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

JUL 22 1992

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

July 16, 1992

Mr. Mulligan
Regional Supervisor
Division of Environmental Management
N. C. Department of EHNR
P. O. Box 2188
Washington, North Carolina 27889

Re: **Texasgulf Inc.**
Permit No. 2331R10
Calciner No. 4

Dear Jim:

As per the requirements of the Air Quality Permit No. 2331R10, Specific Conditions and Limitations No. 7, the No. 4 Calciner was compliance tested for particulate emissions on June 30, 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/th

Enclosures

pc: Mike Aldridge - DEM, Raleigh (w/encl)
H. M. Breza (w/encl)
J. N. Richardson (w/encl)
J. C. Carrere (w/encl)
00-12-000 (w/o encl)
15-09-027 (w/encl)

Printed on Recycled Paper

SOURCE PERFORMANCE TEST

CALCINER NO. 4

TEXASGULF INC.

PHOSPHATE OPERATIONS

AURORA, NC

JUNE 30, 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-15-09-027

TEXASGULF INC. PHOSPHATE OPERATIONS

Summary

On June 30, 1992 sampling and analyses were conducted to determine the particulate emission rate at Texasgulf's Calciner No. 4 using Method 5 w/Backhalf Analysis.

The results of this series of runs showed the average particulate emission rate to be 21.46 pounds per hour. The average dry feed rate during the testing was 81 tons/hour. The average allowable particulate emission rate at this feedrate is 49.37 pounds of particulate/hour. A total of 3 stack samples were taken.

During the second axis of Run 1, a lower than expected Delta P was observed. It is surmised that water was trapped in the pitot line.

Performing the stack sampling were Senior Environmental Technicians Jack Taylor and Phillip Forest. Senior Environmental Technician Jack Taylor performed the workdown.

Mr. Don Wynne, of the North Carolina Division of Environmental Management was present during the testing as an official observer.

TEXASGULF INC. PHOSPHATE OPERATIONS

Test Summary – Calciner No. 4

Method 5 W/Backhalf	06/30/92	06/30/92	06/30/92
	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	57,236	68,080	68,152
Sample Volume, DSCF	32.054	32.898	32.066
Lbs. of Particulate/Hr. Total	16.55	23.73	24.10
Lbs. of Particulate/Hr. Front	12.01	14.07	13.33
Lbs. of Particulate/Hr. Back	4.54	9.67	10.76
Percent Isokinetic	99.46	101.57	102.49
Average Lbs of Particulate/Hr.(Total)			21.46
Allowable Lbs/Hr.			49.37
Dry Feed Rate TPH	81	81	81
Average Dry Feed Rate TPH			81

TEXASGULF INC. PHOSPHATE OPERATIONS

Calciner No. 4

Stack Data Summary Method 5 w/Backhalf

Date	Time	Run #	Velocity	Volumetric Flow	Average Stac
		FPS	FPS	TSCF/Min	Temp (oF)
06/30	10:03	1	39.663	57,236	163
06/30	12:02	2	47.162	68,080	163
06/30	14:25	3	47.253	68,152	164

TEXASGULF memo

Date: 07/08/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #4 Run 1

Sample Date	Time
06/30/92	10:03

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
81	57,236

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	16.55	Total	4.8989
Front Half	12.01	Front Half	3.5564
Back Half	4.54	Back Half	1.3425

M.R. Ashby

Supervisor, Environmental Laboratory File: ec-15-09-027

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

This stack sample was taken isokinetically. The %I = 99.46

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 1
Calciner #4

Rpt. Date	07/07/92
Smple Date	06/30/92
Smple Time	10:03

Barometric Pressure	30.12	Initial Dry Gas Mtr	920.725
Stack Static Pressure	-0.95	Final Dry Gas Mtr	954.502
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2453	Dry Mole Wt Stk Gas	29.208
Pitot Tube Corr	0.84	Stack Pressure	30.05
Sampling Time in Min.	72	Feed Rate, TPH	90
		Bulk Moisture (Lab Analysis)	9.91
		Feed Rate Dry TPH	81.08
Lbs Coal/Ton of Dry Feed	35.7	Coal Feed TPH	1.45
		Process Weight	82.53

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	156	0.78	1.39	94	85
Pt	2	164	0.99	1.76	97	86
Pt	3	163	1.05	1.87	95	87
Pt	4	164	1.19	2.12	97	88
Pt	5	166	1.10	1.96	98	89
Pt	6	165	0.93	1.66	98	90
Pt	7	164	0.54	0.96	104	91
Pt	8	164	0.41	0.73	108	92
Pt	9	166	0.40	0.71	111	93
Pt	10	165	0.35	0.62	112	93
Pt	11	164	0.30	0.53	113	95
Pt	12	163	0.11	0.20	110	95
Pt	13	152	0.11	0.20	96	94
Pt	14	163	0.13	0.23	101	93
Pt	15	164	0.29	0.52	105	93
Pt	16	164	0.35	0.62	105	93
Pt	17	164	0.39	0.69	107	94
Pt	18	165	0.43	0.77	109	95
Pt	19	165	0.14	0.25	107	95
Pt	20	164	0.10	0.18	107	95
Pt	21	165	0.11	0.20	108	96
Pt	22	164	0.18	0.32	111	96
Pt	23	165	0.13	0.23	110	97
Pt	24	163	0.10	0.18	110	97
Averages		163	0.44	0.79	105	93

Stack oR	623	Average Meter Temp oR	559

Gas Volume Collected	33.777
Corrected Gas Volume	33.625
Gas Volume STP	32.054

Calciner #4
Run 1

06/30/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	612.44
Final	364	146	110	622.18

Totals mls of water collected	320
Increase in grams of silica gel	9.74
Total Gas Volume	47.576
Bws	0.3262
One - Bws	0.6738
Wet Molecular Weight of Stack Gas	25.55
Stack Pressure	30.050
Stack Velocity FPS	39.663
Stack Volumetric Flow Rate TSTD Ft3/Min	57236

