



CF Industries Inc.
Plant City Phosphate Complex

P.O. Drawer L.
Plant City, Florida 33564-9007
Telephone: 813/782-1591

RECEIVED

MAK 14 2007

BUREAU OF AIR REGULATION

March 8, 2007

Mr. Chris Bradley
Florida Department of
Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

SUBJECT: "D" SAP Plant-Compliance Test
Permit No. 0570005-017-AV
Emission Unit 008

Dear Mr. Bradley:

Enclosed are duplicate copies of the recent Stack Test run at CF Industries, Inc., Plant City Phosphate Complex, on our "D" Sulfuric Acid Plant. Also, enclosed is a copy of the report for nitrogen oxides emissions testing. Southern Environmental Sciences, Inc. was contracted to perform this testing.

If there are any questions concerning the results, please give Michael Messina a call at 813-364-5639.

Sincerely,

Thomas A. Edwards
Thomas A. Edwards,
Superintendent,
Environmental Affairs

TAE/JHF/gm
u:\ENVRPT\167063.doc

Enclosures

cc: Lynn Robinson, HCEPC
R.C. May
J.M. Messina
F.J. Dlugos

PERMIT NO. 0570005-017-AV

Emission Unit 008

CF INDUSTRIES, INC.

PLANT CITY PHOSPHATE COMPLEX

"D" SULFURIC ACID PLANT

PLANT CITY, FLORIDA

JANUARY 30, 2007

TEST CONDUCTED BY:

ENVIRONMENTAL LABORATORY
CF Industries, Inc.
Plant City Phosphate Complex
Plant City, Florida 33564

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INTRODUCTION:

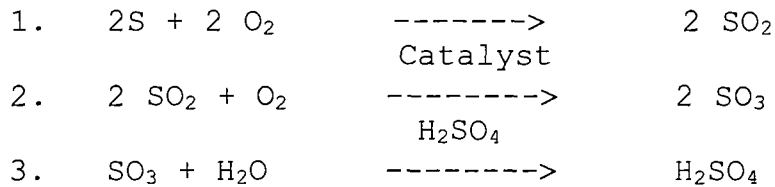
The Environmental Control Laboratory of CF Industries, Inc., Plant City Phosphate Complex, conducted emission tests at "D" Unit Sulfuric Acid Plant in Plant City, Florida, on January 30, 2007. Three 72-minute test runs were performed. The purpose of the test was to obtain emission data demonstrating compliance with Hillsborough County and State of Florida DEP Performance Standards. The measurements were made for sulfuric acid mist (including SO₃) and sulfur dioxide at the stack outlet to the atmosphere. The results were within the permitted limits.

Complete results are given in Appendix A.

PROCESS DESCRIPTION:

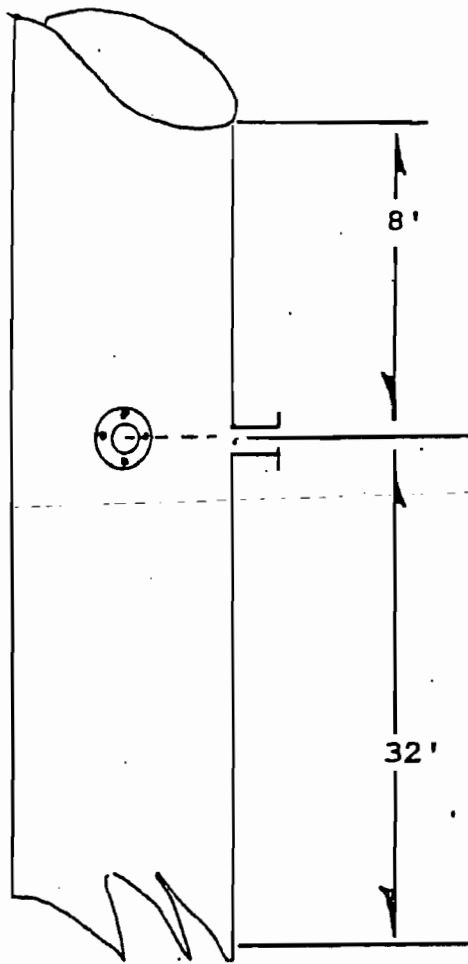
Sulfuric acid is produced by burning molten sulfur with dry air in a combustion chamber. The SO₂ gas stream is passed through a catalyst bed of vanadium where the SO₂ gas is converted to SO₃. The SO₃ gas is then absorbed with 98% H₂SO₄ to produce more H₂SO₄.

The principal reaction takes place as follows:

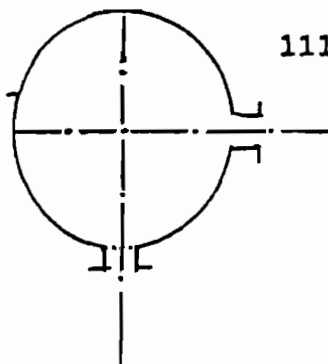


LOCATION OF SAMPLING POINTS

The sampling sites and number of traverse points were selected as per Figure 1-2 EPA Method 1 specified in 40 CFR 60, Appendix A.



Traverse Point Number	Distance from inside wall
1	2.33"
2	7.44"
3	13.10"
4	19.65"
5	27.75"
6	39.52"
7	71.48"
8	83.25"
9	91.35"
10	97.90"
11	103.56"
12	108.67"



111" I.D.

FIGURE 1

SAMPLE POINT DESCRIPTION
"D" SAP PRODUCTION

SAMPLING AND ANALYTICAL PROCEDURES

The methods described in EPA Methods 1, 2, 3, 8 & 9 contained in 40 CFR 60, Appendix A and adopted by reference in Chapter 62-297.401 F.A.C. are used when testing during compliance by CF Industries, Inc.

APPENDIX "A"

EMISSION CALCULATIONS AND RESULTS

CF INDUSTRIES, INC.
 PLANT CITY PHOSPHATE COMPLEX
SOURCE SAMPLING NOMENCLATURE SHEET

pb	=	Barometric pressure, in Hg
Ps	=	Stack pressure, in Hg
As	=	Stack area, square feet
As'	=	Effective area of positive stack gas flow, square feet
Ts	=	Stack temperature, °R
Tm	=	Meter temperature, °R
$\sqrt{\Delta P_{ave}}$	=	Average square root of velocity head, in. H ₂ O
Cp	=	S-type pitot tube correction factor
Kp	=	85.48 ft/sec (lb mole - °R) ^{1/2}
Ms	=	Molecular weight of gas at stack conditions
Md	=	Molecular weight of gas at dry conditions
Bwo	=	Proportion by volume of water vapor in gas stream
Vwstd	=	Volume of water vapor in gas sample
V	=	Total volume of liquid collected in impinger and silica gel
P H ₂ O	=	Density of water, 1 gm/ml
M H ₂ O	=	Molecular weight of water, 18 lb/lb mole
R	=	Ideal gas constant, 28.83 inches Hg-cu ft/lb-mole °R
T std	=	Absolute temperature at standard conditions, 528 °R
P std	=	Absolute pressure at standard conditions, 29.92 in. Hg
Vm std	=	Volume of gas sample through dry gas meter (standard conditions) ft ³
Vm	=	Volume of gas sample through the dry gas meter (meter condition)
Δ H	=	Orifice pressure of sampling meter
S.T.P.	=	Standard condition, dry, 528 °R, 29.92 inches Hg
An	=	Sampling nozzle area, square feet
Vs	=	Velocity of stack gas, feet per sec.
Qs	=	Volumetric flow rate, dry basis, standard condition, CFM
C mist	=	Concentration of mist in stack gas, grs/SCF
C SO ₂	=	Concentration of SO ₂ in stack gas, grs/SCF
C NH ₃	=	Concentration of NH ₃ in stack gas, grs/SCF
I	=	Percent isokinetic volume sampled
∅	=	Sampling time (minutes)

$$\begin{aligned}
 V_{wstd} &= 0.04707 \text{ cuft/ml } (V_1) \\
 V_{mstd} &= V_m \left(\frac{T_{std}}{T_m} \right) \left(\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}} \right) \\
 B_{wo} &= \frac{V_{wstd}}{V_{wstd} + V_{mstd}} \\
 M_s &= M_d (1 - B_{wo}) + 18 (B_{wo}) \\
 V_s (avg) &= K_p C_p \sqrt{P (avg)} \sqrt{\frac{460 + T_s}{M_s P_s}} \\
 Q_s &= 60 (1 - B_{wo}) V_s A_s \left(\frac{T_{std}}{T_s} \right) \left(\frac{P_s}{P_{std}} \right)
 \end{aligned}$$

