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

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

Texasgulf Inc.
an elf aquitaine company

P.O. Box 48
Aurora, North Carolina 27806

W.A. Schimming
Manager
Environmental Affairs
(919) 322-8239

September 21, 1992

Mr. Jim Mulligan
Regional Supervisor
Division of Environmental Management
N. C. Department of EHNR
P. O. Box 1507
Washington, North Carolina 27889

Re: **Texasgulf Inc.**
Permit No. 2331R10
Calciner No. 6

Dear Jim:

As per the requirements of Air Quality Permit No. 2331R10, Special Conditions and Limitations No. 7, the Calciner Plant No. 6 has been compliance tested for particulate emissions on August 4 and 5, 1992. A copy of the compliance test results are attached for your review.

If I may provide you any additional information on this subject, please let me know.

Sincerely,

W. A. Schimming

WAS:BAP/re

Enclosure

pc: Mike Aldridge - DEM, Raleigh (w/encl)
H. M. Breza (w/encl)
J. M. Waters (w/encl)
J. C. Carrere (w/encl)
B. A. Peacock (w/o encl)
00-12-000 (w/o encl)
15-09-022 (w/encl)

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SOURCE PERFORMANCE TEST

CALCINER NO. 6

TEXASGULF INC.

PHOSPHATE OPERATIONS

AURORA, NC

AUGUST 4 AND 5, 1992

PREPARED BY:

JOHN C. CARRERE, JR.
ENV. DATA COORDINATOR

REVIEWED BY:

JIMMY A. HARDY
SR. ENV. TECHNICIAN

REVIEWED BY:

MIKE L. ASBY
ENV. LAB SUPERVISOR

REVIEWED BY:

BRAD A. PEACOCK
SR. ENV. ENGINEER

File: EC-15-09-022

TEXASGULF INC. PHOSPHATE OPERATIONS

Summary

On August 4 and 5, 1992 sampling and analyses were conducted to determine the particulate emission rate at Texasgulf's Calciner No. 6 using Method 5 w/Backhalf Analysis. The result of this series of runs showed the average particulate emission rate to be 26.12 pound per hour. The average dry feed rate during the testing was 86.1 tons/hour. The average allowable particulate emission rate at this feedrate is 49.99 pounds of particulate/hour. A total of 3 stack samples were taken.

Performing the stack sampling were Senior Environmental Technicians Jimmy Hardy and Phillip Forest. Senior Environmental Technician Jack Taylor performed the work down.

TEXASGULF INC. PHOSPHATE OPERATIONS

Calciner Calculations

1) LBS. of Particulate/Day

Total =	((A + B) x C x 60 / 1000 / 453.59 x 24)
Front Half =	(A x C x 60 / 1000 / 453.59 x 24)
Back Half =	(B x C x 60 / 1000 / 453.59 x 24)

2) Mr = D - E

3) Vic = (F + G + H + I)

4) Mass of Inorganic Fraction = (((J x (K / ((K - L) - U) x 1000))

5) Mo = (M - N) x 1000

6) CPM mg/DSCF = (O + P) / Q

7) CPM mg/TSCF = (R x S)

8) CPM mg = (O + (J x 1000))

9) 5 % of Mass of CPM = (T x 0.05)

10) Feed Rate, Dry TPH = (V x ((100 - W)/100))

11) Coal Feed TPH = (X x Y) / 2000

12) Process Weight = (Z + AA)

13) Allowable Emission Rate = (AB ^0.11)*50)-40

Where:

A = Mg Particulate
B = CPM Mg
C = Stack Volumetric Flow Rate TSCFM
D = Total Weight of Inorganic Fraction (incl. weighing vessel)
E = Tare Weight of Inorganic Fraction weighing vessel
F = Total mls of H2O collected
G = Initial volume of Impinger 1
H = Initial volume of Impinger 2
I = Initial volume of Impinger 3
J = Mr
K = Vic
L = Vb
M = Final Weight of Organic Fraction (incl. weighing vessel)
N = Tare Weight of Organic Fraction weighing vessel
O = Mo
P = Mi
Q = Gas Volume STP
R = CPM mg/DSCF
S = 1 - BWS
T = CPM mg
U = Blank
V = Feed Rate TPH
W = Bulk Moisture (from Lab Analysis, 24 hr composite)
X = Lbs of Coal / Ton of Dry Feed
Z = Coal Feed Rate TPH
AA = Dry Feed Rate
AB = Process Weight

TEXASGULF INC. PHOSPHATE OPERATIONS

Test Summary - Calciner No. 6

Method 5 W/Backhalf	08/04/92	08/05/92	08/05/92
	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	60,061	59,804	59,118
Sample Volume, DSCF	30.805	29.504	30.385
Lbs. of Particulate/Hr. Total	23.93	30.42	24.02
Lbs. of Particulate/Hr. Front	14.58	16.62	12.22
Lbs. of Particulate/Hr. Back	9.36	13.80	11.80
Percent Isokinetic	98.66	99.16	99.06
Average Lbs of Particulate/Hr.(Total)			26.12
Allowable Lbs/Hr.			49.99
Dry Feed Rate TPH	85.4	86.4	86.4
Average Dry Feed Rate TPH			86.1

TEXASGULF INC. PHOSPHATE OPERATIONS

Calciner No. 6

Stack Data Summary Method 5 w/Backhalf

Date	Time	Run #	Velocity FPS	Volumetric Flow TSCF/Min	Average Stack Temp (oF)
08/04	13:10	1	41.531	60,061	162
08/05	09:30	2	41.245	59,804	163
08/05	11:30	3	40.750	59,118	162

Texasgulf Inc. memo

an elf aquitaine company

Date: 08/24/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #6 Run 1

Sample Date	Time
08/04/92	13:10

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
85	60,061

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	23.93	Total	6.7222
Front Half	14.58	Front Half	4.0939
Back Half	9.36	Back Half	2.6283

M. L. Ashy

Supervisor, Environmental Laboratory File: ec-15-09-022

The Allowable Emission Rate for Particulate Matter at this Process Rate is
49.88 Lbs.Particulate/Hour.

This stack sample was taken isokinetically. The %I = 98.66

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf		Report Date	08/24/92
Run 1		Sample Date	08/04/92
Calciner #6		Sample Time	13:10
Barometric Pressure	30.10	Initial Dry Gas Mtr	709.801
Stack Static Pressure	-0.50	Final Dry Gas Mtr	742.858
Stack Diameter	72	Dry Gas Factor	0.9926
Nozzle Diameter	0.2346	Dry Mole Wt Stk Gas	29.564
Pitot Tube Corr	0.84	Stack Pressure	30.06
Sampling Time in Min.	72	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.99
		Feed Rate Dry TPH	85.45
Lbs Coal/Ton of Dry Feed	34.9	Coal Feed TPH	1.49
		Process Weight	86.94

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	159	0.45	0.66	102	98
Pt	2	161	0.65	0.96	105	98
Pt	3	165	0.70	1.03	106	98
Pt	4	162	0.70	1.03	108	98
Pt	5	165	0.65	0.96	110	97
Pt	6	163	0.50	0.74	110	97
Pt	7	163	0.30	0.44	108	97
Pt	8	161	0.30	0.44	107	98
Pt	9	158	0.30	0.44	107	99
Pt	10	160	0.35	0.52	107	99
Pt	11	162	0.40	0.59	108	100
Pt	12	163	0.35	0.52	113	100
Pt	13	157	0.28	0.41	107	101
Pt	14	162	0.30	0.44	111	101
Pt	15	163	0.30	0.44	114	101
Pt	16	161	0.29	0.43	116	102
Pt	17	163	0.30	0.44	117	102
Pt	18	164	0.35	0.52	120	104
Pt	19	164	0.40	0.59	120	104
Pt	20	165	0.40	0.59	121	105
Pt	21	163	0.45	0.66	121	105
Pt	22	164	0.45	0.66	121	106
Pt	23	163	0.55	0.81	120	107
Pt	24	165	0.55	0.81	117	107
Averages		162	0.43	0.63	112	101

