:00:00	13757.6	1.0	245.6	147.4	6.4	0.4	9.6	1.6	183.4	1551.6	2.9	706.8	489.1	264.2	239.6
4-Aug-04	19:00:00	20:00:00	13758.6	1.0	245.2	147.2	6.3	0.3	9.5	2.7	163.5	1455.4	2.9	681.6	491.2	263.1	239.7
4-Aug-04	20:00:00	21:00:00	13759.6	1.0	250.6	150.5	6.4	0.2	9.7	2.9	163.2	1355.2	2.7	733.6	480.3	272.9	248.2
4-Aug-04	21:00:00	22:00:00	13760.6	1.0	250.6	150.4	6.5	0.2	9.6	4.6	229.7	1238.6	2.6	773.5	459.4	310.1	287.0
4-Aug-04	22:00:00	23:00:00	13761.6	1.0	250.6	150.4	6.5	0.2	9.6	1.0	403.9	1514.3	2.6	819.5	449.2	351.2	353.9
4-Aug-04	23:00:00	0:00:00	13762.6	1.0	250.6	150.4	6.4	0.0	9.6	1.0	321.5	1542.2	2.7	771.5	456.6	253.9	236.9
5-Aug-04	0:00:00	1:00:00	13763.6	1.0	250.5	150.4	6.4	0.1	9.8	1.1	285.8	1449.1	2.7	778.5	451.8	259.8	240.4
5-Aug-04	1:00:00	2:00:00	13764.6	1.0	250.6	150.4	6.4	0.0	9.8	0.8	352.5	1306.1	2.7	790.4	437.4	262.1	239.0
5-Aug-04	2:00:00	3:00:00	13765.6	1.0	250.5	150.4	6.4	0.0	9.6	0.7	406.8	1260.6	2.8	775.8	434.1	264.7	241.4
5-Aug-04	3:00:00	4:00:00	13766.6	1.0	250.5	150.4	6.4	0.1	9.5	0.8	276.5	1317.7	2.9	753.8	445.5	267.1	245.2
5-Aug-04	4:00:00	5:00:00	13767.6	1.0	250.6	150.4	6.4	0.1	9.4	1.0	270.5	1198.7	2.9	782.4	422.2	342.0	331.9
5-Aug-04	5:00:00	6:00:00	13768.6	1.0	250.6	150.4	6.4	0.1	9.4	0.9	478.4	1025.0	3.0	800.6	413.9	331.2	330.4
5-Aug-04	6:00:00	7:00:00	13769.5	1.0	250.6	150.5	6.3	0.0	9.6	1.3	262.7	1059.3	3.1	756.8	427.9	290.4	280.3
5-Aug-04	7:00:00	8:00:00	13770.5	1.0	248.2	149.0	6.3	0.1	9.5	1.4	371.7	910.2	3.1	764.2	402.8	427.6	432.3
5-Aug-04	8:00:00	9:00:00	13771.5	1.0	245.6	147.4	6.3	0.1	9.2	0.8	458.3	1145.4	3.1	727.9	426.0	510.1	517.0
5-Aug-04	9:00:00	10:00:00	13772.5	1.0	245.6	147.4	6.2	0.1	9.6	0.6	392.0	1385.1	2.8	745.6	442.8	508.5	515.5
5-Aug-04	10:00:00	11:00:00	13773.5	1.0	245.6	147.4	6.2	0.1	9.4	0.5	409.6	1508.9	2.8	753.5	447.1	508.7	515.4
5-Aug-04	11:00:00	12:00:00	13774.5	0.2	185.3	99.2	1.5	0.1	2.3	14.1	161.3	410.7	14.6	421.4	151.9	512.1	516.9
5-Aug-04	12:00:00	13:00:00	13774.8	0.5	124.0	74.4	0.0	13.5	2.9	6.3	1134.3	484.5	9.9	398.1	238.3	437.0	437.5
5-Aug-04	13:00:00	14:00:00	13775.3	1.0	222.8	133.7	2.6	14.4	6.8	1.6	372.7	1659.2	2.8	845.9	469.8	453.9	459.9
5-Aug-04	14:00:00	15:00:00	13776.3	1.0	245.6	147.4	6.3	1.6	9.1	1.2	290.3	1255.3	2.4	865.9	457.9	498.4	505.2

			0.6003															
			461-KL1_ONTIME		431-RW1-FZ1		461-RW1-FZ1	461-BU1-FZ1	451-RW1-FZ1	461-2K1-AZ3	461-2K1-AZ1	461-2K1-AZ2	441-2K1-AZ3	441-2K1-AZ1	441-2K1-AZ2	421-BF1-TZ4	421-BF1-TZ5
			kiln run time	Kiln run Hours	kiln feed flow rate	Clinker Rate	pulv. coal to kiln	oil to kiln	pulv. coal to calciner	kiln O2	kiln CO	kiln NO	pre heater O2	pre heater CO	pre heater NO	MAIN BAGHOUSE INLET TEMPERATURE	MAIN BAGHOUSE INLET TEMPERATURE
5-Aug-04	15:00:00	16:00:00	13777.3	1.0	245.6	147.4	6.5	0.3	9.3	3.3	159.3	1420.8	3.0	720.8	528.7	505.5	512.3
5-Aug-04	16:00:00	17:00:00	13778.3	0.7	245.6	147.4	4.4	0.0	6.4	6.9	129.2	1191.5	7.4	708.8	382.3	506.0	513.0
5-Aug-04	17:00:00	18:00:00	13779.0	0.8	174.4	104.7	0.3	17.0	5.7	5.7	300.3	1273.2	8.7	521.7	323.0	473.1	475.7
5-Aug-04	18:00:00	19:00:00	13779.8	1.0	239.3	143.7	6.1	0.4	9.6	3.8	160.7	1911.5	2.8	756.8	455.8	484.8	490.8
5-Aug-04	19:00:00	20:00:00	13780.8	1.0	245.6	147.4	6.2	0.1	9.1	4.4	156.9	1639.7	3.1	751.9	478.0	505.0	510.7
5-Aug-04	20:00:00	21:00:00	13781.8	1.0	237.4	142.5	6.2	0.0	8.8	4.5	157.0	1709.5	3.4	691.6	494.1	385.9	402.2
5-Aug-04	21:00:00	22:00:00	13782.8	1.0	235.6	141.4	6.2	0.0	8.9	5.0	153.4	1782.3	3.9	614.2	499.5	236.9	225.9
5-Aug-04	22:00:00	23:00:00	13783.7	1.0	235.6	141.4	6.2	0.1	8.7	4.3	154.8	1805.2	3.7	613.7	530.7	243.3	230.3
5-Aug-04	23:00:00	0:00:00	13784.7	1.0	235.6	141.4	6.2	0.0	8.7	3.5	158.9	1698.5	3.6	616.5	552.6	247.8	233.8
6-Aug-04	0:00:00	1:00:00	13785.7	1.0	235.6	141.4	6.2	0.0	8.7	3.9	157.3	1567.0	3.6	625.5	518.7	242.1	228.6
6-Aug-04	1:00:00	2:00:00	13786.7	1.0	235.6	141.4	6.3	0.0	8.5	3.2	161.7	1169.1	3.4	670.7	452.2	243.3	229.7
6-Aug-04	2:00:00	3:00:00	13787.7	1.0	235.6	141.4	6.4	0.0	8.5	2.2	175.7	1151.8	3.5	677.7	457.2	249.8	232.7
6-Aug-04	3:00:00	4:00:00	13788.7	1.0	235.6	141.4	6.4	0.0	8.6	2.2	176.6	1208.3	3.5	680.4	459.6	249.2	232.0
6-Aug-04	4:00:00	5:00:00	13789.7	1.0	218.1	130.9	6.2	0.0	7.7	3.2	163.3	1046.7	4.3	641.1	437.9	254.2	235.4
6-Aug-04	5:00:00	6:00:00	13790.7	1.0	205.1	123.1	6.0	0.1	7.7	3.0	166.3	1123.9	4.0	621.7	424.4	261.5	276.0
6-Aug-04	6:00:00	7:00:00	13791.7	0.0	125.2	75.1	0.1	4.4	0.2	3.8	3488.3	216.6	9.7	194.2	89.4	337.2	342.3
6-Aug-04	7:00:00	8:00:00	13791.7	0.0	151.4	90.9	0.0	4.4	0.0	3.1	822.8	439.1	6.1	156.2	271.1	289.5	295.1
6-Aug-04	8:00:00	9:00:00	13791.7	0.9	131.6	79.0	0.0	21.0	5.2	4.1	153.7	1443.4	5.4	547.8	486.8	358.0	372.2
6-Aug-04	9:00:00	10:00:00	13792.7	1.0	234.8	140.9	3.5	10.9	9.3	2.1	469.0	2216.5	2.2	1131.7	492.6	394.2	415.0
6-Aug-04	10:00:00	11:00:00	13793.7	1.0	244.4	146.7	6.5	0.3	8.8	2.3	324.6	1800.7	3.0	756.6	517.3	248.0	237.7
6-Aug-04	11:00:00	12:00:00	13794.7	1.0	244.4	146.7	6.5	0.2	9.2	2.5	213.8	2014.2	3.2	702.2	527.9	241.5	228.2
6-Aug-04	12:00:00	13:00:00	13795.7	1.0	245.5	147.4	6.5	0.2	9.4	1.9	181.1	1837.7	3.0	760.8	504.4	264.0	243.4
6-Aug-04	13:00:00	14:00:00	13796.7	1.0	245.4	147.3	6.5	0.2	9.6	1.8	194.9	1800.6	3.1	739.9	508.3	266.2	245.1
6-Aug-04	14:00:00	15:00:00	13797.7	1.0	245.3	147.3	6.3	0.2	10.0	2.4	181.3	1763.7	3.2	658.7	533.7	270.1	248.4
6-Aug-04	15:00:00	16:00:00	13798.6	1.0	245.4	147.3	6.3	0.3	10.0	2.5	170.1	1877.0	3.4	627.0	557.2	281.3	241.2
6-Aug-04	16:00:00	17:00:00	13799.6	1.0	245.4	147.3	6.3	0.3	9.9	3.1	174.6	1723.5	3.3	662.2	545.6	254.9	236.2
6-Aug-04	17:00:00	18:00:00	13800.6	1.0	245.4	147.3	6.3	0.3	9.8	2.6	171.7	1723.5	3.3	647.9	541.1	254.4	235.8
6-Aug-04	18:00:00	19:00:00	13801.6	1.0	245.5	147.3	6.3	0.3	9.9	2.2	165.8	1725.8	3.1	686.3	525.5	262.1	239.1
6-Aug-04	19:00:00	20:00:00	13802.6	1.0	245.4	147.3	6.3	0.2	9.7	2.2	163.3	1707.6	3.2	702.5	525.7	268.8	244.5
6-Aug-04	20:00:00	21:00:00	13803.6	1.0	245.5	147.3	6.3	0.1	9.9	2.6	162.8	1641.0	3.3	661.1	535.3	264.9	242.2
6-Aug-04	21:00:00	22:00:00	13804.6	1.0	245.6	147.4	6.2	0.0	9.9	1.7	168.2	1856.1	3.1	675.9	535.6	260.5	237.4
6-Aug-04	22:00:00	23:00:00	13805.6	1.0	245.6	147.4	6.2	0.0	9.9	2.1	161.5	1913.0	3.3	644.1	552.2	261.7	238.4
6-Aug-04	23:00:00	0:00:00	13806.6	1.0	245.6	147.4	6.2	0.0	10.0	1.7	162.6	1910.8	3.1	673.5	540.7	258.4	237.1
7-Aug-04	0:00:00	1:00:00	13807.6	1.0	245.6	147.4	6.2	0.0	9.9	2.2	161.2	1839.7	3.0	671.1	520.7	344.4	334.6
7-Aug-04	1:00:00	2:00:00	13808.6	1.0	245.6	147.4	6.2	0.1	9.7	3.2	160.2	1714.9	3.0	704.2	512.6	370.9	375.3
7-Aug-04	2:00:00	3:00:00	13809.6	1.0	245.6	147.4	6.4	0.1	9.4	8.9	110.0	1196.1	3.2	680.2	542.3	259.8	248.6
7-Aug-04	3:00:00	4:00:00	13810.6	1.0	245.6	147.4	6.5	0.0	9.6	20.5	-4.2	-4.2	3.1	710.9	540.8	252.2	234.1
7-Aug-04	4:00:00	5:00:00	13811.6	1.0	245.6	147.4	6.5	0.0	9.4	20.5	-4.0	0.4	3.1	720.1	516.6	246.0	230.4
7-Aug-04	5:00:00	6:00:00	13812.6	1.0	245.6	147.4	6.5	0.0	9.1	20.5	-4.0	-3.9	3.3	721.4	489.7	235.1	224.2
7-Aug-04	6:00:00	7:00:00	13813.6	1.0	245.6	147.4	6.6	0.0	9.1	20.5	-4.0	-4.0	3.3	693.4	484.6	239.2	225.6
7-Aug-04	7:00:00	8:00:00	13814.6	1.0	245.5	147.4	6.6	0.0	9.0	10.4	107.6	884.7	2.9	772.8	480.3	277.4	240.8
7-Aug-04	8:00:00	9:00:00	13815.6	1.0	245.5	147.4	6.6	0.0	9.0	1.3	209.7	1298.9	2.5	988.6	432.6	348.5	263.7
7-Aug-04	9:00:00	10:00:00	13816.6	1.0	245.6	147.4	6.5	0.1	8.9	1.0	255.8	933.1	2.5	1090.2	373.3	360.1	281.9
7-Aug-04	10:00:00	11:00:00	13817.6	1.0	245.6	147.4	6.4	0.1	9.2	1.0	249.8	1298.2	2.5	924.3	424.5	366.8	282.0

