Texasgulf Inc.
elf aquitaine group

P.O. Box 48 Aurora, North Carolina 27806

W.A. Schimming
Manager
Environmental Affairs
(919) 322-4111

September 25, 1991

Mr. Jim 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 Air Quality Permit No. 2331R10, Special Conditions and Limitations No. 7, the No. 4 Calciner was compliance tested for particulate emissions and sulfur dioxide on August 28 and 29, 1991. 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. N. Richardson (w/encl)
J. C. Carrere (w/encl)
00-12-000 (w/o encl)
15-09-027 (w/encl)

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SOURCE PERFORMANCE TEST

CALCINER NUMBER 4

TEXASGULF INC.

PHOSPHATE OPERATIONS

AURORA, NC

AUGUST 28, 1991

PREPARED BY:

JOHN C. CARRERE, JR.
ENV. DATA COORDINATOR

REVIEWED BY:

JIMMY A. HARDY
SR. ENV. TECHNICIAN

REVIEWED BY:

B. A. PEACOCK
SR. ENV. ENGINEER

REVIEWED BY:

MIKE L. ASBY
ENV. LAB SUPERVISOR

TEXASGULF INC. PHOSPHATE OPERATIONS

Summary

On August 28, 1991 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 17.12 pounds per hour. The average dry feed rate during the testing was 86 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 Technician Jimmy Hardy and Environmental Technician Jack Taylor. Senior Environmental Technician Phillip Forest performed the workdown and analyses.

The North Carolina Division of Environmental Management was aware of the test but chose not to have an observer present.

TEXASGULF INC. PHOSPHATE OPERATIONS

Test Summary – Calciner No. 4

Method 5 W/Backhalf	08/28/91	08/28/91	08/28/91
INCLUDES MOISTURE	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	67,579	67,170	67,439
Sample Volume, DSCF	46.410	33.679	34.568
Lbs. of Particulate/Hr. Total	16.24	18.32	16.80
Lbs. of Particulate/Hr. Front	13.58	14.48	14.10
Lbs. of Particulate/Hr. Back	2.66	3.83	2.70
Percent Isokinetic	98.56	97.88	98.38
Average Lbs of Particulate/Hr.(Total)			17.12
Allowable Lbs/Hr.	49.99	49.99	49.99
Average Allowable Pounds/Hr.			49.99
Dry Feed Rate TPH	86	86	86
Average Dry Feed Rate TPH			86

$\frac{0.1058 \times 1000}{46.41} =$

69.23

TEXASGULF INC. PHOSPHATE OPERATIONS

Calciner No. 4

Stack Data Summary Method 5 w/Backhalf

Date	Time	Run #	Velocity	Volumetric Flow	Average Stack
		FPS	FPS	TSCF/Min	Temp (oF)
08/28	09:52	1	46.482	67,579	163
08/28	12:26	2	46.250	67,170	164
08/28	14:27	3	46.454	67,439	164

TEXASGULF memo

Date: 09/13/91

To: Mill Superintendent

From: Environmental Affairs

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

Sample Date	Time
08/28/91	09:52

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	67,579

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	16.24	Total	4.5160
Front Half	13.58	Front Half	3.7770
Back Half	2.66	Back Half	0.7390

M L. Ashley

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

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 = 98.56

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 1
Calciner #4

Rpt. Date	09/13/91		
Smple Date	08/28/91		
Smple Time	09:52		
Barometric Pressure	30.31	Initial Dry Gas Mtr	470.388
Stack Static Pressure	-0.69	Final Dry Gas Mtr	519.907
Stack Diameter	72	Dry Gas Factor	0.9878
Nozzle Diameter	0.2376	Dry Mole Wt Stk Gas	29.744
Pitot Tube Corr	0.84	Stack Pressure	30.26
Sampling Time in Min.	96	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.10
		Feed Rate Dry TPH	86.30
Lbs Coal/Ton of Dry Feed	37.15	Coal Feed TPH	1.60
		Process Weight	87.91

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	157	0.81	1.23	102	94
Pt	2	160	1.11	1.68	107	94
Pt	3	163	1.14	1.73	111	95
Pt	4	164	1.00	1.52	113	96
Pt	5	166	0.89	1.35	116	97
Pt	6	165	0.70	1.06	117	98
Pt	7	165	0.38	0.58	114	100
Pt	8	164	0.31	0.47	113	101
Pt	9	164	0.30	0.45	115	102
Pt	10	163	0.29	0.44	116	103
Pt	11	161	0.30	0.45	116	104
Pt	12	160	0.25	0.39	116	104
Pt	13	160	0.45	0.68	107	102
Pt	14	163	0.58	0.88	113	101
Pt	15	164	0.62	0.94	115	101
Pt	16	164	0.59	0.89	94	94
Pt	17	165	0.65	0.99	107	93
Pt	18	166	0.60	0.91	108	94
Pt	19	164	0.48	0.73	111	95
Pt	20	165	0.29	0.44	112	96
Pt	21	164	0.36	0.55	113	96
Pt	22	164	0.39	0.59	114	97
Pt	23	163	0.41	0.62	115	98
Pt	24	160	0.39	0.59	116	99
Averages		163	0.55	0.84	112	98

Stack oR	623	Average Meter Temp oR	565
Gas Volume Collected		49.519	
Corrected Gas Volume		48.915	
Gas Volume STP		46.410	

Calciner #4
Run 1

08/28/91

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	632.99
Final	405	273	105	643.33

Totals mls of water collected	483
Increase in grams of silica gel	10.34
Total Gas Volume	69.633
Bws	0.3335
One - Bws	0.6665
Wet Molecular Weight of Stack Gas	25.83
Stack Pressure	30.259
Stack Velocity FPS	46.482
Stack Volumetric Flow Rate TSTD Ft3/Min	67579
Particulate Calculations	
Inorganic	
Large Tare, grams	274.81875
Large Final, grams	274.82615
Mr =	0.00740
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	783
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	7.400
Organic	
Small Tare,grams	137.4213
Small Final,grams	137.43460
Mo, mg =	13.3
CPM mg/DSCF =	0.4460
CPM mg/TSCF =	0.2973
CPM mg	20.7000
5% of mass of CPM	1.035
Front Half	
Final Beaker Weight	136.62815
Tare Beaker Weight	136.61385
Final Filter Weight	0.5955
Tare Weight of Filter	0.504
Net Sample Weight	0.1058
Mg Particulate/DSCF	2.2797
Mg Particulate/TSCF	1.5194

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	389.75	325.97	63.78
Lbs Particulate/Hr	16.24	13.58	2.66
Lbs Particulate/Ton of Product	4.5160	3.7770	0.7390

Isokinetic Sampling Rate	98.56
Allowable Part. Emission Rate, Lbs/Hr.	49.99

TEXASGULF memo

Date: 09/13/91

To: Mill Superintendent

From: Environmental Affairs

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

Sample Date	Time
08/28/91	12:26

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	67,170

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	18.32	Total	5.0933
Front Half	14.48	Front Half	4.0278
Back Half	3.83	Back Half	1.0655