PERCENT ISOKINETIC

$$I = \frac{T_s (1.667) \left[(0.00267) V_1 + \left(\frac{T_{std}}{T_m} \right) P_{bar} + \frac{\Delta H}{13.6} \right]}{\theta V_s P_s A_n}$$

$$C_s = 0.0154 \text{ grs/mg } \frac{M_f \text{ or } M_n}{V_{mstd}}$$

$$\text{lbs/hr} = (C_s \times Q_s \times 60) / 7000$$

$$\text{lbs/day} = \text{lbs/hr} \times 24 \text{ hrs/day}$$

J. H. Falls
3/15/93

71

D SAP**PERMIT NO. 0570005-017-AV
EMISSION UNIT 008**

	1	2	3
STACK BOX			
RUN NUMBER			
DATE	30-Jan-07	30-Jan-07	30-Jan-07
TIME START	11:35 AM	1:17 PM	2:54 PM
TIME END	1:01 PM	2:46 PM	4:21 PM
BP, INCHES Hg	30.26	30.19	30.16
STACK PRESSURE, INCHES Hg	30.27	30.20	30.17
AVG.SQ.ROOT(VEL. HEAD) IN Hg	0.5135	0.5098	0.5135
ORIFICE PRESS. OF METER, IN WATER	1.2975	1.2813	1.2980
AVG STACK TEMP., F	156.04	155.63	158.08
STACK, DRY BULB	156.04	155.63	158.08
METER TEMPERATURE, F	81.25	86.38	89.29
VOL. OF GAS, DM CONDITIONS, FT3	50.162	50.235	51.047
VOL. GAS, STP, DRY COND. FT3	49.696	49.185	49.668
STACK GAS MOISTURE, % VOLUME	0	0	0
MW OF STACK GAS, DRY COND.	28.4	28.4	28.4
MW OF STACK GAS, STACK COND.	28.4	28.4	28.4
PITOT CORRECTION FACTOR	0.84	0.84	0.84
STACK GAS VELOCITY, STACK COND. FT3/SEC	31.21	31.01	31.32
STACK AREA, FT2	67.2	67.2	67.2
EFFECTIVE STACK AREA, FT2	67.2	67.2	67.2
STACK GAS FLOW-RATE AT STP, SCFMD	109124	108248	108764
NET TIME OF TEST, MINUTES	72	72	72
SAMPLE NOZZLE AREA, FT2	0.000415	0.000415	0.000415
PERCENT ISOKINETIC	102.4	102.2	102.7
SULFURIC ACID MIST(INCLUDES SO3), MG	26.13	15.62	16.37
SULFURIC ACID MIST, LBS/HR.	7.57	4.54	4.73
SULFURIC ACID MIST, LBS/DAY	181.77	108.91	113.56
SULFUR DIOXIDE, MG	1268.75	1263.61	1269.78
SULFUR DIOXIDE, LBS/HR.	367.75	367.09	367.03
SULFUR DIOXIDE, LBS/DAY	8826.0	8810.2	8808.8
SULFURIC ACID MIST, LBS/TON OF H2SO4 PROD.	0.07	0.04	0.04
SULFURIC ACID MIST, LBS/TON LIMIT	0.10	0.10	0.10
SULFUR DIOXIDE, LBS/TON OF H2SO4 PROD.	3.38	3.37	3.37
SULFUR DIOXIDE, LBS/TON LIMIT	3.50	3.50	3.50
SULFUR DIOXIDE, LBS/TON OF H2SO4 PROD. (METER IN PLANT)	3.17	3.19	3.22
PRODUCTION RATE, TPD	2613	2613	2613
PRODUCTION RATE, TPD LIMIT	2750	2750	2750
VISIBLE EMISSIONS	0%		
VISIBLE EMISSIONS LIMIT	10%		

EMISSION CALCULATIONS

Date: January 30, 2007

Unit: D SAP

Run #2

$$\begin{aligned} V_{wstd} &= 0.04707 \text{ Cuft/ml} \times (v_1) \\ &= 0.04707 \text{ Cuft/ml} \times 0.0 \text{ ml} \\ &= \mathbf{0.000} \text{ Cuft.} \end{aligned}$$

$$\begin{aligned} V_{mstd} &= V_m \left[\frac{T_{std}}{T_m + 460} \right] \left[\frac{P_{bar} + (H / 13.6)}{P_{std}} \right] Y_i \\ &= 50.235 \text{ Cuft} \times \left[\frac{528}{460 + 86.38} \right] \times \left[\frac{(30.19 + (1.2813 / 13.6))}{29.92} \right] \times 1.001 \\ &= \mathbf{49.185} \text{ Cuft.} \end{aligned}$$

$$\begin{aligned} B_{wo} &= \frac{V_{wstd}}{V_{wstd} + V_{mstd}} \\ &= \frac{0.000}{0 + 49.185} \times 100 \\ &= \mathbf{0.00} \% \end{aligned}$$

$$\begin{aligned} M_s &= M_d (1 - B_{wo}) + 18 (B_{wo}) \\ &= 28.4 \times (1 - 0.0) + 18 \times 0.0 \\ &= \mathbf{28.40} \end{aligned}$$

$$\begin{aligned} V_s (\text{avg}) &= K_p C_p P (\text{avg sq rt}) \sqrt{(460 + T_s) / (M_s P_s)} \\ &= 85.48 \times 0.84 \times 0.5098 \times \sqrt{(460 + 155.63) / (28.4 \times 30.20)} \\ &= \mathbf{31.01} \text{ ft/sec} \end{aligned}$$

$$\begin{aligned} Q_s &= 60 (1 - B_{wo}) V_s A_s (T_{std} / T_s) (P_s / P_{std}) \\ &= 60 (1 - 0.0) \times 31.01 \times 67.2 \times (528 / (460 + 155.63)) \times (30.20 / 29.92) \\ &= \mathbf{108,248} \text{ scfm} \end{aligned}$$

$$\begin{aligned}
Cs &= 0.0154 \text{ grs/mg} \times (\text{total mg of sample}) / Vmstd \\
&= 0.0154 \text{ grs/mg} \times 1263.61 \text{ mg} / 49.185 \text{ cuft} \\
&= \mathbf{0.3956 \text{ grs/cuft}}
\end{aligned}$$

$$\begin{aligned}
\text{lbs/hr} &= (Cs \times Qs \times 60 \text{ min/hr}) / 7000 \text{ grs/lb} \\
&= (0.3956 \times 108248 \times 60) / 7000 \\
&= \mathbf{367.09 \text{ lbs/hr SO}_2}
\end{aligned}$$

$$\begin{aligned}
\text{lbs/day} &= \text{lbs/hr} \times 24 \text{ hrs/day} \\
&= 367.09 \times 24 \\
&= \mathbf{8810.18 \text{ lbs/day SO}_2}
\end{aligned}$$

$$\begin{aligned}
Cs &= 0.0154 \text{ grs/mg} \times (\text{total mg of sample}) / Vmstd \\
&= 0.0154 \text{ grs/mg} \times 15.62 \text{ mg} / 49.185 \text{ cuft} \\
&= \mathbf{0.0049 \text{ grs/cuft}}
\end{aligned}$$

$$\begin{aligned}
\text{lbs/hr} &= (Cs \times Qs \times 60 \text{ min/hr}) / 7000 \text{ grs/lb} \\
&= (0.0049 \times 108248 \times 60) / 7000 \\
&= \mathbf{4.54 \text{ lbs/hr SO}_3 + \text{Acid Mist}}
\end{aligned}$$

$$\begin{aligned}
\text{lbs/day} &= \text{lbs/hr} \times 24 \text{ hrs/day} \\
&= 4.54 \times 24 \\
&= \mathbf{108.91 \text{ lbs/day SO}_3 + \text{Acid Mist}}
\end{aligned}$$

Percent Isokinetics:

$$\begin{aligned}
I &= \frac{Ts (1.667) \{ (0.00267) V1 \} + (VmY / Tm) \{ (Pbar + (^H / 13.6)) \}}{0 Vs Ps An} \\
&= \frac{(460 + 155.63) (1.667) \{ (0.00267 \times 0.0) \} + (50.235 / (460 + 86.38)) \times \{ (30.19 + (1.2813 / 13.6)) \}}{72 \times 31.01 \times 30.20 \times 0.000415} \\
&= \mathbf{102.2 \%}
\end{aligned}$$

10.