			0.6003		451-KL1_ONTIME		451-RW1-FZ1		451-RW1-FZ1	451-BU1-FZ1	451-RW1-FZ1	451-2K1-AZ3	451-2K1-AZ1	451-2K1-AZ2	441-2K1-AZ3	441-2K1-AZ1	441-2K1-AZ2	421-BF1-TZ4	421-BF1-TZ5
					kiln run time	Kiln run Hours	kiln feed flow rate	Clinker Rate	pulv. coal to kiln	oil to kiln	pulv. coal to calciner	kiln O2	kiln CO	kiln NO	pre heater O2	pre heater CO	pre heater NO	MAIN BAGHOUSE INLET TEMPERATURE MDDNG	MAIN BAGHOUSE INLET TEMPERATURE MDDNG
7-Aug-04	11:00:00	12:00:00		13818.6	1.0	245.6	147.4	6.3	0.1	9.6	2.1	173.2	1550.3	2.6	809.0	458.2	381.3	306.2
7-Aug-04	12:00:00	13:00:00		13819.6	1.0	245.6	147.4	6.3	0.1	9.4	3.1	172.6	1464.6	2.7	825.9	445.2	319.3	248.6
7-Aug-04	13:00:00	14:00:00		13820.6	1.0	245.6	147.4	6.3	0.1	9.0	3.1	196.8	1439.1	3.2	716.4	445.1	305.3	254.5
7-Aug-04	14:00:00	15:00:00		13821.6	1.0	245.6	147.4	6.3	0.1	9.2	12.1	125.4	501.4	3.0	797.1	410.2	350.9	258.4
7-Aug-04	15:00:00	16:00:00		13822.6	1.0	245.6	147.4	6.3	0.1	9.6	2.9	194.4	1335.9	3.3	715.0	452.8	423.9	408.9
7-Aug-04	16:00:00	17:00:00		13823.6	1.0	245.6	147.4	6.3	0.0	9.2	2.1	232.7	1224.2	2.7	667.3	405.3	357.4	288.1
7-Aug-04	17:00:00	18:00:00		13824.5	1.0	237.8	142.8	6.3	0.0	8.9	3.0	242.9	732.5	3.3	776.9	383.3	355.5	267.4
7-Aug-04	18:00:00	19:00:00		13825.5	1.0	205.6	123.4	6.1	0.0	7.9	20.0	0.4	18.4	3.3	621.1	367.4	239.6	225.4
7-Aug-04	19:00:00	20:00:00		13826.5	1.0	205.6	123.4	6.0	0.0	7.6	20.6	-4.6	-4.6	3.3	609.9	377.4	247.4	228.7
7-Aug-04	20:00:00	21:00:00		13827.5	1.0	205.6	123.4	6.1	0.0	7.5	20.7	-4.3	-3.5	3.5	583.5	388.1	247.2	227.6
7-Aug-04	21:00:00	22:00:00		13828.5	1.0	205.6	123.4	6.1	0.0	7.5	6.9	159.4	1328.7	3.7	554.5	432.6	245.3	225.6
7-Aug-04	22:00:00	23:00:00		13829.5	1.0	205.6	123.4	6.0	0.1	7.7	1.1	254.9	1839.8	3.7	545.6	447.1	257.8	234.9
7-Aug-04	23:00:00	0:00:00		13830.5	1.0	205.6	123.4	6.0	0.2	7.7	1.9	288.6	1402.5	4.2	532.4	408.5	256.3	234.0
8-Aug-04	0:00:00	1:00:00		13831.5	1.0	205.6	123.4	6.0	0.3	7.7	2.8	162.7	1369.9	4.1	516.5	417.1	249.9	227.7
8-Aug-04	1:00:00	2:00:00		13832.5	1.0	205.6	123.4	6.0	0.2	7.9	1.6	182.2	1403.0	4.2	532.1	400.2	251.4	228.7
8-Aug-04	2:00:00	3:00:00		13833.5	1.0	205.6	123.4	6.0	0.2	7.8	3.4	160.4	1864.6	4.2	483.9	501.1	262.3	242.0
8-Aug-04	3:00:00	4:00:00		13834.5	1.0	205.6	123.4	5.9	0.2	7.9	3.2	155.5	2508.4	4.1	476.7	557.6	257.4	235.2
8-Aug-04	4:00:00	5:00:00		13835.5	1.0	205.6	123.4	5.9	0.2	8.3	3.0	155.2	2529.0	4.0	486.9	549.6	264.8	243.5
8-Aug-04	5:00:00	6:00:00		13836.5	1.0	208.6	125.2	5.9	0.2	8.5	2.5	156.6	2438.8	3.5	517.2	522.2	267.6	245.5
8-Aug-04	6:00:00	7:00:00		13837.5	1.0	224.9	135.0	6.3	0.2	9.0	2.5	166.8	2341.3	4.1	565.3	490.6	270.0	248.6
8-Aug-04	7:00:00	8:00:00		13838.5	1.0	242.0	145.3	6.5	0.2	9.4	3.2	161.0	2140.6	3.3	680.5	483.6	462.6	464.8
8-Aug-04	8:00:00	9:00:00		13839.5	1.0	245.6	147.4	6.5	0.2	9.5	2.6	166.7	1778.7	3.2	771.9	437.7	511.4	516.0
8-Aug-04	9:00:00	10:00:00		13840.5	1.0	245.6	147.4	6.5	0.2	9.5	2.1	183.6	1359.7	3.3	832.0	387.9	510.3	514.9
8-Aug-04	10:00:00	11:00:00		13841.5	1.0	245.6	147.4	6.6	0.3	9.4	1.9	170.2	1176.6	3.5	791.6	380.5	514.3	518.8
8-Aug-04	11:00:00	12:00:00		13842.5	1.0	237.0	142.3	6.6	0.3	8.9	2.4	158.6	1250.2	5.5	601.1	370.3	434.8	451.7
8-Aug-04	12:00:00	13:00:00		13843.5	1.0	235.6	141.4	6.6	0.3	8.7	2.2	171.1	955.7	6.3	591.1	333.9	293.8	289.9
8-Aug-04	13:00:00	14:00:00		13844.5	1.0	235.6	141.4	6.6	0.3	8.5	1.9	169.7	829.3	6.5	582.0	308.4	244.5	228.6
8-Aug-04	14:00:00	15:00:00		13845.5	1.0	235.6	141.4	6.6	0.2	8.3	1.7	172.2	763.8	6.8	581.6	291.0	242.6	227.1
8-Aug-04	15:00:00	16:00:00		13846.5	1.0	235.6	141.4	6.6	0.2	8.4	2.1	164.6	748.0	6.7	591.4	291.2	250.5	231.1
8-Aug-04	16:00:00	17:00:00		13847.5	1.0	235.6	141.4	6.7	0.3	8.4	1.4	198.6	581.1	6.8	604.0	283.2	262.2	238.0
8-Aug-04	17:00:00	18:00:00		13848.5	1.0	235.6	141.4	6.7	0.3	8.3	1.1	1135.8	469.6	6.8	600.8	273.1	265.6	241.1
8-Aug-04	18:00:00	19:00:00		13849.5	1.0	235.6	141.4	6.7	0.3	7.9	5.4	2697.8	212.6	7.0	581.6	266.2	260.4	236.9
8-Aug-04	19:00:00	20:00:00		13850.5	1.0	235.6	141.4	6.7	0.3	8.1	2.2	163.8	657.5	6.9	571.6	290.3	241.4	226.0
8-Aug-04	20:00:00	21:00:00		13851.4	1.0	226.8	136.1	6.9	0.3	7.7	1.9	185.2	658.0	7.5	520.9	304.7	245.3	227.9
8-Aug-04	21:00:00	22:00:00		13852.4	1.0	225.5	135.4	6.9	0.3	7.8	2.3	172.1	1785.3	7.8	485.9	398.9	256.3	235.7
8-Aug-04	22:00:00	23:00:00		13853.4	1.0	225.5	135.4	6.9	0.2	7.8	1.7	209.8	2136.8	8.0	453.9	427.3	262.4	239.3
8-Aug-04	23:00:00	0:00:00		13854.4	-13854.4	225.5	135.3	6.7	0.1	8.4	1.2	302.4	1983.4	7.6	465.7	400.9	275.9	245.8

Baghouse Temperature Data

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

ONE MINUTE REPORT
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE: KILN
CEMS ID NO : 1234
DATE CR EATED : 9/14/2002 004 @ 09:47
TIME PE RIOD : START:1 2:10 END:18:58
REPORT DATE : 8/4/2002