M R. Ashley

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

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 = 97.88

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 2
Calciner #4

Rpt. Date 09/13/91
Smple Date 08/28/91
Smple Time 12:26

Barometric Pressure	30.31	Initial Dry Gas Mtr	521.600
Stack Static Pressure	-0.69	Final Dry Gas Mtr	557.474
Stack Diameter	72	Dry Gas Factor	0.9878
Nozzle Diameter	0.2342	Dry Mole Wt Stk Gas	29.744
Pitot Tube Corr	0.84	Stack Pressure	30.26
Sampling Time in Min.	72	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.10
		Feed Rate Dry TPH	86.30
Lbs Coal/Ton of Dry Feed	37.15	Coal Feed TPH	1.60
		Process Weight	87.91

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	157	0.77	1.10	97	94
Pt	2	160	1.00	1.43	101	94
Pt	3	163	1.02	1.46	105	93
Pt	4	165	0.98	1.40	107	94
Pt	5	166	0.85	1.22	111	95
Pt	6	165	0.72	1.03	112	95
Pt	7	164	0.44	0.63	112	96
Pt	8	165	0.38	0.54	113	97
Pt	9	163	0.35	0.50	113	97
Pt	10	165	0.36	0.52	114	98
Pt	11	164	0.31	0.44	114	99
Pt	12	160	0.30	0.43	115	99
Pt	13	161	0.45	0.64	102	98
Pt	14	164	0.54	0.77	108	98
Pt	15	165	0.62	0.89	103	98
Pt	16	164	0.60	0.86	107	96
Pt	17	165	0.62	0.89	112	97
Pt	18	166	0.52	0.75	113	97
Pt	19	165	0.33	0.47	114	98
Pt	20	166	0.30	0.43	114	99
Pt	21	164	0.33	0.47	115	99
Pt	22	165	0.41	0.59	116	100
Pt	23	164	0.40	0.57	117	100
Pt	24	164	0.43	0.62	118	101
Averages		164	0.54	0.78	111	97

Stack oR	624	Average Meter Temp oR	564
Gas Volume Collected		35.874	
Corrected Gas Volume		35.436	
Gas Volume STP		33.679	

Calciner #4 08/28/91
Run 2

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	627.51
Final	390	148	103	635.10

Totals mls of water collected	341
Increase in grams of silica gel	7.59
Total Gas Volume	50.088
Bws	0.3276
One - Bws	0.6724
Wet Molecular Weight of Stack Gas	25.90
Stack Pressure	30.259
Stack Velocity FPS	46.250
Stack Volumetric Flow Rate TSTD Ft3/Min	67170
Particulate Calculations	
Inorganic	
Large Tare, grams	273.7187
Large Final, grams	273.7232
Mr =	0.00450
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	641
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	4.500
Organic	
Small Tare,grams	137.9625
Small Final,grams	137.9796
Mo, mg =	17.1
CPM mg/DSCF =	0.6414
CPM mg/TSCF =	0.4312
CPM mg	21.6000
5% of mass of CPM	1.08
Front Half	
Final Beaker Weight	139.8217
Tare Beaker Weight	139.8064
Final Filter Weight	0.5706
Tare Weight of Filter	0.5042
Net Sample Weight	0.08165
Mg Particulate/DSCF	2.4244
Mg Particulate/TSCF	1.6301

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	439.58	347.62	91.96
Lbs Particulate/Hr	18.32	14.48	3.83
Lbs Particulate/Ton of Product	5.0933	4.0278	1.0655

Isokinetic Sampling Rate	97.88
Allowable Part. Emission Rate, Lbs/Hr.	49.99

TEXASGULF memo

Date: 09/13/91

To: Mill Superintendent

From: Environmental Affairs

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

Sample Date	Time
08/28/91	14:27

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	67,439

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	16.80	Total	4.6709
Front Half	14.10	Front Half	3.9198
Back Half	2.70	Back Half	0.7511

M K. Oxley

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

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 = 98.38

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 3
Calciner #4

Rpt. Date 09/13/91
Smple Date 08/28/91
Smple Time 14:27

Barometric Pressure	30.31	Initial Dry Gas Mtr	560.566
Stack Static Pressure	-0.69	Final Dry Gas Mtr	597.694
Stack Diameter	72	Dry Gas Factor	0.9878
Nozzle Diameter	0.2376	Dry Mole Wt Stk Gas	29.744
Pitot Tube Corr	0.84	Stack Pressure	30.26
Sampling Time in Min.	72	Feed Rate, TPH	96
		Bulk Moisture (Lab Analysis)	10.10
		Feed Rate Dry TPH	86.30
Lbs Coal/Ton of Dry Feed	37.15	Coal Feed TPH	1.60
		Process Weight	87.91

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	161	0.81	1.23	109	99
Pt	2	164	1.01	1.53	114	99
Pt	3	165	1.04	1.58	115	99
Pt	4	166	1.02	1.55	116	99
Pt	5	164	0.91	1.38	117	100
Pt	6	165	0.68	1.03	118	100
Pt	7	166	0.39	0.59	118	100
Pt	8	165	0.31	0.47	117	101
Pt	9	165	0.30	0.46	117	101
Pt	10	165	0.24	0.36	116	102
Pt	11	163	0.29	0.44	117	102
Pt	12	159	0.22	0.33	117	103
Pt	13	161	0.45	0.68	108	102
Pt	14	164	0.55	0.83	115	102
Pt	15	165	0.62	0.94	117	102
Pt	16	166	0.58	0.88	118	102
Pt	17	165	0.60	0.91	118	102
Pt	18	166	0.57	0.87	118	102
Pt	19	164	0.39	0.59	118	102
Pt	20	165	0.32	0.49	116	103
Pt	21	164	0.39	0.59	116	102
Pt	22	164	0.49	0.74	116	102
Pt	23	164	0.50	0.76	116	103
Pt	24	160	0.51	0.77	115	103
Averages		164	0.55	0.83	116	101

Stack oR	624	Average Meter Temp oR	569

Gas Volume Collected	37.128
Corrected Gas Volume	36.675
Gas Volume STP	34.568

Calciner #4 08/28/91
Run 3

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	645.73
Final	383	176	104	653.51

Totals mls of water collected	363
Increase in grams of silica gel	7.78
Total Gas Volume	52.022
Bws	0.3355
One - Bws	0.6645
Wet Molecular Weight of Stack Gas	25.80
Stack Pressure	30.259
Stack Velocity FPS	46.454
Stack Volumetric Flow Rate TSTD Ft3/Min	67439
Particulate Calculations	
Inorganic	
Large Tare, grams	272.7605
Large Final, grams	272.7631
Mr =	0.00260
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	663
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	2.600
Organic	
Small Tare,grams	138.6412
Small Final,grams	138.6543
Mo, mg =	13.15
CPM mg/DSCF =	0.4556
CPM mg/TSCF =	0.3028
CPM mg	15.7500
5% of mass of CPM	0.7875
Front Half	
Final Beaker Weight	138.8317
Tare Beaker Weight	138.8199
Final Filter Weight	0.5747
Tare Weight of Filter	0.5043
Net Sample Weight	0.0822
Mg Particulate/DSCF	2.3779
Mg Particulate/TSCF	1.5801