Particulate Calculations

Inorganic	
Large Tare, grams	303.6853
Large Final, grams	303.6928
Mr =	0.00750
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	620
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	7.5
Organic	
Small Tare,grams	164.5523
Small Final,grams	164.5733
Mo, mg =	21
CPM mg/DSCF =	0.8891
CPM mg/TSCF =	0.5990
CPM mg	28.5000
5% of mass of CPM	1.425
Front Half	
Final Beaker Weight	164.8129
Tare Beaker Weight	164.7779
Final Filter Weight	0.5924
Tare Weight of Filter	0.5519
Net Sample Weight	0.0755
Mg Particulate/DSCF	2.3554
Mg Particulate/TSCF	1.5869

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	397.21	288.36	108.85
Lbs Particulate/Hr	16.55	12.01	4.54
Lbs Particulate/Ton of Product	4.8989	3.5564	1.3425

Isokinetic Sampling Rate	99.46
Allowable Part. Emission Rate, Lbs/Hr.	49.37

TEXASGULF memo

Date: 07/08/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #4 Run 2

Sample Date	Time
06/30/92	12:02

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
81	68,080

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	23.73	Total	7.0254
Front Half	14.07	Front Half	4.1642
Back Half	9.67	Back Half	2.8612

M.R. Osby

Supervisor, Environmental Laboratory File: ec-15-09-027

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

This stack sample was taken isokinetically. The %I = 101.57

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf		Rpt. Date	07/07/92
Run 2		Smple Date	06/30/92
Calciner #4		Smple Time	12:02
Barometric Pressure	30.12	Initial Dry Gas Mtr	960.205
Stack Static Pressure	-0.95	Final Dry Gas Mtr	995.142
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2261	Dry Mole Wt Stk Gas	29.208
Pitot Tube Corr	0.84	Stack Pressure	30.05
Sampling Time in Min.	72	Feed Rate, TPH	90
		Bulk Moisture (Lab Analysis)	9.91
		Feed Rate Dry TPH	81.08
Lbs Coal/Ton of Dry Feed	35.7	Coal Feed TPH	1.45
		Process Weight	82.53

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	150	0.62	0.80	100	92
Pt	2	162	1.01	1.30	105	92
Pt	3	164	1.22	1.57	106	93
Pt	4	163	1.12	1.44	106	94
Pt	5	165	1.10	1.42	107	94
Pt	6	165	1.08	1.39	109	95
Pt	7	164	0.53	0.68	110	95
Pt	8	165	0.58	0.75	100	95
Pt	9	165	0.41	0.53	106	95
Pt	10	164	0.34	0.44	108	95
Pt	11	165	0.33	0.43	110	95
Pt	12	163	0.30	0.39	111	96
Pt	13	153	0.29	0.37	105	96
Pt	14	162	0.17	0.22	106	95
Pt	15	164	0.43	0.56	111	96
Pt	16	165	0.52	0.68	114	96
Pt	17	166	0.66	0.85	115	97
Pt	18	165	0.60	0.77	116	97
Pt	19	166	0.45	0.58	116	98
Pt	20	165	0.28	0.36	115	98
Pt	21	165	0.37	0.48	116	98
Pt	22	165	0.40	0.52	117	99
Pt	23	164	0.43	0.56	117	99
Pt	24	162	0.35	0.45	116	99
Averages		163	0.57	0.73	110	96

Stack oR	623	Average Meter Temp oR	563

Gas Volume Collected	34.937
Corrected Gas Volume	34.780
Gas Volume STP	32.898

Calciner #4
Run 2

06/30/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	630.24
Final	399	133	104	638.39

Totals mls of water collected	336
Increase in grams of silica gel	8.15
Total Gas Volume	49.098
Bws	0.3299
One - Bws	0.6701
Wet Molecular Weight of Stack Gas	25.51
Stack Pressure	30.050
Stack Velocity FPS	47.162
Stack Volumetric Flow Rate TSTD Ft3/Min	68080

Particulate Calculations

Inorganic	
Large Tare, grams	307.5234
Large Final, grams	307.5243
Mr =	0.00090
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	636
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	0.9
Organic	
Small Tare,grams	142.3399
Small Final,grams	142.3917
Mo, mg =	51.8
CPM mg/DSCF =	1.6019
CPM mg/TSCF =	1.0734
CPM mg	52.7000
5% of mass of CPM	2.635
Front Half	
Final Beaker Weight	137.8416
Tare Beaker Weight	137.8132
Final Filter Weight	0.5843
Tare Weight of Filter	0.5360
Net Sample Weight	0.0767
Mg Particulate/DSCF	2.3315
Mg Particulate/TSCF	1.5622

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	569.63	337.64	231.99
Lbs Particulate/Hr	23.73	14.07	9.67
Lbs Particulate/Ton of Product	7.0254	4.1642	2.8612

Isokinetic Sampling Rate	101.57
Allowable Part. Emission Rate, Lbs/Hr.	49.37

TEXASGULF memo

Date: 07/08/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #4 Run 3

Sample Date	Time
06/30/92	14:25

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
81	68,152

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	24.10	Total	7.1333
Front Half	13.33	Front Half	3.9469
Back Half	10.76	Back Half	3.1864

M. L. Ashby

Supervisor, Environmental Laboratory File: ec-15-09-027

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

This stack sample was taken isokinetically. The %I = 102.49

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf		Rpt. Date	07/07/92
Run 3		Smple Date	06/30/92
Calciner #4		Smple Time	14:25
Barometric Pressure	30.12	Initial Dry Gas Mtr	999.601
Stack Static Pressure	-0.95	Final Dry Gas Mtr	1033.755
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2226	Dry Mole Wt Stk Gas	29.208
Pitot Tube Corr	0.84	Stack Pressure	30.05
Sampling Time in Min.	72	Feed Rate, TPH	90
		Bulk Moisture (Lab Analysis)	9.91
		Feed Rate Dry TPH	81.08
Lbs Coal/Ton of Dry Feed	35.7	Coal Feed TPH	1.45
		Process Weight	82.53