Run 1 Dioxin /Furan
Raw Mill Operating
Average Temp. (F°)
312.4

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
12:30	322.1	15:01	297.4	16:01	317.2	17:01	335.2
12:31	320.3	15:02	297.4	16:02	317.2	17:02	335.5
12:32	318.7	15:03	297.1	16:03	316.3	17:03	336.0
12:33	318.5	15:04	278.3	16:04	316.0	17:04	336.8
12:34	318.7	15:05	297.8	16:05	316.1	17:05	336.8
12:35	319.1	15:06	297.0	16:06	315.0	17:06	336.2
12:36	319.1	15:07	297.1	16:07	313.1		
12:37	319.2	15:08	296.9	16:08	310.9		
12:38	319.1	15:09	297.3	16:09	309.3		
12:39	318.8	15:10	297.4	16:10	308.5		
12:40	322.6	15:11	297.4	16:11	307.6		
12:41	344.6	15:12	297.7	16:12	306.5		
12:42	369.6	15:13	298.9	16:13	304.6		
12:43	391.7	15:14	298.9	16:14	304.0		
12:44	409.5	15:15	299.7	16:15	303.9		
Run Stopped		15:16	301.4	16:16	304.3		
14:17	297.7	15:17	302.9	16:17	304.7		
14:18	297.2	15:18	304.3	16:18	306.0		
14:19	296.3	15:19	305.9	16:19	307.6		
14:20	296.1	15:20	306.6	16:20	309.0		
14:21	296.1	15:21	307.2	16:21	309.2		
14:22	296.1	15:22	308.0	16:22	309.8		
14:23	295.9	15:23	309.2	16:23	310.3		
14:24	295.5	15:24	310.8	16:24	311.5		
14:25	295.0	15:25	312.7	16:25	311.9		
14:26	294.2	15:26	313.8	16:26	311.1		
14:27	293.7	15:27	315.0	16:27	310.5		
14:28	293.4	15:28	316.2	16:28	310.5		
14:29	293.9	15:29	317.3	16:29	310.9		
14:30	293.7	15:30	317.8	16:30	311.7		
14:31	293.5	15:31	317.8	16:31	312.3		
14:32	293.5	15:32	318.3	16:32	313.1		
14:33	294.1	15:33	318.4	16:33	314.5		
14:34	293.7	15:34	318.7	16:34	315.5		
14:35	293.8	15:35	319.3	16:35	317.4		
14:36	294.5	15:36	320.5	16:36	319.3		
14:37	295.5	15:37	322.6	16:37	320.1		
14:38	295.4	15:38	324.2	16:38	320.8		
14:39	295.4	15:39	325.4	16:39	320.0		
14:40	295.9	15:40	325.2	16:40	319.1		
14:41	296.2	15:41	324.7	16:41	319.2		
14:42	295.6	15:42	324.4	16:42	319.8		
14:43	295.1	15:43	323.9	16:43	319.3		
14:44	294.9	15:44	322.8	16:44	319.7		
14:45	295.3	15:45	321.6	16:45	320.4		
14:46	296.4	15:46	320.7	16:46	320.4		
14:47	296.9	15:47	321.4	16:47	320.5		
14:48	297.2	15:48	321.3	16:48	322.0		
14:49	297.4	15:49	322.1	16:49	323.0		
14:50	297.2	15:50	323.1	16:50	325.1		
14:51	296.4	15:51	322.5	16:51	327.2		
14:52	295.9	15:52	321.5	16:52	329.3		
14:53	295.2	15:53	321.2	16:53	331.2		
14:54	294.7	15:54	321.1	16:54	332.7		
14:55	295.5	15:55	320.1	16:55	333.0		
14:56	296.1	15:56	319.6	16:56	333.0		
14:57	296.8	15:57	319.1	16:57	333.5		
14:58	297.2	15:58	319.2	16:58	334.5		
14:59	297.4	15:59	318.7	16:59	335.1		
15:00	297.4	16:00	317.5	17:00	335.1		

ONE MINL : 1
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234 **Run 2 Dioxin /Furan**
DATE CREATED : 09-14-2004 @ 09:55 **Raw Mill Operating**
TIME PERIOD : START:08:34 END:16:42 **Average Temp. (F°)**
REPORT DATE : 08-07-2004 **317.2**

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
8:34	312.1	9:35	311.0	10:36	316.5
8:35	313.1	9:36	309.1	10:37	318.6
8:36	314.2	9:37	306.6	10:38	321.0
8:37	315.2	9:38	304.7	10:39	322.8
8:38	315.8	9:39	303.9	10:40	324.1
8:39	316.5	9:40	303.3	10:41	323.9
8:40	316.5	9:41	302.6	10:42	324.3
8:41	316.5	9:42	301.9	10:43	326.0
8:42	316.4	9:43	301.1	10:44	326.5
8:43	316.1	9:44	301.0	10:45	326.4
8:44	316.5	9:45	301.6	10:46	325.8
8:45	317.6	9:46	301.9	10:47	325.3
8:46	317.8	9:47	303.0	10:48	324.2
8:47	318.5	9:48	303.2	10:49	321.7
8:48	318.4	9:49	303.8	10:50	320.0
8:49	318.2	9:50	304.9	10:51	319.4
8:50	318.2	9:51	306.0	10:52	319.1
8:51	316.9	9:52	306.5	10:53	317.7
8:52	316.9	9:53	305.1	10:54	316.6
8:53	316.5	9:54	304.6	10:55	317.0
8:54	316.1	9:55	303.5	10:56	318.1
8:55	314.3	9:56	303.1	10:57	318.7
8:56	313.8	9:57	302.6	10:58	319.1
8:57	313.8	9:58	302.5	10:59	319.7
8:58	314.6	9:59	302.8	11:00	321.1
8:59	315.1	10:00	304.7	11:01	323.2
9:00	316.1	10:01	307.0	11:02	325.1
9:01	316.5	10:02	308.5	11:03	325.6
9:02	316.1	10:03	309.6	11:04	326.5
9:03	315.5	10:04	310.7	11:05	325.6
9:04	315.3	10:05	311.7	11:06	323.7
9:05	315.5	10:06	312.5	11:07	322.2
9:06	315.7	10:07	312.5	11:08	321.8
9:07	316.2	10:08	312.5	11:09	321.5
9:08	315.8	10:09	311.8	11:10	320.3
9:09	315.7	10:10	311.2	11:11	319.3
9:10	315.2	10:11	310.2	11:12	318.8
9:11	314.1	10:12	310.0	11:13	319.6
9:12	312.6	10:13	310.5	11:14	319.1
9:13	312.5	10:14	309.9	11:15	318.2
9:14	312.0	10:15	309.7	11:16	317.8
9:15	311.8	10:16	308.4	11:17	317.5
9:16	311.1	10:17	306.8	11:18	316.6
9:17	311.2	10:18	304.8	11:19	316.1
9:18	312.2	10:19	303.6	11:20	316.4
9:19	312.2	10:20	303.3	11:21	318.0
9:20	311.4	10:21	303.2	11:22	319.5
9:21	311.1	10:22	302.9	11:23	318.9
9:22	311.6	10:23	302.0	11:24	317.3
9:23	311.2	10:24	301.8	11:25	316.2
9:24	311.8	10:25	302.5	11:26	315.2
9:25	311.3	10:26	302.5	11:27	314.2
9:26	311.5	10:27	302.6	11:28	312.6
9:27	311.9	10:28	303.1	11:29	312.0
9:28	312.4	10:29	303.6	11:30	324.4
9:29	313.8	10:30	305.7	11:31	352.8
9:30	315.2	10:31	307.8	11:32	380.3
9:31	315.9	10:32	309.2	11:33	402.7
9:32	314.9	10:33	309.6	11:34	420.4
9:33	313.5	10:34	311.1	11:35	433.6
9:34	312.8	10:35	313.7	11:36	443.9
				11:37	451.3

ONE MIN UTE REPORT: 1
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234
DATE CREATED : 09-14-2004 @ 09:55
TIME PERIOD : START:08:34 END:16:42
REPORT DATE : 08-07-2004

Run 3 Dioxin /Furan
Raw Mill Operating
Average Temp. (F°)
291.7

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
12:12	288.8	13:13	259.0	14:14	313.6	Run Stopped	
12:13	289.3	13:14	256.5	14:15	315.1	16:14	296.2
12:14	289.4	13:15	254.7	14:16	316.5	16:15	295.9
12:15	286.4	13:16	254.0	14:17	317.2	16:16	296.2
12:16	282.2	13:17	253.6	14:18	317.6	16:17	296.5
12:17	279.0	13:18	253.4	14:19	316.6	16:18	295.9
12:18	276.4	13:19	253.4	14:20	316.2	16:19	296.2
12:19	273.9	13:20	253.8	14:21	314.1	16:20	297.0
12:20	273.0	13:21	254.3	14:22	311.0	16:21	298.2
12:21	273.5	13:22	255.2	14:23	307.6	16:22	297.8
12:22	273.4	13:23	256.7	14:24	305.3	16:23	296.2
12:23	272.9	13:24	257.6	14:25	303.6	16:24	294.6
12:24	272.7	13:25	258.4	14:26	301.7	16:25	295.8
12:25	273.0	13:26	259.0	14:27	300.7	16:26	298.2
12:26	272.6	13:27	260.0	14:28	299.9	16:27	299.3
12:27	272.5	13:28	261.0	14:29	300.4	16:28	300.8
12:28	272.0	13:29	261.6	14:30	301.0	16:29	303.0
12:29	271.3	13:30	262.6	14:31	301.7	16:30	304.8
12:30	270.4	13:31	263.3	14:32	303.3	16:31	304.1
12:31	270.7	13:32	264.1	14:33	304.3	16:32	304.1
12:32	271.1	13:33	265.1	14:34	305.4	16:33	305.1
12:33	272.4	13:34	269.4	14:35	306.8	16:34	306.1
12:34	272.4	13:35	275.5	14:36	307.5	16:35	305.4
12:35	271.5	13:36	280.5	14:37	309.0	16:36	305.3
12:36	271.0	13:37	284.2	14:38	309.1	16:37	306.5
12:37	272.0	13:38	287.9	14:39	309.2	16:38	307.7
12:38	275.0	13:39	289.9	14:40	308.6	16:39	308.1
12:39	277.9	13:40	291.6	14:41	308.5	16:40	307.7
12:40	281.0	13:41	292.7	14:42	309.0	16:41	307.7
12:41	283.1	13:42	293.7	14:43	308.0	16:42	308.5
12:42	285.8	13:43	294.2	14:44	306.6		
12:43	287.4	13:44	294.7	14:45	305.1		
12:44	289.3	13:45	295.7	14:46	304.2		
12:45	290.2	13:46	296.8	14:47	303.0		
12:46	291.5	13:47	297.2	14:48	302.0		
12:47	292.2	13:48	297.2	14:49	301.9		
12:48	292.6	13:49	298.0	14:50	301.9		
12:49	292.6	13:50	298.9	14:51	301.9		
12:50	293.5	13:51	298.8	14:52	302.8		
12:51	294.6	13:52	299.2	14:53	302.7		
12:52	295.6	13:53	299.6	14:54	303.2		
12:53	296.5	13:54	297.1	14:55	303.4		
12:54	297.6	13:55	292.1	14:56	304.4		
12:55	299.5	13:56	287.8	14:57	305.2		
12:56	300.5	13:57	283.4	14:58	305.2		
12:57	302.0	13:58	280.8	14:59	306.1		
12:58	302.5	13:59	278.6	15:00	308.1		
12:59	302.6	14:00	276.8	15:01	309.1		
13:00	302.6	14:01	276.6	15:02	310.6		
13:01	302.4	14:02	277.8	15:03	311.2		
13:02	301.0	14:03	280.5	15:04	311.7		
13:03	298.7	14:04	283.3	15:05	312.2		
13:04	297.3	14:05	286.5	15:06	310.2		
13:05	296.0	14:06	289.5	15:07	309.8		
13:06	292.0	14:07	293.8	15:08	309.6		
13:07	284.7	14:08	296.8	15:09	308.5		
13:08	278.4	14:09	299.9	15:10	306.8		
13:09	272.4	14:10	302.4	15:11	306.3		
13:10	267.7	14:11	304.6	15:12	305.2		
13:11	264.6	14:12	308.6	15:13	306.9		
13:12	262.0	14:13	312.0	Run Stopped			