	Total	Front Half	Back Half
Total Particulates			
Lbs Particulate/Day	403.11	338.29	64.82
Lbs Particulate/Hr	16.80	14.10	2.70
Lbs Particulate/Ton of Product	4.6709	3.9198	0.7511

Isokinetic Sampling Rate	98.38
Allowable Part. Emission Rate, Lbs/Hr.	49.99

RAW DATA

Box #1

TEXASGULF INC. PHOSPHATE OEPRATIONS

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-28-91 Plant CALCINER # 4

Run No. 1 Time 0952

	Filter	Front Half Beaker "B"	Back Half Inorganic Beaker C	Back Half Inorganic Beaker D	Organic Beaker A
Tare	.5040	136.61385	134.26475	140.5540	137.4213
1st Weight					
2nd Weight					
3rd Weight					
4th Weight					
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5955	136.62815	134.26895	140.5573	137.4346
	0.0915	0.0143	0.00410	.0033	.0133

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	238+167	244+29	105	Post (grams)	643.33
Pre Volume (mls)	100	100	100	Pre (grams)	632.99
	305	173	5		10.34

Revised 07/11/91
TGEA027.WR1

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #4 Date 8-28-91 Time 0952 Run 1

Mtr Box 4 Meter H@ 1.7409 K Factor 1.5154649 Barometric 30.31

Assmd Moist 34% Nozzle Dia. .2376 Dry Gas X .9878 Console Oper JT

	PT	Simple Min.	Head Delta P	Orifice Delta H	Meter Ft3 470,388	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
0952	1	4	.81	1.23	477.9	102	94	157	230		5.5
	2	8	1.11	1.68	475.7	107	94	160	265		8.0
	3	12	1.14	1.73	478.7	111	95	163	245		8.0
	4	16	1.00	1.52	481.6	113	96	164	225		7.0
	5	20	.89	1.35	484.3	116	97	166	240		6.5
	6	24	.70	1.06	488.7	117	98	165	245		5.5
	7	28	.38	.58	488.5	114	100	165	250		3.5
	8	32	.31	.47	490.0	113	101	164	230	69	3.0
	9	36	.30	.45	491.6	115	102	164	235	69	3.0
	10	40	.29	.44	493.2	116	103	163	240	70	3.0
	11	44	.30	.45	494.7	116	104	161	240	70	3.0
1040	12	46	.25	.39	496.201	116	104	160	225	70	3.0
1050	13	4	.45	.68	498.0	107	102	160	250		4.0
	14	8	.58	.88	500.2	113	101	163	225		5.0
1102	15	12	.62	.94	502.5	115	101	164	245		5.5
1124	16	16	.59	.89	504.6	94	94	164	230		5.0
	17	20	.65	.99	506.9	107	93	165	245		5.5
	18	24	.60	.91	509.1	108	94	166	240		5.5
	19	28	.48	.73	511.1	111	95	164	225		5.0
	20	32	.29	.44	512.7	112	96	165	240	70	4.0
	21	36	.36	.55	514.5	113	96	164	245	72	4.5
	22	40	.34	.59	516.2	114	97	164	240	69	5.0
	23	44	.41	.62	518.1	115	98	163	225	69	5.0
1200	24	48	.39	.59	519.907	116	99	160	235	70	4.8
	Total		17.3471								
	Avg										

Probe and Sample Box Operator JH

Pre Leak Check At 10.0 "Hg = .006 C.F.M. Post Leak Check At 20 "Hg .005 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

1.5154649 = (846.72 x (.003187) x (1.7409) x (.7056) x (.4356) x (1) x (39.744/35.751) x (567/604) x (1))

TGEA021.WR1

down 1110? Hot box element went out

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box #2

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-28-91 Plant CALCINER #4

Run No. 2 Time 1226

	Filter	Front Half Beaker "E"	Back Half Inorganic Beaker H	Back Half Inorganic Beaker G	Organic Beaker F
Tare	.5042	139.8064	135.4060	138.31265	137.9625
1st Weight					
2nd Weight					
3rd Weight					
4th Weight					
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.57055	139.8217	135.40785	138.3153	137.9796
	.06635	.0153	.00185	.00265	.0165

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	240 + 150	148	103	Post (grams)	635.10
Pre Volume (mls)	100	100	100	Pre (grams)	627.51

Revised 07/11/91
TGEA027.WR1

390 48 3 7.59

348.59

#2

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CA1 Date 8-28-91 Time 1226 Run 2

Mtr Box 4 Meter H@ 1.7409 K Factor 1.4331087 Barometric 30.31

Assmd Moist 34% Nozzle Dia. .2342 Dry Gas X .9878 Console Oper JT

PT	Simple Min.	Head Delta P	Orifice Delta H	Meter Ft3 521.600	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
1	3	.77	1.10	523.4	97	94	157	240		6.0
2	6	1.00	1.43	525.2	101	94	160	225		9.0
3	9	1.02	1.46	527.3	105	93	163	225		10.0
4	12	.98	1.40	529.3	107	94	165	223		8.5
5	15	.85	1.22	531.2	111	95	166	225		7.3
6	18	.72	1.03	533.0	112	95	165	228		6.0
7	21	.44	.63	534.5	112	96	164	230		4.5
8	24	.38	.54	535.7	113	97	165	245	72	4.0
9	27	.35	.50	537.0	113	97	163	240	72	3.8
10	30	.36	.52	538.3	114	98	165	235	71	4.0
11	33	.31	.44	539.4	114	99	164	225	70	3.2
12	36	.30	.43	540.637	115	99	160	225	70	3.2
13	3	.45	.64	542.0	102	98	161	225		5.0
14	6	.54	.77	543.5	108	98	164	223		5.5
15	9	.62	.89	545.1	103	98	165	230		5.5
16	12	.60	.86	546.6	107	96	164	240		5.3
17	15	.62	.89	548.2	112	97	165	235		5.5
18	18	.52	.75	549.8	113	97	166	240		5.2
19	21	.33	.47	551.1	114	98	165	235		4.0
20	24	.30	.43	552.3	114	99	166	240	70	3.8
21	27	.33	.47	553.4	115	99	164	235	71	4.0
22	30	.41	.59	554.7	116	100	165	230	72	4.9
23	33	.40	.57	556.1	117	100	164	235	72	4.5
24	36	.43	.62	557.474	118	101	164	235	72	5.0
Total										
Avg		17.3291								

Probe and Sample Box Operator JT

Pre Leak Check At 10.0 "Hg = ≤.001 C.F.M. Post Leak Check At 10 "Hg .006 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

$$1.4331087 = (846.72 \times (.0030085) \times (1.7409) \times (.7056) \times (.4356) \times (\checkmark) \times (\frac{29.744}{29.751}) \times (\frac{568}{674}) \times (1))$$