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	150	0.71	0.87	97	90
Pt	2	163	0.90	1.11	104	90
Pt	3	164	1.03	1.27	107	91
Pt	4	165	1.12	1.38	110	91
Pt	5	165	1.10	1.35	110	92
Pt	6	170	0.81	1.00	112	93
Pt	7	166	0.35	0.43	112	95
Pt	8	165	0.20	0.25	110	96
Pt	9	165	0.41	0.50	113	96
Pt	10	165	0.30	0.37	113	97
Pt	11	166	0.34	0.42	114	97
Pt	12	164	0.31	0.38	113	98
Pt	13	152	0.33	0.41	106	98
Pt	14	162	0.37	0.46	111	98
Pt	15	164	0.46	0.57	114	98
Pt	16	165	0.56	0.69	117	98
Pt	17	166	0.68	0.84	118	98
Pt	18	165	0.71	0.87	118	99
Pt	19	166	0.53	0.65	118	99
Pt	20	165	0.40	0.49	117	99
Pt	21	165	0.47	0.58	118	99
Pt	22	164	0.51	0.63	118	100
Pt	23	165	0.45	0.55	118	100
Pt	24	163	0.37	0.46	118	100
Averages		164	0.56	0.69	113	96

Stack oR	624	Average Meter Temp oR	565

Gas Volume Collected	34.154
Corrected Gas Volume	34.000
Gas Volume STP	32.066

Calciner #4
Run 3

06/30/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	640.96
Final	388	137	105	650.95

Totals mls of water collected	330
Increase in grams of silica gel	9.99
Total Gas Volume	48.070
Bws	0.3329
One - Bws	0.6671
Wet Molecular Weight of Stack Gas	25.48
Stack Pressure	30.050
Stack Velocity FPS	47.253
Stack Volumetric Flow Rate TSTD Ft3/Min	68152

Particulate Calculations

Inorganic	
Large Tare, grams	322.4180
Large Final, grams	322.4296
Mr =	0.01160
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	630
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	11.6
Organic	
Small Tare,grams	169.6389
Small Final,grams	169.6847
Mo, mg =	45.8
CPM mg/DSCF =	1.7901
CPM mg/TSCF =	1.1941
CPM mg	57.4000
5% of mass of CPM	2.87
Front Half	
Final Beaker Weight	162.7641
Tare Beaker Weight	162.7358
Final Filter Weight	0.5925
Tare Weight of Filter	0.5497
Net Sample Weight	0.0711
Mg Particulate/DSCF	2.2173
Mg Particulate/TSCF	1.4791

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	578.37	320.02	258.36
Lbs Particulate/Hr	24.10	13.33	10.76
Lbs Particulate/Ton of Product	7.1333	3.9469	3.1864

Isokinetic Sampling Rate	102.49
Allowable Part. Emission Rate, Lbs/Hr.	49.37

RAW DATA

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 1

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 6-30-92 Plant CA/ #4

Run No. 1 Time 1003

	Filter	11 Front Half Beaker	Back Half Inorganic Beaker 111	Back Half Inorganic Beaker 29	Organic Beaker 49
Tare	.5519	164.7779	162.2149 (303.6853)	141.4704	164.5523
1st Weight	.5926	164.8111	162.2173	141.4732	164.5732
2nd Weight	.5922	164.8179	162.2186	141.4740	164.5779
3rd Weight		164.8129	162.2190	141.4739	164.5734
4th Weight					
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5924	164.8129	162.2188 (303.6928)	141.4740	164.5733

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	250+114	146	110	Post (grams)	622.18
Pre Volume (mls)	~~250+114~~ 100	~~146~~ 100	100	Pre (grams)	612.44

Revised 07/11/91
TGEA027.WR1

TEXASGULF INC. PHOSPHATE OPERATIONS

Bot 1

CONSOLE WORKSHEET

Plant CAI # 4 Date 6-30-92 Time 1003 Run 1

Mtr Box 4 Meter H@ 1.7043 K Factor 1.78 Barometric 30.12

Assmd Moist 3% Nozzle Dia. .2453 Dry Gas X .9955 Console Oper JT

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 920.725	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW 1005	1	3	.78	1.39	922.7	94	85	250	250		12.9
	2	6	.99	1.76	924.6	97	86	164	225		19.0
	3	9	1.05	1.87	927.0	95	87	163	225		19.6
	4	12	1.19	2.12	929.2	97	88	164	240		20.0
	5	15	1.10	1.96	931.4	98	89	166	245		19.8
	6	18	.93	1.66	933.6	98	90	165	225		19.0
	7	21	.54	.96	935.3	104	91	164	225		9.3
	8	24	.41	.73	936.8	108	92	164	240		7.1
	9	27	.40	.71	938.3	111	93	166	245	68	7.0
	10	30	.35	.62	939.7	112	93	165	230	68	6.1
	11	33	.30	.53	941.0	113	95	164	225	66	5.9
	12	36	.11	.20	941.968	110	95	163	240	66	3.0
SW 1039	13	3	.11	.20	942.7	96	94	152	225		3.0
1050	14	6	.13	.23	943.6	101	93	163	240		3.1
	15	9	.29	.52	944.9	105	93	164	230		5.5
	16	12	.35	.62	946.2	105	93	164	235		6.0
	17	15	.39	.69	947.7	107	94	164	245		6.9
	18	18	.43	.77	949.2	109	95	165	235		7.5
	19	21	.14	.25	950.2	107	95	165	240		3.3
	20	24	.10	.18	951.0	107	95	164	225	68	3.0
	21	27	.11	.20	951.8	108	96	165	230	68	3.0
	22	30	.18	.32	952.8	111	96	164	240	68	4.1
	23	33	.13	.23	953.7	110	97	165	235	67	3.6
1126	24	36	.10	.18	954.502	110	97	163	250	68	3.0
	Total										
	Avg										