Stack oR	622	Average Meter Temp oR	567

Gas Volume Collected	33.057
Corrected Gas Volume	32.812
Gas Volume STP	30.805

Calciner #6 08/04/92
Run 1

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	605.14
Final	366	130	105	611.96

Totals mls of water collected	301
Increase in grams of silica gel	6.82
Total Gas Volume	45.294
Bws	0.3199
One - Bws	0.6801
Wet Molecular Weight of Stack Gas	25.86
Stack Pressure	30.063
Stack Velocity FPS	41.531
Stack Volumetric Flow Rate TSTD Ft3/Min	60061

Particulate Calculations

Inorganic	
Large Tare, grams	313.8108
Large Final, grams	313.82015
Mr =	0.00940
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	601
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	9.4
Organic	
Small Tare,grams	161.3138
Small Final,grams	161.3577
Mo, mg =	43.95
CPM mg/DSCF =	1.7319
CPM mg/TSCF =	1.1779
CPM mg	53.3500
5% of mass of CPM	2.6675
Front Half	
Final Beaker Weight	160.4913
Tare Beaker Weight	160.4551
Final Filter Weight	0.5925
Tare Weight of Filter	0.5456
Net Sample Weight	0.0831
Mg Particulate/DSCF	2.6976
Mg Particulate/TSCF	1.8347

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	574.41	349.83	224.59
Lbs Particulate/Hr	23.93	14.58	9.36
Lbs Particulate/Ton of Product	6.7222	4.0939	2.6283

Isokinetic Sampling Rate	98.66
Allowable Part. Emission Rate, Lbs/Hr.	49.88

Texasgulf Inc. memo

an elf aquitaine company

Date: 08/24/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #6 Run 2

Sample Date	Time
08/05/92	09:30

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	59,804

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	30.42	Total	8.4537
Front Half	16.62	Front Half	4.6198
Back Half	13.80	Back Half	3.8339

M. L. Cisby

Supervisor, Environmental Laboratory File: ec-15-09-022

The Allowable Emission Rate for Particulate Matter at this Process Rate is
49.99 Lbs.Particulate/Hour.

This stack sample was taken isokinetically. The %I = 99.16

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf		Report Date	08/24/92
Run 2		Sample Date	08/05/92
Calciner #6		Sample Time	09:30
Barometric Pressure	30.19	Initial Dry Gas Mtr	768.101
Stack Static Pressure	-0.52	Final Dry Gas Mtr	799.354
Stack Diameter	72	Dry Gas Factor	0.9926
Nozzle Diameter	0.2298	Dry Mole Wt Stk Gas	29.564
Pitot Tube Corr	0.84	Stack Pressure	30.15
Sampling Time in Min.	72	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.04
		Feed Rate Dry TPH	86.36
Lbs Coal/Ton of Dry Feed	34.9	Coal Feed TPH	1.51
		Process Weight	87.87

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	158	0.50	0.68	104	93
Pt	2	161	0.65	0.88	105	91
Pt	3	158	0.70	0.95	108	92
Pt	4	159	0.72	0.98	109	92
Pt	5	163	0.65	0.88	110	93
Pt	6	164	0.55	0.75	111	93
Pt	7	165	0.30	0.41	110	94
Pt	8	163	0.30	0.41	110	94
Pt	9	163	0.30	0.41	110	95
Pt	10	165	0.40	0.54	111	95
Pt	11	164	0.37	0.50	111	96
Pt	12	165	0.40	0.54	112	96
Pt	13	159	0.25	0.34	96	92
Pt	14	161	0.26	0.35	99	93
Pt	15	162	0.26	0.35	102	93
Pt	16	163	0.30	0.41	104	93
Pt	17	163	0.30	0.41	105	94
Pt	18	164	0.34	0.46	106	94
Pt	19	164	0.40	0.54	108	94
Pt	20	163	0.40	0.54	110	95
Pt	21	163	0.42	0.57	111	96
Pt	22	162	0.42	0.57	111	96
Pt	23	164	0.48	0.65	112	97
Pt	24	165	0.50	0.68	113	97
Averages		163	0.42	0.58	108	94

Stack oR	623	Average Meter Temp oR	561

Gas Volume Collected	31.253
Corrected Gas Volume	31.022
Gas Volume STP	29.504

Calciner # 6 08/05/92

Run 2

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	630.26
Final	354	133	103	637.46

Totals mls of water collected	290
Increase in grams of silica gel	7.2
Total Gas Volume	43.494
Bws	0.3217
One - Bws	0.6783
Wet Molecular Weight of Stack Gas	25.84
Stack Pressure	30.152
Stack Velocity FPS	41.245
Stack Volumetric Flow Rate TSTD Ft3/Min	59804

Particulate Calculations

Inorganic	
Large Tare, grams	321.8068
Large Final, grams	321.8101
Mr =	0.00335
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	590
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	3.35
Organic	
Small Tare,grams	158.1633
Small Final,grams	158.2358
Mo, mg =	72.5
CPM mg/DSCF =	2.5709
CPM mg/TSCF =	1.7439
CPM mg	75.8500
5% of mass of CPM	3.7925
Front Half	
Final Beaker Weight	155.3683
Tare Beaker Weight	155.3178
Final Filter Weight	0.5815
Tare Weight of Filter	0.5406
Net Sample Weight	0.0914
Mg Particulate/DSCF	3.0979
Mg Particulate/TSCF	2.1015

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	730.08	398.98	331.10
Lbs Particulate/Hr	30.42	16.62	13.80
Lbs Particulate/Ton of Product	8.4537	4.6198	3.8339

Isokinetic Sampling Rate	99.16
Allowable Part. Emission Rate, Lbs/Hr.	49.99

Texasgulf Inc. memo

an elf aquitaine company

Date: 08/24/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #6 Run 3

Sample Date	Time
08/05/92	11:30

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	59,118

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	24.02	Total	6.6750
Front Half	12.22	Front Half	3.3957
Back Half	11.80	Back Half	3.2792

M. L. Ashby

Supervisor, Environmental Laboratory File: ec-15-09-022

The Allowable Emission Rate for Particulate Matter at this Process Rate is
49.99 Lbs.Particulate/Hour.

This stack sample was taken isokinetically. The %I = 99.06

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf		Report Date	08/24/92
Run 3		Sample Date	08/05/92
Calciner #6		Sample Time	11:30
Barometric Pressure	30.1900	Initial Dry Gas Mtr	807.600
Stack Static Pressure	-0.52	Final Dry Gas Mtr	839.892
Stack Diameter	72	Dry Gas Factor	0.9926
Nozzle Diameter	0.2346	Dry Mole Wt Stk Gas	29.564
Pitot Tube Corr	0.84	Stack Pressure	30.15
Sampling Time in Min.	72	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.04
		Feed Rate Dry TPH	86.36
Lbs Coal/Ton of Dry Feed	34.9	Coal Feed TPH	1.51
		Process Weight	87.87

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	157	0.55	0.81	105	96
Pt	2	161	0.65	0.96	108	96
Pt	3	162	0.70	1.03	110	96
Pt	4	165	0.70	1.03	110	96
Pt	5	163	0.65	0.96	111	96
Pt	6	162	0.55	0.81	112	96
Pt	7	162	0.30	0.44	110	97
Pt	8	163	0.30	0.44	111	97
Pt	9	162	0.30	0.44	111	98
Pt	10	163	0.33	0.49	111	98
Pt	11	162	0.35	0.52	111	98
Pt	12	164	0.40	0.59	111	98
Pt	13	158	0.28	0.41	101	96
Pt	14	161	0.25	0.37	104	96
Pt	15	163	0.27	0.40	104	96
Pt	16	163	0.28	0.41	106	96
Pt	17	164	0.28	0.41	106	96
Pt	18	164	0.32	0.47	105	97
Pt	19	163	0.36	0.53	109	97
Pt	20	161	0.36	0.53	110	97
Pt	21	162	0.40	0.59	111	97
Pt	22	161	0.42	0.62	113	98
Pt	23	163	0.47	0.69	112	98
Pt	24	164	0.48	0.71	111	98
Averages		162	0.41	0.61	109	97