TGEA021.WR1

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box #3

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 8-28-91 Plant CALCINER # 4

Run No. 3 Time 1427

	Filter	Front Half Beaker I	Back Half Inorganic Beaker K	Back Half Inorganic Beaker L	Organic Beaker J
Tare	.5043	138.81985	133.7381	139.0224	138.64115
1st Weight					
2nd Weight					
3rd Weight					
4th Weight					
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.5747	138.83165	133.7394	139.0237	138.6543
	.0704	.0118	.0013	.0013	.01315

.09795

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	243+140	176	104	Post (grams)	653.51
Pre Volume (mls)	100	100	100	Pre (grams)	645.73
	283	76	4		7.78

370.78

Revised 07/11/91
TGEA027.WR1

TEXASGULF INC. PHOSPHATE OPERATIONS

of 3

CONSOLE WORKSHEET

Plant Calcined 4 Date 8-28-91 Time 1427 Run 3

Mtr Box 4 Meter H@ 1.7409 K Factor 1.5181377 Barometric 30.31

Assmd Moist .34% Nozzle Dia. .2376 Dry Gas X .9878 Console Oper JT

	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
					560.566						
1427	1	3	.81	1.23	562.4	109	99	161	250		6.0
	2	6	1.01	1.53	564.5	114	99	164	225		9.0
	3	9	1.04	1.58	566.6	115	99	165	235		9.0
	4	12	1.02	1.55	568.8	116	99	166	255		9.0
	5	15	.91	1.38	571.0	117	100	164	245		7.5
	6	18	.68	1.03	572.7	118	100	165	225		4.0
	7	21	.39	.59	574.1	118	100	166	228		4.0
	8	24	.31	.47	575.3	117	101	165	255		3.5
	9	27	.30	.46	576.5	117	1.01	165	255	72	3.5
	10	30	.24	.36	577.6	116	102	165	235	72	3.0
	11	33	.29	.44	578.7	117	102	163	250	70	3.5
1503	12	36	.22	.33	579.784	117	103	159	235	70	3.0
~ 1508	13	3	.45	.68	581.1	108	102	161	225		4.0
	14	6	.55	.83	582.6	115	102	164	225		5.2
	15	9	.62	.94	584.3	117	102	165	230		6.0
	16	12	.58	.88	585.9	118	102	166	235		5.5
	17	15	.60	.91	587.6	118	102	165	240		5.8
	18	18	.57	.87	589.2	118	102	166	226		5.8
	19	21	.39	.59	590.6	118	102	164	223		5.5
	20	24	.32	.49	591.8	116	103	165	245	70	4.0
	21	27	.39	.59	593.1	116	102	164	250	70	4.8
	22	30	.49	.74	594.6	116	102	164	245	69	5.2
	23	33	.50	.76	596.1	116	103	164	225	70	5.5
1544	24	36	.51	.77	597.694	115	103	160	245	70	5.5
	Total										
	Avg		17.360					164			

Probe and Sample Box Operator JH

Pre Leak Check At 10.0 "Hg = .006 C.F.M. Post Leak Check At 9.0 "Hg .003 C.F.M.

Pitot Leak Check Red ✓ Green ✓

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

1.5181377 = (846.72 x (1003187) x (1.7409) x (.7056) x (.4356) x (29.744 / 29.751) x (568 / 634) x (1)

TGEA021.WR1

Texasgulf Chemicals Co.

ISOKINETIC WORKSHEET

DATE: 8-28-91 STACK: Calciner 4 TIME: 0948

METER BOX: 4 OPERATOR JT

1. NOZZLE DIA. (A) 8A .2382 / 14A .2349 " (B) .2368 / .2328 " (C) .2379 / .2348 "

.9878

@ - .2376

Avg. @ - .2392

2. ΔH @ 1.7409

3. C_p .84 Assy. #

4. BAROMETRIC PRESSURE (P_b) 30.31 "Hg

ΔP STATIC .69 "H_2

5. STACK PRESSURE (P_s) 30.36 "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 = 691 34 % H_2O

11. M_d 29.744 lb./lb. - MOLE

12. M_s 25,751 lb./lb. - MOLE

13. T_s 164 °F + 460 = 624 °R

14. T_m 107 °F + 460 = 567 °R

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

Preliminary

	ΔP	T_s
1.	.80	
2.	1.11	~~169~~ 157
3.	1.18	163
4.	1.01	163
5.	.82	165
6.	.70	166
7.	.38	165
8.	.32	163
9.	.30	165
10.	.25	163
11.	.29	163
12.	.27	161

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

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

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

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

$29.744 = \left((0.44) \cdot (\quad)\right) + \left((0.32) \cdot (\quad)\right) + \left((0.28) \cdot (\quad + \quad)\right)$

(4) $M_s = \left[\left(M_d\right) \cdot \left(1 - B_{ws}\right)\right] + \left[(18) \times (B_{ws})\right]$ (.66; 6.12)

$25.751 = \left[(\quad) \cdot (\quad)\right] + \left[(18) \cdot (\quad)\right]$

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

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

$\_\_\_\_\_ = (846.72) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot (\quad) \cdot \left(\frac{\quad}{\quad}\right)\left(\frac{{}^\circ R}{{}^\circ R}\right)$

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

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

Orsat Analyses

Date 8-27-91 Plant Calciner #4 Technician JT

Pb _____ Stack Temp _____ Ambient Temp _____

Dry Bulb Temp _____ Wet Bulb Temp _____

Stack Static Press _____ Stack Press _____

		CO2	O2	CO+N
Run 1	Burette Reading	7.4	21.3	21.3
	Percent	7.4	13.9	78.7
Run 2	Burette Reading	7.4	21.4	21.4
	Percent	7.4	14.0	78.6
Run 3	Burette Reading	7.4	21.4	21.4
	Percent	7.4	14.0	78.6
	AVG	7.4	14.0	78.6

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

3.256 4.48 22.008

Md = ((0.44 * %CO2) + (0.32 * %O2) + (0.28 * %CO+N))

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

V.P.= _____

Bws = _____

Md = 29.744

Ms = _____

Leak Check - no movement for 5 minutes

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.

CALIBRATIONS

TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration *PRE*

07/25/91		Console	4
Technician Jack Taylor		Number of Runs	8
Barometric Pressure	30.10	Test Meter Factor	0.9976
Test Meter No.	699357		
Delta H Setting	0.25	Meter Pressure	30.12
Test Meter Initial	781.501		
Test Meter Final	786.505	Test Dry Gas Volume	5.004
Console Meter Inital	803.900		
Console Meter Final	809.159	Console Dry Gas Volume	5.259
Test Meter oF In	76		
Test Meter oF Out	75	Test Average oR	535.5
Console Meter oF In	97		
Console Meter oF Out	86	Console Average oR	551.5
Total Time In Mins.	17.78	Corr Test Meter Vol	4.99
Delta Ha=	1.7367	y Factor=	0.9770
Delta H Setting	0.50	Meter Pressure	30.14
Test Meter Initial	787.000		
Test Meter Final	792.003	Test Dry Gas Volume	5.003
Console Meter Inital	809.900		
Console Meter Final	815.271	Console Dry Gas Volume	5.371
Test Meter oF In	77		
Test Meter oF Out	76	Test Average oR	536.5
Console Meter oF In	105		
Console Meter oF Out	91	Console Average oR	558
Total Time In Mins.	12.720	Corr Test Meter Vol	4.99
Delta Ha=	1.7643	y Factor=	0.9653
Delta H Setting	0.75	Meter Pressure	30.16
Test Meter Initial	792.500		
Test Meter Final	797.521	Test Dry Gas Volume	5.021
Console Meter Inital	815.900		
Console Meter Final	821.181	Console Dry Gas Volume	5.281
Test Meter oF In	78		
Test Meter oF Out	76	Test Average oR	537
Console Meter oF In	109		
Console Meter oF Out	92	Console Average oR	560.5
Total Time In Mins.	10.27	Corr Test Meter Vol	5.01
Delta Ha=	1.7083	y Factor=	0.9882