Probe and Sample Box Operator PF

Pre Leak Check At 15.0 "Hg = .011 C.F.M. Post Leak Check At 20.0 "Hg .002 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

1.78 = (846.72 x ( ) x ( ) x ( ) x ( ) x ( ) x (/) x (/) x (/)

.0036207 1.7043 .7016 .4761 29.208 / 25.734 560 / 1.75

TGEA021.WR1

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 2

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 6-30-92 Plant Cal #4

Run No. 2 Time 1202

307-5224

	Filter	Front Half Beaker 5	Back Half Inorganic Beaker 100	Back Half Inorganic Beaker 25	Organic Beaker 33
Tare	.5360	137.8132	165.1434	142.3810	142.3399
1st Weight	.5869	137.8417	165.1430	142.3806	142.3895
2nd Weight	.5841	137.8424	165.1442	142.3814	142.3919
3rd Weight	.5845	137.8414	165.1450	142.3815	142.3914
4th Weight			165.1426		
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5843	137.8416	165.1428	142.3815	142.3917

307-5243

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	NCG 208 + 191	133	104	Post (grams)	638.39
Pre Volume (mls)	100	100	100	Pre (grams)	630.24

Revised 07/11/91
TGEA027.WR1

.2225
.2227

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CA/ #4 Date 6-30 92 Time 1202 Run 2

Mtr Box 4 Meter H@ 1.7043 K Factor 1.29 Barometric 30.12

Assmd Moist 3% Nozzle Dia. .2261 Dry Gas X .9955 Console Oper JT

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 960.205	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW 1202	1	3	.62	.80	961.7	100	92	150	225		7.4
	2	6	1.01	1.30	963.6	105	92	162	225		13.0
	3	9	1.22	1.57	965.8	106	93	164	235		16.0
	4	12	1.12	1.44	967.8	106	94	163	240		15.0
	5	15	1.10	1.42	969.9	107	94	165	240		14.1
	6	18	1.08	1.39	972.07	109	95	165	230		14.0
1221	7	21	.53	.68	973.641	110	95	164	230		7.0
1233	8	24	.58	.75	975.1	100	95	165	235		7.8
	9	27	.41	.53	976.5	106	95	165	240	68	6.2
	10	30	.34	.44	977.6	108	95	164	250	68	5.1
	11	33	.33	.43	978.8	110	95	165	240	68	5.1
1248	12	36	.30	.39	979.970	111	96	165	245	68	5.0
NW 1253	13	3	.29	.37	981.0	105	96	153	225		4.9
	14	6	.17	.22	981.9	106	95	162	225		3.9
	15	9	.43	.56	983.1	111	96	164	225		6.2
	16	12	.52	.68	984.6	114	96	165	225		7.1
	17	15	.66	.85	986.1	115	97	166	225		8.9
	18	18	.60	.77	987.7	116	97	165	230		8.0
	19	21	.45	.58	989.1	116	98	166	225		6.4
	20	24	.28	.36	990.2	115	98	165	230	68	5.0
	21	27	.37	.48	991.3	116	98	165	230	68	5.5
	22	30	.40	.52	992.6	117	99	165	225	68	6.0
	23	33	.43	.56	993.9	117	99	164	230	68	6.4
1329	24	36	.35	.45	995.142	116	99	162	225	68	5.8
	Total										
	Avg										

Probe and Sample Box Operator PF

Pre Leak Check At 14.0 "Hg = .017 C.F.M. Post Leak Check At 16.0 "Hg .014 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

1.29 = (846.72 x ( ) x ( ) x ( ) x ( ) x ( ) x (/) x (/) x (/)

TGEA021.WR1 .6626134 1.7043 .7056 .4761 29.208/25.734 562/625

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 3

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 6-30-92 Plant Cal #4

Run No. 3 Time 1425

322.4180

	Filter	Front Half Beaker Y	Back Half Inorganic Beaker V	Back Half Inorganic Beaker X	Organic Beaker 9
Tare	.5497	162.7358	153.7256	168.6924	169.6389
1st Weight	.5924	162.7641	153.7305	168.6961	169.6773
2nd Weight	.5926	162.7641	153.7315	168.6983	169.6846
3rd Weight			153.7315	168.6979	169.6848
4th Weight					
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5925	162.7641	153.7315	168.6981	169.6847

322.4296

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	388 236 + 152	137	105	Post (grams)	650.95
Pre Volume (mls)	100	100	100	Pre (grams)	640.96