Stack oR	622	Average Meter Temp oR	563

Gas Volume Collected	32.292
Corrected Gas Volume	32.053
Gas Volume STP	30.385

Calciner #6 08/05/92

Run 3

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	663.26
Final	365	128	105	670.78

Totals mls of water collected	298
Increase in grams of silica gel	7.52
Total Gas Volume	44.766
Bws	0.3213
One - Bws	0.6787
Wet Molecular Weight of Stack Gas	25.85
Stack Pressure	30.152
Stack Velocity FPS	40.750
Stack Volumetric Flow Rate TSTD Ft3/Min	59118

Particulate Calculations

Inorganic	
Large Tare, grams	313.4692
Large Final, grams	313.4730
Mr =	0.00385
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	598
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	3.85
Organic	
Small Tare,grams	159.2212
Small Final,grams	159.2849
Mo, mg =	63.7
CPM mg/DSCF =	2.2232
CPM mg/TSCF =	1.5090
CPM mg	67.5500
5% of mass of CPM	3.3775
Front Half	
Final Beaker Weight	145.9819
Tare Beaker Weight	145.9517
Final Filter Weight	0.5938
Tare Weight of Filter	0.5540
Net Sample Weight	0.06995
Mg Particulate/DSCF	2.3021
Mg Particulate/TSCF	1.5626

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	576.46	293.26	283.20
Lbs Particulate/Hr	24.02	12.22	11.80
Lbs Particulate/Ton of Product	6.6750	3.3957	3.2792

Isokinetic Sampling Rate	99.06
Allowable Part. Emission Rate, Lbs/Hr.	49.99

PRODUCTION DATA

NUMBER 6 CALCINER----AUGUST 4, 1992

$$\frac{96 \text{ tons feed}}{\text{hour}} \rightarrow (96)\frac{(100\% - \%\ H_2O)}{100} = \frac{\text{Tons dry feed}}{\text{hour}}$$

$$\frac{(96 \text{ t feed})}{\text{hour}}\frac{(100 - 10.99)}{100} = (96)\ (0.8901) = \frac{85.5 \text{ t dry feed}}{\text{hour}}$$

Loss on Ignition is calculated each month from assays. In July it was 7.41%.

(So) Coal usage is based on consumption per ton calcine and is $\frac{37.5\# \text{ coal}}{\text{ton calcine}}$ *for a YTD figure.*

Calculate coal usage based on Dry Feed:

Take coal usage $\frac{(37.5\# \text{ coal})}{\text{ton calcine}}$ $\frac{(1 \text{ ton calcine})}{(1.0741 \text{ tons dry feed})}$ =

$\frac{34.91\# \text{ coal}}{(1 \text{ ton dry feed})}$ *or at* $\frac{85.5 \text{ tons dry feed}}{\text{hour}}$ =

$$\frac{(34.91\# \text{ coal})}{\text{ton dry feed}}\frac{(85.5 \text{ tons dry feed})}{\text{hour}} = \frac{2{,}984.81\# \text{ coal}}{\text{hour}}$$

or $\frac{1.492 \text{ tons coal}}{\text{hour}}$

August 21, 1992 ojc

NUMBER 6 CALCINER----AUGUST 5, 1992

$$\frac{96 \text{ tons feed}}{\text{hour}} \rightarrow (96)\frac{(100\% - \%\ H_2O)}{100} = \frac{\text{Tons dry feed}}{\text{hour}}$$

$$\frac{(96 \text{ t feed})}{\text{hour}}\frac{(100 - 10.04)}{100} = (96)\ (0.8996) = \frac{86.4 \text{ t dry feed}}{\text{hour}}$$

Loss on Ignition is calculated each month from assays. In July it was 7.41%.

(So) Coal usage is based on consumption per ton calcine and is $\frac{37.5\# \text{ coal}}{\text{ton calcine}}$ *for a YTD figure.*

Calculate coal usage based on Dry Feed:

Take coal usage $\frac{(37.5\# \text{ coal})}{\text{ton calcine}}$ $\frac{(1 \text{ ton calcine})}{(1.0741 \text{ tons dry feed})}$ =

$\frac{34.91\# \text{ coal}}{(1 \text{ ton dry feed})}$ *or at* $\frac{86.4 \text{ tons dry feed}}{\text{hour}}$ =

$$\frac{(34.91\# \text{ coal})}{\text{ton dry feed}}\frac{(86.4 \text{ tons dry feed})}{\text{hour}} = \frac{3{,}016.22\# \text{ coal}}{\text{hour}}$$

or $\frac{1.508 \text{ tons coal}}{\text{hour}}$

August 21, 1992 ojc

RAW DATA

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 1

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-4-92

Plant Cal #6

Run No. 1

Time 1310

	Filter	Front Half HH Beaker	Back Half Inorganic Beaker EE	Back Half Inorganic Beaker GG	Organic Beaker JJ
Tare	.5456	160.45505	155.36695	158.4498	161.31375
1st Weight	.5924	160.4911	155.3689	158.4530	161.3575
2nd Weight	.5926	160.4914	155.3676	158.4534	161.3579
3rd Weight			155.3670		
4th Weight			155.3669		
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5925	160.49175	155.36695	158.4532	161.3577

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	214 + 152	130	105	Post (grams)	611.96
Pre Volume (mls)	100	100	100	Pre (grams)	605.14

Revised 07/11/91
TGEA027.WR1

Box #1

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #6 Date 8-4-92 Time 1310 Run #1 (ONLY RUN DUE TO PLUGGED CYCLONE)

Mtr Box #4 Meter H@ 1.7226 K Factor 1.4772327 Barometric 30.10

Assmd Moist 33 % Nozzle Dia. 0.2346 Dry Gas X 0.9926 Console Oper P.A. FOREST

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 709.801	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW PORT	1	3	0.45	0.66	711.2	102	98	159	235		4.0
	2	6	0.65	0.96	712.9	105	98	161	265		5.0
	3	9	0.70	1.03	714.6	106	98	165	235		5.3
	4	12	0.70	1.03	716.5	108	98	162	225		5.8
	5	15	0.65	0.96	718.2	110	97	165	240		5.5
	6	18	0.50	0.74	719.7	110	97	163	250		4.8
	7	21	0.30	0.44	720.9	108	97	163	245	70	3.3
	8	24	0.30	0.44	722.0	107	98	161	240	70	3.2
	9	27	0.30	0.44	723.2	107	99	158	230	68	3.2
	10	30	0.35	0.52	724.5	107	99	160	235	68	3.9
STOP 1346	11	33	0.40	0.59	725.8	108	100	162	230	68	4.0
	12	36	0.35	0.52	727.112	113	100	163	235	68	3.8
START NW PORT 1353	13 1	3	0.28	0.41	728.2	107	101	157	235		3.0
	14 2	6	0.30	0.44	729.4	111	101	162	240		3.3
	15 3	9	0.30	0.44	730.6	114	101	163	240		3.5
	16 4	12	0.29	0.43	731.8	116	102	161	240		3.5
	17 5	15	0.30	0.44	732.9	117	102	163	225		3.5
	18 6	18	PAE 0.35	0.52 ~~0.44~~	734.2	120	104	164	235		4.0
	19 7	21	0.40	0.59	735.5	120	104	164	245	67	4.1
	20 8	24	0.40	0.59	736.9	121	105	165	250	68	4.2
	21 9	27	0.45	0.66	738.3	121	105	163	245	68	4.6
	22 10	30	0.45	0.66	739.7	121	106	164	240	68	4.8
	23 11	33	0.55	0.81	741.3	120	107	163	240	69	5.2
STOP 1429	24 12	36	0.55	0.81	742.858	117	107	165	235	69	5.3
	Total										
	Avg				33.057						

Probe and Sample Box Operator J. A. HARDY

Pre Leak Check At 9.5 "Hg = 0.018 C.F.M. Post Leak Check At 9.5 "Hg 0.012 C.F.M.