Console Calibration
07/25/91

Delta H Setting	1.00	Meter Pressure	30.17
Test Meter Initial	798.100		
Test Meter Final	803.113	Test Dry Gas Volume	5.013
Console Meter Inital	822.200		
Console Meter Final	827.441	Console Dry Gas Volume	5.241
Test Meter oF In	78		
Test Meter oF Out	76	Test Average oR	537
Console Meter oF In	105		
Console Meter oF Out	92	Console Average oR	558.5
Total Time In Mins.	8.880	Corr Test Meter Vol	5.00
Delta Ha=	1.7145	y Factor=	0.9900

Delta H Setting	1.25	Meter Pressure	30.19
Test Meter Initial	803.600		
Test Meter Final	813.614	Test Dry Gas Volume	10.014
Console Meter Inital	828.401		
Console Meter Final	838.856	Console Dry Gas Volume	10.455
Test Meter oF In	78		
Test Meter oF Out	76	Test Average oR	537
Console Meter oF In	108		
Console Meter oF Out	93	Console Average oR	560.5
Total Time In Mins.	15.97	Corr Test Meter Vol	9.99
Delta Ha=	1.7308	y Factor=	0.9943

Delta H Setting	1.50	Meter Pressure	30.21
Test Meter Initial	814.200		
Test Meter Final	824.204	Test Dry Gas Volume	10.004
Console Meter Inital	839.700		
Console Meter Final	850.125	Console Dry Gas Volume	10.425
Test Meter oF In	79		
Test Meter oF Out	77	Test Average oR	538
Console Meter oF In	109		
Console Meter oF Out	93	Console Average oR	561
Total Time In Mins.	14.62	Corr Test Meter Vol	9.98
Delta Ha=	1.7491	y Factor=	0.9946

Console Calibration
25-Jul-91

Delta H Setting	1.75	Meter Pressure	30.23
Test Meter Initial	824.700		
Test Meter Final	834.707	Test Dry Gas Volume	10.007
Console Meter Inital	850.901		
Console Meter Final	861.287	Console Dry Gas Volume	10.386
Test Meter oF In	79		
Test Meter oF Out	77	Test Average oR	538
Console Meter oF In	107		
Console Meter oF Out	92	Console Average oR	559.5
Total Time In Mins.	13.58	Corr Test Meter Vol	9.98
Delta Ha=	1.7643	y Factor=	0.9954
Delta H Setting	2.00	Meter Pressure	30.25
Test Meter Initial	835.402		
Test Meter Final	845.436	Test Dry Gas Volume	10.034
Console Meter Inital	862.301		
Console Meter Final	872.699	Console Dry Gas Volume	10.398
Test Meter oF In	79		
Test Meter oF Out	77	Test Average oR	538
Console Meter oF In	108		
Console Meter oF Out	93	Console Average oR	560.5
Total Time In Mins.	12.73	Corr Test Meter Vol	10.01
Delta Ha=	1.7592	y Factor=	0.9981
Average Delta Ha=	1.7409	Average y Factor=	0.9878

Console Calibration Worksheet

Date 9-4-91 Barometric Press. 30.23 Console # 4 Technician J. HARVEY Circle One: Pre Post

Delta H	Tst Mtr Init	Tst Mtr Final	Tst Mtr dF In	Tst Mtr dF Out	Orsl Mtr Init	Orsl Mtr Final	Orsl Mtr dF In	Orsl Mtr dF Out	Time
.25	883.500	888.501	72	70	804.207	809.583	1.6	96	18.37
.50	888.501	893.501	73	71	809.553	814.930	1.3	97	12.50
.75	893.701	898.703	72	72	815.145	820.495	1.0	97	10.50
1.00	898.703	903.705	72	72	820.495	825.836	1.1	97	9.07
1.25	903.705	914.009	72	72	825.836	836.779	1.5	97	16.78
1.50	914.009	924.001	72	72	836.779	847.358	1.7	99	14.90
1.75	924.004	934.028	73	72	847.358	858.013	1.7	99	13.87
2.00	934.025	944.105	73	72	858.013	869.174	1.6	100	13.05

Leak ✓ @ 15" Hg : 000 CFM

Test Hose 699357

TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration *POST*

09/04/91		Console	4
Technician Jimmy Hardy		Number of Runs	8
Barometric Pressure	30.23	Test Meter Factor	0.9976
Test Meter No.	699357		
Delta H Setting	0.25	Meter Pressure	30.25
Test Meter Initial	883.500		
Test Meter Final	888.501	Test Dry Gas Volume	5.001
Console Meter Inital	804.207		
Console Meter Final	809.583	Console Dry Gas Volume	5.376
Test Meter oF In	72		
Test Meter oF Out	70	Test Average oR	531
Console Meter oF In	106		
Console Meter oF Out	96	Console Average oR	561
Total Time In Mins.	18.37	Corr Test Meter Vol	4.99
Delta Ha=	1.7864	y Factor=	0.9798
Delta H Setting	0.50	Meter Pressure	30.27
Test Meter Initial	888.501		
Test Meter Final	893.501	Test Dry Gas Volume	5
Console Meter Inital	809.583		
Console Meter Final	814.930	Console Dry Gas Volume	5.347
Test Meter oF In	73		
Test Meter oF Out	71	Test Average oR	532
Console Meter oF In	110		
Console Meter oF Out	97	Console Average oR	563.5
Total Time In Mins.	12.800	Corr Test Meter Vol	4.99
Delta Ha=	1.7342	y Factor=	0.9869
Delta H Setting	0.75	Meter Pressure	30.29
Test Meter Initial	893.701		
Test Meter Final	898.703	Test Dry Gas Volume	5.002
Console Meter Inital	815.149		
Console Meter Final	820.495	Console Dry Gas Volume	5.346
Test Meter oF In	72		
Test Meter oF Out	72	Test Average oR	532
Console Meter oF In	113		
Console Meter oF Out	97	Console Average oR	565
Total Time In Mins.	10.5	Corr Test Meter Vol	4.99
Delta Ha=	1.7444	y Factor=	0.9895