Revised 07/11/91
TGEA027.WR1

TEXASGULF INC. PHOSPHATE OPERATIONS

Box 3

CONSOLE WORKSHEET

Plant Cal #4 Date 6-30-92 Time 1425 Run 3

Mtr Box 4 Meter H@ 1.7043 K Factor 1.23 Barometric 30.12

Assmd Moist 3% Nozzle Dia. .2276 Dry Gas X .9955 Console Oper JT

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 499.601	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
1425	1	3	.71	.87	001.2	97	90	150	225		6.0
	2	6	.90	1.11	003.0	104	90	163	235		8.9
	3	9	1.03	1.27	004.9	107	91	164	250		9.9
	4	12	1.12	1.38	007.0	110	91	165	235		11.0
	5	15	1.10	1.35	009.0	110	92	165	240		11.0
	6	18	.81	1.00	010.8	112	93	170	250		8.9
	7	21	.35	.43	012.0	112	95	166	240		4.0
	8	24	.20	.25	013.0	110	96	165	225	68	2.5
	9	27	.41	.50	014.1	113	96	165	230	68	4.0
	10	30	.30	.37	015.2	113	97	165	245	68	3.8
	11	33	.34	.42	016.3	114	97	166	245	68	4.0
1501	12	36	.31	.38	017.449	113	98	164	235	68	3.5
1507	13	3	.33	0.41	018.6	106	98	152	225		3.9
	14	6	.37	.46	019.9	111	98	162	225		4.0
	15	9	.46	.57	021.1	114	98	164	230		4.5
	16	12	.56	.69	022.6	117	98	165	230		5.0
	17	15	.68	.84	024.1	118	98	166	225		6.0
	18	18	.71	.87	025.7	118	99	165	225		6.1
	19	21	.53	.65	027.2	118	99	166	225	68	5.0
	20	24	.40	.49	028.5	117	99	165	230	68	4.2
	21	27	.47	.58	029.8	118	99	165	230	68	4.8
	22	30	.51	.63	031.2	118	100	164	235	68	5.0
	23	33	.45	.55	032.5	118	100	165	225	68	4.8
1543	24	36	.37	.46	033.755	118	100	163	235	68	4.0
	Total										
	Avg										

Probe and Sample Box Operator PF

Pre Leak Check At 11.0 "Hg = .009 C.F.M. Post Leak Check At 11.0 "Hg .015 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

1.23 = (846.72 x ( ) x ( ) x ( ) x ( ) x ( ) x (/) x (/) x (/)

TGEA021.WR1 0024553

1.7043 7056.476 | 29.708 / 15.734 568 / 625

Texasgulf Chemicals Co.

ISOKINETIC WORKSHEET

DATE: 6-30-92 STACK: Cat 1 #4 TIME: _____

METER BOX: 4 OPERATOR JT

1. NOZZLE DIA. (A) ⑤ .2461 ⑥ .2430 " (B) .2432 .2446 " (C) .2460 .2435 "

Y = .9955

2. ΔH @ 1.7043 Avg. ⑤ .2453

3. C_p .84 Assy. # _____

4. BAROMETRIC PRESSURE (P_b) 30.12 "Hg

ΔP STATIC -.95 "H.

5. STACK PRESSURE (P_s) 30.05 "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 = 31 % H_2O

11. M_d 29.208 lb./lb. - MOLE

12. M_s 25.734 lb./lb. - MOLE

13. T_s 164 °F + 460 = 625 °R

14. T_m _____ °F + 460 = _____ °R

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

Preliminary

ΔP	T_s
1. .78	158
2. .99	165
3. .103	161
4. .111	160
5. .102	164
6. .94	164
7. .35	164
8. .17	165
9. .12	162
10. .11	161
11. .12	161
12. .16	163

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

$\underline{29.108} = \left((0.44) \cdot (\quad)\right) + \left((0.32) \cdot (\quad)\right) + \left((0.28) \cdot (\quad + \quad)\right)$

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

$\underline{29.734} = \left[(\quad) \cdot (.69)\right] + \left[(18) \cdot (\quad)\right]$

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

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

$_____ = (846.72) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot (____)(\frac{____\ {}^oF}{____\ {}^oF}$

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

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

Orsat Analyses

Date 6-29-92 Plant CAC #4 Technican /

Pb / Stack Temp / Ambient Temp /

Dry Bulb Temp / Wet Bulb Temp /

Stack Static Press / Stack Press /

		CO2	O2	CO+N
Run 1	Burette Reading	3.2	21.0	79
	Percent	3.2	17.8	
Run 2	Burette Reading	3.0	20.8	79.2
	Percent	3.0	17.8	
Run 3	Burette Reading	3.1	20.9	79.1
	Percent	3.1	17.8	

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))
3.1 17.8 79.1

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

V.P.= _____

Bws = _____

Md = 29.208

Ms = _____

Leak check - No leak 5 min

Cyclonic Flow Test

Plant CALCINER #4 Technician(s) JH + JT

Date 8-27-91 Time 1400

SW

Point #	Delta P	Angle Alpha
1	.70	20
2	1.10	9
3	.90	1
4	.90	1
5	.75	0
6	.60	0
7	.30	1
8	.30	0
9	.25	2
10	.25	5
11	.25	8
12	.25	11
Average		over

Average absolute Alpha must not be greater than 20 degrees.