ONE MINUTE REPORT Page : 1
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 33182
SOURCE : KILN
CEMS ID NO : 1234
DATE CREATED : 09-14-2004 @ 09:52
TIME PERIOD : START:08:14 END:20:06
REPORT F DATE : 08-05-2004

Dioxin /Furans Run 1
"Raw Mill Not-Operating"
Average Temp (F°)
513.0

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
8:19	513.2	9:20	512.5	10:21	515.0	11:22	527.2
8:20	513.6	9:21	513.5	10:22	516.5	11:23	524.9
8:21	514.0	9:22	514.8	10:23	517.6	11:24	524.5
8:22	514.4	9:23	516.5	10:24	517.5	11:25	522.1
8:23	513.9	9:24	517.0	10:25	516.4		
8:24	512.7	9:25	516.1	10:26	514.0		
8:25	512.0	9:26	515.0	10:27	511.8		
8:26	511.0	9:27	513.0	10:28	510.6		
8:27	510.3	9:28	511.0	10:29	508.8		
8:28	510.8	9:29	509.4	10:30	508.2		
8:29	511.3	9:30	508.3	10:31	507.4		
8:30	513.3	9:31	508.5	10:32	506.3		
8:31	515.2	9:32	509.8	10:33	505.2		
8:32	516.7	9:33	511.2	10:34	504.2		
8:33	516.3	9:34	512.2	10:35	503.8		
8:34	515.3	9:35	512.9	10:36	504.4		
8:35	513.5	9:36	513.1	10:37	506.0		
8:36	512.0	9:37	513.0	10:38	507.9		
8:37	511.0	9:38	513.1	10:39	509.5		
8:38	511.6	9:39	512.9	10:40	511.1		
8:39	512.1	9:40	512.5	10:41	513.1		
8:40	513.0	9:41	512.5	10:42	515.4		
8:41	513.6	9:42	513.0	10:43	516.9		
8:42	514.4	9:43	513.0	10:44	518.3		
8:43	514.9	9:44	513.0	10:45	519.3		
8:44	515.4	9:45	513.6	10:46	519.1		
8:45	514.7	9:46	513.6	10:47	517.8		
8:46	513.6	9:47	513.7	10:48	515.6		
8:47	512.9	9:48	513.6	10:49	514.0		
8:48	513.1	9:49	513.6	10:50	512.9		
8:49	513.6	9:50	513.6	10:51	513.0		
8:50	514.7	9:51	513.7	10:52	513.9		
8:51	515.9	9:52	513.2	10:53	514.9		
8:52	516.8	9:53	513.0	10:54	515.0		
8:53	516.7	9:54	512.0	10:55	515.1		
8:54	515.0	9:55	511.2	10:56	514.4		
8:55	512.9	9:56	510.6	10:57	513.2		
8:56	510.6	9:57	509.5	10:58	511.5		
8:57	509.6	9:58	508.5	10:59	510.5		
8:58	510.0	9:59	507.4	11:00	509.3		
8:59	510.3	10:00	506.9	11:01	508.5		
9:00	510.3	10:01	506.4	11:02	507.9		
9:01	510.6	10:02	506.1	11:03	507.0		
9:02	509.8	10:03	506.1	11:04	507.0		
9:03	509.3	10:04	506.7	11:05	508.0		
9:04	508.4	10:05	507.7	11:06	509.2		
9:05	508.4	10:06	509.1	11:07	510.6		
9:06	509.3	10:07	510.0	11:08	512.0		
9:07	511.0	10:08	511.0	11:09	513.6		
9:08	512.2	10:09	512.4	11:10	515.1		
9:09	512.5	10:10	514.0	11:11	517.2		
9:10	513.7	10:11	515.5	11:12	518.8		
9:11	514.4	10:12	516.3	11:13	520.4		
9:12	513.9	10:13	516.1	11:14	521.0		
9:13	511.9	10:14	515.2	11:15	527.2		
9:14	510.4	10:15	513.4	11:16	530.7		
9:15	509.0	10:16	512.0	11:17	533.7		
9:16	508.3	10:17	511.7	11:18	534.2		
9:17	508.8	10:18	511.6	11:19	533.3		
9:18	509.9	10:19	512.1	11:20	530.6		
9:19	511.3	10:20	513.7	11:21	530.3		

ONE MINUTE REPORT Page : 1
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 33182
SOURCE : KILN
CEMS ID NO : 1234
DATE CREATED : 09-14-2004 @ 09:52
TIME PERIOD : START:08:14 END:20:06
REPORT R DATE : 08-05-2004

Dioxin /Furans Run 2
"Raw Mill Not-Operating"
Average Temp (F°)
508.2

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
14:45	515.0	15:46	505.0	Run Stopped		19:31	504.0
14:46	515.7	15:47	504.9	18:30	499.0	19:32	505.0
14:47	516.5	15:48	504.0	18:31	501.2	19:33	506.7
14:48	516.6	15:49	502.3	18:32	503.4	19:34	508.0
14:49	515.5	15:50	501.2	18:33	504.6	19:35	509.2
14:50	513.8	15:51	500.5	18:34	505.1	19:36	509.9
14:51	513.1	15:52	500.6	18:35	506.1	19:37	511.0
14:52	512.9	15:53	501.4	18:36	506.5	19:38	512.1
14:53	513.5	15:54	502.9	18:37	507.5	19:39	513.1
14:54	514.9	15:55	504.3	18:38	508.3	19:40	514.2
14:55	517.1	15:56	505.4	18:39	508.2	19:41	515.4
14:56	518.8	15:57	506.5	18:40	507.3	19:42	516.2
14:57	519.9	15:58	507.4	18:41	505.5	19:43	516.3
14:58	520.3	15:59	507.9	18:42	503.9	19:44	516.3
14:59	520.3	16:00	508.4	18:43	501.7	19:45	516.3
15:00	519.7	16:01	508.0	18:44	500.9	19:46	516.6
15:01	518.7	16:02	506.0	18:45	499.9	19:47	517.2
15:02	517.8	16:03	503.4	18:46	499.5	19:48	518.1
15:03	516.9	16:04	501.2	18:47	499.0	19:49	518.8
15:04	516.1	16:05	499.6	18:48	499.8	19:50	519.3
15:05	514.8	16:06	499.0	18:49	501.3	19:51	519.6
15:06	513.8	16:07	499.1	18:50	502.8	19:52	519.4
15:07	513.0	16:08	499.7	18:51	505.1	19:53	519.1
15:08	512.8	16:09	500.7	18:52	507.2	19:54	518.3
15:09	512.4	16:10	502.5	18:53	509.2	19:55	517.0
15:10	511.7	16:11	504.0	18:54	510.7	19:56	514.9
15:11	511.7	16:12	505.5	18:55	511.4	19:57	512.2
15:12	511.7	16:13	506.9	18:56	511.0	19:58	509.0
15:13	511.7	16:14	507.0	18:57	510.1	19:59	506.6
15:14	511.7	16:15	505.4	18:58	509.3	20:00	504.4
15:15	511.7	16:16	504.4	18:59	508.6	20:01	503.2
15:16	512.3	16:17	503.3	19:00	508.3	20:02	502.7
15:17	512.8	16:18	503.2	19:01	508.3	20:03	503.0
15:18	512.7	16:19	504.2	19:02	508.3	20:04	501.0
15:19	512.5	16:20	505.3	19:03	508.3	20:05	490.3
15:20	512.0	16:21	506.3	19:04	507.7	20:06	478.8
15:21	512.1	16:22	507.0	19:05	507.1		
15:22	511.4	16:23	507.2	19:06	506.5		
15:23	510.9	16:24	507.6	19:07	505.6		
15:24	510.4	16:25	507.6	19:08	505.4		
15:25	509.4	16:26	507.4	19:09	504.0		
15:26	508.5	16:27	506.6	19:10	502.1		
15:27	507.7	16:28	505.7	19:11	500.6		
15:28	506.9	16:29	505.8	19:12	500.2		
15:29	505.9	16:30	506.4	19:13	499.0		
15:30	506.2	16:31	506.6	19:14	497.9		
15:31	507.8	16:32	507.5	19:15	497.7		
15:32	509.5	16:33	507.6	19:16	497.9		
15:33	509.7	16:34	508.5	19:17	498.5		
15:34	509.7	16:35	509.1	19:18	499.2		
15:35	509.2	16:36	511.3	19:19	500.2		
15:36	508.4	16:37	514.3	19:20	500.4		
15:37	507.8	16:38	517.4	19:21	500.2		
15:38	506.6	16:39	520.0	19:22	499.3		
15:39	504.4	16:40	521.0	19:23	498.8		
15:40	502.4	16:41	525.3	19:24	498.3		
15:41	500.9	16:42	530.2	19:25	497.7		
15:42	501.0	16:43	530.3	19:26	498.3		
15:43	502.4	16:44	528.5	19:27	499.3		
15:44	503.7	16:45	524.5	19:28	500.7		
15:45	504.8	16:46	522.7	19:29	502.1		
		Run Stopped		19:30	503.1		

ONE MINL : 1
COMPANYNAME : Rinker Materials Corporation
LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234
DATE CREATED : 09-14-2004 @ 09:57
TIME PERIOD : START:07:49 END:10:59
REPORT DATE : 08-08-2004