Pitot Leak Check Red ✓@29 Green ✓@22

$$K = (846.72 \times D_n^4 \times H@ \times Cp^2 \times (1 - Bws)^2 \times (M_d/M_s) \times (P_s/P_m) \times (T_m oR/T_s oR))$$

1.3512764 = (846.72 x (0.0027887) x (1.7226) x (0.7056) x (0.4489) x (X) x (1 X) x (29.564 / 25.748) x (570 / 624)

TGEA021.WR1

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 2

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-5-92 Plant Cal #6

Run No. 2 Time 0930

	Filter	Front Half Beaker FF	Back Half Inorganic Beaker II	Back Half Inorganic Beaker DD	Organic Beaker LL
Tare	.5406	155.3178	159.9473	161.8595	158.16325
1st Weight	.5813	155.3694	159.9488	161.8622	158.2344
2nd Weight	.5817	155.3704	159.9508	161.8614	158.2366
3rd Weight		155.3683	159.9491	161.8609	158.2360
4th Weight		155.3683			158.2355
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5815	155.3683	159.94895	161.86115	158.23575

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	215 + 139	133	103	Post (grams)	637.46
Pre Volume (mls)	100	100	100	Pre (grams)	630.26

Revised 07/11/91
TGEA027.WR1

Box #2

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #6 Date 8-5-92 Time 0930 Run ~~#1~~ 2

Mtr Box #4 Meter H@ 1.7226 K Factor 1.3556213 Barometric 30.19

Assmd Moist 33% Nozzle Dia. 0.2298 Dry Gas X 0.9926 Console Oper P.A. FOREST

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter F3 768.101	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW PORT	1	3	0.50	0.68	769.5	104	93	158	225		4.4
	2	6	0.65	0.88	771.1	105	91	161	230		5.1
	3	9	0.70	0.95	772.8	108	92	158	230		5.5
	4	12	0.72	0.98	774.5	109	92	159	225		5.8
	5	15	0.65	0.88	776.1	110	93	163	225		5.5
	6	18	0.55	0.75	777.6	111	93	164	225		5.0
	7	21	0.30	0.41	778.8	110	94	165	230		3.8
	8	24	0.30	0.41	779.9	110	94	163	235	72	3.8
	9	27	0.30	0.41	781.0	110	95	163	240	68	3.8
	10	30	0.40	0.54	782.3	111	95	165	245	67	4.2
	11	33	0.37	0.50	783.5	111	96	164	225	67	4.1
STOP 1006	12	36	0.40	0.54	784.762	112	96	165	225	69	4.5
NW PORT	1 3	3	0.25	0.34	785.8	96	92	159	225		3.2
START 1023	2 4	6	0.26	0.35	786.8	99	93	161	235		4.0
	3 5	9	0.26	0.35	787.9	102	93	162	235		3.8
	4 6	12	0.30	0.41	789.0	104	93	163	230		4.0
	5 7	15	0.30	0.41	790.2	105	94	163	225		4.0
	6 8	18	0.34	0.46	791.3	106	94	164	230		4.1
	7 9	21	0.40	0.54	792.6	108	94	164	230		4.8
	8 10	24	0.40	0.54	793.8	110	95	163	235	68	4.9
	9 11	27	0.42	0.57	795.2	111	96	163	235	69	4.9
	10 12	30	0.42	0.57	796.5	111	96	162	240	70	4.9
	11 13	33	0.48	0.65	797.9	112	97	164	240	70	5.1
STOP 1059	12 14	36	0.50	0.68	799.354	113	97	165	245	70	5.3
	Total										
	Avg				31.253						

Probe and Sample Box Operator J.A. HARDY

Pre Leak Check At 9.8 "Hg = 0.01 C.F.M. Post Leak Check At 8.8 "Hg 0.013 C.F.M.

Pitot Leak Check Red ✓@ 1.00 Green ✓@ 0.86

$K = (846.72 \times D_n^4 \times H@ \times Cp^2 \times (1 - Bws)^2 \times (M_d / M_s) \times (P_s / P_m) \times (T_m oR / T_s oR))$

_____ = (846.72 x ( ) x ( ) x ( ) x ( ) x ( ) x (/) x (/) x (/)

TGEA021.WR1

Box 3

TEXASGULF INC. PHOSPHATE OEPRATIONS

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-5-92

Plant CA/ #6

Run No. 3

Time 1130

	Filter	Front Half Beaker AB	Back Half Inorganic Beaker AA	Back Half Inorganic Beaker CC	Organic Beaker KK
Tare	.5540	145.9517	155.3554	158.11375	159.2712
1st Weight	.5937	145.9816	155.3568	158.1155	159.2849
2nd Weight	.5939	145.9821	155.3578	158.1169	159.2849
3rd Weight			155.3567	158.1161	
4th Weight				158.1164	
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5938	145.98185	155.35675	158.11625	159.2849

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	207 + 158	128	105	Post (grams)	670.78
Pre Volume (mls)	100	100	100	Pre (grams)	663.26

Revised 07/11/91
TGEA027.WR1

Box #3

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #6 Date 8-5-92 Time 1130 Run 3

Mtr Box #4 Meter H@ 1.7226 K Factor 1.4724827 Barometric _____

Assmd Moist 33% Nozzle Dia. ~~0.9926~~ 0.2346 Dry Gas X 0.9926 Console Oper P.A. FOREST

PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
				807.600						
1	3	0.55	0.81	809.2	105	96	157	235		2.8
2	6	0.65	0.96	810.8	108	96	161	240		3.0
3	9	0.70	1.03	812.6	110	96	162	240		3.4
4	12	0.70	1.03	814.4	110	96	165	240		3.5
5	15	0.65	0.96	816.1	111	96	163	230		3.3
6	18	0.55	0.81	817.7	112	96	162	225		3.1
7	21	0.30	0.44	818.9	110	97	162	230		2.2
8	24	0.30	0.44	820.2	111	97	163	240	66	2.2
9	27	0.30	0.44	821.3	111	98	162	240	68	2.3
10	30	0.33	0.49	822.4	111	98	163	230	68	2.2
11	33	0.35	0.52	823.6	111	98	162	240	70	2.4
12	36	0.40	0.59	824.963	111	98	164	245	70	2.5
13 1	3	0.28	0.41	826.1	101	96	158	230		2.2
14 2	6	0.25	0.37	827.2	104	96	161	235		2.2
15 3	9	0.27	0.40	828.3	104	96	163	245		2.2
16 4	12	0.28	0.41	829.4	106	96	163	250		2.2
17 5	15	0.28	0.41	830.6	106	96	164	240		2.3
18 6	18	0.32	0.47	831.7	105	97	164	240		2.4
19 7	21	0.36	0.53	833.0	109	97	163	235		2.9
20 8	24	0.36	0.53	834.3	110	97	161	225	66	2.9
21 9	27	0.40	0.59	835.6	111	97	162	225	67	3.0
22 10	30	0.42	0.62	837.0	113	98	161	225	68	3.0
23 11	33	0.47	0.69	838.4	112	98	163	230	70	3.1
24 12	36	0.48	0.71	839.892	111	98	164	230	70	3.5
Total										
Avg				32.292						

SW PORT

STOP 1200
SW PORT
START 1220

STOP 1256

Probe and Sample Box Operator J.A. HARDY

Pre Leak Check At 9.5 "Hg = 0.012 C.F.M. Post Leak Check At 11.0 "Hg 0.005 C.F.M.

Pitot Leak Check Red ✓ @ 0.78 Green ✓ @ 0.58

$$K = (846.72 \times D_n^4 \times H@ \times Cp^2 \times (1 - Bws)^2 \times (M_d/M_s) \times (P_s/P_m) \times (T_m oR/T_s oR))$$

1.4724827 = (846.72 x (0.003029) x (1.7224) x (0.7056) x (0.4409) x (X) x (X /) x (29.564 / 25.748) x (570 / 622)

TGEA021.WR1

Texasgulf Chemicals Co.