RUN NO. 1

11:35 PM TO 1:01 PM (1/30/07)

<u>TIME</u>	<u>SO2 MONITOR READING (ppm)</u>	<u>O2 Monitor (%)</u>	<u>SO2 (#/TON)</u>
11:30 AM	358	3.43	3.16
11:45 AM	362	3.55	3.22
12:00 PM	355	3.50	3.15
12:15 AM	355	3.45	3.14
12:30 PM	358	3.44	3.16
12:45 PM	360	3.49	3.19
1:00 PM	360	3.47	3.19
			AVERAGE 3.17

RUN NO. 2

1:17 PM TO 2:46 PM (1/30/07)

<u>TIME</u>	<u>SO2 MONITOR READING (ppm)</u>	<u>O2 Monitor (%)</u>	<u>SO2 (#/TON)</u>
1:15 PM	353	3.48	3.13
1:30 PM	362	3.44	3.20
1:45 PM	360	3.55	3.20
2:00 PM	367	3.39	3.23
2:15 PM	357	3.48	3.16
2:30 PM	363	3.45	3.21
			AVERAGE 3.19

RUN NO. 3

2:54 PM TO 4:21 PM (1/30/07)

<u>TIME</u>	<u>SO2 MONITOR READING (ppm)</u>	<u>O2 Monitor (%)</u>	<u>SO2 (#/TON)</u>
3:00 PM	360	3.59	3.21
3:15 PM	358	3.55	3.18
3:30 PM	365	3.52	3.24
3:45 PM	360	3.47	3.19
4:00 PM	362	3.45	3.20
4:15 PM	362	3.55	3.22
4:30 PM	368	3.51	3.27
			AVERAGE 3.22

$$Es = (CsS) / [0.265 - (0.0126\%O_2)]$$

where:

Es = emission rate of SO₂, (lb/ton of 100% H₂SO₄ produced)

Cs = concentration of SO₂, (lb/dscf)

S = acid production rate factor, (11,800 dscf/ton of 100% H₂SO₄ produced)

%O₂ = oxygen concentration, percent dry basis

11.

SO2 MONITORING LOG

Plant Q

Date 11/30/07

SO2 Chart Readings					
Time	:00	:15	:30	:45	AVG.
6:00 AM	375	375	376	361	372
7:00 AM	372	370	367	370	370
8:00 AM	366	366	363	362	365
9:00 AM	359	358	361	359	359
10:00 AM	355	SPAN	TEST	361	356.61
11:00 AM	364	359	358	362	360.50
12:00 PM	355	355	358	360	357.07
1:00 PM	360	353	362	360	358.67
2:00 PM	367	357	363	361	362.18
3:00 PM	360	358	365	360	360.89
4:00 PM	362	362	368	360	363.02
5:00 PM	353	350	361	365	357
6:00 PM	366	364	362	364	364
7:00 PM	361	356	360	359	359
8:00 PM	361	360	351	359	358
9:00 PM	359	357	358	354	357
10:00 PM	357	353	363	360	358
11:00 PM	359	363	364	362	362
12:00 AM	359	360	361	366	361
1:00 AM	364	364	365	364	364
2:00 AM	364	366	367	364	366
3:00 AM	363	361	362	361	362
4:00 AM	365	362	365	365	364
5:00 AM	364	364	366	365	365

O2 Chart Readings					
Time	:00	:15	:30	:45	AVG.
6:00 AM	3.45	3.45	3.43	3.55	3.47
7:00 AM	3.45	3.45	3.54	3.44	3.47
8:00 AM	3.47	3.52	3.48	3.47	3.48
9:00 AM	3.51	3.49	3.56	3.55	3.53
10:00 AM	3.58	SPAN	TEST	3.47	3.55
11:00 AM	3.52	3.47	3.43	3.55	3.49
12:00 PM	3.5	3.45	3.44	3.49	3.47
1:00 PM	3.53	3.48	3.44	3.55	3.5
2:00 PM	3.39	3.48	3.45	3.52	3.42
3:00 PM	3.56	3.55	3.52	3.47	3.53
4:00 PM	3.45	3.55	3.51	3.55	3.52
5:00 PM	3.58	3.43	3.55	3.45	3.50
6:00 PM	3.50	3.44	3.43	3.55	3.48
7:00 PM	3.44	3.49	3.45	3.52	3.47
8:00 PM	3.51	3.47	3.51	3.49	3.49
9:00 PM	3.49	3.52	3.49	3.44	3.49
10:00 PM	3.58	3.46	3.58	3.47	3.52
11:00 PM	3.51	3.50	3.45	3.46	3.48
12:00 AM	3.53	3.43	3.46	3.45	3.47
1:00 AM	3.49	3.46	3.45	3.48	3.47
2:00 AM	3.48	3.50	3.40	3.45	3.46
3:00 AM	3.47	3.48	3.52	3.44	3.48
4:00 AM	3.49	3.52	3.45	3.48	3.49
5:00 AM	3.40	3.48	3.45	3.49	3.45

Lbs SO2/ton H2SO4	
Time	AVG.
6:00 AM	
7:00 AM	
8:00 AM	3.23
9:00 AM	
10:00 AM	
11:00 AM	
12:00 PM	
1:00 PM	
2:00 PM	3.20
3:00 PM	
4:00 PM	
5:00 PM	
6:00 PM	
7:00 PM	
8:00 PM	3.17
9:00 PM	
10:00 PM	
11:00 PM	
12:00 AM	
1:00 AM	
2:00 AM	3.23
3:00 AM	
4:00 AM	
5:00 AM	

Lbs SO2/ton H2SO4 = ppm SO2 * .001959 / .265 - (.125 * %SO2)

EXIT REIGH TEST		
SHIFT	TIME	%SO2
7:00 AM		
7:00 AM		
7:00 PM		
7:00 PM		

Remarks: Span test 10:06-10:36 use

Day Shift Operator Mark Anderson
 Night Shift Operator C. J. Bell

To calculate Lbs/ Ton:
 1) Multiply the hourly average ppm SO2 (from the log sheet) by .001959 _____ (a)
 2) Multiply the hourly average % O2 (from the log sheet) by .0126 _____ (b)
 3) Subtract the number calculated in step two (b) from .0265 _____ (c)
 4) Divide the number calculated in step 1 (a) by the number calculated in step 3 (c) _____. This will give Lbs/ ton _____

Production Rate

DATE: January 30, 2007

SAMPLING TIME FROM: 11:35 AM TO 4:21 PM

STATEMENT OF PROCESS WEIGHT:

COMPANY NAME: CF INDUSTRIES, INC. PLANT CITY PHOSPHATE COMPLEX
 MAILING ADDRESS: P.O. DRAWER L PLANT CITY, FL 33564
 SOURCE IDENTIFICATION: "D" SAP PRODUCTION FACILITY
 SOURCE LOCATION: "D" SAP PRODUCTION STACK

PERMIT SOURCE: 0570005-017-AV
 Emission Unit 008

DATA ON OPERATING CYCLE TIME:

START OF OPERATION, TIME
 END OF OPERATION, TIME
 ELAPSED TIME
 IDLE TIME DURING CYCLE

	1/30/2007	1/30/2007	1/30/2007			
RUN #1	RUN #2	RUN #3				
11:35 AM	1:17 PM	2:54 PM				
1:01 PM	2:46 PM	4:21 PM				
86	89	89				
0	0	0				

DESIGN PROCESS RATING:

PROCESS WEIGHT RATE (INPUT) 37.42 TPH

PRODUCT (OUTPUT) 114.58 TPH

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE:

MATERIAL: SULFUR, TPH
 MATERIAL:
 MATERIAL:

RUN #1	RUN #2	RUN #3			
35.56	35.56	35.56			

TOTAL PROCESS WEIGHT RATE:
 PRODUCT: SULFURIC ACID, TPD

RUN #1	RUN #2	RUN #3			
2613	2613	2613			

I certify that the above statement is true to the best of my knowledge and belief.