Dioxin /Furans Run 3
"Raw Mill Not-Operating"
Average Temp (F°)
514.7

TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)	TIME hh:mm	BAG HOUSE TEMP (DEG F)
7:49	522.6	8:51	514.4	9:53	518.5	10:55	512.5
7:50	523.0	8:52	514.5	9:54	520.4	10:56	512.1
7:51	522.6	8:53	514.4	9:55	521.4	10:57	511.7
7:52	522.1	8:54	513.9	9:56	521.7	10:58	511.7
7:53	521.6	8:55	513.8	9:57	521.7	10:59	511.7
7:54	521.0	8:56	513.7	9:58	522.3		
7:55	521.0	8:57	513.8	9:59	522.3		
7:56	520.6	8:58	514.5	10:00	521.9		
7:57	520.4	8:59	514.5	10:01	521.4		
7:58	520.4	9:00	514.1	10:02	520.3		
7:59	520.3	9:01	513.6	10:03	519.2		
8:00	520.4	9:02	512.6	10:04	518.8		
8:01	520.3	9:03	512.1	10:05	518.4		
8:02	519.8	9:04	511.6	10:06	518.4		
8:03	519.2	9:05	511.1	10:07	517.7		
8:04	518.6	9:06	510.2	10:08	518.2		
8:05	517.5	9:07	509.3	10:09	518.4		
8:06	516.5	9:08	508.8	10:10	519.1		
8:07	516.3	9:09	508.3	10:11	519.3		
8:08	516.4	9:10	507.3	10:12	519.7		
8:09	516.4	9:11	506.8	10:13	519.7		
8:10	516.4	9:12	506.3	10:14	519.7		
8:11	515.8	9:13	505.8	10:15	519.1		
8:12	515.3	9:14	505.4	10:16	518.6		
8:13	515.1	9:15	506.0	10:17	518.1		
8:14	514.5	9:16	507.0	10:18	517.0		
8:15	514.5	9:17	508.6	10:19	516.4		
8:16	513.6	9:18	510.2	10:20	516.3		
8:17	512.6	9:19	511.2	10:21	515.9		
8:18	511.5	9:20	511.1	10:22	516.8		
8:19	511.0	9:21	510.7	10:23	517.2		
8:20	510.4	9:22	509.6	10:24	517.7		
8:21	510.2	9:23	508.6	10:25	517.9		
8:22	509.8	9:24	508.1	10:26	518.3		
8:23	510.8	9:25	507.7	10:27	518.4		
8:24	511.9	9:26	508.2	10:28	518.6		
8:25	512.4	9:27	508.4	10:29	519.5		
8:26	512.8	9:28	508.5	10:30	520.1		
8:27	512.5	9:29	509.2	10:31	520.5		
8:28	513.1	9:30	509.6	10:32	521.0		
8:29	513.0	9:31	509.6	10:33	521.1		
8:30	512.6	9:32	509.8	10:34	520.5		
8:31	512.0	9:33	510.0	10:35	520.0		
8:32	511.7	9:34	511.5	10:36	519.5		
8:33	511.3	9:35	512.5	10:37	518.6		
8:34	511.1	9:36	513.0	10:38	518.1		
8:35	511.6	9:37	514.0	10:39	516.5		
8:36	511.7	9:38	515.2	10:40	515.3		
8:37	511.8	9:39	515.8	10:41	514.2		
8:38	511.7	9:40	516.7	10:42	513.7		
8:39	511.8	9:41	517.2	10:43	512.7		
8:40	511.7	9:42	517.7	10:44	512.2		
8:41	511.8	9:43	517.7	10:45	511.6		
8:42	511.1	9:44	518.1	10:46	511.0		
8:43	510.6	9:45	518.1	10:47	510.5		
8:44	510.8	9:46	516.9	10:48	510.3		
8:45	511.2	9:47	515.5	10:49	510.0		
8:46	512.2	9:48	514.1	10:50	510.9		
8:47	513.1	9:49	513.2	10:51	511.3		
8:48	513.8	9:50	513.0	10:52	512.3		
8:49	514.4	9:51	513.7	10:53	512.4		
8:50	514.4	9:52	516.2	10:54	512.5		

Opacity Data

MINUTE REPORT
COMPANYNAME : Rinker Materials Corporation
COMPANYLOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID PM-RUN 1 "MILL OPERATING
DATE CREATED : 09-14-2004 @ 09:46
TIME PERIOD : START:12:10 END:18:58 Average 6-minute OPACITY % 2.1
REPORT DATE : 08-04-2004

OPACITY			OPACITY		
TIME hh:mm	(%)	6-MINUTE AVE.	TIME hh:mm	(%)	6-MINUTE AVE.
12:10	2.2		Resume PM Test		
12:11	2.3		14:27	1.8	
12:12	1.8		14:28	1.6	
12:13	1.7		14:29	1.6	
12:14	2.0		14:30	1.6	
12:15	2.5	2.1	14:31	1.8	
12:16	2.3		14:32	3.1	2.0
12:17	1.8		14:33	1.7	
12:18	1.9		14:34	1.7	
12:19	2.2		14:35	2.1	
12:20	1.8		14:36	2.1	
12:21	1.7	2.0	14:37	2.0	
12:22	1.8		14:38	1.7	1.9
12:23	1.8		14:39	1.8	
12:24	3.5		14:40	2.4	
12:25	2.1		14:41	1.9	
12:26	2.0		14:42	1.7	
12:27	2.1	2.2	14:43	1.8	
12:28	2.3		14:44	2.1	2.0
12:29	2.1		14:45	1.7	
12:30	1.8		14:46	1.6	
12:31	1.9		14:47	1.6	
12:32	2.2		14:48	1.9	
12:33	2.1	2.1	14:49	2.4	
12:34	1.8		14:50	1.8	1.8
12:35	1.7		14:51	1.6	
12:36	2.2		14:52	1.6	
12:37	2.0		14:53	1.7	
12:38	1.8		14:54	1.6	
12:39	1.9	1.9	14:55	1.5	
12:40	4.0		14:56	1.5	1.6
12:41	4.6		14:57	2.5	
12:42	4.2		14:58	1.8	
12:43	3.9		14:59	1.4	
12:44	3.2		15:00	1.5	
12:45	3.4	3.9			1.7

MINUTE REPORT
COMPANYNAME : Rinker Materials Corporation
COMPANYLOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE KILN
CEMS ID
DATE CREATED : 09-14-2004 @ 09:46 PM-RUN 2 "MILL OPERATING
TIME PERIOD : START:12:10 END:18:58 %
REPORT DATE : 08-04-2004 Average 6-minute OPACITY 2.7

TIME hh:mm	OPACITY (%)	6-MINUTE AVE.	TIME hh:mm	OPACITY (%)	6-MINUTE AVE.
16:15	1.7		16:54	1.4	
16:16	1.4		16:55	1.4	
16:17	1.3		16:56	2.0	1.6
16:18	2.0		16:57	1.8	
16:19	1.7		16:58	1.3	
16:20	1.4	1.6	16:59	1.2	
16:21	1.4		17:00	1.2	
16:22	2.0		17:01	1.9	
16:23	2.1		17:02	1.4	1.5
16:24	1.4		17:03	1.3	
16:25	1.5		17:04	1.4	
16:26	1.7	1.7	17:05	2.7	
16:27	1.5		17:06	1.6	
16:28	1.0		17:07	1.4	
16:29	44.5		17:08	1.8	1.7
16:30	44.5		17:09	1.8	
16:31	-0.1		17:10	1.3	
16:32	-0.1	15.2	17:11	1.3	
16:33	-0.1		17:12	1.2	
16:34	0.0		17:13	1.5	
16:35	1.5		17:14	1.8	1.5
16:36	1.3		17:15	1.3	
16:37	1.4		17:16	1.3	
16:38	1.3	0.9	17:17	1.8	
16:39	2.1		17:18	1.5	
16:40	2.3		17:19	1.5	
16:41	1.6		17:20	1.4	1.5
16:42	1.4		17:21	1.5	
16:43	1.6		17:22	2.6	
16:44	1.8	1.8	17:23	1.9	
16:45	1.5		17:24	1.6	
16:46	1.3		17:25	1.7	
16:47	1.5		17:26	2.0	1.9
16:48	1.9		17:27	1.7	
16:49	1.5		17:28	1.5	
16:50	1.4	1.5	17:29	1.4	
16:51	1.6		17:30	1.8	
16:52	1.6				
16:53	1.5				

MINUTE REPORT
COMPANYNAME : Rinker Materials Corporation
COMPANYLOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE KILN
CEMS ID
DATE CREATED : 09-14-2004 @ 09:46 PM-RUN 3 "MILL OPERATING
TIME PERIOD : START:12:10 END:18:58 Average 6-minute OPACITY %
REPORT DATE : 08-04-2004 1.6

TIME hh:mm	OPACITY (%)	OPACITY 6-MINUTE AVE.	TIME hh:mm	OPACITY (%)	OPACITY 6-MINUTE AVE.
17:50	1.4		18:30	1.9	
17:51	1.6		18:31	1.5	1.7
17:52	1.6		18:32	1.3	
17:53	1.6		18:33	1.4	
17:54	1.5		18:34	1.5	
17:55	1.6	1.6	18:35	1.4	
17:56	2.0		18:36	1.5	
17:57	1.6		18:37	1.5	1.4
17:58	1.6		18:38	1.5	
17:59	1.8		18:39	1.9	
18:00	1.9		18:40	1.6	
18:01	1.7	1.8	18:41	1.5	
18:02	1.7		18:42	1.8	
18:03	1.7		18:43	1.6	1.7
18:04	1.4		18:44	1.6	
18:05	2.2		18:45	1.5	
18:06	1.6		18:46	1.4	
18:07	1.5	1.7	18:47	1.6	
18:08	1.6		18:48	1.6	
18:09	1.8		18:49	1.4	1.5
18:10	2.1		18:50	1.5	
18:11	1.7		18:51	1.5	
18:12	1.8		18:52	1.6	
18:13	2.0	1.8	18:53	1.5	
18:14	2.0		18:54	1.3	
18:15	1.7		18:55	1.4	1.5
18:16	1.8		18:56	1.8	
18:17	1.9		18:57	1.4	
18:18	1.6		18:58	1.4	
18:19	1.6	1.8			
18:20	1.8				
18:21	1.7				
18:22	2.0				
18:23	1.5				
18:24	1.5				
18:25	1.2	1.6			
18:26	2.1				
18:27	1.6				
18:28	1.4				
18:29	1.2				

ONE MINUTE REPORT
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234 PM-RUN 1
DATE CREATED : 09-14-2004 @ 09:51 RAWMILL NOT-OPERATING
TIME PERIOD : START:08:14 END:20:06 Average 6-minute OPACITY %
REPORT DATE : 08-05-2004 2.9

TIME hh:mm	OPACITY (%)	6-MINUTE AVE.	TIME hh:mm	OPACITY (%)	6-MINUTE AVE.
8:14	2.8		8:53	3.0	
8:15	3.0		8:54	4.0	
8:16	3.4		8:55	3.7	2.9
8:17	2.7		8:56	3.0	
8:18	2.8		8:57	2.6	
8:19	3.0	2.9	8:58	2.9	
8:20	2.9		8:59	2.8	
8:21	2.8		9:00	2.5	
8:22	2.9		9:01	2.7	2.9
8:23	3.3		9:02	3.1	
8:24	3.8		9:03	2.7	
8:25	3.6	3.1	9:04	2.7	
8:26	3.3		9:05	2.6	
8:27	2.9		9:06	2.5	
8:28	2.6		9:07	3.2	2.7
8:29	3.3		9:08	2.7	
8:30	2.6		9:09	2.4	
8:31	2.7	3.1	9:10	2.4	
8:32	2.6		9:11	3.0	
8:33	4.2		9:12	3.2	
8:34	3.0		9:13	3.0	2.8
8:35	3.1		9:14	2.8	
8:36	3.3		9:15	3.2	
8:37	3.0	3.2	9:16	3.1	
8:38	2.6		9:17	2.4	
8:39	2.6		9:18	2.5	
8:40	2.7		9:19	2.7	2.8
8:41	3.2		9:20	2.4	
8:42	3.0				
8:43	2.8	2.9			
8:44	3.1				
8:45	3.5				
8:46	3.0				
8:47	2.7				
8:48	2.6				
8:49	2.4	3.0			
8:50	4.0				
8:51	2.6				
8:52	2.6				

