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

JUL 22 1992

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. 2

Dear Jim:

As per the requirements of Air Quality Permit No. 2331R10, Specific Conditions and Limitations No. 7, the No. 2 Calciner was compliance tested for particulate emissions July 7, 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)
15-09-026 (w/encl)

Printed on Recycled Paper

SOURCE PERFORMANCE TEST

CALCINER NO. 2

TEXASGULF INC.

PHOSPHATE OPERATIONS

AURORA, NC

JULY 07, 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-15-09-026

TEXASGULF INC. PHOSPHATE OPERATIONS

Summary

On July 07, 1992 sampling and analyses were conducted to determine the particulate emission rate at Texasgulf's Calciner No. 2 using Method 5 w/Backhalf Analysis.

The results of this series of runs showed the average particulate emission rate to be 23.98 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 49.94 pounds of particulate/hour. A total of 3 stack samples were taken.

Performing the stack sampling were Senior Environmental Technicians Jack Taylor and Phillip Forest. Senior Environmental Technician Jimmy Hardy 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. 2

Method 5 W/Backhalf	07/07/92	07/07/92	07/07/92
	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	63,070	63,368	62,613
Sample Volume, DSCF	31.422	30.871	31.797
Lbs. of Particulate/Hr. Total	25.52	22.07	24.36
Lbs. of Particulate/Hr. Front	20.91	19.05	20.19
Lbs. of Particulate/Hr. Back	4.61	3.03	4.17
Percent Isokinetic	99.52	100.05	101.06
Average Lbs of Particulate/Hr.(Total)			23.98
Allowable Lbs/Hr.			49.94
Dry Feed Rate TPH	86	86	86
Average Dry Feed Rate TPH			86

TEXASGULF INC. PHOSPHATE OPERATIONS

Calciner No. 2

Stack Data Summary Method 5 w/Backhalf

Date	Time	Run #	Velocity FPS	Volumetric Flow TSCF/Min	Average Stack Temp (oF)
07/07	10:00	1	43.561	63,070	163
07/07	11:40	2	43.781	63,368	163
07/07	13:25	3	43.248	62,613	163

TEXASGULF memo

Date: 07/13/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #2 Run 1

Sample Date	Time
07/07/92	10:00

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	63,070

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	25.52	Total	7.1384
Front Half	20.91	Front Half	5.8491
Back Half	4.61	Back Half	1.2894

M. R. Asby

Supervisor, Environmental Laboratory File: ec-15-09-026

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

This stack sample was taken isokinetically The %I = 99.52

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 1
Calciner #2

Rpt. Date	07/13/92
Smple Date	07/07/92
Smple Time	10:00

Barometric Pressure	30.14	Initial Dry Gas Mtr	47.702
Stack Static Pressure	-0.38	Final Dry Gas Mtr	81.423
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2328	Dry Mole Wt Stk Gas	29.642
Pitot Tube Corr	0.84	Stack Pressure	30.11
Sampling Time in Min.	72	Feed Rate, TPH	95
		Bulk Moisture (Lab Analysis)	9.70
		Feed Rate Dry TPH	85.79
Lbs Coal/Ton of Dry Feed	37.9	Coal Feed TPH	1.63
		Process Weight	87.41

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	156	0.75	1.05	105	96
Pt	2	158	0.85	1.19	104	96
Pt	3	158	0.85	1.19	106	97
Pt	4	159	0.75	1.05	109	98
Pt	5	161	0.72	1.01	111	99
Pt	6	162	0.52	0.73	113	100
Pt	7	164	0.38	0.53	115	101
Pt	8	165	0.28	0.39	115	102
Pt	9	166	0.25	0.35	116	103
Pt	10	166	0.25	0.35	116	103
Pt	11	165	0.29	0.41	117	104
Pt	12	166	0.30	0.42	117	105
Pt	13	157	0.28	0.39	112	105
Pt	14	160	0.40	0.56	115	105
Pt	15	162	0.51	0.71	118	105
Pt	16	162	0.52	0.73	120	106
Pt	17	164	0.62	0.87	119	106
Pt	18	165	0.60	0.84	118	106
Pt	19	163	0.30	0.42	116	107
Pt	20	164	0.30	0.42	117	107
Pt	21	165	0.32	0.45	117	107
Pt	22	165	0.40	0.56	118	107
Pt	23	165	0.50	0.70	122	108
Pt	24	165	0.50	0.70	122	108
Averages		163	0.48	0.67	115	103