Console Calibration

09/04/91

Delta H Setting	1.00	Meter Pressure	30.30
Test Meter Initial	898.703		
Test Meter Final	903.705	Test Dry Gas Volume	5.002
Console Meter Inital	820.495		
Console Meter Final	825.830	Console Dry Gas Volume	5.335
Test Meter oF In	72		
Test Meter oF Out	72	Test Average oR	532
Console Meter oF In	114		
Console Meter oF Out	97	Console Average oR	565.5
Total Time In Mins.	9.070	Corr Test Meter Vol	4.99
Delta Ha=	1.7339	y Factor=	0.9918

Delta H Setting	1.25	Meter Pressure	30.32
Test Meter Initial	903.705		
Test Meter Final	914.009	Test Dry Gas Volume	10.304
Console Meter Inital	825.830		
Console Meter Final	836.779	Console Dry Gas Volume	10.949
Test Meter oF In	72		
Test Meter oF Out	72	Test Average oR	532
Console Meter oF In	115		
Console Meter oF Out	97	Console Average oR	566
Total Time In Mins.	16.78	Corr Test Meter Vol	10.28
Delta Ha=	1.7466	y Factor=	0.9958

Delta H Setting	1.50	Meter Pressure	30.34
Test Meter Initial	914.009		
Test Meter Final	924.004	Test Dry Gas Volume	9.995
Console Meter Inital	836.779		
Console Meter Final	847.388	Console Dry Gas Volume	10.609
Test Meter oF In	72		
Test Meter oF Out	72	Test Average oR	532
Console Meter oF In	117		
Console Meter oF Out	99	Console Average oR	568
Total Time In Mins.	14.9	Corr Test Meter Vol	9.97
Delta Ha=	1.7502	y Factor=	0.9998

Console Calibration
04-Sep-91

Delta H Setting	1.75	Meter Pressure	30.36
Test Meter Initial	924.004		
Test Meter Final	934.028	Test Dry Gas Volume	10.024
Console Meter Inital	847.388		
Console Meter Final	858.013	Console Dry Gas Volume	10.625
Test Meter oF In	73		
Test Meter oF Out	72	Test Average oR	532.5
Console Meter oF In	117		
Console Meter oF Out	99	Console Average oR	568
Total Time In Mins.	13.87	Corr Test Meter Vol	10.00
Delta Ha=	1.7624	y Factor=	0.9997
Delta H Setting	2.00	Meter Pressure	30.38
Test Meter Initial	934.028		
Test Meter Final	944.105	Test Dry Gas Volume	10.077
Console Meter Inital	858.013		
Console Meter Final	868.674	Console Dry Gas Volume	10.661
Test Meter oF In	73		
Test Meter oF Out	72	Test Average oR	532.5
Console Meter oF In	116		
Console Meter oF Out	100	Console Average oR	568
Total Time In Mins.	13.03	Corr Test Meter Vol	10.05
Delta Ha=	1.7590	y Factor=	1.0009
Average Delta Ha=	1.7521	Average y Factor=	0.9930

TEXASGULF INC. PHOSPHATE OPERATIONS

PRE

Temperature Calibrations

Console #4 Date 6-28 & 7-1-91

Technician P.A FOREST

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In (Must agree: +/- 5.4 oF)	A	48	49.4	1.4
	B	74	74.8	0.8
	C	127	125.9	1.1
Dry Gas Meter Out (Must agree: +/- 5.4 oF)	A	46	46.5	0.5
	B	75	74.8	0.2
	C	126	125.0	1.0
Impinger Thermometer # 1 (Must agree: +/- 2 oF)	A	42	41.4	0.6
	B	70	70.8	0.8
	C	122	123.2	1.2
Impinger Thermometer # 2 (Must agree: +/- 2 oF)	A	41	41.4	0.4
	B	70	70.8	0.8
	C	122	123.2	1.2
Impinger Thermometer # 3 (Must agree: +/- 2 oF)	A	41	41.4	0.4
	B	71	70.8	0.2
	C	122	123.2	1.2
HotBox Thermometer # 1 (Must agree: +/- 5.4 oF)	A	68	71.0 ~~70.8~~ PAF	3.0
	B	121	122.2	1.2
	C	251	252.0	1.0
HotBox Thermometer # 2 (Must agree: +/- 5.4 oF)	A	68	71.0	3.0
	B	120	122.2	2.2
	C	251	252.0	1.0
HotBox Thermometer # 3 (Must agree: +/- 5.4 oF)	A	67	71.0	4.0
	B	119	122.2	3.2
	C	249	252.0	3.0

Pre

Temperature Calibrations

Please Circle One: Pre Post Console 4

Technician JT Date 6-10-91

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In	A	32	35.0	3.0
(Must agree: +/-5.4 oF)	B	71	73.0	2.0
	C	174	172.6	1.4
Dry Gas Meter Out	A	32	35.0	3.0
(Must agree: +/-5.4 oF)	B	72	73.0	1.0
	C	175	173.8	1.2
Impinger Thermometer # 1	A	36	34.0	2.0
(Must agree: +/-2 oF)	B	74	73.0	1.0
	C	174	175.8	1.8
Impinger Thermometer # 2	A	35	34.0	1.0
(Must agree: +/-2 oF)	B	74	73.0	1.0
	C	174	175.8	1.8
Impinger Thermometer # 3	A	36	34.0	2.0
(Must agree: +/-2 oF)	B	75	73.0	2.0
	C	175	175.8	0.8
HotBox Thermometer # 1	A	70	73.0	3.0
(Must agree: +/-5.4 oF)	B	258	258.5	0.5
HotBox Thermometer # 2	A	70	73.0	3.0
(Must agree: +/-5.4 oF)	B	257	260.2	3.2
HotBox Thermometer # 3	A	69	73.0	4.0
(Must agree: +/-5.4 oF)	B	256	258.5	2.5
Probe Heater Assy # B		212°F @	.75 cfm	
Probe Heater Assy # 14		22°F @	175 cfm	
Probe Heater Assy #				

PRE

Temperature Calibrations cont'd.

Instrument		Indicator oF	Actual oF	Difference %
Stack Thermocouple Assy #_B_	A	71	71.5	.6
(Must agree: +/-1.5%)	A	70	71.0	1.4
	A	70	71.0	1.4
	B	131	132.4	1.0
	B	130	130.9	.6
	B	132	133.4	1.0
	C	167	168.8	1.0
	C	168	170.2	1.3
	C	168	170	1.2
Stack Thermocouple Assy #_M_	A	71	72.0	1.4
(Must agree: +/-1.5%)	A	71	71.5	0.6
	A	70	71.0	1.4
	B	133	134.6	1.2
	B	130	131.8	1.4
	B	129	131.0	1.5
	C	168	169.6	0.9
	C	170	172.6	1.5
	C	170	172.2	1.3
Stack Thermocouple Assy #____	A			
(Must agree: +/-1.5%)	A			
	A			
	B			
	B			
	B			
	C			
	C			
	C			