ONE MINUTE REPORT
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234 PM-RUN 2
DATE CREATED : 09-14-2004 @ 09:51 RAWMILL NOT-OPERATING
TIME PERIOD : START:08:14 END:20:06 Average 6-minute OPACITY %
REPORT DATE : 08-05-2004 2.6

TIME hh:mm	OPACITY (%)	6-MINUTE AVE.	TIME hh:mm	OPACITY (%)	6-MINUTE AVE.
9:55	2.4		10:35	2.3	
9:56	2.3		10:36	2.6	2.6
9:57	2.1		10:37	2.7	
9:58	3.6		10:38	2.4	
9:59	2.5		10:39	2.2	
10:00	2.2	2.6	10:40	1.9	
10:01	2.5		10:41	3.3	
10:02	2.4		10:42	2.3	2.5
10:03	2.2		10:43	2.1	
10:04	2.1		10:44	2.6	
10:05	2.2		10:45	2.4	
10:06	2.4	2.3	10:46	2.7	
10:07	2.6		10:47	3.1	
10:08	2.2		10:48	3.2	2.5
10:09	2.3		10:49	3.5	
10:10	2.5		10:50	2.7	
10:11	2.3		10:51	2.3	
10:12	2.6	2.4	10:52	2.4	
10:13	3.0		10:53	2.6	
10:14	2.9		10:54	2.3	2.8
10:15	4.2		10:55	2.4	
10:16	3.0		10:56	2.4	
10:17	2.5		10:57	2.4	
10:18	2.5	3.0	10:58	4.0	
10:19	2.7		10:59	2.5	
10:20	2.6		11:00	2.5	2.7
10:21	2.2		11:01	2.7	
10:22	2.2		11:02	2.9	
10:23	2.4		11:03	2.6	
10:24	2.9	2.4	11:04	2.5	
10:25	2.6		11:05	2.6	
10:26	2.6		11:06	2.9	2.6
10:27	3.1		11:07	2.5	
10:28	2.7		11:08	2.4	
10:29	2.3				
10:30	2.3	2.7			
10:31	2.3				
10:32	3.1				
10:33	2.6				
10:34	2.6				

ONE MINUTE REPORT
COMPANY NAME : Rinker Materials Corporation
COMPANY LOCATION : 1200 NW 137th Ave. Miami, FL 33182
SOURCE : KILN
CEMS ID NO : 1234 PM-RUN 3
DATE CREATED : 09-14-2004 @ 09:51 RAWMILL NOT-OPERATING
TIME PERIOD : START:08:14 END:20:06 Average 6-minute OPACITY %
REPORT DATE : 08-05-2004 3.1

TIME hh:mm	OPACITY (%)	OPACITY 6-MINUTE AVE.	TIME hh:mm	OPACITY (%)	OPACITY 6-MINUTE AVE.
14:40	2.7		15:20	2.8	
14:41	2.7		15:21	3.3	3.1
14:42	3.2		15:22	3.8	
14:43	3.6		15:23	3.0	
14:44	2.9		15:24	3.0	
14:45	2.7	3.0	15:25	3.4	
14:46	2.9		15:26	3.5	
14:47	3.2		15:27	3.0	3.3
14:48	4.4		15:28	3.1	
14:49	3.7		15:29	2.9	
14:50	3.8		15:30	3.4	
14:51	3.1	3.5	sume PM Test		
14:52	3.4		16:07	2.6	
14:53	2.7		16:08	3.0	
14:54	2.6		16:09	2.7	
14:55	2.6		16:10	2.5	
14:56	3.3		16:11	2.4	
14:57	3.2	3.0	16:12	2.6	2.6
14:58	3.0		16:13	3.2	
14:59	3.3		16:14	2.6	
15:00	3.7		16:15	2.8	
15:01	3.4		16:16	2.7	
15:02	3.1		16:17	3.2	2.7
15:03	3.1	3.3	16:18	2.8	
15:04	3.4		16:19	2.5	
15:05	3.9		16:20	2.4	
15:06	3.2		16:21	2.8	
15:07	3.1		16:22	3.5	
15:08	3.5		16:23	2.4	2.9
15:09	3.4	3.4	16:24	2.6	
15:10	3.1		16:25	3.0	
15:11	3.0		16:26	2.7	
15:12	3.0		16:27	2.5	
15:13	3.9		16:28	2.6	
15:14	3.4		16:29	Calibration	2.6
15:15	2.9	3.3	16:30	Block	
15:16	2.8		16:31		
15:17	3.3		16:32		
15:18	3.5		16:33		
15:19	3.0		16:34	2.6	

Equipment Calibrations

Nozzle Calibration

Date: 8-5-04

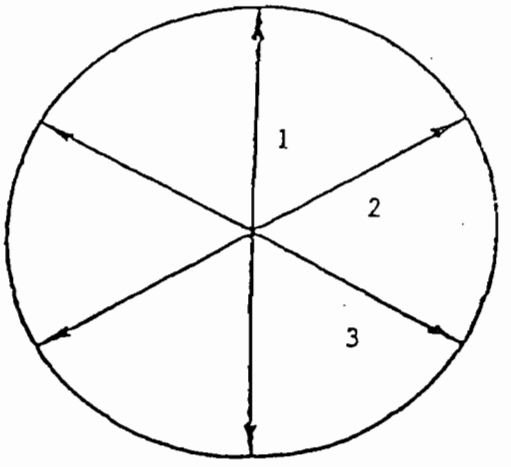
Plant Name: Rinker

Location: Miami, FL

Source: Cement Kiln D/F RMD

Measurement Number	Inside Diameter (inches)
1	0.262
2	0.263
3	0.264
Average	0.263
Area of Nozzle	0.000377 Ft.^{2}

Calibrated by: R Paul



Nozzle X-Section

KAForms: Nozzle Calibration
jhm,04/24/01

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Nozzle Calibration

Date: 8-4-04

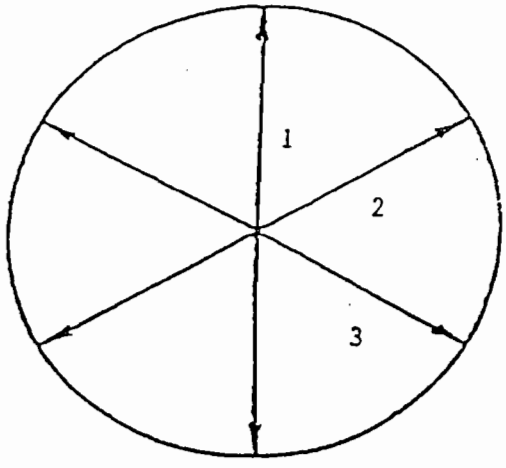
Plant Name: Rinker

Location: Miami, Fl.

Source: Cement Kiln D/F RM4

Measurement Number	Inside Diameter (inches)
1	0.231
2	0.230
3	0.232
Average	0.231
Area of Nozzle	0.000291 Ft.^{2}

Calibrated by: R Paul



Nozzle X-Section

KAForms: Nozzle Calibration
jhm,04/24/01

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

Pitot Tube Calibration Measurements

Pitot Tube Identification Number: SS I

Date Calibrated: 7-1-03

Pitot Tube Assembly Level: Yes ☑ No ☐

Pitot Tube Openings Damaged: Yes ☐ No ☑; If yes, please explain: _____

Dt_A = 0.372 in. (Dt_A = 0.1875 - 0.3750 in.)

Dt_B = 0.373 in. (Dt_B = 0.1875 - 0.3750 in.)

α_A = 1.5° (<10°) α_B = 1.0 ° (<10°)

β_A = 1.5° (<5°) β_B = 2.0 ° (<5°)

γ = 0.5°, θ = 0.5 °,

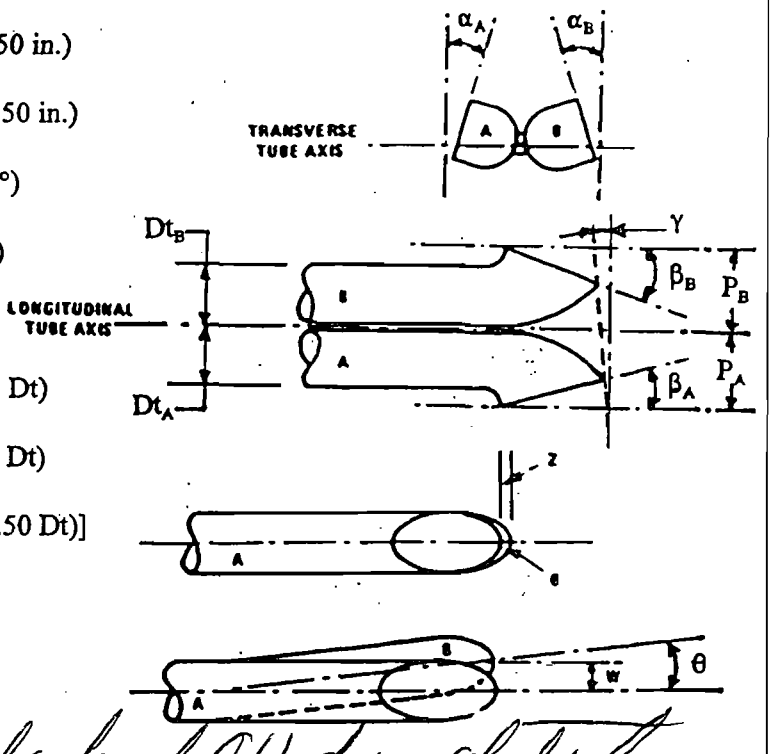
P_A = 0.464 (P_A = 1.05 Dt to 1.50 Dt)

P_B = 0.467 (P_B = 1.05 Dt to 1.50 Dt)

$P_A + P_B = A$ = 0.931 [A = 2x(1.05 Dt to 1.50 Dt)]

Z = A SIN γ = <0.01 in. (<0.125 in.)

W = A SIN θ = <0.01 in. (<0.031 in.)



Comments: Pitot tubes looked OK day of test

Calibration required? Yes ☐ No ☐

Calibrated by: Rodney Paul

KAForms: Pitot Tube Calibration Measurements
jhm,10/23/01

Post Test Thermocouple Calibration

Date: 8-5-04

Plant Name: Rinker

Location: Miami

Source: Kiln RMD

Thermocouple Readout No.	KAK-6
Umbilical Cord No.	KAK-100
Switch Box No.	KAK-6
Thermocouple No.	KAK-55
Average Stack Temperature °F	455
* Observed Mercury in Glass (ASTM) °F	459
Observed Thermocouple Reading °F	459

* Observed temperature must be within ten percent of the average stack temperature.