Stack oR	623	Average Meter Temp oR	569
Gas Volume Collected		33.721	
Corrected Gas Volume		33.569	
Gas Volume STP		31.422	

Calciner #2
Run 1

07/07/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	- 100	- 100	- 100	- 649.24
Final	+ 398	+ 129	+ 102	+ 656.42

Totals mls of water collected	329
Increase in grams of silica gel	7.18
Total Gas Volume	47.247
Bws	0.3349
One - Bws	0.6651
Wet Molecular Weight of Stack Gas	25.74
Stack Pressure	
Stack Velocity FPS	30.112
Stack Volumetric Flow Rate TSTD Ft3/Min	43.561
	63070
Particulate Calculations	
Inorganic	
Large Tare, grams	
Large Final, grams	303.2007
Mr =	303.2043
Sum Water + MeCl2, Mb (or 5% of mass)	0.00360
Vic =	0
Vb =	629
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	0
Organic	3.6000
Small Tare,grams	
Small Final,grams	173.4916
Mo, mg =	173.5141
CPM mg/DSCF =	22.5
CPM mg/TSCF =	0.8306
CPM mg	0.5524
5% of mass of CPM	26.1000
Front Half	1.305
Final Beaker Weight	+ 140.9602
Tare Beaker Weight	- 140.9302
Final Filter Weight	+ 0.6393
Tare Weight of Filter	- 0.5509
Net Sample Weight	0.1184
Mg Particulate/DSCF	3.7680
Mg Particulate/TSCF	2.5060

0.0300 } 0.1184
+0.0884

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	612.37	501.76	110.61
Lbs Particulate/Hr	25.52	20.91	4.61
Lbs Particulate/Ton of Product	7.1384	5.8491	1.2894

Isokinetic Sampling Rate	99.52
Allowable Part. Emission Rate, Lbs/Hr.	49.94

TEXASGULF memo

Date: 07/13/92

To: Mill Superintendent

From: Environmental Affairs

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

Sample Date	Time
07/07/92	11:40

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	63,368

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	22.07	Total	6.1757
Front Half	19.05	Front Half	5.3285
Back Half	3.03	Back Half	0.8471

M. B. Ashley

Supervisor, Environmental Laboratory File: ec-15-09-026

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

This stack sample was taken isokinetically. The %I = 100.05

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 2
Calciner #2

Rpt. Date	07/13/92
Smple Date	07/07/92
Smple Time	11:40

Barometric Pressure	30.13	Initial Dry Gas Mtr	83.500
Stack Static Pressure	-0.38	Final Dry Gas Mtr	116.755
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2305	Dry Mole Wt Stk Gas	29.642
Pitot Tube Corr	0.84	Stack Pressure	30.10
Sampling Time in Min.	72	Feed Rate, TPH	95
		Bulk Moisture (Lab Analysis)	9.70
		Feed Rate Dry TPH	85.79
Lbs Coal/Ton of Dry Feed	37.9	Coal Feed TPH	1.63
		Process Weight	87.41

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	157	0.75	1.01	106	102
Pt	2	160	0.82	1.10	111	101
Pt	3	161	0.82	1.10	114	101
Pt	4	160	0.80	1.07	116	101
Pt	5	161	0.65	0.87	118	102
Pt	6	162	0.55	0.74	119	102
Pt	7	163	0.40	0.54	120	102
Pt	8	165	0.30	0.40	119	103
Pt	9	165	0.25	0.34	120	104
Pt	10	166	0.25	0.34	120	104
Pt	11	166	0.28	0.38	121	105
Pt	12	167	0.30	0.40	122	105
Pt	13	158	0.28	0.38	112	105
Pt	14	160	0.45	0.60	118	105
Pt	15	161	0.45	0.60	119	105
Pt	16	162	0.60	0.81	121	105
Pt	17	161	0.62	0.83	121	105
Pt	18	162	0.62	0.83	122	105
Pt	19	164	0.30	0.40	120	105
Pt	20	164	0.30	0.40	119	105
Pt	21	163	0.32	0.43	120	105
Pt	22	165	0.40	0.54	121	105
Pt	23	165	0.50	0.67	120	106
Pt	24	165	0.50	0.67	119	106
Averages		163	0.48	0.64	118	104

