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P.O. Box 48 Aurora, North Carolina 27806

**Phosphate Operations**

(919) 322-4111

October 22, 1990

Mr. Vic Copelan  
Air Quality Section  
Division of Environmental Management  
N. C. Department of EHNR  
P. O. Box 1507  
Washington, North Carolina 27889

Dear Vic:

In accordance with Special Conditions and Limitations No. 6 of Air Permit No. 4176R4, the DAP #1 Plant has been compliance tested for particulate matter and total fluoride emissions. The compliance test results are set forth in the attached report and are being submitted within 90-days of the start-up date (August 2, 1990) as specified in Condition No. 6.

Following your review of the attached materials, if I may provide you any additional information on the compliance testing, please let me know.

Sincerely,

A handwritten signature in cursive script that reads 'Wayne Powell'.

J. W. Powell  
Senior Environmental Scientist

JWP/re

Attachment

pc: T. J. Regan, Jr.  
W. A. Schimming  
W. T. Cooper  
T. J. Perry  
00-05-000  
~~12-01-003-114~~

File: 15-09-017

**SOURCE PERFORMANCE TESTS**  
**DIAMMONIUM PHOSPHATE NO. 1**  
**TEXASGULF, INC.**  
**PHOSPHATE OPERATIONS**  
**AURORA, NORTH CAROLINA**  
**SEPTEMBER 1990**

**PREPARED BY:**

**JOHN C. CARRERE, JR.**  
**ENVIRONMENTAL DATA COORDINATOR**

**REVIEWED BY:**

**J. WAYNE POWELL**  
**SR. ENVIRONMENTAL SCIENTIST**

**REVIEWED BY:**

**MIKE L. ASBY**  
**ENVIRONMENTAL LAB SUPERVISOR**

## TEXASGULF, INC. PHOSPHATE OPERATIONS

### Summary

On September 11, 1990 sampling and analyses were conducted to determine the total fluoride emissions using EPA approved Method 13-B: Determination of Total Fluoride Emissions from Stationary Sources; Specific Ion Electrode Method on Diammonium Phosphate Plant No. 1. The sample analyses were performed using an Orion 901 Specific Ion Electrode Analyzer. The instrument has the ability to compute a calibration slope from the calibration samples and display the output directly as parts per million total fluoride. A hand drawn calibration curve is attached to certify the accuracy of the instrument.

Senior Environmental Technician Ted Davis and Environmental Technician Jack Taylor performed the sampling and Senior Environmental Technician Brad Lee performed the work-down and analyses.

The results showed the average total fluoride emission rate to be 3.16 pounds of total fluorides per hour. The allowable emission rate, based on the average P205 input rate, was 5.35 pounds total fluorides per hour (0.234 lb F-/Ton of P205 input). The allowable emission rate is 0.400 lb. F-/Ton of P205 input.

On September 12, 1990 sampling and analyses were conducted to determine the particulate emissions at Texasgulf's Diammonium Phosphate Plant No. 1, using EPA approved Method 5; Determination of Particulate Emissions from Stationary Sources. The results of the testing indicated a particulate matter emission rate of 69.59 pounds per hour. The average allowable emission rate, based on the process rate, was 53.18 pounds per hour. The test results may be found in the appendix. Maintenance activities were performed and the DAP No. 1 Plant was retested for particulate matter emissions on September 21, 1990.

Run number 1 was not included in the average due to an insufficient amount of sample gas collected.

The results of Run Nos. 2, 3, and 4 show the average particulate

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emission rate to be 41.36 pounds per hour. The allowable emission rates for Run Nos. 2, 3, and 4 were 53.06, 53.06, and 53.05 pounds of particulate per hour, respectively (53.06 lb/hr average).

Senior Environmental Technician Brad Lee and Environmental Technician Jack Taylor performed the sampling and Senior Technician Ted Davis performed the work-down and analyses.

Mr. Don Wynne of the North Carolina Division of Environmental Management was present during both the Method 13-B and Method 5 compliance tests as an official observer.