Percent Difference $\frac{(\text{ASTM} + 460) - (\text{Thermo} + 460)}{(\text{ASTM} + 460)} \times 100 =$ 0.0%

Tolerance ≤ 1.5%

Signature: R Paul

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

KAForms: Post Test Thermocouple Calibration
jhm,07/30/01

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

KA70 RO/UMB		ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	KA70 RO/UMB	
KA1/100'	STACK	31	32	78	77	211	210	421	420	KA1/100'	STACK
	BOX	33	33	77	77	210	210	421	420		BOX
	IMP	32	33	77	78	210	209	420	421		IMP
KA2/200'	STACK	32	33	78	77	210	209	414	415	KA2/200'	STACK
	BOX	31	33	78	77	210	209	417	416		BOX
	IMP	32	32	77	77	211	210	419	418		IMP
KA3/25'	STACK	33	33	77	78	211	210	413	412	KA3/25'	STACK
SWBXKA3	BOX	32	33	78	78	212	211	410	411		BOX
	IMP	34	33	78	77	210	211	410	411		IMP
KA4/25'	STACK	33	32	77	78	212	213	412	413	KA4/25'	STACK
SWBXKA3	BOX	32	33	78	77	211	211	413	413		BOX
	IMP	32	33	77	78	212	212	413	414		IMP
KAK/200K	STACK	32	33	78	78	209	211	417	418	KAK/200K	STACK
KAK-38	BOX	32	32	78	78	210	211	418	419	KAK-38	BOX
SWBXKAK1	IMP	31	32	78	78	212	212	420	419		IMP
KA1/200'	STACK	31	32	77	77	211	210	423	422	KA1/200'	STACK
	BOX	31	32	77	77	209	210	421	420		BOX
	IMP	33	32	77	78	210	211	420	420		IMP
KA2/100'	STACK	33	33	77	78	208	209	420	419	KA2/100'	STACK
	BOX	31	32	78	77	210	211	420	421		BOX
	IMP	32	33	78	78	210	210	422	421		IMP

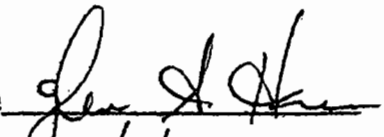
Signature _____

Date 5/6/03

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

THERMOCOUPLE #	ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	THERMOCOUPLE #
KA-06	32	32	77	78	211	210	420	419	KA-06
KA-07	32	33	78	77	212	211	420	421	KA-07
KA-08	34	33	77	78	209	210	423	422	KA-08
KA-09	33	33	77	78	212	211	420	419	KA-09
KA-10	33	32	78	77	212	212	417	418	KA-10
KA-11	35	34	78	78	209	209	415	416	KA-11
KA-12	34	34	79	78	211	210	419	418	KA-12
KA-38	33	33	79	78	212	211	422	422	KA-38
KA-39	33	32	78	77	209	210	420	421	KA-39
KA-50	31	32	77	77	210	211	420	420	KA-50
KA-64	33	34	77	78	213	212	414	415	KA-64
KA-70	35	34	77	78	210	209	416	417	KA-70
KA-71	34	33	78	78	212	211	418	418	KA-71
KA-72	31	32	76	77	211	210	421	421	KA-72
KA-105	31	32	77	78	210	210	421	420	KA-105
KA-108	33	33	76	77	212	211	422	423	KA-108
KA-115	33	33	77	77	211	212	421	422	KA-115
KA-126	31	32	77	78	211	210	424	423	KA-126

THERMOCOUPLE #	ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	THERMOCOUPLE #
KAK-08	32	32	77	77	210	210	420	419	KAK-08
KAK-09	32	31	78	78	212	211	418	418	KAK-09
KAK-10	31	32	76	77	211	210	420	421	KAK-10
KAK-11	33	33	78	77	211	212	424	423	KAK-11
KAK-12	32	33	77	78	211	210	423	422	KAK-12
KAK-38	34	33	78	77	210	209	420	420	KAK-38
KAK-65	33	32	76	77	209	208	417	418	KAK-65
KAK-72	32	31	77	77	211	211	415	416	KAK-72
KAK-110	34	33	79	78	211	210	421	422	KAK-110
KAK-07	32	32	78	77	212	211	421	421	KAK-07

Signature 

Date 5/6/03

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

Range (C)	Measured Voltage (mV)	Measured Voltage (V)	Calc. Temp. (C)	Readout Temp. (C)	Percent Difference (%)
KAK-12	33.0	0.033	793	796	-0.3453
	41.0	0.041	993	989	0.4131
KAK-38	32.5	0.033	781	784	-0.3728
	41.4	0.041	1003	999	0.4346
KAK-72	32.8	0.033	788	790	-0.2045
	41.1	0.041	996	993	0.2676
KAK-65	32.1	0.032	771	769	0.3079
	40.9	0.041	991	995	-0.4500
KA-110	32.7	0.033	786	788	-0.2605
	40.5	0.041	980	981	-0.0695

EQUATIONS :

T (calc.)= (0.226584602+(24152.109*V)+(67233.4248*V^2)+(2210340.682*V^3)
-(860963914.9*V^4)+(48350600000*V^5)-(1184520000000*V^6)
+(13869000000000*V^7)-(63370800000000*V^8))

Where :

V = Measured Voltage (Volts)
T(calc.) = Temperature calculated based on voltage

Signature Jeff L. Hamm

Date 5/6/03

Pitot Tube Calibration Measurements

Pitot Tube Identification Number: SS II

Date Calibrated: 7-1-03

Pitot Tube Assembly Level: Yes ☑ No ☐

Pitot Tube Openings Damaged: Yes ☐ No ☑, If yes, please explain: _____

Dt_A = 0.373 in. (Dt_A = 0.1875 - 0.3750 in.)

Dt_B = 0.373 in. (Dt_B = 0.1875 - 0.3750 in.)

α_A = 1.5° (<10°) α_B = 2.0° (<10°)

β_A = 1.5° (<5°) β_B = 1.5° (<5°)

γ = 1.0°, θ = 1.0°,

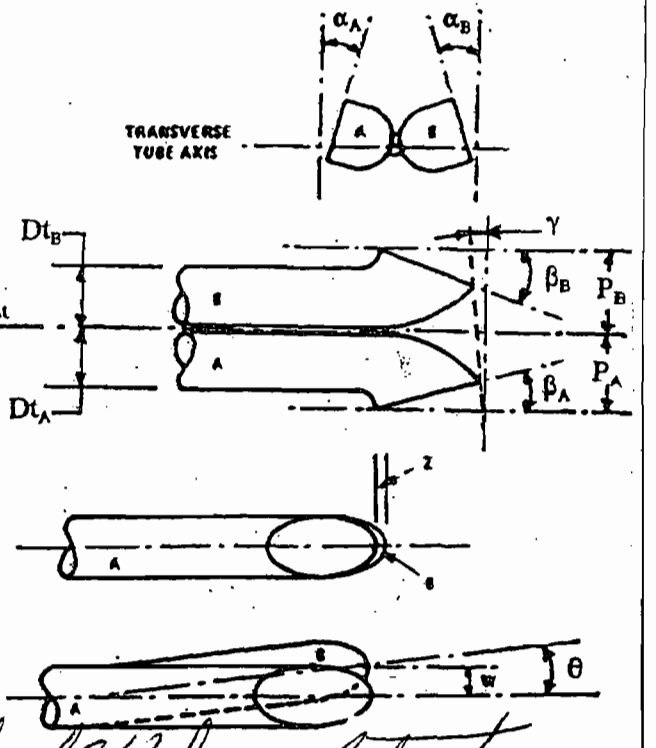
P_A = 0.465 (P_A = 1.05 Dt to 1.50 Dt)

P_B = 0.466 (P_B = 1.05 Dt to 1.50 Dt)

$P_A + P_B = A$ = 0.931 [A = 2x(1.05 Dt to 1.50 Dt)]

Z = A SIN γ = 0.016 in. (<0.125 in.)

W = A SIN θ = 0.016 in. (<0.031 in.)



Comments: Pitot tubes leaked OK day of test

Calibration required? Yes ☐ No ☐

Calibrated by: Rodney Paul

KAForms: Pitot Tube Calibration Measurements
jhm,10/23/01

Post Test Thermocouple Calibration

Date: 8-5-04

Plant Name: Rinker

Location: Miami

Source: Cement Kiln

Thermocouple Readout No.	KA-2
Umbilical Cord No.	200'
Switch Box No.	KA-2
Thermocouple No.	KA-72
Average Stack Temperature °F	460
* Observed Mercury in Glass (ASTM) °F	456
Observed Thermocouple Reading °F	458

* Observed temperature must be within ten percent of the average stack temperature.

Percent Difference $\frac{(\text{ASTM} + 460) - (\text{Thermo} + 460)}{(\text{ASTM} + 460)} \times 100 =$ 0.22%

Tolerance ≤ 1.5%

Signature: R Paul

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

KAForms: Post Test Thermocouple Calibration
jhm,07/30/01

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

KA70 RO/UMB		ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	KA70 RO/UMB	
KA1/100'	STACK	31	32	78	77	211	210	421	420	KA1/100'	STACK
	BOX	33	33	77	77	210	210	421	420		BOX
	IMP	32	33	77	78	210	209	420	421		IMP
KA2/200'	STACK	32	33	78	77	210	209	414	415	KA2/200'	STACK
	BOX	31	33	78	77	210	209	417	416		BOX
	IMP	32	32	77	77	211	210	419	418		IMP
KA3/25'	STACK	33	33	77	78	211	210	413	412	KA3/25'	STACK
SWBXKA3	BOX	32	33	78	78	212	211	410	411		BOX
	IMP	34	33	78	77	210	211	410	411		IMP
KA4/25'	STACK	33	32	77	78	212	213	412	413	KA4/25'	STACK
SWBXKA3	BOX	32	33	78	77	211	211	413	413		BOX
	IMP	32	33	77	78	212	212	413	414		IMP
KAK/200K	STACK	32	33	78	78	209	211	417	418	KAK/200K	STACK
KAK-38	BOX	32	32	78	78	210	211	418	419	KAK-38	BOX
SWBXKAK1	IMP	31	32	78	78	212	212	420	419		IMP
KA1/200'	STACK	31	32	77	77	211	210	423	422	KA1/200'	STACK
	BOX	31	32	77	77	209	210	421	420		BOX
	IMP	33	32	77	78	210	211	420	420		IMP
KA2/100'	STACK	33	33	77	78	208	209	420	419	KA2/100'	STACK
	BOX	31	32	78	77	210	211	420	421		BOX
	IMP	32	33	78	78	210	210	422	421		IMP

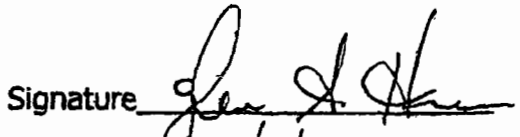
Signature _____

Date 5/6/03

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

THERMOCOUPLE #	ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	THERMOCOUPLE #
KA-06	32	32	77	78	211	210	420	419	KA-06
KA-07	32	33	78	77	212	211	420	421	KA-07
KA-08	34	33	77	78	209	210	423	422	KA-08
KA-09	33	33	77	78	212	211	420	419	KA-09
KA-10	33	32	78	77	212	212	417	418	KA-10
KA-11	35	34	78	78	209	209	415	416	KA-11
KA-12	34	34	79	78	211	210	419	418	KA-12
KA-38	33	33	79	78	212	211	422	422	KA-38
KA-39	33	32	78	77	209	210	420	421	KA-39
KA-50	31	32	77	77	210	211	420	420	KA-50
KA-64	33	34	77	78	213	212	414	415	KA-64
KA-70	35	34	77	78	210	209	416	417	KA-70
KA-71	34	33	78	78	212	211	418	418	KA-71
KA-72	31	32	76	77	211	210	421	421	KA-72
KA-105	31	32	77	78	210	210	421	420	KA-105
KA-108	33	33	76	77	212	211	422	423	KA-108
KA-115	33	33	77	77	211	212	421	422	KA-115
KA-126	31	32	77	78	211	210	424	423	KA-126