Stack oR	623	Average Meter Temp oR	571

Gas Volume Collected	33.255
Corrected Gas Volume	33.105
Gas Volume STP	30.871

Calciner #2
Run 2

07/07/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	618.23
Final	396	132	103	625.26

Totals mls of water collected	331
Increase in grams of silica gel	7.03
Total Gas Volume	46.783
Bws	0.3401
One - Bws	0.6599
Wet Molecular Weight of Stack Gas	25.68
Stack Pressure	30.102
Stack Velocity FPS	43.781
Stack Volumetric Flow Rate TSTD Ft3/Min	63368

Particulate Calculations	
Inorganic	
Large Tare, grams	274.9289
Large Final, grams	274.9302
Mr =	0.00130
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	631
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	1.3
Organic	
Small Tare,grams	166.9654
Small Final,grams	166.9810
Mo, mg =	15.6
CPM mg/DSCF =	0.5474
CPM mg/TSCF =	0.3612
CPM mg	16.9000
5% of mass of CPM	0.845
Front Half	
Final Beaker Weight	147.7603
Tare Beaker Weight	147.7369
Final Filter Weight	0.6286
Tare Weight of Filter	0.5457
Net Sample Weight	0.1063
Mg Particulate/DSCF	3.4434
Mg Particulate/TSCF	2.2722

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	529.78	457.11	72.67
Lbs Particulate/Hr	22.07	19.05	3.03
Lbs Particulate/Ton of Product	6.1757	5.3285	0.8471

Isokinetic Sampling Rate	100.05
Allowable Part. Emission Rate, Lbs/Hr.	49.94

TEXASGULF memo

Date: 07/13/92

To: Mill Superintendent

From: Environmental Affairs

Subject: EPA Method 5 w/Backhalf Isokinetic Sample
Calciner #2 Run 3

Sample Date	Time
07/07/92	13:25

Dry Feed Rate, TPH	Stack Volumetric Flow Rate TSTD Ft3/Min
86	62,613

Lbs. Particulate/Hr.		Lbs. Particulate/Ton of Product	
Total	24.36	Total	6.8157
Front Half	20.19	Front Half	5.6482
Back Half	4.17	Back Half	1.1676

M.R. Osby

Supervisor, Environmental Laboratory File: ec-15-09-026

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

This stack sample was taken isokinetically. The %I = 101.06

TEXASGULF INC. PHOSPHATE OPERATIONS

Method 5 w/Backhalf
Run 3
Calciner #2

Rpt. Date	07/13/92
Smple Date	07/07/92
Smple Time	13:25

Barometric Pressure	30.15	Initial Dry Gas Mtr	117.102
Stack Static Pressure	-0.38	Final Dry Gas Mtr	150.888
Stack Diameter	72	Dry Gas Factor	0.9955
Nozzle Diameter	0.2328	Dry Mole Wt Stk Gas	29.642
Pitot Tube Corr	0.84	Stack Pressure	30.12
Sampling Time in Min.	72	Feed Rate, TPH	95
		Bulk Moisture (Lab Analysis)	9.70
		Feed Rate Dry TPH	85.79
Lbs Coal/Ton of Dry Feed	37.9	Coal Feed TPH	1.63
		Process Weight	87.41

		Stk oF	Delta P	Delta H	oF In	oF Out
Pt	1	156	0.80	1.13	100	98
Pt	2	160	0.85	1.20	103	97
Pt	3	161	0.85	1.20	104	97
Pt	4	160	0.80	1.13	105	97
Pt	5	161	0.65	0.92	109	97
Pt	6	163	0.50	0.71	111	98
Pt	7	164	0.38	0.54	113	98
Pt	8	165	0.29	0.41	113	98
Pt	9	165	0.25	0.35	113	99
Pt	10	166	0.25	0.35	113	99
Pt	11	165	0.25	0.35	114	100
Pt	12	166	0.25	0.35	114	100
Pt	13	156	0.28	0.40	102	98
Pt	14	160	0.40	0.57	106	98
Pt	15	161	0.50	0.71	109	98
Pt	16	163	0.55	0.78	110	98
Pt	17	164	0.65	0.92	111	97
Pt	18	163	0.60	0.85	111	97
Pt	19	164	0.30	0.42	110	97
Pt	20	164	0.28	0.40	111	98
Pt	21	165	0.31	0.44	111	98
Pt	22	165	0.40	0.57	112	98
Pt	23	166	0.45	0.64	111	98
Pt	24	166	0.50	0.71	111	98
Averages		163	0.47	0.67	109	98