Signature:

Brett Belknap

Title:

Production Superintendent

VISIBLE EMISSION OBSERVATION FORM

No. 1 14.

COMPANY NAME
CF Industries, Inc. Plant City Complex

STREET ADDRESS
10608 Paul Buchman Highway

10 miles north of Plant City

CITY *Plant City* STATE *FL* ZIP *33564*

PHONE (KEY CONTACT) *(813) 782-1591 (x5608)* SOURCE ID NUMBER *0570005-008*

PROCESS EQUIPMENT *Sulfuric Acid Production Facility* OPERATING MODE *2613 TPD*

CONTROL EQUIPMENT *Double absorption tower* OPERATING MODE *Normal*

DESCRIBE EMISSION POINT
Circular stack opening 8 Feet in diameter

HEIGHT ABOVE GROUND LEVEL *~198.5'* HEIGHT RELATIVE TO OBSERVER
Start *~195'* End *~195'*

DISTANCE FROM OBSERVER Start *~600'* End *~600'* DIRECTION FROM OBSERVER
Start *NE* End *NE*

DESCRIBE EMISSIONS
Start *N/A* End *N/A*

EMISSION COLOR Start *N/A* End *N/A* IF WATER DROPLET PLUME
Attached Detached

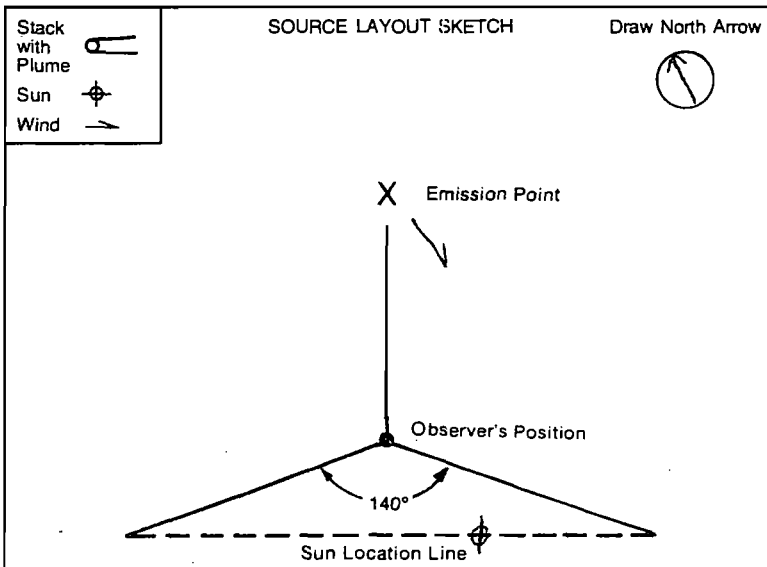
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
Start *~4' above stack* End *~4' above stack*

DESCRIBE PLUME BACKGROUND
Start *Overcast sky* End *Overcast sky*

BACKGROUND COLOR Start *White, gray* End *gray* SKY CONDITIONS
Start *Overcast* End *Overcast*

WIND SPEED Start *Calm-3mph* End *Calm-3mph* WIND DIRECTION
Start *N* End *NW*

AMBIENT TEMP Start *54°F* End *55°F* WET BULB TEMP *25* RH, percent *25*



ADDITIONAL INFORMATION

OBSERVATION DATE <i>1/30/07</i>		START TIME <i>1145</i>		END TIME <i>1215</i>	COMMENTS
SEC	0	15	30	45	
MIN	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

OBSERVER'S NAME (PRINT)
Lloyd G. Camp

OBSERVER'S SIGNATURE
Lloyd G. Camp DATE *1/30/07*

ORGANIZATION
CF Industries, Inc. Plant City Complex

CERTIFIED BY
Eastern Technical Associates DATE *8/9/06*

CONTINUED ON VEO FORM NUMBER *2*

VISIBLE EMISSION OBSERVATION FORM

No. 2

15

COMPANY NAME
CF Industries, Inc. Plant City Complex

STREET ADDRESS
10608 Paul Buchman Highway
10 miles north of Plant City

CITY
Plant City STATE
FL ZIP
33564

PHONE (KEY CONTACT)
(813) 782-1591 (x5608) SOURCE ID NUMBER
0570005-008

PROCESS EQUIPMENT
Sulfuric Acid Production Facility OPERATING MODE
2,613 TPD

CONTROL EQUIPMENT
Double absorption tower OPERATING MODE
Normal

DESCRIBE EMISSION POINT
Circular stack opening 8 Feet in diameter

HEIGHT ABOVE GROUND LEVEL
~198.5' HEIGHT RELATIVE TO OBSERVER
Start *~195'* End *~195'*

DISTANCE FROM OBSERVER
Start *~600'* End *~600'* DIRECTION FROM OBSERVER
Start *NE* End *NE*

DESCRIBE EMISSIONS
Start *N/A* End *N/A*

EMISSION COLOR
Start *N/A* End *N/A* IF WATER DROPLET PLUME
Attached Detached

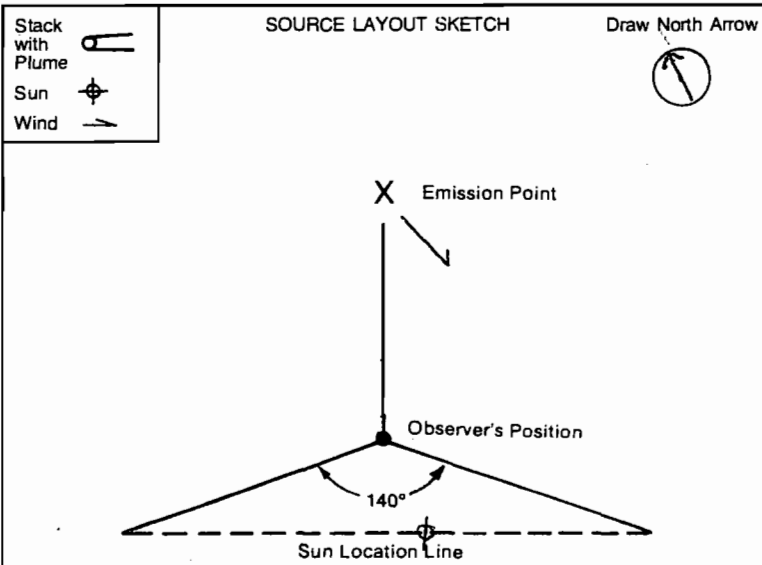
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
Start *~4' above stack* End *~4' above stack*

DESCRIBE PLUME BACKGROUND
Start *Overcast sky* End *Overcast sky*

BACKGROUND COLOR
Start *White, gray* End *gray* SKY CONDITIONS
Start *Overcast* End *Overcast*

WIND SPEED
Start *Calm-3mph* End *Calm-3mph* WIND DIRECTION
Start *NW* End *N*

AMBIENT TEMP
Start *55°F* End *55°F* WET BULB TEMP
23 RH, percent



OBSERVATION DATE		START TIME				END TIME
1/30/07		1215				1245
SEC	0	15	30	45	COMMENTS	
MIN						
1	0	0	0	0		
2	0	0	0	0		
3	0	0	0	0		
4	0	0	0	0		
5	0	0	0	0		
6	0	0	0	0		
7	0	0	0	0		
8	0	0	0	0		
9	0	0	0	0		
10	0	0	0	0		
11	0	0	0	0		
12	0	0	0	0		
13	0	0	0	0		
14	0	0	0	0		
15	0	0	0	0		
16	0	0	0	0		
17	0	0	0	0		
18	0	0	0	0		
19	0	0	0	0		
20	0	0	0	0		
21	0	0	0	0		
22	0	0	0	0		
23	0	0	0	0		
24	0	0	0	0		
25	0	0	0	0		
26	0	0	0	0		
27	0	0	0	0		
28	0	0	0	0		
29	0	0	0	0		
30	0	0	0	0		

OBSERVER'S NAME (PRINT)
Lloyd G. Camp

OBSERVER'S SIGNATURE
Lloyd G. Camp DATE
1/30/07

ORGANIZATION
CF Industries, Inc. Plant City Complex

CERTIFIED BY
Eastern Technical Associates DATE
8/9/06

ADDITIONAL INFORMATION

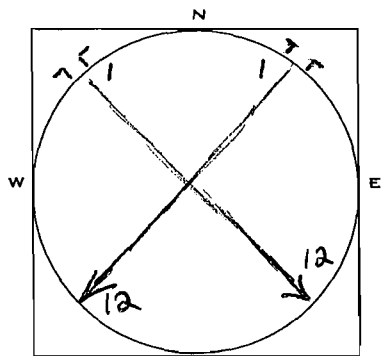
CONTINUED ON VEO FORM NUMBER

APPENDIX "B"