TEXASGULF INC. PHOSPHATE OPERATIONS

POST

Temperature Calibrations

Date 9-5-91

Technician J. HARDY

Instrument		Indicator oF	Actual oF	Difference %
Stack Thermocouple Assy # 8 (Must agree: +/- 1.5 %)	A	70	71.6	2.2
	A	70	72.2	3.0
	A	71	72.6	2.2
	B	~~149~~ 152	150 8 ~~147.8~~	0.8
	B	~~145~~ 150	147 ~~145.9~~	2.0
	B	152 ~~147 150~~	152.8 ~~150.4~~	0.5
	C	220	218	0.9
	C	220	219	0.5
	C	218	217	0.5
Stack Thermocouple Assy # 14 (Must agree: +/- 1.5 %)	A	72	72.2	0.3
	A	72	72.8	1.1
	A	72	73.2	1.6
	B	149	149.8	0.5
	B	148	148.2	0.1
	B	147	146.4	0.4
	C	218	218	0
	C	218	221	1.4
	C	218	218	0
Stack Thermocouple Assy # _____ (Must agree: +/- 1.5 %)	A			
	A			
	A			
	B			
	B			
	B			
	C			
	C			
	C			
Probe Heater Assy # _____				
Probe Heater Assy # 14		220°±1.75	CFM	
Probe Heater Assy # 8		2200±15	CFM	

TGEA026.WR1 06/13/91

TEXASGULF INC. PHOSPHATE OPERATIONS

Post

Temperature Calibrations

534.AH

Console #4 Date 9.4/5-91

Technician J.HARDY

Instrument		Indicator oF	Actual oF	Difference oF
Dry Gas Meter In (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	64	66.8	3.2
	C	157	159.2	2.2
Dry Gas Meter Out (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	64	60.8	3.2
	C	158	159.2	1.2
Impinger Thermometer # 1 (Must agree: +/- 2 oF)	A	74	75.6	1.6
	B	1710	176	0
	C	212	211.5	0.5
Impinger Thermometer # 2 (Must agree: +/- 2 oF)	A	74	75.6	1.6
	B	~~172~~ 174	176	2.0
	C	210	211.5	1.5
Impinger Thermometer # 3 (Must agree: +/- 2 oF) (Lev→)	A	~~70~~ 70.2	~~75~~ 72	1.8
	B	174	176	2
	C	212	211.5	0.5
HotBox Thermometer # 1 (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	176	176	0
	C	215	211	4
HotBox Thermometer # 2 (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	175	176	1
	C	210	211	1
HotBox Thermometer # 3 (Must agree: +/- 5.4 oF)	A	75	75.6	0.6
	B	176	176	0
	C	210	211	1

PRE
~~Post~~-Calibration

Date 6-26-91 Tech P.A. Forest

Delta H Magnehelic

Leak Check @ 1.92 " H20 for 3 minutes.

	Gauge	Manometer	Delta
SITIVE	1.92	1.91	0.01
GATIVE	1.73	1.72	0.01

Leak Check @ 1.06 " H20 for 3 minutes.

	Gauge	Manometer	Delta
SITIVE	1.06	1.05	0.01
GATIVE	0.99	0.98	0.01

Leak Check @ 0.41 " H20 for 3 minutes.

	Gauge	Manometer	Delta
OSITIVE	0.41	0.40	0.00
EGATIVE	0.22	0.21	0.01

Delta P Magnehelic

Leak Check @ 1.79 " H20 for 3 minutes.

	Gauge	Manometer	Delta
Positive	1.79	1.78	0.01
EGATIVE	1.81	1.80	0.01

Leak Check @ 1.01 " H20 for 3 minutes.

	Gauge	Manometer	Delta
Positive	1.01	1.00	0.01
Negative	0.91	0.92	0.01

Leak Check @ 0.10 " H20 for 3 minutes.

	Gauge	Manometer	Delta
Positive	0.10	0.10	0.00
Negative	0.10	0.91	0.01

Console #4

Post-Calibration

Date 9-4-91 Tech J. HAIRD

Delta H Magnehelic

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
185	183	.02

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
.97	.96	.01

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
.29	.27	.02

Delta P Magnehelic

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
~~184~~ 182	181	.01

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
~~182~~	~~181~~	
104	104	0

Leak Check @ ✓ " H20 for 3 minutes.

Gauge	Manometer	Delta
.38	.38	0

ACETONE BLANK WORKSHEET

Lot # 07021

BEAKER WT. INIT.	(10) 147.7745	FILTER WT. INIT.	
BEAKER WT. FINAL	147.7735	FILTER WT. FINAL	
WT. OF RESIDUE	-.0010	NET FILTER WT.	