Stack oR	623	Average Meter Temp oR	564

Gas Volume Collected	33.786
Corrected Gas Volume	33.634
Gas Volume STP	31.797

Calciner #2
Run 3

07/07/92

Impinger Volumes/Weights

	No.1 (mls)	No. 2 (mls)	No.3 (mls)	No. 4 (g) (silica gel)
Initial	100	100	100	660.39
Final	399	128	102	667.74

Totals mls of water collected	329
Increase in grams of silica gel	7.35
Total Gas Volume	47.630
Bws	0.3324
One - Bws	0.6676
Wet Molecular Weight of Stack Gas	25.77
Stack Pressure	30.122
Stack Velocity FPS	43.248
Stack Volumetric Flow Rate TSTD Ft3/Min	62613

Particulate Calculations

Inorganic	
Large Tare, grams	272.3956
Large Final, grams	272.3968
Mr =	0.00120
Sum Water + MeCl2, Mb (or 5% of mass)	0
Vic =	629
Vb =	0
Mc =	0
Mass of Inorganic,mg, Mrc (Mi) =	1.2
Organic	
Small Tare,grams	137.6426
Small Final,grams	137.6654
Mo, mg =	22.8
CPM mg/DSCF =	0.7548
CPM mg/TSCF =	0.5039
CPM mg	24.0000
5% of mass of CPM	1.2
Front Half	
Final Beaker Weight	134.6607
Tare Beaker Weight	134.6347
Final Filter Weight	0.6391
Tare Weight of Filter	0.5490
Net Sample Weight	0.1161
Mg Particulate/DSCF	3.6513
Mg Particulate/TSCF	2.4375

Total Particulates	Total	Front Half	Back Half
Lbs Particulate/Day	584.69	484.53	100.16
Lbs Particulate/Hr	24.36	20.19	4.17
Lbs Particulate/Ton of Product	6.8157	5.6482	1.1676

Isokinetic Sampling Rate	101.06
Allowable Part. Emission Rate, Lbs/Hr.	49.94

RAW DATA

TEXASGULF INC. PHOSPHATE OEPRATIONS

Box 1

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 7-[redacted]7-92 Plant CAL. # 2

Run No. 1 Time 1000

303 2007

	Filter	8 Front Half Beaker	Back Half Inorganic W-9/14 Beaker [redacted]	Back Half Inorganic Beaker BW6	Organic 14 Beaker ~~[illegible]~~
Tare	.5509	140 9302	138. 9087	164.2920	173.4916
1st Weight	63.93	140.9600	138.9118	164.2936	173.5080
2nd Weight	.6393	140.9604	138.9072	164.2905	173.5140
3rd Weight			138 9108	164.2934	173.5142
4th Weight			138.9107		
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.6393	140.9602	138.4108 ~~[illegible]~~	164.2935	173.5141

303.2043

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	250+148	129	102	Post (grams)	656.42
Pre Volume (mls)	100	100	100	Pre (grams)	649.24

Revised 07/11/91
TGEA027.WR1

Box #1

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #2 Date 7-7-92 Time 1000 Run # 1