Cyclonic Flow Test

Plant Calciner Technician(s) JH & JT

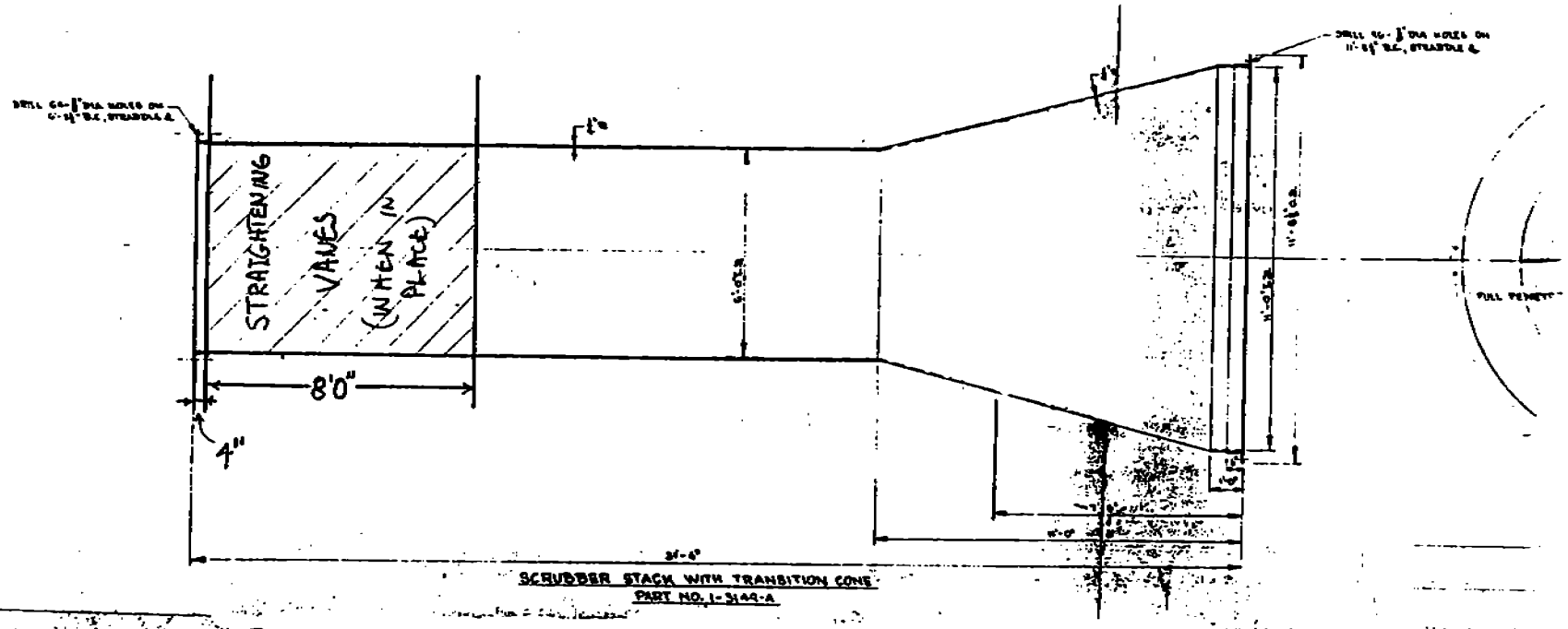
Date 8-27-91 Time 1400

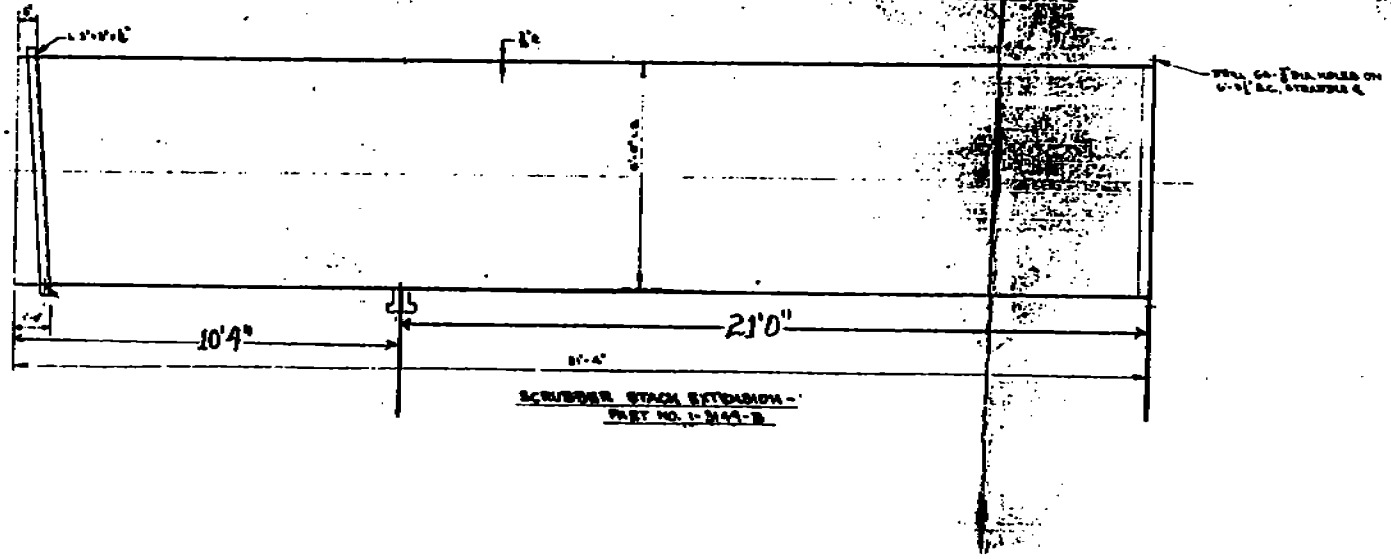
NW

Point #	Delta P	Angle Alpha
1	.30	2
2	.50	1
3	.65	0
4	.50	2
5	.60	4
6	.55	1
7	.30	0
8	.30	3
9	.40	8
10	.40	9
11	.45	11
12	.45	14
Average		4.7°

Average absolute Alpha must not be greater than 20 degrees.

NUMBER FOUR SCRUBBER STACK





CALIBRATIONS

TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration

06/17/92		Console	4
Technician Jack Taylor		Number of Runs	8
Barometric Pressure	30.36	Test Meter Factor	0.9986
Test Meter No.	699357		
Delta H Setting	0.25	Meter Pressure	30.38
Test Meter Initial	759.302		
Test Meter Final	764.392	Test Dry Gas Volume	5.09
Console Meter Inital	805.401		
Console Meter Final	810.777	Console Dry Gas Volume	5.376
Test Meter oF In	73		
Test Meter oF Out	72	Test Average oR	532.5
Console Meter oF In	100		
Console Meter oF Out	83	Console Average oR	551.5
Total Time In Mins.	17.70	Corr Test Meter Vol	5.08
Delta Ha=	1.6275	y Factor=	0.9786
Delta H Setting	0.50	Meter Pressure	30.40
Test Meter Initial	764.700		
Test Meter Final	769.711	Test Dry Gas Volume	5.011
Console Meter Inital	811.401		
Console Meter Final	816.719	Console Dry Gas Volume	5.318
Test Meter oF In	72		
Test Meter oF Out	72	Test Average oR	532
Console Meter oF In	104		
Console Meter oF Out	87	Console Average oR	555.5
Total Time In Mins.	12.72	Corr Test Meter Vol	5.00
Delta Ha=	1.7187	y Factor=	0.9813
Delta H Setting	0.75	Meter Pressure	30.42
Test Meter Initial	770.000		
Test Meter Final	775.007	Test Dry Gas Volume	5.007
Console Meter Inital	817.401		
Console Meter Final	822.688	Console Dry Gas Volume	5.287
Test Meter oF In	74		
Test Meter oF Out	72	Test Average oR	533
Console Meter oF In	104		
Console Meter oF Out	90	Console Average oR	557
Total Time In Mins.	10.40	Corr Test Meter Vol	5.00
Delta Ha=	1.7280	y Factor=	0.9865