FIELD DATA

CF INDUSTRIES COMPLIANCE TEST FIELD SHEET

PLANT	D SULFURIC ACID
RUN NUMBER	1
LOCATION	CF INDUSTRIES, PLANT CITY
DATE	1/30/07
OPERATOR	ERNEST KRETSCHMAR
SAMPLE UNIT S/N	S-311A
CONTROL UNIT S/N	C-254



AMBIENT AIR TEMPERATURE	55	DEGREES F
BAROMETRIC PRESSURE	30.26	INCHES HG
ASSUMED MOISTURE	0	%
HEATER BOX SETTING	N/A	DEGREES F
PROBE TIP DIAMETER	0.276	INCHES
PROBE LENGTH	10.5	FEET
PROBE HEATER SETTING	N/A	

SCHEMATIC OF STACK CROSS SECTION

N₂ Leak out 15" (Rundown) etc

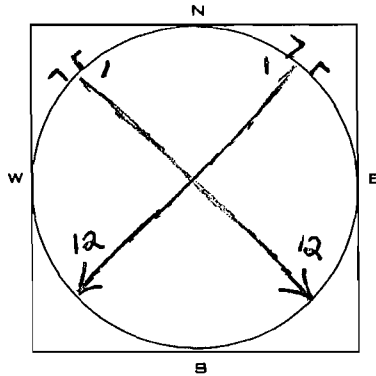
K=4.88

No Leak out 15" (Rundown) etc

TRAVERSE POINT	CLOCK (TIME)	DRY GAS METER (CUBIC FEET)	PITOT DELTA P (INCHES) (OF WATER)	ORIFICE DELTA H (INCHES) (OF WATER)	DRY GAS TEMPERATURE (DEGREES F)		PUMP VACUUM (INCHES HG) GAUGE	BOX TEMPERATURE (DEGREES F)	IMPINGER TEMPERATURE (DEGREES F)	STACK TEMPERATURE (DEGREES F)
					INLET	OUTLET				
1	11:35AM	339.209	0.23	1.12	74°	71°	3.8	N/A ↓ V	55°	138°
2	11:38	341.2	0.28	1.37	82°	69°	4.2		48°	148°
3	11:41	343.3	0.33	1.61	84°	69°	5.0		48°	157°
4	11:44	345.6	0.33	1.61	85°	69°	5.0		47°	158°
5	11:47	348.0	0.31	1.51	87°	70°	4.8		49°	157°
6	11:50	350.1	0.31	1.51	87°	71°	4.8		50°	158°
7	11:53	352.3	0.20	0.98	88°	72°	3.5		52°	157°
8	11:56	354.2	0.20	0.98	88°	72°	3.5		52°	158°
9	11:59	356.0	0.20	0.98	89°	73°	3.5		53°	158°
10	12:02	358.0	0.23	1.12	90°	74°	3.8		53°	158°
11	12:05	360.0	0.27	1.32	92°	75°	4.2		53°	158°
12	12:08	361.9	0.30	1.46	92°	75°	4.5		54°	158°
STOP	12:11PM	364.093								
1	12:12SPM	364.093	0.33	1.61	78°	75°	5.0	N/A ↓ V	54°	146°
2	12:28	306.4	0.27	1.32	89°	77°	4.0		55°	158°
3	12:31	368.6	0.23	1.12	90°	76°	3.8		55°	158°
4	12:34	370.6	0.30	1.46	90°	75°	4.5		55°	158°
5	12:37	372.8	0.33	1.61	91°	76°	5.0		55°	157°
6	12:40	374.9	0.33	1.61	92°	76°	5.0		55°	157°
7	12:43	377.4	0.20	0.98	91°	77°	3.5		55°	158°
8	12:46	379.3	0.20	0.98	91°	77°	3.5		55°	157°
9	12:49	381.1	0.23	1.12	92°	77°	4.0		54°	158°
10	12:52	383.1	0.23	1.12	93°	78°	4.0		54°	158°
11	12:55	385.1	0.27	1.32	93°	77°	4.2		54°	159°
12	12:58	387.2	0.27	1.32	93°	78°	4.2		54°	158°
STOP	1:01PM	389.371								
		50.162	5135	1.2975	81.25					156.04

CF INDUSTRIES COMPLIANCE TEST FIELD SHEET

PLANT	D SULFURIC ACID
RUN NUMBER	8
LOCATION	CF INDUSTRIES, PLANT CITY
DATE	1/30/07
OPERATOR	ERNEST KRETSCHMAR
SAMPLE UNIT S/N	S-311A
CONTROL UNIT S/N	C-254



SCHEMATIC OF STACK CROSS SECTION

AMBIENT AIR TEMPERATURE	59	DEGREES F
BAROMETRIC PRESSURE	30.19	INCHES HG
ASSUMED MOISTURE		0%
HEATER BOX SETTING		N/A DEGREES F
PROBE TIP DIAMETER	0.276	INCHES
PROBE LENGTH	10.5	FEET
PROBE HEATER SETTING		N/A

No leak at 15" (run start) etc

K=4.88

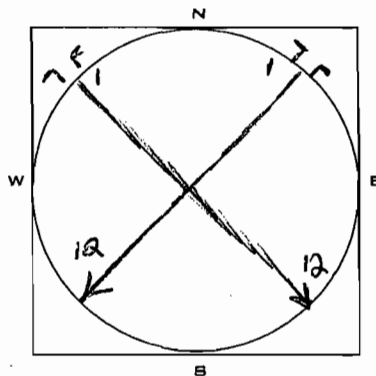
No leak at 10" (run start) etc

TRAVERSE POINT	CLOCK (TIME)	DRY GAS METER (CUBIC FEET)	PITOT DELTA P (INCHES) (OF WATER)	ORIFICE DELTA H (INCHES) (OF WATER)	DRY GAS TEMPERATURE (DEGREES F)		PUMP VACUUM (INCHES HG) GAUGE	HEATER BOX TEMPERATURE (DEGREES F)	IMPINGER TEMPERATURE (DEGREES F)	STACK TEMPERATURE (DEGREES F)
					INLET	OUTLET				
1	1:17 PM	391.804	0.23	1.12	80°	77°	4.0	N/A ↓	55°	140°
2	1:20	393.8	0.28	1.37	89°	77°	4.5		52°	149°
3	1:23	395.9	0.32	1.56	89°	77°	5.0		51°	157°
4	1:26	398.2	0.34	1.66	90°	77°	5.2		51°	158°
5	1:29	400.5	0.34	1.66	91°	77°	5.2		52°	158°
6	1:32	402.9	0.30	1.46	92°	77°	5.0		53°	158°
7	1:35	404.405.1	0.20	0.98	92°	77°	4.0		54°	158°
8	1:38	407.1	0.18	0.88	92°	77°	3.5		54°	159°
9	1:41	408.8	0.18	0.88	92°	78°	3.5		53°	159°
10	1:44	410.5	0.23	1.12	93°	78°	4.0		53°	159°
11	1:47	412.5	0.25	1.22	94°	78°	4.2		53°	159°
12	1:50	414.5	0.28	1.37	95°	79°	4.5		53°	158°
STOP	1:53 PM	416.724								
1	2:10 PM	416.724	0.23	1.12	84°	80°	4.0	N/A ↓	53°	139°
2	2:13	418.7	0.28	1.37	95°	81°	4.5		53°	146°
3	2:16	420.8	0.31	1.51	96°	82°	5.0		54°	156°
4	2:19	423.1	0.31	1.51	97°	82°	5.0		54°	157°
5	2:22	425.4	0.33	1.61	97°	82°	5.2		56°	158°
6	2:25	427.5	0.31	1.51	97°	82°	5.0		57°	158°
7	2:28	430.1	0.23	1.12	96°	83°	4.0		58°	158°
8	2:31	432.2	0.20	0.98	95°	83°	3.5		60°	158°
9	2:34	433.9	0.18	0.88	95°	83°	3.5		58°	158°
10	2:37	435.7	0.23	1.12	96°	82°	4.0		59°	159°
11	2:40	437.7	0.28	1.37	97°	83°	4.5		58°	158°
12	2:43	440.0	0.28	1.37	97°	83°	4.5		59°	158°
STOP	2:46 PM	442.039								
		50.235	5.098	1.2813		86.38				155.63

CF INDUSTRIES COMPLIANCE TEST FIELD SHEET

19.