Mtr Box # 4 Meter H@ 1.7043 K Factor 1.3966231 Barometric 30.14

Assmd Moist 33.90 Nozzle Dia. 0.2328 Dry Gas X 0.9955 Console Oper P.A. FOREST

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 47.702	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW PORT START 1000	1	3	0.75	1.05	49.4	105	96	156	240		7.2
	2	6	0.85	1.19	51.3	104	96	158	250		8.5
	3	9	0.85	1.19	53.2	106	97	158	230		8.7
	4	12	0.75	1.05	55.0	109	98	159	225		7.9
	5	15	0.72	1.01	56.7	111	99	161	245		7.0
	6	18	0.52	0.73	58.3	113	100	162	265		6.3
	7	21	0.38	0.53	59.6	115	101	164	255		4.9
	8	24	0.28	0.39	60.7	115	102	165	240	68	3.5
	9	27	0.25	0.35	61.8	116	103	166	260	67	3.5
	10	30	0.25	0.35	62.8	116	103	166	255	67	3.5
STOP 1036	11	33	0.29	0.41	63.9	117	104	165	235	68	3.9
	12	36	0.30	0.42	65.085	117	105	166	245	68	4.0
START NW PORT 1043	13 1	3	0.28	0.39	66.1	112	105	157	225		3.2
	14 2	6	0.40	0.56	67.4	115	105	160	225		4.9
	15 3	9	0.51	0.71	69.0	118	105	162	245		5.8
	16 4	12	0.52	0.73	70.4	120	106	162	260		5.9
	17 5	15	0.62	0.87	72.1	119	106	164	235		6.6
	18 6	18	0.60	0.84	73.7	118	106	165	235		6.8
	19 7	21	0.30	0.42	74.9	116	107	163	250	66	4.8
	20 8	24	0.30	0.42	76.0	117	107	164	265	67	4.4
	21 9	27	0.32	0.45	77.2	117	107	165	260	68	4.4
	22 10	30	0.40	0.56	78.5	118	107	165	240	69	5.0
	23 11	33	0.50	0.70	80.0	122	108	165	245	69	5.8
STOP 1119	24 12	36	0.50	0.70	81.423	122	108	165	250	68	5.9
	Total										
	Avg				33.721						

Probe and Sample Box Operator J. H. TAYLOR

Pre Leak Check At 11.5 "Hg = 0.017 C.F.M. Post Leak Check At 10.0 "Hg 0.004 C.F.M.

Pitot Leak Check Red ✓@2.7 Green ✓@2.9

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

$\_\_\_\_ = (846.72 \times (0.0) \times (\quad) \times (\quad) \times (\quad) \times (\quad) \times (\quad / \quad) \times (29.\_ / \quad) \times (572 / 624)$

TGEA021.WR1

Box 2

TEXASGULF INC. PHOSPHATE OEPRATIONS

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 7-7-92 Plant CAL. #2

Run No. 2 Time 1140

274.9289

	Filter	6 Front Half Beaker	Back Half Inorganic Beaker B	Back Half Inorganic Beaker G	Organic Beaker 3
Tare	.5457	147.7369	136.6151	138.3138	166.9654
1st Weight	.6285	147.7618	136.6172	138.3150	166.9809
2nd Weight	.6291	147.7586	136.6138	138.3120	166.9838
3rd Weight	.6286	147.7604	136.6164	138.3136	166.9819
4th Weight		147.7601	136.6166	138.3138	166.9811
5th Weight					
6th Weight					
7th Weight					
Averaged Constant	.6286	147.7603	136.6165	138.3137	166.9810

274.9302

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	250+146	132	103	Post (grams)	625.26
Pre Volume (mls)	100	100	100	Pre (grams)	618.23

Revised 07/11/91
TGEA027.WR1

TEXASGULF INC. PHOSPHATE OPERATIONS

Box #2

CONSOLE WORKSHEET

Plant CALCINER #2 Date 7-7-92 Time 1140 Run #2

Mtr Box #4 Meter H@ 1.7043 K Factor 1.3422265 Barometric 30.13

Assmd Moist 33.90 Nozzle Dia. 0.2305 Dry Gas X 0.9955 Console Oper D.A. FOREST

PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 83.500	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW PORT 1	3	0.75	1.01	85.2	106	102	157	255		7.2
2	6	0.82	1.10	87.0	111	101	160	260		8.0
3	9	0.82	1.10	88.9	114	101	161	240		8.2
4	12	0.80	1.07	90.7	116	101	160	240		8.5
5	15	0.65	0.87	92.4	118	102	161	255		7.0
6	18	0.55	0.74	93.9	119	102	162	245		6.1
7	21	0.40	0.54	95.2	120	102	163	230		4.8
8	24	0.30	0.40	96.4	119	103	165	240	74	4.0
9	27	0.25	0.34	97.4	120	104	165	250	73	3.6
10	30	0.25	0.34	98.4	120	104	166	235	72	3.6
11	33	0.28	0.38	99.5	121	105	166	235	69	3.8
STOP 1216 12	36	0.30	0.40	100.632	122	105	167	250	70	3.9
NW PORT START 1225 13 1	3	0.28	0.38	101.7	112	105	158	225		3.2
14 2	6	0.45	0.60	103.0	118	105	160	240		5.0
15 3	9	0.45	0.60	104.3	119	105	161	250		5.0
16 4	12	0.60	0.81	105.9	121	105	162	240		6.1
17 5	15	0.62	0.83	107.5	121	105	161	230		6.6
18 6	18	0.62	0.83	109.1	122	105	162	245		6.9
19 7	21	0.30	0.40	110.3	120	105	164	265		4.5
20 8	24	0.30	0.40	111.4	119	105	164	245	72	4.2
21 9	27	0.32	0.43	112.6	120	105	163	230	72	4.3
22 10	30	0.40	0.54	113.9	121	105	165	245	72	5.0
23 11	33	0.50	0.67	115.3	120	106	165	260	71	5.8
24 12	36	0.50	0.67	116.755	119	106	165	245	70	5.8
STOP 1301 Total										
Avg				33.255						