THERMOCOUPLE #	ICE (F)	ASTM (F)	AMB. (F)	ASTM (F)	212 (F)	ASTM (F)	400 (F)	ASTM (F)	THERMOCOUPLE #
KAK-08	32	32	77	77	210	210	420	419	KAK-08
KAK-09	32	31	78	78	212	211	418	418	KAK-09
KAK-10	31	32	76	77	211	210	420	421	KAK-10
KAK-11	33	33	78	77	211	212	424	423	KAK-11
KAK-12	32	33	77	78	211	210	423	422	KAK-12
KAK-38	34	33	78	77	210	209	420	420	KAK-38
KAK-65	33	32	76	77	209	208	417	418	KAK-65
KAK-72	32	31	77	77	211	211	415	416	KAK-72
KAK-110	34	33	79	78	211	210	421	422	KAK-110
KAK-07	32	32	78	77	212	211	421	421	KAK-07

Signature 

Date 5/6/03

KOOGLER & ASSOCIATES, ENVIRONMENTAL SERVICES
ANNUAL THERMOCOUPLE CALIBRATION
MAY 5-6, 2003

Range (C)	Measured Voltage (mV)	Measured Voltage (V)	Calc. Temp. (C)	Readout Temp. (C)	Percent Difference (%)
KAK-12	33.0	0.033	793	796	-0.3453
	41.0	0.041	993	989	0.4131
KAK-38	32.5	0.033	781	784	-0.3728
	41.4	0.041	1003	999	0.4346
KAK-72	32.8	0.033	788	790	-0.2045
	41.1	0.041	996	993	0.2676
KAK-65	32.1	0.032	771	769	0.3079
	40.9	0.041	991	995	-0.4500
KA-110	32.7	0.033	786	788	-0.2605
	40.5	0.041	980	981	-0.0695

EQUATIONS :

T (calc.)= (0.226584602+(24152.109*V)+(67233.4248*V^2)+(2210340.682*V^3)
-(860963914.9*V^4)+(48350600000*V^5)-(1184520000000*V^6)
+(13869000000000*V^7)-(63370800000000*V^8))

Where :

V = Measured Voltage (Volts)
T(calc.) = Temperature calculated based on voltage

Signature Jeff A. Haun

Date 5/6/03

POST-TEST DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Koogler & Associates
Environmental Services

1) Select one critical orifice to calibrate the dry gas meter which represents the observed operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet
4) Record readings in outlined boxes below, other columns are automatically calculated.

COMPANY: RINKER - MIAMI, FL.
SOURCE: CEMENT KILN
DATE: 8/9/04
PRETEST Y: 0.988

METER SERIAL #: KA-2
CRITICAL ORIFICE SERIAL #: 1376

	INITIAL	FINAL	AVG (P_{bar})
BAROMETRIC PRESSURE (in Hg):	30.08	30.08	30.08

RUN NO.	ORIFICE NO.	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN)	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
1	17	0.4851	18	996.600	1003.189	6.589	75	69	70	68	70	69	12.0	0.94	6.63	7.57	1.143	1.328
2	17	0.4505	18	3.189	9.789	6.600	75	70	70	70	74	71	11.0	0.94	6.61	6.45	0.975	1.540
3	17	0.4505	18	9.789	16.377	6.588	75	70	71	74	76	73	11.0	0.94	6.58	6.45	0.980	1.540
																AVG =	1.032	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

(1) $$V_m(std) = K_1 V_m Y \left[\frac{P_{bar} + \left(\Delta H / 13.6\right)}{T_m} \right]$$

(2) $$V_{cr}(std) = K' \left[\frac{P_{bar}\,\theta}{\sqrt{T_{amb}}} \right]$$

(3) $$Y = \frac{V_{cr}(std)}{V_m(std)}$$

(4) $$\Delta H_@ = \left(\frac{0.75 * \theta}{V_{CR}(sdt)} \right)^2 * \Delta H$$

V_m(std) = Net volume of gas sample passed through DGM, corrected to standard conditions.
K_1 = 17.64 °R/in. Hg
Y = DGM calibration factor
V_{cr}(std) = Volume of gas sample passed through the critical orifice, corrected to standard conditions.
Pbar = Barometric pressure at the sampling site (in. Hg).
ΔH = Orifice pressure differential (in. H2O).
θ = Total smapling time (min.)
T_m = Absolute DGM avg. temperature °R
T_{amb} = Absolute ambient temperature °R
K' = Average K' factor from Critical Orifice Calibration

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y =	**1.032**
AVERAGE DELTA Y=	**0.044**
DELTA Y LIMIT =	**0.05**
IS TEST WITHIN 5%?	**YES**

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record data and information in the **GREEN** cells, YELLOW cells are calculated.

DATE: 6/2204 | METER SERIAL #: KA-2 | BAROMETRIC PRESSURE (in Hg): INITIAL 29.95, FINAL 29.95, AVG (P_{bar}) 29.95

METER PART #: KA-2 | CRITICAL ORIFICE SET SERIAL #: 1376

IF Y VARIATION EXCEEDS 2.00%, ORIFICE SHOULD BE RECALIBRATED

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (In Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH (In H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y VARIATION (%)	$\Delta H_@$
17	1	0.4505	18	689.311	695.673	6.362	78	78	78	78	78	78	10.70	0.94	6.2655	6.2260	0.994		1.54
	2	0.4505	18	695.673	702.817	7.144	78	78	78	78	78	78	12.00	0.94	7.0357	6.9824	0.992		1.54
	3	0.4505	18	702.817	710.457	7.640	78	77	78	77	78	77.5	12.90	0.94	7.5312	7.5061	0.997		1.54
																AVG =	0.994	-0.62	
22	1	0.5836	18	628.759	636.326	7.567	76	76	77	77	77	76.75	10.00	1.6	7.4817	7.5519	1.009		1.56
	2	0.5836	18	636.326	644.024	7.698	78	75	75	78	78	76.5	10.00	1.6	7.6148	7.5378	0.990		1.57
	3	0.5836	18	653.457	661.064	7.607	78	76	78	76	76	76.5	10.00	1.6	7.5248	7.5378	1.002		1.57
																AVG =	1.000	-0.01	
26	1	0.7142	16	661.064	670.70	9.636	78	78	77	78	77	77.5	10.40	2.3	9.5304	9.5037	1.007		1.50
	2	0.7142	16	670.70	680.075	9.375	78	77	77	77	77	77	10.10	2.3	9.2809	9.3169	1.004		1.51
	3	0.7142	16	680.075	689.311	9.236	78	77	78	77	78	77.5	10.00	2.4	9.1370	9.2247	1.010		1.57
																AVG =	1.007	0.63	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:

The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 1.000

AVERAGE $\Delta H_@$ = 1.54

(1) $$Vm_{(std)} = K_1 * Vm * \frac{Pbar + (\Delta H / 13.6)}{Tm}$$

= Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $$Vcr_{(std)} = K' * \frac{Pbar * \Theta}{\sqrt{Tamb}}$$

= Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $$Y = \frac{Vcr_{(std)}}{Vm_{(std)}}$$

= DGM calibration factor

$$\Delta H_@ = \left(\frac{0.75\,\theta}{V_{cr(std)}}\right)^2 \Delta H \left(\frac{V_{m(std)}}{V_m}\right)$$

FIELD DATA SHEET: **POST-TEST DRY GAS METER CALIBRATION USING CRITICAL ORIFICES**

Koogler & Associates
Environmental Services

1) Select one critical orifice to calibrate the dry gas meter which approximates the test average delta H range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in outlined boxes below.

COMPANY: Rinker
SOURCE: Cement Kiln
TEST DATE: 8.6.04
METER Y: 0.988
AVG. DELTA H:

METER SERIAL #: KA6
CRITICAL ORIFICE SERIAL #:

BAROMETRIC PRESSURE (in Hg):	INITIAL	FINAL

RUN	ORIFICE NO.	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	ELAPSED TIME (MIN)	DGM ΔH (in H_2O)
1	17	0.4505	18	492.029	503.693	80	90	90	90	90	18.0	0.99
2	17	0.4505	18	503.693	509.948	80	90	90	90	90	10.3	0.98
3	17	0.4505	18	509.948	517.636	80	90	90	90	90	12.0	0.98

Test Conducted by: Adam West
Signature: Adam West
Date: 8.17.04

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

POST-TEST DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Koogler & Associates
Environmental Services

1) Select one critical orifice to calibrate the dry gas meter which represents the observed operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in outlined boxes below, other columns are automatically calculated.

COMPANY: Rinker
SOURCE: Cemnet Kilen
DATE: 8/17/04
PRETEST Y: 0.988

METER SERIAL #: KA-6
CRITICAL ORIFICE SERIAL #: 1376

BAROMETRIC PRESSURE (in Hg):	INITIAL	FINAL	AVG (P_{bar})
	30.07	30.07	30.07

RUN NO.	ORIFICE NO.	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN)	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
1	17	0.4505	18	492.029	503.693	11.664	80	90	90	90	90	90	18.0	0.99	11.28	10.60	0.930	1.638
2	17	0.4505	18	503.693	509.948	6.255	80	90	90	90	90	90	10.3	0.98	6.05	6.01	0.993	1.621
3	17	0.4505	18	509.948	517.636	7.688	80	90	90	90	90	90	12.0	0.98	7.44	7.00	0.941	1.621
																AVG =	0.955	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:

The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.955
AVERAGE DELTA Y= -0.033
DELTA Y LIMIT = 0.05
IS TEST WITHIN 5%? YES

(1) $$V_m(std) = K_1 V_m Y \left[\frac{P_{bar} + \left(\Delta H / 13.6\right)}{T_m} \right]$$

(2) $$V_{cr}(std) = K' \left[\frac{P_{bar}\,\theta}{\sqrt{T_{amb}}} \right]$$

(3) $$Y = \frac{V_{cr}(std)}{V_m(std)}$$

(4) $$\Delta H_@ = \left(\frac{0.75 * \theta}{V_{CR}(sdt)} \right)^2 * \Delta H$$

V_m(std) = Net volume of gas sample passed through DGM, corrected to standard conditions.
K_1 = 17.64 °R/in. Hg
Y = DGM calibration factor
V_{cr} (std) = Volume of gas sample passed through the critical orifice, corrected to standard conditions.
Pbar = Barometric pressure at the sampling site (in. Hg).
ΔH = Orifice pressure differential (in. H2O).
θ = Total smapling time (min.)
T_m = Absolute DGM avg. temperature °R
T_{amb} = Absolute ambient temperature °R
K' = Average K' factor from Critical Orifice Calibration

Project Participants

PROJECT PARTICIPANTS

Koogler & Associates

John B. Koogler, Ph.D., P.E.	Project Advisor
Steven Cloutier	Technical Manager
Glen Haven	Field Test Crew
Rodney Paul	Field Test Crew
Cory J Bell	Field Test Crew
Adam West	Field Test Crew
Eric Thomas	Field Test Crew

Rinker Materials Corporation

Michael Vardeman	Environmental Manager, Cement Division