200 MLS

CONSTANT WTS.		
BEAKER		FILTER
147.7732		
147.7735		

TECHNICIAN: JT

DATE: 8-21-91

SOURCE PERFORMANCE FOR: Calc.wer. #2 + 4

MeCl

~~ACETONE~~ BLANK WORKSHEET

Lot # 910309

BEAKER WT. INIT.	(38) 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		

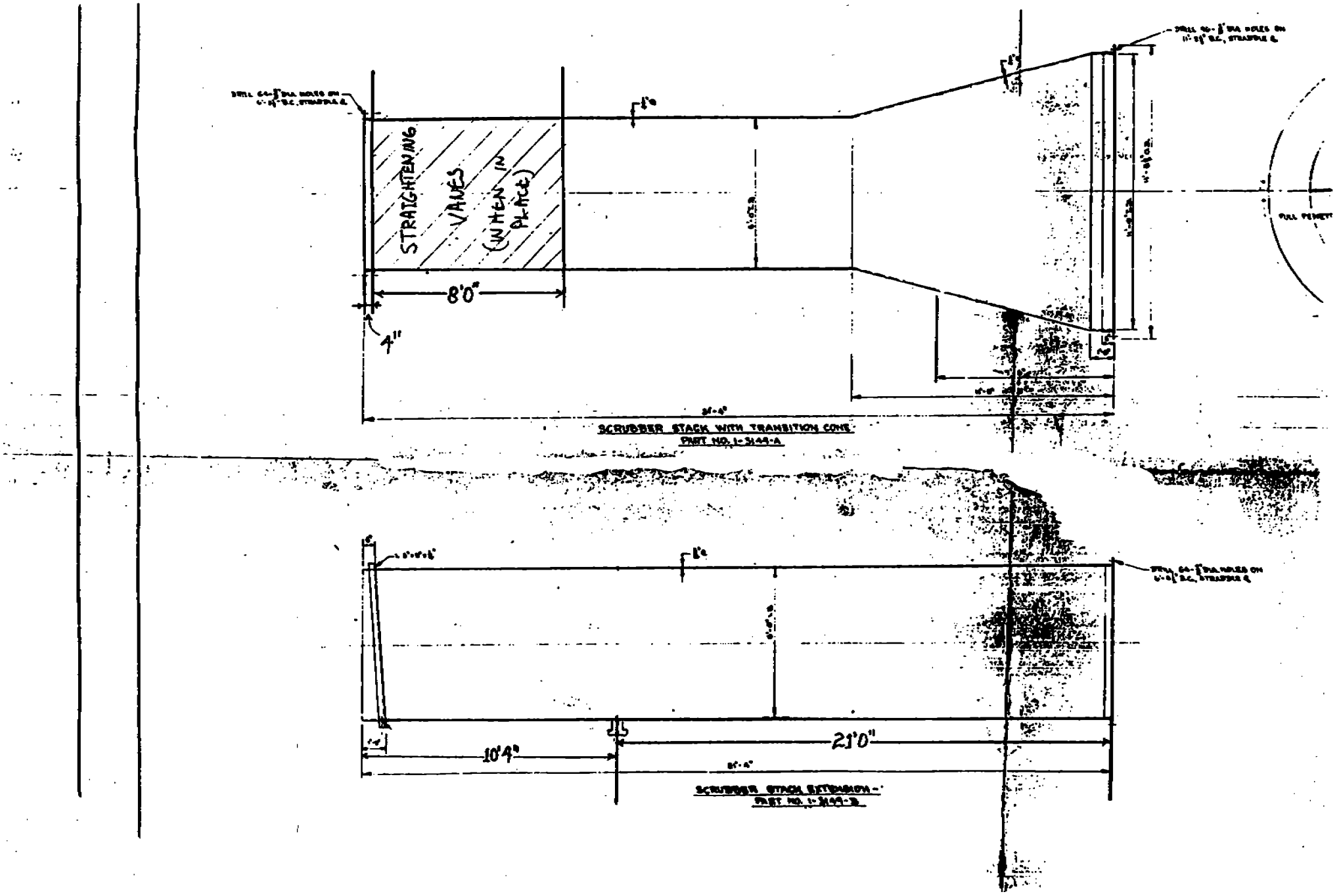
TECHNICIAN: JT

DATE: 8-31-91

SOURCE PERFORMANCE FOR: CA/CINOR F2 #4

PRODUCTION DATA

NUMBER FOUR SCRUBBER STACK



Texasgulf

CALCINER NO.	DATE
4	8-28-91

TIME	SYSTEM AMPS: ELEMENT FAN	TEMPERING BLOWER	AGITATING BLOWER	MAIN FLUIDIZING BLOWER	AFTER COOLER FLUIDIZING BLOWER	SYSTEM DIFFERENTIAL PRESSURES: COOLING BED	DRYER COOLER BED	CALCINING PLATE	CALCINING BED	HOT WINDBOX	AGITATING AIR	PREHEAT PLATE	PREHEAT BED	AFTER COOLER CYCLONE	AIR FLOW: TEMPERING	MAIN FLUIDIZING	AFTER COOLER FLUIDIZING	AGITATING AIR	BED LEVELS: PREHEAT	CALCINE	COOLING	AFTER COOLER	FUEL OIL: TEMPERATURE	FLOW	FEED RATE
A.M.																									99
	87	55	-	136	151	28	50	20	65	4.5	35	12	12	15	15200	17200	5000	2800	14	65	30	35			99
	87	55	-	136	151	28	50	20	65	4.1	34	13	12	15	15200	17200	5000	2900	14	65	30	35			99
	82	55		136	150	28	50	18	65	4.4	36	13	10	15	15200	17200	5000	2900	12	60	30	35			99
	83	60		136	150	28	50	19	65	4.2	36	12	11	15	15300	17300	5000	2900	12	65	30	35			99
	82	59		136	145	28	50	20	65	4.1	36	12	11	15	15200	17200	5000	2900	12	65	20	35			96
	85	59		136	145	28	50	20	65	4.1	36	12	12	15	15300	17300	5000	2900	12	65	30	35			96
	83	59		135	145	28	50	20	65	4.0	35	12	11	15	15200	17200	5000	2900	12	65	30	35			96
	84	59		135	148	28	50	20	65	4.2	35	12	12	15	15200	17200	5000	2900	12	65	30	35			96
	82	58		135	148	28	50	20	65	4.0	36	12	11	15	15200	17100	5000	2900	12	65	30	35			96
	83	58		135	148	28	50	20	65	4.0	36	12	11	15	15200	17100	5000	2900	12	65	30	35			96
	84	59		135	148	28	50	20	65	4.0	36	12	11	15	15200	17100	5000	2900	12	65	30	35			96
	86	61		135	148	28	50	20	65	4.3	36	12	11	15	15200	17100	5000	2900	12	65	30	35			96

TIME	SYSTEM PRESSURE INDICATORS: FEED CYCLONE INLET	COOLING PRESSURE	CALCINING PRESSURE	HOT WINDBOX	PREHEAT PRESSURE	INCHES WATER: FEED CYCLONE OUTLET	DUST CYCLONE OUTLET	SCRUBBER INLET	AFTER COOLER WINDBOX	AFTER COOLER PRESSURE	PREHEAT PRESSURE	MAIN PRESSURE	SYSTEM TEMPERATURES °F: HOT WINDBOX	CALCINING PRESSURE	CALCINER BED	COOLING PRESSURE	COOLING BED	AFTER COOLER WINDBOX	AFTER COOLER CYCLONE	NO. 1 DUST CYCLONE	NO. 2 DUST CYCLONE	SCRUBBER	NO. 1 DUST TANK TEMP.	NO. 2 DUST TANK TEMP.	PRODUCT
A.M.																							26		21412
	165	110	30	26	+0.5	2.0	4.0	20	75	24	312	275	1011	1461	1456	1140	1135	295	296	1117	1107	300	28		21478
	165	115	32	28	0.5	0.2	3.4	20	75	26	318	283	1018	1462	1484	1149	1146	296	297	1112	1110	305	28		21497
	160	110	30	26	+1.0	1.6	4.0	20	65	21	363	309	1020	1527	1523	1085	1067	285	280	1162	1160	340	26		21605
	160	111	30	25	+1.0	1.0	3.0	20	75	29	335	295	997	1451	1497	1137	1134	282	303	1094	1088	—	28		21621
	160	110	30	25	+1.5	1.0	3.0	20	70	22	353	317	993	1449	1498	1136	1129	292	271	1097	1089	—	28		21725
	160	110	30	25	.8	1.0	3.0	20	75	30	356	306	992	1453	1499	1106	1102	296	299	1101	1092	—	28		21778
	160	115	30	25	+1.4	1.0	3.0	20	70	24	346	306	1000	1452	1497	1124	1121	295	290	1104	1094	—	28		21857
	160	116	30	25	+1.0	1.2	3.2	20	70	22	350	314	995	1447	1499	1143	1140	291	262	1093	1088	—	28		21914
	160	110	30	25	+.5	2.5	4.7	20	68	20	351	314	991	1447	1500	1122	1115	294	297	1093	1083	—	28		21977
	160	110	30	25	1.0	2.5	4.5	20	68	20	354	318	992	1445	1500	1121	1121	290	297	1095	1092		28		22037
	160	110	30	25	1.0	2.5	4.5	20	70	24	360	323	991	1443	1496	1114	1112	293	310	1097	1095		28		22132
	160	110	30	25	1.0	1.5	4.0	20	75	25	353	314	993	1440	1493	1126	1118	302	287	1095	1095		28		22179
																									22252
																									22298
																									22359
																									22359
																									22499
																									22552
																									22558
																									22678
																									22745
																									22805
																									22941