Page 2
Console Calibration
06/17/92

Delta H Setting	1.00	Meter Pressure	30.43
Test Meter Initial	775.700		
Test Meter Final	780.711	Test Dry Gas Volume	5.011
Console Meter Inital	823.500		
Console Meter Final	828.769	Console Dry Gas Volume	5.269
Test Meter oF In	74		
Test Meter oF Out	72	Test Average oR	533
Console Meter oF In	109		
Console Meter oF Out	90	Console Average oR	559.5
Total Time In Mins.	8.98	Corr Test Meter Vol	5.00
Delta Ha=	1.7074	y Factor=	0.9945
Delta H Setting	1.25	Meter Pressure	30.45
Test Meter Initial	781.200		
Test Meter Final	791.208	Test Dry Gas Volume	10.008
Console Meter Inital	829.500		
Console Meter Final	840.014	Console Dry Gas Volume	10.514
Test Meter oF In	71		
Test Meter oF Out	71	Test Average oR	531
Console Meter oF In	112		
Console Meter oF Out	92	Console Average oR	562
Total Time In Mins.	16.12	Corr Test Meter Vol	9.99
Delta Ha=	1.7036	y Factor=	1.0030
Delta H Setting	1.50	Meter Pressure	30.47
Test Meter Initial	791.600		
Test Meter Final	801.606	Test Dry Gas Volume	10.006
Console Meter Inital	840.600		
Console Meter Final	851.064	Console Dry Gas Volume	-10.464
Test Meter oF In	71		
Test Meter oF Out	71	Test Average oR	531
Console Meter oF In	109		
Console Meter oF Out	90	Console Average oR	559.5
Total Time In Mins.	14.75	Corr Test Meter Vol	9.99
Delta Ha=	1.7200	y Factor=	1.0025

Page 3
Console Calibration
17-Jun-92

Delta H Setting	1.75	Meter Pressure	30.49
Test Meter Initial	802.200		
Test Meter Final	812.224	Test Dry Gas Volume	10.024
Console Meter Inital	852.201		
Console Meter Final	862.657	Console Dry Gas Volume	10.456
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	112		
Console Meter oF Out	91	Console Average oR	561.5
Total Time In Mins.	13.68	Corr Test Meter Vol	10.01
Delta Ha=	1.7170	y Factor=	1.0071
Delta H Setting	2.00	Meter Pressure	30.51
Test Meter Initial	812.800		
Test Meter Final	822.813	Test Dry Gas Volume	10.013
Console Meter Inital	863.501		
Console Meter Final	873.914	Console Dry Gas Volume	10.413
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	112		
Console Meter oF Out	92	Console Average oR	562
Total Time In Mins.	12.77	Corr Test Meter Vol	10.00
Delta Ha=	1.7121	y Factor=	1.0104
Average Delta Ha=	1.7043	Average y Factor=	0.9955

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

Page 3
Console Calibration
13-Jul-92

Delta H Setting	1.75	Meter Pressure	30.25
Test Meter Initial	873.000		
Test Meter Final	883.000	Test Dry Gas Volume	10
Console Meter Inital	276.100		
Console Meter Final	286.406	Console Dry Gas Volume	10.306
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	100		
Console Meter oF Out	83	Console Average oR	551.5
Total Time In Mins.	13.48	Corr Test Meter Vol	9.99
Delta Ha=	1.7191	y Factor=	1.0011
Delta H Setting	2.00	Meter Pressure	30.27
Test Meter Initial	883.300		
Test Meter Final	893.326	Test Dry Gas Volume	10.026
Console Meter Inital	286.900		
Console Meter Final	297.256	Console Dry Gas Volume	10.356
Test Meter oF In	72		
Test Meter oF Out	71	Test Average oR	531.5
Console Meter oF In	105		
Console Meter oF Out	85	Console Average oR	555
Total Time In Mins.	12.68	Corr Test Meter Vol	10.01
Delta Ha=	1.7185	y Factor=	1.0046
Average Delta Ha=	1.7226	Average y Factor=	0.9926

Post-Calibration

Date 6.17.92 Tech JT

Delta H Magnehelic

Leak Check @ .41 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.41	.40	1
−	.39	.38	1

Leak Check @ 1.07 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	1.07	1.06	1
−	1.05	1.06	1

Leak Check @ 1.79 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	1.79	1.79	0
−	1.90	1.90	0

Delta P Magnehelic

Leak Check @ .42 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.27	.26	1
−	.42	.43	1

Leak Check @ 1.10 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.98	.97	1
−	1.10	1.10	0

Leak Check @ 1.81 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	1.82	1.81	
−	1.81	1.79	2

TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Console 4 Date 6-17-92

Technician SJ

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In	A	33	34.5	1.5
(Must agree: +/- 5.4 oF)	B	70	70.5	0.5
	C	214	213.5	0.5
Dry Gas Meter Out	A	33	34.0	1.0
(Must agree: +/- 5.4 oF)	B	70	70.5	0.5
	C	235	239.5	4.5
Impinger Thermometer # 1	A	34	32.0	2.0
(Must agree: +/- 2 oF)	B	70	71.0	1.0
	C	186	188.0	2.0
Impinger Thermometer # 2	A	34	32.5	1.5
(Must agree: +/- 2 oF)	B	69	71.0 ~~32.0~~	2.0
	C	216	218.0	2.0
Impinger Thermometer # 3	A	69	71.0	2.0
(Must agree: +/- 2 oF)	B	33	31.5	1.5
	C	184	185.5	1.5
HotBox Thermometer # 1	A	70	70.5	0.5
(Must agree: +/- 5.4 oF)	B	165	167.2	2.2
	C	269	266.0	3.0
HotBox Thermometer # 2	A	71	70.5	0.5
(Must agree: +/- 5.4 oF)	B	169	172.5	3.5
	C	266	267.5	1.5
HotBox Thermometer # 3	A	67	70.5	3.5
(Must agree: +/- 5.4 oF)	B	165	166.5	1.5
	C	270	272.5	2.5

TGEA025.WR1 06/13/91

TEXASGULF INC. PHOSPHATE OPERATIONS

Temperature Calibrations

Date 6-18-92

Technician ST

Instrument		Indicator oF	Actual oF	Difference %
Stack Thermocouple Assy # 3	A	70	70.5	0.7
(Must agree: +/- 1.5 %)	A	70	71.0	1.4
	A	70	71.0	1.4
	B	139	139.3	0.2
	B	137	137.2	0.1
	B	133	133.5	0.4
	C	214	213.5	0.2
	C	220	219.5	0.2
	C	221	220	0.5
Stack Thermocouple Assy # 6	A	70	71.0	1.4
(Must agree: +/- 1.5 %)	A	70	71.0	1.4
	A	70	71.0	1.4
	B	140	142.0	1.4
	B	138	139.6	1.1
	B	136	137.0	0.7
	C	220	223	1.3
	C	220	223.5	1.5
	C	220	222.5	1.1
Stack Thermocouple Assy # _____	A			
(Must agree: +/- 1.5 %)	A			
	A			
	B			
	B			
	B			
	C			
	C			
	C			
Probe Heater Assy # 3		717 °F @	75 CFM	
Probe Heater Assy # 6		717 °F @	75 CFM	
Probe Heater Assy # _____				

TGEA026.WR1 06/13/91

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		212°F @ .75 CFM		
Probe Heater Assy # 6		212°F @ .75 CFM		
Probe Heater Assy # _____				

TGEA026.WR1 06/13/91

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	2.2
	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	177	177.8	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

TGEA025.WR1 06/13/91

Post-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	147.7353	FILTER WT. FINAL	
WT. OF RESIDUE	-.00005	NET FILTER WT.	

200 MLS

CONSTANT WTS.		
BEAKER		FILTER
147.7352 ✓		
147.7381		
147.7355 ✓		

TECHNICIAN:

DATE:

SOURCE PERFORMANCE FOR: COAL, #1 & #5 Calciner

MeCl

~~ACETONE~~ BLANK WORKSHEET

Lot # 910309

BEAKER WT. INIT.	(3B) 139.6726	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: Calcinox #2 + 4

PRODUCTION DATA

NUMBER 4 CALCINER----JUNE 30, 1992

$$\frac{90 \text{ tons feed}}{\text{hour}} \rightarrow (90)\frac{(100\% - \%\ H_2O)}{100} = \frac{\text{Tons dry feed}}{\text{hour}}$$

$$\frac{(90 \text{ t feed})}{\text{hour}}\frac{(100 - 9.91)}{100} = (90)\ (0.9009) = \frac{81.1 \text{ t dry feed}}{\text{hour}}$$

Loss on Ignition is calculated each month from assays. In June it was 7.19%.

(So) Coal usage is based on consumption per ton calcine and is $\frac{38.3\# \text{ coal}}{\text{ton calcine}}$ *for a YTD figure.*

Calculate coal usage based on Dry Feed:

Take coal usage $\frac{(38.3\# \text{ coal})}{\text{ton calcine}}$ $\frac{(1 \text{ ton calcine})}{(1.0719 \text{ tons dry feed})}$ =

$\frac{35.73\# \text{ coal}}{(1 \text{ ton dry feed})}$ *or at* $\frac{81.1 \text{ tons dry feed}}{\text{hour}}$ =

$$\frac{(35.73\# \text{ coal})}{\text{ton dry feed}}\frac{(81.1 \text{ tons dry feed})}{\text{hour}} = \frac{2{,}897.70\# \text{ coal}}{\text{hour}}$$

or $\frac{1.449 \text{ tons coal}}{\text{hour}}$

July 2, 1992 ojc

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE CALIBRATION WORKSHEET

Date 7-13-92 Barometric Pressure 30.12 Console No. 4 Technician JT Circle One: Pre Post

SN 699357 Y= .9986

Delta H	Test Meter Initial	Test Meter Final	Console Meter Initial	Console Meter Final	Test Meter oF In	Test Meter oF Out	Console Meter of F In	Console Meter of F In	Time
0.25	830.800	835.806	230.500	235.812	72	71	98	84	17.95
0.50	836.000	841.006	236.200	241.504	72	71	101	86	12.73
0.75	841.201	846.210	241.800	247.100	72	71	104	87	10.37
1.00	846.400	851.412	247.500	252.763	71	70	106	87	8.95
1.25	851.900	861.908	253.600	264.094	71	70	108	88	16.07
1.50	862.300	872.306	264.700	275.159	72	71	109	89	14.67
1.75	873.000	883.000	276.100	286.406	72	71	100	83	13.48
2.00	883.300	893.326	286.900	297.256	72	71	105	85	12.68

Leak ✓ @ 10" Hg .000 movement for 1 min; All points @ 4" Hg