PLANT	D SULFURIC ACID
RUN NUMBER	3
LOCATION	CF INDUSTRIES, PLANT CITY
DATE	1/30/07
OPERATOR	ERNEST KRETSCHMAR
SAMPLE UNIT S/N	S-311A
CONTROL UNIT S/N	C-254



SCHEMATIC OF STACK CROSS SECTION

AMBIENT AIR TEMPERATURE	61	DEGREES F
BAROMETRIC PRESSURE	30.16	INCHES HG
ASSUMED MOISTURE	0	%
HEATER BOX SETTING	N/A	DEGREES F
PROBE TIP DIAMETER	0.276	INCHES
PROBE LENGTH	10.5	FEET
PROBE HEATER SETTING	N/A	

No leak at 15" (row start) etc

K=4.88 No leak at 10" (row start) etc

TRAVERSE POINT	CLOCK (TIME)	DRY GAS METER (CUBIC FEET)	PITOT DELTA P (INCHES) (OF WATER)	ORIFICE DELTA H (INCHES) (OF WATER)	DRY GAS TEMPERATURE (DEGREES F)		PUMP VACUUM (INCHES HG) GAUGE	BOX TEMPERATURE (DEGREES F)	IMPINGER TEMPERATURE (DEGREES F)	STACK TEMPERATURE (DEGREES F)
					INLET	OUTLET				
1	2:54 PM	447.501	0.23	1.12	82°	80°	3.0		63°	140°
2	2:57	449.7	0.23	1.37	93°	81°	3.2	N/A	58°	149 151°
3	3:00	451.2	0.33	1.61	94°	80°	3.5		58°	158°
4	3:03	454.0	0.33	1.61	95°	80°	3.5		58°	159°
5	3:06	456.4	0.33	1.61	96°	80°	3.5		57°	159°
6	3:09	458.7	0.30	1.46	95°	80°	3.3		57°	159°
7	3:12	460.9	0.23	1.12	95°	81°	3.0		58°	160°
8	3:15	463.0	0.13	0.88	95°	81°	3.0		59°	160°
9	3:18	464.6	0.20	0.98	95°	81°	3.0		59°	160°
10	3:21	466.6	0.25	1.22	97°	82°	3.2		59°	161°
11	3:24	468.7	0.22	1.37	98°	82°	3.2		59°	161°
12	3:27	470.8	0.22	1.37	98°	82°	3.2		59°	161°
STOP	3:30 PM	473.021								
1	3:45 PM	473.021	0.23	1.12	87°	82°	3.0		61°	138°
2	3:48	474.9	0.25	1.22	98°	83°	3.0	N/A	59°	150°
3	3:51	476.9	0.23	1.37	98°	83°	3.2		59°	160°
4	3:54	479.5	0.33	1.61	99°	83°	3.5		59°	161°
5	3:57	481.8	0.33	1.61	100°	84°	3.5		60°	161°
6	4:00	484.0	0.33	1.61	100°	84°	3.5		61°	161°
7	4:03	486.4	0.25	1.22	100°	84°	3.2		61°	162°
8	4:06	488.5	0.20	0.98	99°	84°	3.0		61°	162°
9	4:09	490.4	0.20	0.98	98°	84°	3.0		60°	162°
10	4:12	492.2	0.23	1.12	99°	85°	3.0		61°	163°
11	4:15	494.3	0.22	1.37	100°	85°	3.0		61°	162°
12	4:18	496.5	0.25	1.22	99°	85°	3.0		62°	163°
STOP	4:21 PM	498.548								
			0.5135	1.298		89.29				158.08

51.047

SAMPLE CHAIN OF CUSTODY

Plant Name CF INDUSTRIES, INC. PLANT CITY PHOSPHATE COMPLEX

Source Identification "D" SULFURIC ACID PRODUCTION FACILITY

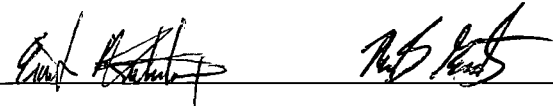
Date Sampled: 30-Jan-07 Sampling Time: 11:35 AM to 4:21 PM

Test for MOISTURE, SO3 & ACID MIST, SO2, AND VISIBLE EMISSION

SAMPLE RECOVERY

Sample Run	Description
1	#1 COLD BOX ASSEMBLY
2	#2 COLD BOX ASSEMBLY
3	#3 COLD BOX ASSEMBLY

Person engaged in sample recoveries:

Signature 

Title ANALYST II, OPERATOR

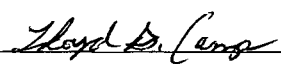
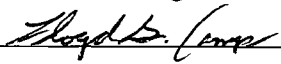
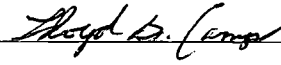
Location at which recovery was made D SAP STACK

Laboratory person receiving samples:

Signature 

Title "A" CLASS TECHNICIAN

ANALYSIS

Constituent	Method	Date	Time	Signature(s)
SO3 & ACID MIST	EPA METHOD 8	1/30/07	11:30 - 18:00	
SO2	EPA METHOD 8	1/30/07	11:30 - 18:00	
VISIBLE EMISSION	EPA METHOD 9	1/30/07	11:45 - 12:45	

**CF INDUSTRIES, INC.
PLANT CITY PHOSPHATE COMPLEX**

DATE	<u>30-Jan-07</u>		
TIME	<u>11:25 AM</u>	TO	<u>1:01 PM</u>
STACK	<u>D SAP</u>		
RUN	<u>#1</u>		

SAMPLE SOLUTION ANALYSIS

	Acid Mist, SO	SO
	3	2
Volume of Sample, ml.	<u>500</u>	<u>500 100</u>
Aliquot, ml.	<u>50</u>	<u>20 20</u>
Normality of Barium Perchlorate	<u>0.012840</u>	<u>0.012840</u>
Mls. of Barium Perchlorate Titrated	<u>4.30</u>	<u>24.83</u>
Blank, ml.	<u>0.15</u>	<u>0.15</u>
Conversion to Milligrams	<u>26.13</u>	<u>1268.75</u>

Analyst

Lloyd L. Camp

dso4titr.xls

CF INDUSTRIES, INC.
PLANT CITY PHOSPHATE COMPLEX

DATE	30-Jan-07		
TIME	1:17 PM	TO	2:46 PM
STACK	D SAP		
RUN	#2		

SAMPLE SOLUTION ANALYSIS

	Acid Mist, SO 3	SO 2
Volume of Sample, ml.	500	500 100
Aliquot, ml.	50	20 20
Normality of Barium Perchlorate	0.012840	0.012840
Mls. of Barium Per- chlorate Titrated	2.63	24.73
Blank, ml.	0.15	0.15
Conversion to Milligrams	15.62	1263.61

Analyst

Royd L. Long

dso4titr.xls

**CF INDUSTRIES, INC.
PLANT CITY PHOSPHATE COMPLEX**

DATE	<u>30-Jan-07</u>		
TIME	<u>2:54 PM</u>	TO	<u>4:21 PM</u>
STACK	<u>D SAP</u>		
RUN	<u>#3</u>		

SAMPLE SOLUTION ANALYSIS

	Acid Mist, SO	SO
	3	2
Volume of Sample, ml.	<u>500</u>	<u>500 100</u>
Aliquot, ml.	<u>50</u>	<u>20 20</u>
Normality of Barium Perchlorate	<u>0.012840</u>	<u>0.012840</u>
Mls. of Barium Perchlorate Titrated	<u>2.75</u>	<u>24.85</u>
Blank, ml.	<u>0.15</u>	<u>0.15</u>
Conversion to Milligrams	<u>16.37</u>	<u>1269.78</u>

Analyst

Hayd L. Camp

dso4titr.xls

23.