ISOKINETIC WORKSHEET

DATE: 8-1-92 STACK: CALCINER #6 TIME: 1310

METER BOX: #4 OPERATOR P.A. FOREST

1. NOZZLE DIA. (A) (#3) 0.2358 / (#4) 0.2307 " (B) 0.2335 / 0.2287 " (C) 0.2345 / 0.2299 "

Avg. #3 0.2346 / #4 0.2298

2. ΔH @ 1.7226

3. C_p 0.84 Assy. # 3 & #4

4. BAROMETRIC PRESSURE (P_b) 30.10 "Hg ΔP STATIC -0.50 "H_2

5. STACK PRESSURE (P_s) _____ "Hg = P_b ± $\frac{\text{INCHES } H_2O}{13.6}$

6. T_d _____ °F

7. T_w _____ °F

8. S. V.P. _____ "Hg

9. V.P. _____ "Hg

10. B_{ws} _____ X 100 = EST 33 % H_2O

11. M_d 29.564 lb./lb. - MOLE

12. M_s 25.748 lb./lb. - MOLE

13. T_s 160 °F + 460 = 620 °R

14. T_m 110 + 102 = 106 → 110 °F + 460 = 570 °R

15. P_m _____ "Hg $\left(\frac{\text{AVG. } \Delta H}{13.6} + P_b\right)$

Y = 0.9926

Preliminary

	ΔP	T_s
1.	0.35 ~~0.254~~	150
2.	0.65 ~~0.254~~	150
3.	0.65	152
4.	0.65	153
5.	0.68	153
6.	0.55	154
7.	0.3	154
8.	0.3	153
9.	0.3	154
10.	0.35	158
11.		159
12.	/	159

DUE TO PLUGGED CYCLONE, ONLY ONE TEST PULLED 8-1-92 PAF

(1) $V.P. = S.V.P. - \left[(3.67 \times 10^{-4}) \cdot (P_s) \cdot (T_d - T_w) \cdot \left[1 + \left(\frac{T_w - 32}{1571}\right)\right]\right]$

$_____ = _____ - \left[(\quad) \cdot (\quad) \cdot (\quad) \cdot \left[1 + (\frac{\quad}{1571}\right.\right.$

(2) $B_{ws} = \frac{V.P.}{P_s} = _____$

(3) $M_d = \left((0.44) \cdot (\%\ CO_2)\right) + \left((0.32) \cdot (\%\ O_2)\right) + \left((0.28) \cdot (\%\ CO + \%\ N_2)\right)$

$\underline{29.564} = \left((0.44) \cdot (\quad)\right) + \left((0.32) \cdot (\quad)\right) + \left((0.28) \cdot (\quad + \quad)\right)$

(4) $M_s = \left[(M_d) \cdot (1 - B_{ws})\right] + \left[(18) \times (B_{ws})\right]$

$\underline{25.748} = \left[(\underset{29.564}{\quad}) \cdot (\quad)\right] + \left[(18) \cdot (\underset{5.94}{.33})\right]$

(5) $\Delta H = K \cdot \Delta P$

$K = (846.72) \cdot (D_n^4) \cdot (\Delta H@) \cdot (C_p^2) \cdot (1-B_{ws})^2 \cdot \left(\frac{M_d}{M_s}\right) \cdot \left(\frac{P_s}{P_m}\right) \cdot \left(\frac{T_m\ {}^oR}{T_s\ {}^oR}\right)$

$\underline{1.4772327} = (846.72) \cdot (\overset{0.0030291}{\quad}) \cdot (\overset{1.7226}{\quad}) \cdot (\overset{0.7056}{\quad}) \cdot (\overset{0.4489}{\quad}) \cdot (\ X\ ) \cdot \left(\frac{29.564}{25.748}\right)\left(\frac{570\ {}^oR}{620\ {}^oR}\right)$

(6) $\% I = \frac{(T_s\ {}^oR) \cdot (\text{GAS VOL. S.T.P.}) \cdot (P_{std}) \cdot (100)}{(T_{std}\ {}^oR) \cdot (V_s\ \text{ft./sec.}) \cdot (P_s) \cdot (\text{Sampling Time Min.})\ (60)\ (A_n)\ (1-B_{ws})}$

$_____\ \% = \frac{(\quad {}^oR) \cdot (\quad \text{stp}) \cdot (29.92) \cdot (100)}{(528^oR) \cdot (\quad \text{ft/sec.}) \cdot (\quad \text{"Hg}) \cdot (\quad \text{Min.}) \cdot (60\ \frac{\text{Sec.}}{\text{Min.}}) \cdot (\quad \text{ft}^2)}$

Texasgulf Chemicals Co.

ISOKINETIC WORKSHEET

DATE: 8-5-92 STACK: CALCINER #6 TIME: _____

METER BOX: #4 OPERATOR P. A. FOREST

1. NOZZLE DIA. (A) ③ 0.2358 / ④ 0.2307 " (B) 0.2335 / 0.2287 " (C) 0.2345 / 0.2299 "

Avg. #3 0.234 / #4 0.2298

2. ΔH @ 1.7226

3. C_p 0.84 Assy. # 3 & # 4

4. BAROMETRIC PRESSURE (P_b) 30.19 "Hg

ΔP STATIC -0.52 "H

5. STACK PRESSURE (P_s) _____ "Hg = $P_b \pm \frac{\text{INCHES } H_2O}{13.6}$

6. T_d _____ °F

7. T_w _____ °F

8. S. V.P. _____ "Hg

9. V.P. _____ "Hg

10. B_{ws} _____ X 100 = EST 33 % H_2O

11. M_d 29.564 lb./lb. - MOLE

12. M_s 25.748 lb./lb. - MOLE

13. T_s 162 °F + 460 = 622 °R

14. T_m 110 °F + 460 = 570 °R

15. P_m _____ "Hg $\left(\frac{\text{AVG. } \Delta H}{13.6} + P_b\right)$

Preliminary

	ΔP	T_s
1.	0.58	149
2.	0.68	151
3.	0.68	154
4.	0.75	153
5.	0.7	154
6.	0.55	154
7.	0.28	149
8.	0.3	152
9.	0.35	152
10.	0.35	149
11.	0.35	153
12.	0.35	154

(1) $V.P. = S.V.P. - \left[(3.67 \times 10^{-4}) \cdot (P_s) \cdot (T_d - T_w) \cdot \left[1 + \left(\frac{T_w - 32}{1571}\right)\right]\right]$

$_____ = _____ - \left[(\quad) \cdot (\quad) \cdot (\quad) \cdot \left[1 + (\frac{\quad}{1571}\right.\right.$

(2) $B_{ws} = \frac{V.P.}{P_s} = _____$

(3) $M_d = \left((0.44) \cdot (\%\ CO_2)\right) + \left((0.32) \cdot (\%\ O_2)\right) + \left((0.28) \cdot (\%\ CO + \%\ N_2)\right)$

$_____ = \left((0.44) \cdot (\quad)\right) + \left((0.32) \cdot (\quad)\right) + \left((0.28) \cdot (\quad + \quad)\right)$

(4) $M_s = \left[(M_d) \cdot (1 - B_{ws})\right] + \left[(18) \times (B_{ws})\right]$

$_____ = \left[(\quad) \cdot (\quad)\right] + \left[(18) \cdot (\quad)\right]$

(5) $\Delta H = K \cdot \Delta P$

$K = (846.72) \cdot (D_n^4) \cdot (\Delta H@) \cdot (C_p^2) \cdot (1-B_{ws})^2 \cdot \left(\frac{M_d}{M_s}\right) \cdot \left(\frac{P_s}{P_m}\right) \cdot \left(\frac{T_m\ {}^oR}{T_s\ {}^oR}\right)$

1.3556213
~~1.355616~~

$_____ = (846.72) \cdot (\overset{0.0027887}{\quad}) \cdot (\overset{1.7226}{\quad}) \cdot (\overset{0.7056}{\quad}) \cdot (\overset{0.4489}{\quad}) \cdot (\ X\ ) \cdot \left(\frac{29.564}{25.748}\right)\left(\frac{570\ {}^oR}{622\ {}^oR}\right)$