Probe and Sample Box Operator J.H. TAYLOR

Pre Leak Check At 10.0 "Hg = 0.005 C.F.M. Post Leak Check At 9.8 "Hg 0.01 C.F.M.

Pitot Leak Check Red ✓ @ 1.50 Green ✓ @ 1.95

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

1.3422265 = (846.72 x (0.0028228) x (1.7043) x (0.7056) x (0.4489) x (X) x (X) x (29.642 / 25.8) x (565 / 624)

TGEA021.WR1

Box 3

TEXASGULF INC. PHOSPHATE OEPRATIONS

CONDENSABLE PARTICULATE MATTER WORKSHEET

Date 7-7-92 Plant CAL. #2

Run No. 3 Time 1325

272.3956

	Filter	41 Front Half Beaker	Back Half Inorganic C Beaker ___	Back Half Inorganic W Beaker ___	Organic Beaker 2
Tare	.5490	134.6347	134.2687	138.1269	137.6476
1st Weight	.6389	134.6615	134.2722	138.1278	137.6674
2nd Weight	.6393	134.6608	134.2700	138.1286	137.6639
3rd Weight		134.6605	134.2710	138.1270	137.6665
4th Weight			134.2708	138.1276	137.6656
5th Weight					137.6652
6th Weight					
7th Weight					
Averaged Constant	.6391	134.6607	134.2709	138.1277	137.6654

272.3986

Impingers Volumes/Gel Weights

	1st Impinger	2nd Impinger	3rd Impinger	Silica Gel Weights	
Post Volume (mls)	252+147	128	102	Post (grams)	667.74
Pre Volume (mls)	100	100	100	Pre (grams)	660.39

Revised 07/11/91
TGEA027.WR1

Box #3

TEXASGULF INC. PHOSPHATE OPERATIONS

CONSOLE WORKSHEET

Plant CALCINER #2 Date 7-7-92 Time 1325 Run #3

Mtr Box #4 Meter H@ 1.7043 K Factor 1.4139264 Barometric 30.15

Assmd Moist 33% Nozzle Dia. 0.2328 Dry Gas X 0.9955 Console Oper D.A. FOREST

	PT	Smple Min.	Head Delta P	Orifice Delta H	Meter Ft3 117.102	Meter In oF	Meter Out oF	Stack oF	Hot Box oF	Imp. oF	Vacuum "Hg
SW PORT	1	3	0.80	1.13	118.9	100	98	156	225		9.3
	2	6	0.85	1.20	120.9	103	97	160	255		11.1
	3	9	0.85	1.20	122.8	104	97	161	260		11.9
	4	12	0.80	1.13	124.6	105	97	160	240		11.8
	5	15	0.65	0.92	126.4	108	97	161	230		10.0
	6	18	0.50	0.71	127.9	111	98	163	240		8.2
	7	21	0.38	0.54	129.2	113	98	164	250	66	6.3
	8	24	0.29	0.41	130.4	113	98	165	260	66	5.5
	9	27	0.25	0.35	131.4	113	99	165	245	66	4.5
	10	30	0.25	0.35	132.5	113	99	166	225	66	4.5
STOP 1401	11	33	0.25	0.35	133.5	114	100	165	235	66	4.5
N.W. PORT	12	36	0.25	0.35	134.548	114	100	166	250	67	4.6
START 1412	13 1	3	0.28	0.40	135.6	102	98	156	225		4.8
	14 2	6	0.40	0.57	136.9	106	98	160	230		6.0
	15 3	9	0.50	0.71	138.4	109	98	161	240		7.1
	16 4	12	0.55	0.78	140.0	110	98	163	250		7.6
	17 5	15	0.65	0.92	141.6	111	97	164	260		~~0.95~~ 10.5
	18 6	18	0.60	0.85	143.2	111	97	163	255		9.0
	19 7	21	0.30	0.42	144.4	110	97	164	260	67	5.9
	20 8	24	0.28	0.40	145.5	111	98	164	255	68	5.3
	21 9	27	0.31	0.44	146.7	111	98	165	235	68	5.8
	22 10	30	0.40	0.57	148.0	112	98	165	240	66	6.2
	23 11	33	0.45	0.64	149.4	111	98	166	250	66	7.5
STOP 1448	24 12	36	0.50	0.71	150.888	111	98	166	255	66	8.0
	Total										
	Avg				33.786						