TYPE S PITOT TUBE INSPECTION DATA

Date: August 6, 2004

Pitot Number: 8-6-04-5

Pitot tube assembly level? yes x no

Pitot tube opening damage? yes no x

If yes explain below.

$\alpha 1$ 1 ($< 10^\circ$)

$\alpha 2$ 2 ($< 10^\circ$)

$\beta 1 =$ 1 ($< 5^\circ$)

$\beta 2$ 0 ($< 5^\circ$)

$\gamma =$ 1 $^\circ$

$\theta =$ 1 $^\circ$

$A =$ 1.010 cm (in)

$Z = A \text{ SINE } \gamma =$ 0.018 cm (in) Where Z is < 0.32 cm ($< 1/8$ in)

$W = A \text{ SINE } \theta =$ 0.018 cm (in) Where W is < 0.08 cm ($< 1/32$ in)

$P_a =$ 0.505 cm, in

$P_b =$ 0.505 cm, in

$P = P_a + P_b /$ = 0.505 cm, in

$D_t =$ 0.375 cm, in

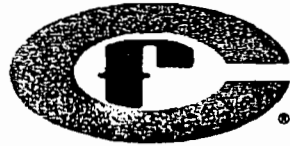
$P/D_t =$ 1.347 Where $P / D_p \geq 1.05$ and ≤ 1.50

Comments: Client: CF Industries

Type of Probe and Effective 31-674X-B1

$C_p = 0.84$

P.O. Drawer L.
Plant City, Florida 33564-9007
Telephone: 813/782-1591



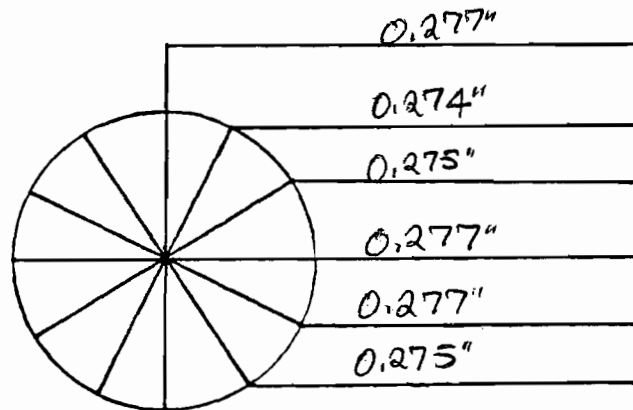
CF Industries, Inc.
Plant City Phosphate Complex

PROBE NOZZLE CALIBRATION DATA

Nozzle Identification Number: 4453

Calibrated by: ERNEST KRETSCHMAN

Date: 1/22/07



Instructions:

Measure to nearest 0.001"

Tolerance:

0.001" for mean of at least three readings.
Maximum deviation between readings ≤ 0.004 ".

Nozzle diameter, D_n : 0.276 In.

Nozzle area A_n : 0.000415 ft²

$$A_n = \frac{\pi}{144} \left(\frac{D_n}{2} \right)^2$$

ANNUAL LSI STACKBOX (C254) THERMOCOUPLE CALIBRATIONS

Date: 9/12/06

FOR TEMPERATURES 0 TO 110 DEGREES C
NIST Traceable Thermometer # J95-258

FOR TEMPERATURES 110 TO 200 DEGREES C
NIST Traceable Thermometer # 90B-2024

Time: 1020-1500

Initial *Paul S. [Signature]*

Display	Item	Ice Water Point			Ambient Water Point			Hot Water Point			Hot Oil Point		
		Thermocouple or RTD Reading (Degrees F)	NIST Reading		Thermocouple or RTD Reading (Degrees F)	NIST Reading		Thermocouple or RTD Reading (Degrees F)	NIST Reading		Thermocouple or RTD Reading (Degrees F)	NIST Reading	
			Actual	Con- version to		Actual	Con- version to		Actual	Con- version to		Actual	Con- version to
			Degrees			Degrees			Degrees			Degrees	
C	F	C	F	C	F	C	F						
[1] Stack	Probe 4.0ft. #2405	32	0.6	33.1	70	22.6	72.7	149	66.1	151.0	N/A	N/A	N/A
	Probe 6.0ft. #1009	33	0.6	33.1	70	22.6	72.7	150	66.1	151.0	N/A	N/A	N/A
	Probe 10.5ft. #2329	33	0.6	33.1	72	22.6	72.7	150	66.2	151.2	N/A	N/A	N/A
[2] Probe (Probe Liner Heater)	Probe 4.0ft. #2405	34	0.4	32.7	69	22.4	72.3	148	66.1	151.0	233	111.4	232.5
	Probe 6.0ft. #1009	33	0.4	32.7	69	22.4	72.3	150	66.1	151.0	233	111.2	232.2
	Probe 10.5ft. #2329	33	0.4	32.7	70	22.4	72.3	151	66.2	151.2	233	111.6	232.9
[3] Hot Box	Thermocouple	34	0.6	33.1	72	22.8	73.0	151	66.1	151.0	233	111.0	231.8
	External Sensor	OUT OF RANGE			75	22.8	73.0	150	66.0	150.8	231	111.4	232.5
[4] Umbilical (Coldbox Exit)		34	0.6	33.1	72	22.8	73.0	152	66.1	151.0	N/A	N/A	N/A
[5] DGM Inlet		34	0.6	33.1	74	22.8	73.0	152	66.1	151.0	N/A	N/A	N/A
[6] DGM Exit		33	0.6	33.1	74	22.8	73.0	151	66.1	151.0	N/A	N/A	N/A

Southern Environmental Sciences, Inc.

1204 North Wheeler Street □ Plant City, Florida 33563 □ (813) 752-5014, Fax: (813) 752-2475

February 16, 2006

Mr. Frank Dlugos
CF INDUSTRIES, INC.
P.O. Drawer L
Plant City, Florida 33564

Re: Meter Box Calibration &
Dry Gas Meter Calibration

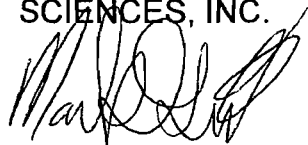
Dear Frank:

The attached calibrations were performed on the Lear Seigler meter box (serial # C254) and the Rockwell dry gas meter (serial # JA631105). All calibrations were performed using a wet test meter that is checked annually using a liquid displacement method as described in "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III, Stationary Source Specific Methods". A copy of the calibration check is enclosed.

Please let me know if we can be of any further assistance.

Very truly yours,

SOUTHERN ENVIRONMENTAL
SCIENCES, INC.



Mark S. Gierke
Source Testing Manager

MSG/mg

Enclosures

DRY GAS METER CALIBRATION

Meter Box Number: Lear Seigler Barometric Pressure: 30.23
 Serial No: C254 Wet Test Meter No.: P-576
 Date: 02/15/06 Calibrated By: MH

Orifice Manometer Setting (Delta H) in. H2O	Gas Volume		Temperature		Time (THETA) Min.	Yi	Delta H@ in. H2O
	Wet Test Meter (Vw) ft.^3	Dry Gas Meter (Vd) ft.^3	Wet Test Meter (Tw) Deg. F	Dry Gas Meter (Td) Deg. F			
0.50	5.000	5.374	70.5	101.25	12.1	0.983	1.540
1.00	5.000	5.316	70.0	101.3	8.57	0.994	1.542
1.50	10.000	10.543	68.0	99.5	14.02	1.001	1.541
2.00	10.000	10.425	67.0	93.5	12.33	1.003	1.600
3.00	10.000	10.134	67.0	85.5	10.02	1.014	1.608
4.00	10.000	9.950	66.0	73.3	8.61	1.009	1.613
						1.001	1.574

Delta H@ Acceptable Range 1.774 to 1.374
 Yi Acceptable Range 1.021 to 0.981

$$Y_i = \frac{V_w P_b (T_d + 460)}{V_d (P_b + \Delta H / 13.6) (T_w + 460)}$$

$$\Delta H@ = \frac{.0317 (\Delta H)}{P_b (T_d + 460)} \left[\frac{(T_w + 460) (\Theta)^2}{V_w} \right]$$

Where:

- Vw = Gas Volume passing through the wet test meter, ft.^3.
- Vd = Gas Volume passing through the dry gas meter, ft.^3.
- Tw = Temperature of the gas in the wet test meter, deg F.
- Td = Average temperature of the gas in the dry gas meter, deg F.
- Delta H = Pressure differential across orifice. in. H2O.
- Yi = Ratio of accuracy of wet test meter to dry gas meter for each run.
- Y = Average ratio of accuracy of wet test meter to dry gas meter
- Pb = Barometric pressure, in. Hg
- Theta = Time of calibration run, min.