(6) $\% I = \frac{(T_s\ {}^oR) \cdot (\text{GAS VOL. S.T.P.}) \cdot (P_{std}) \cdot (100)}{(T_{std}\ {}^oR) \cdot (V_s\ \text{ft./sec.}) \cdot (P_s) \cdot (\text{Sampling Time Min.})\ (60)\ (A_n)\ (1-B_{ws})}$

$_____ \% = \frac{(\quad {}^oR) \cdot (\quad \text{stp}) \cdot (29.92) \cdot (100)}{(528^oR) \cdot (\quad \text{ft/sec.}) \cdot (\quad \text{"Hg}) \cdot (\quad \text{Min.}) \cdot (60\ \frac{\text{Sec.}}{\text{Min.}}) \cdot (\quad \text{ft}^2)}$

Page 1 of 2

Cyclonic Flow Test

Plant Colmee #6 Technician(s) JH + JT

Date 5-22-91 Time 1400

Northwest Port

Point #	Delta P	Angle Alpha
1	.50	6
2	.50	12
3	.55	7
4	.50	3
5	.40	1
6	.36	2
7	.34	0
8	.36	0
9	.30	0
10	.25	8
11	.18	9
12	.12	23
Average		over

Average absolute Alpha must not be greater than 20 degrees.

Cyclonic Flow Test

Plant Calciner Technician(s) JH & JT

Date 5-22-91 Time 1400

Southwest Port

Point #	Delta P	Angle Alpha
1	.70	10
2	.90	1
3	1.10	0
4	1.00	0
5	.80	0
6	.60	0
7	.28	6
8	.22	1
9	.25	5
10	.25	8
11	.30	9
12	.30	7
Average		4.9

Average absolute Alpha must not be greater than 20 degrees.

Orsat Analyses

Date 8-3-92 Plant CAL #6 Technician JHARA

Pb / Stack Temp / Ambient Temp /

Dry Bulb Temp / Wet Bulb Temp /

Stack Static Press / Stack Press /

		CO2	O2	CO+N
Run 1	Burette Reading	6.0	21.0	~~[illegible]~~
	Percent	6.0	15.0	79.0
Run 2	Burette Reading	6.0	21.2	—
	Percent	6.0	15.2	78.8
Run 3	Burette Reading	6.0	21.1	—
	Percent	6.0	15.1	78.9

No Leak for 5min

Ps = (Static Press/13.6) + Pb

V.P.= S.V.P. - ((3.67*10^-4) * (Ps) * (Td - Tw) * ((1 + (Tw-32)/1571))

Bws = V.P./Ps

Md = ((0.44 * %CO2) + (0.32 * %O2) + (0.28 * %CO+N)) (%CO2 = 6.0, %O2 = 15.1, %CO+N = 78.9)

Ms = ((Md * (1-Bws)) + ((18 * Bws))