Probe and Sample Box Operator J. H. TAYLOR

Pre Leak Check At 10.0 "Hg = 0.017 C.F.M. Post Leak Check At 12.2 "Hg 0.013 C.F.M.

Pitot Leak Check Red ✓ @ 0.265 Green ✓ @ 2.30

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

1.4139264 = (846.72 x (0.0029372) x (X) x (1.7043) x (0.7056) x (0.4489) x (X) x (29.642 / 25.8) x (572 / 624)

TGEA021.WR1

Texasgulf Chemicals Co.

ISOKINETIC WORKSHEET

DATE: 7-7-92 STACK: CALCINER #2 TIME: _____

METER BOX: #4 OPERATOR P. A. FOREST

1. NOZZLE DIA. (A) #3 0.2338 / #6 0.2303 " (B) 0.2311 / 0.2308 " (C) 0.2334 / 0.2303 "

Avg. #3 0.2328 / #6 0.2305

2. ΔH @ 1.7043

47.39
46.4

3. C_p 0.84 Assy. # 3 & #6

4. BAROMETRIC PRESSURE (P_b) 30.14 "Hg

ΔP STATIC −0.38 "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 = 33% EST. % H_2O

11. M_d 29.642 lb./lb. - MOLE

12. M_s 25.800 lb./lb. - MOLE

13. T_s 164 °F + 460 = 624 °R

14. T_m 102 + 91 = 97 → 105 °F + 460 = 565 °R

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

Y = 0.9955

Preliminary

ΔP	T_s
1. 0.76	151
2. 0.80	157
3. 0.80	158
4. 0.70	159
5. 0.60	161
6. 0.51	161
7. 0.40	164
8. 0.29	165
9. 0.25	166
10. 0.25	165
11. 0.28	165
12. 0.28	165

DOUG WYNNE DEM OBSERVER

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

$\underline{29.642} = \left((0.44) \cdot (\quad)\right) + \left((0.32) \cdot (\quad)\right) + \left((0.28) \cdot (\quad + \quad)\right)$

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

$\underline{25.800} = \left[\underset{29.642}{(\quad)} \cdot \underset{19.8614}{(0.67)}\right] + \left[\underset{5.94}{(18) \cdot (0.33)}\right]$

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

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

$\underline{1.39660231} = (846.72) \cdot \underset{0.0029372}{(\quad)} \cdot \underset{1.7043}{(\quad)} \cdot \underset{0.7056}{(\quad)} \cdot \underset{0.4489}{(\quad)} \cdot \quad (\ X\ ) \cdot \left(\frac{29.642}{25.800}\right)\left(\frac{565\ {}^oF}{624\ {}^oF}\right)$

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

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

Orsat Analyses

Date 7-6-92 Plant Calciner #2 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	6.6	21.2	
	Percent	6.6	14.6	78.8
Run 2	Burette Reading	6.6	21.2	
	Percent	6.6	14.6	78.8
Run 3	Burette Reading	6.6	21.3	
	Percent	6.6	14.7	78.7
		6.6	14.63	78.77

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

2.904 4.682 22.056

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

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

V.P.= _____

Bws = _____

Md = 29.642

Ms = _____

LEAK ✓ no movement for 15 minutes

Cyclonic Flow Test

Plant CAL #3 Technician(s) J.H + PF

Date 8-21-91 Time 1032

PORT SW

Point #	Delta P	Angle Alpha
1	.70	2°
2	.92	9°
3	.84	7°
4	.90	7°
5	.85	2°
6	.58	0°
7	.36	2°
8	33	12°
9	.24	13°
10	.20	16°
11	.18	10°
12	.11	12
Average		OVER

STATIC — .30

Average absolute Alpha must not be greater than 20 degrees.