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28.

STANDARD DRY GAS METER CALIBRATION

GAS METER MANUF.	ROCKWELL	PERFORMED FOR	C. F. Industries - Plant City
MODEL #	175-S	DATE	02/16/06
SERIAL #	JA 631105	BAROMETRIC PRESSURE	30.28
WET TEST METER #	P-576	LEAK CHECK	0.00 CFM @ 15" Hg

Approximate Flowrate (CFM)	Gas Volume		Temperature		Dry Gas Meter Delta P (H ₂ O)	Time (THETA) Min	Flowrate (CFM)	Dry Gas Meter Coeff (Yds)	Avg. Gas Meter Coeff (Yds)
	Wet Test Meter (Vw) ft. ³	Dry Gas Meter (Vd) ft. ³	Wet Test Meter (Tw) Deg. F.	Dry Gas Meter (Td) Deg. F.					
0.40	7.000	6.902	60.0	74.0	0.08	14.92	0.482	1.041	
0.40	7.000	6.925	61.0	74.0	0.08	14.97	0.480	1.036	1.038
0.40	5.000	4.945	65.0	78.0	0.08	10.78	0.472	1.036	
0.60	5.000	4.936	62.0	75.0	0.32	8.43	0.607	1.037	
0.60	5.000	4.927	63.0	76.5	0.32	8.27	0.618	1.040	1.039
0.60	5.000	4.942	63.0	77.0	0.32	8.32	0.614	1.038	
0.80	6.000	5.957	63.5	77.5	0.68	6.98	0.877	1.032	
0.80	5.000	4.966	64.0	77.5	0.68	5.90	0.864	1.031	1.032
0.80	5.000	4.962	64.0	78.0	0.68	5.85	0.872	1.033	
1.00	5.000	5.000	65.0	80.0	1.23	4.63	1.099	1.026	
1.00	5.000	5.000	65.0	80.0	1.23	4.62	1.102	1.026	1.026
1.00	5.000	5.000	65.0	80.0	1.23	4.63	1.099	1.026	
1.20	5.000	5.046	66.0	79.0	1.10	3.85	1.319	1.013	
1.20	5.000	5.043	66.0	78.0	1.10	3.83	1.326	1.011	1.012
1.20	5.000	5.040	66.0	78.0	1.10	3.81	1.333	1.012	

$$Q = \frac{P_b \times V_w \times 528}{(T_w + 460) \times \Theta \times 29.92}$$

$$Y_{ds} = \frac{V_w}{V_d} \times \frac{(T_d + 460)}{(T_w + 460)} \times \frac{P_b}{[P_b + (\Delta P / 13.6)]}$$

- Where:
- V_w = Gas Volume passing through the wet test meter, ft.³.
 - V_d = Gas Volume passing through the dry gas meter, ft.³.
 - T_w = Temperature of the gas in the wet test meter, deg F.
 - T_d = Average temperature of the gas in the dry gas meter, deg F.
 - Delta P = Dry gas meter pressure differential, in. H₂O.
 - Y_{ds} = Dry gas meter Coefficient
 - P_b = Barometric pressure, in. Hg
 - Theta = Time of calibration run, min.

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29,

SOUTHERN ENVIRONMENTAL SCIENCES, INC.

WET TEST METER CALIBRATION CHECK

Wet Test Meter #: P-576

Barometric Pressure: 30.18

Manufacturer: American Meter

Calibration Factor: 1.00

Date: 01/05/06

Checked by: MG

Gas Volume		Temperature		Yi
Liquid Displaced (Ld) ft. ³	Wet Test Meter (Vw) ft. ³	Ambient (Ta) Deg. F.	Wet Test Meter (Tw) Deg. F.	
1.198	1.202	67.0	69.0	1.000
1.198	1.204	67.0	70.0	1.001
1.198	1.202	67.0	69.0	1.000
1.197	1.204	67.0	70.0	1.000
1.199	1.202	67.0	69.0	1.001
1.199	1.204	67.0	69.0	1.000
				1.000

$$Y_i = \frac{V_w P_b (T_w + 460)}{V_d (P_b + \Delta H / 13.6) (T_a + 460)}$$

Where:

Vw = Gas Volume passing through the wet test meter, ft.³.

Vd = Gas Volume passing through the dry gas meter, ft.³.

Tw = Temperature of the gas in the wet test meter, deg F.

Ta = Ambient temperature, deg F.

Yi = Accuracy of wet test meter to displaced liquid.

Y = Average accuracy of wet test meter.

Pb = Barometric pressure, in. Hg

STANDARD METER CALIBRATION CURVE

GAS METER MANUF.	ROCKWELL	PERFORMED FOR	C. F. Industries - Plant City
MODEL #	175-S	DATE	02/16/06
SERIAL #	JA 631105		

FLOWRATE (CFM)	DRY GAS METER COEFF (Yds)
0.478	1.038
0.613	1.039
0.871	1.032
1.100	1.026
1.326	1.012

Regression Output:

Constant	1.0344084
Std. Error of Est.	0.0022086
R Squared	0.9494629
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	-0.025997
Std. Err. of Coef.	0.0034628

FLOW (CFM)	CORRECTION FACTOR
0.40	1.024
0.45	1.023
0.50	1.021
0.55	1.020
0.60	1.019
0.65	1.018
0.70	1.016
0.75	1.015
0.80	1.014
0.85	1.012
0.90	1.011
0.95	1.010
1.00	1.008
1.05	1.007
1.10	1.006
1.15	1.005
1.20	1.003

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POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test numbers _____ Date 2/1/07 Meter box number C254 Plant D SULFURIC
 Barometric pressure, $P_b = 29.99$ in. Hg Dry gas meter number 463613 Pretest Y 1.001

Orifice manometer setting, (ΔH) , in. H ₂ O	Gas volume		Temperature				Time (θ) , min	Vacuum setting, in. Hg	Y_i	Y_i	$V_w P_b (t_d + 460)$
	Dry test meter (V_w) , ft ³	Dry gas meter (V_d) , ft ³	Dry test meter (t_w) , °F	Dry gas meter							$V_d P_b + \frac{\Delta H}{13.6} t_w + 460$
				Inlet (t_{d_i}) , °F	Outlet (t_{d_o}) , °F	Average (t_d) , °F					
1.30	654.928	607.633	70.0°	106°	91°	94.75°	15.0	6.0	0.9992		$(9.991)(29.99)(554.75)$
	644.937	597.200	70.0°	94°	83°						$(10.433)(30.086)(530.00)$
1.30	665.535	618.751	70.0°	106°	92°	95.50°	16.0	6.0	1.0004		$(10.607)(29.99)(555.50)$
	654.928	607.633	70.0°	94°	90°						$(11.077)(30.086)(530.00)$
1.30	676.822	630.588	70.0°	106°	93°	95.75°	17.0	6.0	0.9967		$(11.287)(29.99)(555.75)$
	665.535	618.751	70.0°	92°	92°						$(11.837)(30.086)(530.00)$

$Y = 0.9987$

^a If there is only one thermometer on the dry gas meter, record the temperature under t_d .

V_w = Gas volume passing through the wet test meter, ft³.

V_d = Gas volume passing through the dry gas meter, ft³.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o} , °F.

ΔH = Pressure differential across orifice, in H₂O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs;
 tolerance = pretest $Y \pm 0.05Y$

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

Dry test meter number Rockwell-JAG31105

Quality Assurance Handbook M5-2.4A

Within $\pm 0.05Y$
 2/1/07 10:48AM
 [Signature]

APPENDIX "C"

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS
CF INDUSTRIES, INC.
PLANT CITY PHOSPHATE COMPLEX

H.E. Morris
R.C. May
T.A. Edwards
J.M. Messina
J.H. Falls
F.J. Dlugos
E. Kretschmar
L. Camp
W. Cherry
N. Grant
M. Andrews

General Manager
Engineering Manager
Supt., Environmental Affairs
Chief of Environmental Affairs
Chief Chemist, Laboratory
Environmental Supervisor
Analyst II
"A" Class Technician
"A" Class Technician
Operator
Operator