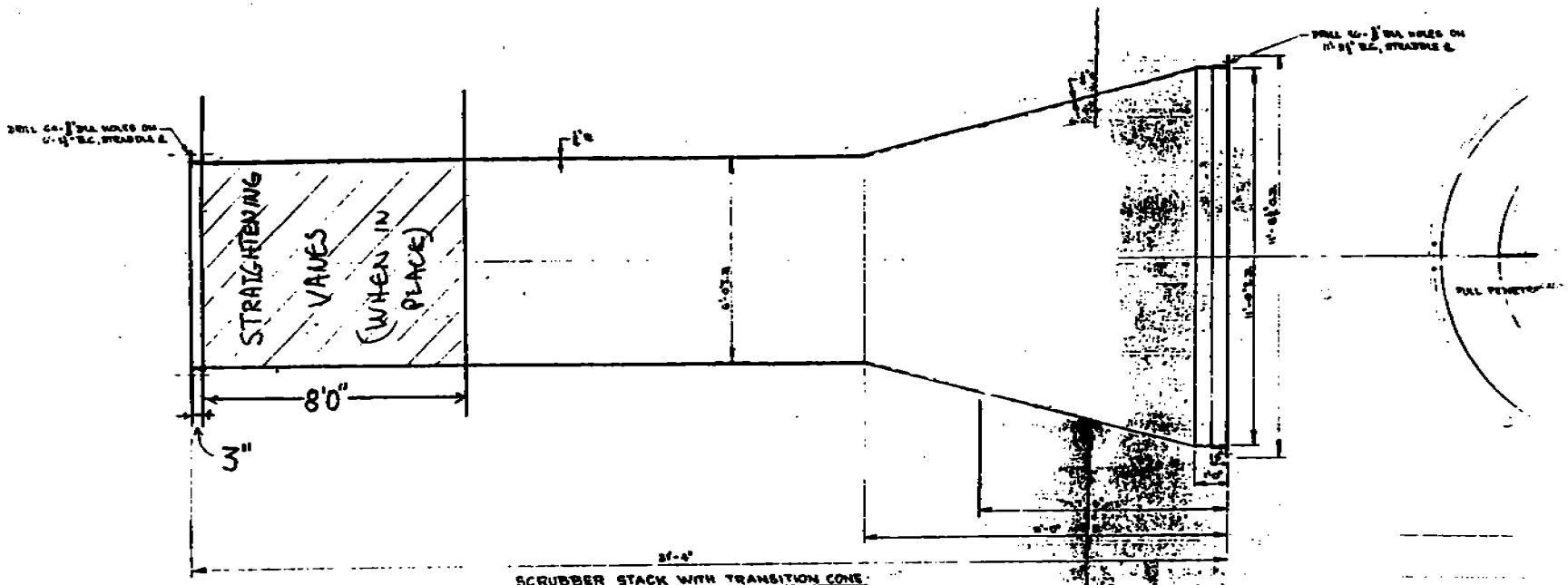
V.P.= /

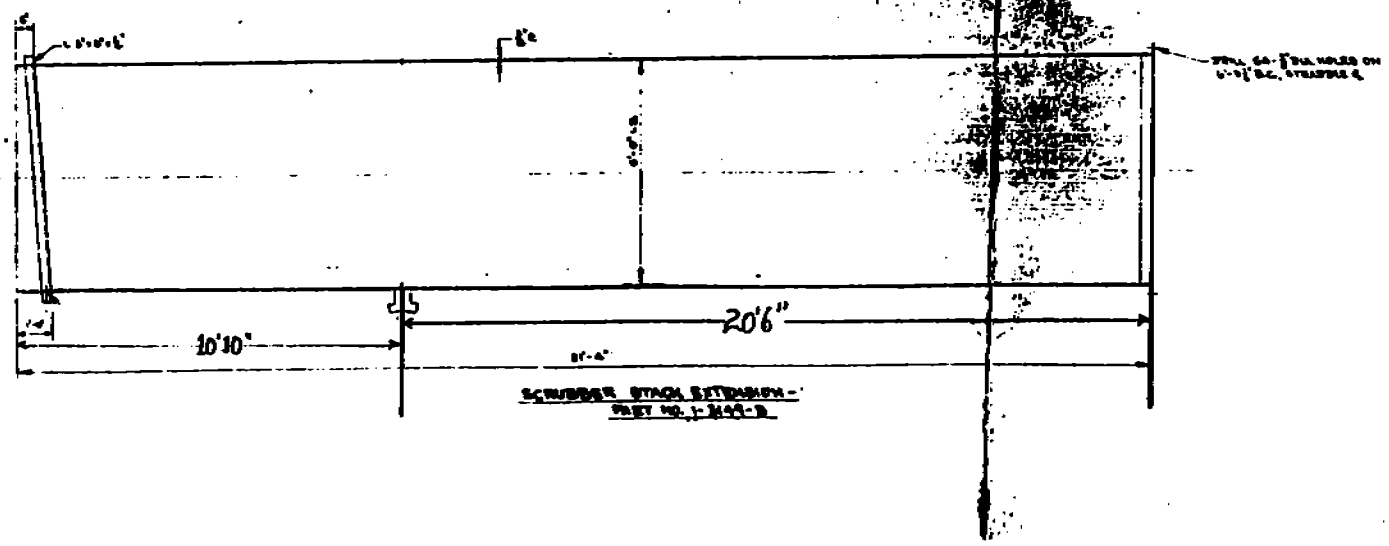
Bws = /

Md = 29.564

Ms = /

NUMBER SIX
SCRUBBER STACK





TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration

07/13/92		Console	4
Technician Jack Taylor		Number of Runs	8
Barometric Pressure	30.12	Test Meter Factor	0.9986
Test Meter No.	699357		
Delta H Setting	0.25	Meter Pressure	30.14
Test Meter Initial	830.800		
Test Meter Final	835.806	Test Dry Gas Volume	5.006
Console Meter Inital	230.500		
Console Meter Final	235.812	Console Dry Gas Volume	5.312
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	98		
Console Meter oF Out	84	Console Average oR	551
Total Time In Mins.	17.95	Corr Test Meter Vol	5.00
Delta Ha=	1.7393	y Factor=	0.9750
Delta H Setting	0.50	Meter Pressure	30.16
Test Meter Initial	836.000		
Test Meter Final	841.006	Test Dry Gas Volume	5.006
Console Meter Inital	236.200		
Console Meter Final	241.504	Console Dry Gas Volume	5.304
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	101		
Console Meter oF Out	86	Console Average oR	553.5
Total Time In Mins.	12.73	Corr Test Meter Vol	5.00
Delta Ha=	1.7416	y Factor=	0.9803
Delta H Setting	0.75	Meter Pressure	30.18
Test Meter Initial	841.201		
Test Meter Final	846.210	Test Dry Gas Volume	5.009
Console Meter Inital	241.800		
Console Meter Final	247.100	Console Dry Gas Volume	5.3
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	104		
Console Meter oF Out	87	Console Average oR	555.5
Total Time In Mins.	10.37	Corr Test Meter Vol	5.00
Delta Ha=	1.7253	y Factor=	0.9846

Page 2
Console Calibration
07/13/92

Delta H Setting	1.00	Meter Pressure	30.19
Test Meter Initial	846.400		
Test Meter Final	851.412	Test Dry Gas Volume	5.012
Console Meter Inital	247.500		
Console Meter Final	252.763	Console Dry Gas Volume	5.263
Test Meter oF In	71		
Test Meter oF Out	70	Test Average oR	530.5
Console Meter oF In	106		
Console Meter oF Out	87	Console Average oR	556.5
Total Time In Mins.	8.95	Corr Test Meter Vol	5.00
Delta Ha=	1.7020	y Factor=	0.9952
Delta H Setting	1.25	Meter Pressure	30.21
Test Meter Initial	851.900		
Test Meter Final	861.908	Test Dry Gas Volume	10.008
Console Meter Inital	253.600		
Console Meter Final	264.094	Console Dry Gas Volume	10.494
Test Meter oF In	71		
Test Meter oF Out	70	Test Average oR	530.5
Console Meter oF In	108		
Console Meter oF Out	88	Console Average oR	558
Total Time In Mins.	16.07	Corr Test Meter Vol	9.99
Delta Ha=	1.7156	y Factor=	0.9987
Delta H Setting	1.50	Meter Pressure	30.23
Test Meter Initial	862.300		
Test Meter Final	872.306	Test Dry Gas Volume	10.006
Console Meter Inital	264.700		
Console Meter Final	275.159	Console Dry Gas Volume	10.459
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	109		
Console Meter oF Out	89	Console Average oR	559
Total Time In Mins.	14.67	Corr Test Meter Vol	9.99
Delta Ha=	1.7197	y Factor=	1.0011

TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Console 4 Date 7-13-92

Technician JT

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In (Must agree: +/- 5.4 oF)	A	32	33.4	1.4
	B	69	71.2	3.2
	C	170	172.3	2.3
Dry Gas Meter Out (Must agree: +/- 5.4 oF)	A	32	33.8	1.8
	B	69	71.2	2.2
	C	176	175.6	0.4
Impinger Thermometer # 1 (Must agree: +/- 2 oF)	A	34	32.6	1.6
	B	73	75.0	2.0
	C	156	156.4	0.4
Impinger Thermometer # 2 (Must agree: +/- 2 oF)	A	34	32.4	1.4
	B	74	75.0	1.0
	C	154	156.0	2.0
Impinger Thermometer # 3 (Must agree: +/- 2 oF)	A	34	32.5	1.5
	B	76	74.6	1.4
	C	158	156.2	1.8
HotBox Thermometer # 1 (Must agree: +/- 5.4 oF)	A	75	75.7	0.7
	B	172	172.8	0.8
	C	300	302.5	2.5
HotBox Thermometer # 2 (Must agree: +/- 5.4 oF)	A	74	75.6	1.6
	B	164	165.6	1.6
	C	298	302.5	4.5
HotBox Thermometer # 3 (Must agree: +/- 5.4 oF)	A	70	72.0	2.0
	B	165	164.6	0.6
	C	281	285.0	4.0

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TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Date 7-14-92

Technician ST

Instrument		Indicator oF	Actual oF	Difference %
Stack Thermocouple Assy # 3	A	72	73.0	1.4
(Must agree: +/- 1.5 %)	A	72	72.7	1.0
	A	72	72.4	0.6
	B	137	138.6	1.2
	B	134	135.4	1.0
	B	132	133.0	0.8
	C	213	213.5	0.2
	C	215	214.0	0.5
	C	212	209.5	1.2
Stack Thermocouple Assy # 6	A	71	72.0	1.4
(Must agree: +/- 1.5 %)	A	71	72.1	1.5
	A	71	72.0	1.4
	B	146	148.0	1.4
	B	145	146.8	1.2
	B	143	144.5	1.0
	C	222	223.5	0.7
	C	219	221	0.9
	C	216	218.5	1.1
Stack Thermocouple Assy # _____	A			
(Must agree: +/- 1.5 %)	A			
	A			
	B			
	B			
	B			
	C			
	C			
	C			
Probe Heater Assy # 3		217°F @ .75	CFM	
Probe Heater Assy # 6		217°F @ .75	CFM	
Probe Heater Assy # ____				

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[redacted] Calibration

Date 7-12-92 Tech JT

Delta H Magnehelic

Leak Check @ .24 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	.24	.23	1
-	.31	.32	1

Leak Check @ .99 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	.99	.99	0
-	1.02	1.02	0

Leak Check @ 1.84 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	1.84	1.85	1
-	1.85	1.85	0

Delta P Magnehelic

Leak Check @ .39 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	.31	.32	1
-	.39	.40	1

Leak Check @ .92 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	1.09	1.09	0
-	.92	.93	1

Leak Check @ 1.71 " H2O for 3 minutes.

	Gauge	Manometer	Delta
+	1.80	1.79	0
-	1.71	1.70	1

ACETONE BLANK WORKSHEET

LOT # 2443 KJBM

BEAKER WT. INIT.	147.7354	FILTER WT. INIT.	
BEAKER WT. FINAL	147.73539	FILTER WT. FINAL	
WT. OF RESIDUE	-.00005	NET FILTER WT.	

700 MLS

CONSTANT WTS.	
BEAKER	FILTER
147.7352 ✓	
147.7381	
147.7355 ✓	

TECHNICIAN:

DATE:

SOURCE PERFORMANCE FOR: COAL 91 CH#5 Calciner

MeCl

~~ACETONE~~ BLANK WORKSHEET

Lot # 910309

BEAKER WT. INIT.	(JB) 139.6226	FILTER WT. INIT.	
BEAKER WT. FINAL	139.6216	FILTER WT. FINAL	
WT. OF RESIDUE	.0010	NET FILTER WT.	