10 + 2

Cyclonic Flow Test

Plant CAL #2 Technician(s) P.F. + JT

Date 8-21-91 Time 1335

NW Port

Point #	Delta P	Angle Alpha
1	.38	5°
2	.42	0°
3	.66	4°
4	.58	3°
5	.70	0°
6	.70	3°
7	.34	2°
8	.30	5°
9	.26	8°
10	.32	10°
11	.28	12°
12	.32	15°
Average		6.6°

Average absolute Alpha must not be greater than 20 degrees.

CALIBRATIONS

TEXASGULF INC. PHOSPHATE OPERATIONS

Console Calibration

06/17/92			
Technician	Jack Taylor	Console	4
		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
Test Meter oF In	71	Console Dry Gas Volume	10.464
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

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 (Must agree: +/- 5.4 oF)	A	33	34.5	1.5
	B	70	70.5	0.5
	C	214	213.5	0.5
Dry Gas Meter Out (Must agree: +/- 5.4 oF)	A	33	34.0	1.0
	B	70	70.5	0.5
	C	235	239.5	4.5
Impinger Thermometer # 1 (Must agree: +/- 2 oF)	A	34	32.0	2.0
	B	70	71.0	1.0
	C	186	188.0	2.0
Impinger Thermometer # 2 (Must agree: +/- 2 oF)	A	34	32.5	1.5
	B	69	71.0	2.0
	C	216	218.0	2.0
Impinger Thermometer # 3 (Must agree: +/- 2 oF)	A	69	71.0	2.0
	B	33	31.5	1.5
	C	184	185.5	1.5
HotBox Thermometer # 1 (Must agree: +/- 5.4 oF)	A	70	70.5	0.5
	B	165	167.2	2.2
	C	269	266.0	3.0
HotBox Thermometer # 2 (Must agree: +/- 5.4 oF)	A	71	70.5	0.5
	B	169	172.5	3.5
	C	266	267.5	1.5
HotBox Thermometer # 3 (Must agree: +/- 5.4 oF)	A	67	70.5	3.5
	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		212 °F @ .75 CFM		
Probe Heater Assy # 6		214 °F @ .75 CFM		
Probe Heater Assy # _____				

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

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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

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Post-Calibration

Date 7-12-92 Tech JT

Delta H Magnehelic

Leak Check @ .74 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.74	.73	1
-	.31	.32	1

Leak Check @ .99 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	.99	.99	0
-	102	102	0

Leak Check @ 184 " H20 for 3 minutes.

	Gauge	Manometer	Delta
+	184	1.85	1
-	.85	185	0

Delta P Magnehelic

Leak Check @ .39 " H20 for 3 minutes.

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

Leak Check @ .72 " H20 for 3 minutes.

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

Leak Check @ 1.71 " H20 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	147.73535	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 EH5 Calciner

McCl

~~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: Calciner #2 & 4

PRODUCTION DATA

NUMBER 2 CALCINER----JULY 7, 1992

$$\frac{95 \text{ tons feed}}{\text{hour}} \rightarrow (95)\frac{(100\% - \%\ H_2O)}{100} = \frac{\text{Tons dry feed}}{\text{hour}}$$

$$\frac{(95 \text{ t feed})}{\text{hour}}\frac{(100 - 9.70)}{100} = (95)\ (0.9030) = \frac{85.8 \text{ t dry feed}}{\text{hour}}$$

Loss on Ignition is calculated each month from assays. In July it was 7.37%.

(So) Coal usage is based on consumption per ton calcine and is $\frac{37.9\# \text{ coal}}{\text{ton calcine}}$ for a YTD figure.

Calculate coal usage based on Dry Feed:

Take coal usage $\frac{(37.9\# \text{ coal})}{\text{ton calcine}}$ $\frac{(1 \text{ ton calcine})}{(1.0737 \text{ tons dry feed})}$ =

$\frac{35.30\# \text{ coal}}{(1 \text{ ton dry feed})}$ or at $\frac{85.8 \text{ tons dry feed}}{\text{hour}}$ =

$\frac{(35.30\# \text{ coal})}{\text{ton dry feed}}$ $\frac{(85.8 \text{ tons dry feed})}{\text{hour}}$ = $\frac{3{,}028.74\# \text{ coal}}{\text{hour}}$

or $\frac{1.514 \text{ tons coal}}{\text{hour}}$

July 10, 1992 ojc