200mls

CONSTANT WTS.	
BEAKER	FILTER
139.6218	
139.6216	

TECHNICIAN: JT

DATE: 8-21-91

SOURCE PERFORMANCE FOR: Calcinor F2 + 4

TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration

08/10/92		Console	4
Technician Jack Taylor		Number of Runs	8
Barometric Pressure	30.09	Test Meter Factor	0.9986
Test Meter No.	699357		
Delta H Setting	0.25	Meter Pressure	30.11
Rechecked 8/11/92			
Test Meter Initial	996.100		
Test Meter Final	1001.102	Test Dry Gas Volume	5.002
Console Meter Inital	108.800		
Console Meter Final	114.091	Console Dry Gas Volume	5.291
Test Meter oF In	73		
Test Meter oF Out	72	Test Average oR	532.5
Console Meter oF In	96		
Console Meter oF Out	84	Console Average oR	550
Total Time In Mins.	17.58	Corr Test Meter Vol	4.99
Delta Ha=	1.6820	y Factor=	0.9745
Delta H Setting	0.50	Meter Pressure	30.13
Test Meter Initial	910.700		
Test Meter Final	915.705	Test Dry Gas Volume	5.005
Console Meter Inital	18.100		
Console Meter Final	23.388	Console Dry Gas Volume	5.288
Test Meter oF In	71		
Test Meter oF Out	70	Test Average oR	530.5
Console Meter oF In	103		
Console Meter oF Out	85	Console Average oR	554
Total Time In Mins.	12.62	Corr Test Meter Vol	5.00
Delta Ha=	1.7061	y Factor=	0.9858
Delta H Setting	0.75	Meter Pressure	30.15
Test Meter Initial	916.000		
Test Meter Final	921.005	Test Dry Gas Volume	5.005
Console Meter Inital	23.900		
Console Meter Final	29.211	Console Dry Gas Volume	5.311
Test Meter oF In	71		
Test Meter oF Out	70	Test Average oR	530.5
Console Meter oF In	105		
Console Meter oF Out	87	Console Average oR	556
Total Time In Mins.	10.30	Corr Test Meter Vol	5.00
Delta Ha=	1.6985	y Factor=	0.9845

Page 2
Console Calibration
08/10/92

Delta H Setting	1.00	Meter Pressure	30.16
Rechecked 8/11/92			
Test Meter Initial	1.400		
Test Meter Final	6.404	Test Dry Gas Volume	5.004
Console Meter Inital	114.700		
Console Meter Final	119.923	Console Dry Gas Volume	5.223
Test Meter oF In	73		
Test Meter oF Out	73	Test Average oR	533
Console Meter oF In	107		
Console Meter oF Out	87	Console Average oR	557
Total Time In Mins.	8.82	Corr Test Meter Vol	5.00
Delta Ha=	1.6740	y Factor=	0.9974
Delta H Setting	1.25	Meter Pressure	30.18
Test Meter Initial	926.700		
Test Meter Final	936.712	Test Dry Gas Volume	10.012
Console Meter Inital	35.600		
Console Meter Final	46.149	Console Dry Gas Volume	10.549
Test Meter oF In	72		
Test Meter oF Out	70	Test Average oR	531
Console Meter oF In	105		
Console Meter oF Out	89	Console Average oR	557
Total Time In Mins.	16.00	Corr Test Meter Vol	10.00
Delta Ha=	1.7072	y Factor=	0.9911
Delta H Setting	1.50	Meter Pressure	30.20
Test Meter Initial	937.000		
Test Meter Final	947.309	Test Dry Gas Volume	10.309
Console Meter Inital	46.700		
Console Meter Final	57.546	Console Dry Gas Volume	10.846
Test Meter oF In	72		
Test Meter oF Out	70	Test Average oR	531
Console Meter oF In	102		
Console Meter oF Out	89	Console Average oR	555.5
Total Time In Mins.	15.08	Corr Test Meter Vol	10.29
Delta Ha=	1.7212	y Factor=	0.9893

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Console Calibration
10-Aug-92

Delta H Setting	1.75	Meter Pressure	30.22
Test Meter Initial	948.000		
Test Meter Final	958.011	Test Dry Gas Volume	10.011
Console Meter Inital	58.500		
Console Meter Final	69.003	Console Dry Gas Volume	10.503
Test Meter oF In	71		
Test Meter oF Out	70	Test Average oR	530.5
Console Meter oF In	108		
Console Meter oF Out	90	Console Average oR	559
Total Time In Mins.	13.57	Corr Test Meter Vol	10.00
Delta Ha=	1.7102	y Factor=	0.9987
Delta H Setting	2.00	Meter Pressure	30.24
Test Meter Initial	958.400		
Test Meter Final	968.399	Test Dry Gas Volume	9.999
Console Meter Inital	69.700		
Console Meter Final	80.152	Console Dry Gas Volume	10.452
Test Meter oF In	72		
Test Meter oF Out	70	Test Average oR	531
Console Meter oF In	110		
Console Meter oF Out	90	Console Average oR	560
Total Time In Mins.	12.72	Corr Test Meter Vol	9.99
Delta Ha=	1.7217	y Factor=	1.0026
Average Delta Ha=	1.7026	Average y Factor=	0.9905

TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Date 8 11-92

Technician JT

Instrument		Indicator oF	Actual oF	Difference %
Stack Thermocouple Assy # 3	A	72	73.0	1.4
(Must agree: +/- 1.5 %)	A	72	73.1	1.5
	A	72	73.0	1.4
	B	146	145.4	0.4
	B	143	143.2	0.1
	B	140	139.5	0.4
	C	238	239.5	0.6
	C	231	233.0	0.9
	C	234	232.0	0.9
Stack Thermocouple Assy # 6	A	72	73.1	1.5
(Must agree: +/- 1.5 %)	A	72	73.0	1.4
	A	72	72.8	1.0
	B	145	144.8	0.1
	B	143	142.3	0.5
	B	141	140.0	0.7
	C	240	239.5	0.2
	C	235	232.5	1.1
	C	230	229.5	0.2
Stack Thermocouple Assy # _____	A			
(Must agree: +/- 1.5 %)	A			
	A			
	B			
	B			
	B			
	C			
	C			
	C			
Probe Heater Assy # 3		317 °F (w)	.75 CFM	
Probe Heater Assy # 6		317 °F (w)	.75 CFM	
Probe Heater Assy # _____				

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Pre-Calibration

Date 8-10-92 Tech JT

Delta H Magnehelic

Leak Check @ .42 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.42	.42	0
−	.36	.36	0

Leak Check @ .93 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.93	.94	1
−	1.00	1.00	0

Leak Check @ 1.80 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	1.80	1.82	2
−	1.81	1.83	2

Delta P Magnehelic

Leak Check @ .32 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.41	.41	0
−	.32	.32	0

Leak Check @ .92 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.99	.98	1
−	.92	.92	0

Leak Check @ 1.83 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	1.74	1.76	2
−	1.83	1.81	2

TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Console 4 Date 8 10 92

Technician JT

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In (Must agree: +/- 5.4 oF)	A	32	33.6	1.6
	B	69	70.8	1.8
	C	229	225.5	3.5
Dry Gas Meter Out (Must agree: +/- 5.4 oF)	A	33	33.4	0.4
	B	69	70.8	1.8
	C	278	274.0	4.0
Impinger Thermometer # 1 (Must agree: +/- 2 oF)	A	36	34.1	1.9
	B	74	72.4	1.6
	C	150	151.2	1.2
Impinger Thermometer # 2 (Must agree: +/- 2 oF)	A	34	34.1	0.1
	B	72	72.2	0.2
	C	149	150.8	1.8
Impinger Thermometer # 3 (Must agree: +/- 2 oF)	A	36	34.1	1.9
	B	73	73.1	0.9
	C	150	150.2	0.2
HotBox Thermometer # 1 (Must agree: +/- 5.4 oF)	A	74	75.4	1.4
	B	162	164.7	2.7
	C	270	267.5	2.5
HotBox Thermometer # 2 (Must agree: +/- 5.4 oF)	A	72	75.6	3.6
	B	144	147.6	3.6
	C	266	264.5	1.5
HotBox Thermometer # 3 (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	140	145.2	5.2
	C	205	264.0	0

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