TEXASGULF PHOSPHATE OPERATIONS

Production Information

Diammonium Phosphate Plant No. 1 Method 13-B Compliance Test  
09/11/90

	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
* P2O5 54 Acid	51.46	51.50	51.54
Sp. Gr. 54 Acid	1.704	1.704	1.706
G.P.H. 54 Acid	1430	1438	1650
* P2O5 30 Acid	26.88	26.70	26.77
Sp. Gr. 30 Acid	1.273	1.2715	1.273
G.P.H. 30 Acid	4895	5720	6010
Production Rate T.P.D.	617	675	737
P2O5 Input, T.P.D.	293	321	350

Diammonium Phosphate Plant No. 1 Method 5 Compliance Test  
09/21/90

	<u>Run 2</u>	<u>Run 3</u>	<u>Run 4</u>
* P2O5 54 Acid	50.43	50.37	50.34
Sp. Gr. 54 Acid	1.679	1.679	1.678
G.P.H. 54 Acid	2131	2143	2019
* P2O5 30 Acid	26.47	26.43	26.39
Sp. Gr. 30 Acid	1.270	1.269	1.268
G.P.H. 30 Acid	6379	6365	6634
Production Rate T.P.D.	832	832	827
P2O5 Input, T.P.D.	395	395	393

TEXASGULF PHOSPHATE OPERATIONS

Test Summary - Method 13-B Compliance DAP No. 1 09/11/90

	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	72,189	71,280	70,287
Sample Volume, DSCF	32.59	32.75	31.78
Fluoride Concentration, mg/DSCF	0.26	0.59	0.52
Fluoride Emission Rate, Lbs./Hour	1.74	4.15	3.59
P2O5 Input, TPD	293	321	350
Percent Isokinetic Sampling Rate	109.21	102.47	102.41
Avg Emission Rate, Lbs. Fluoride/Hr.			3.16
Avg. Allowable Emission Rate, Lbs. F-/Hr.			5.35

Test Summary - Method 5 Compliance DAP No. 1 09/21/90

	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	71,957	73,289	72,678
Sample Volume, DSCF	41.73	32.66	32.57
Particulate mg/DSCF	6.47	5.57	5.36
Particulate Emission Rate, Lbs./Hour	45.72	39.92	38.45
Percent Isokinetic Sampling Rate	98.23	100.57	100.72
Avg Particulate Emission Rate, Lbs/Hr.			41.36
Allowable Emission Rate, Lbs. Particulate/Hr	53.06	53.06	53.05

TEXASGULF PHOSPHATE OPERATIONS

Compliance Summary

Method 13-B                      09/11/90

<u>Run</u>	<u>Lbs. F-/Hour</u>	<u>Production Rate Tons/Day</u>
1	1.739	617
2	4.154	675
3	3.594	737
<b>Averages</b>	3.162	676
<b>Average Allowable Fluoride Emission Rate Lbs/Hr.</b>		5.35

Method 5                              09/21/90

<u>Run</u>	<u>Lbs. Particulate/Hour</u>	<u>Production Rate Tons/Day</u>
1	45.72	832
2	39.92	832
3	38.45	827
<b>Averages</b>	41.36	830
<b>Average Allowable Particulate Emission Rate Lbs./Hr.</b>		53.06

## TEXASGULF PHOSPHATE OPERATIONS

### Calculations

- 1) Total Mg Fluoride -  $(A \times B \times C) / 1000) / R$
- 2) Mg Fluoride/DSCF -  $(D / E)$
- 3) Mg Fluoride/TSCF -  $(D / F)$
- 4) Lbs. Fluoride/Hour -  $((G \times H) / 453600) \times 60$
- 5) P2O5 Input Tons/Day -  $(8.34 \times I \times J \times K \times 60 \times 24) / 2000$
- 6) Lbs. Fluoride/Ton of P2O5 Input -  $(L / M)$
- 7) Mg Particulate/DSCF -  $(N / E)$
- 8) Mg Particulate/TSCF -  $(N / F)$
- 9) Lbs. Particulate/Day -  $(O \times H \times 60) / 1000 / 453.59$
- 10) Lbs. Particulate/Hour -  $(P / 24)$
- 11) Lbs. Particulate/Ton of P2O5 Input -  $(P / M)$
- 12) Production Rate DAP Tons/Day -  $(M /.475)$
- 13) Allowable Lbs. Particulate/Hour -  $((Q / 24) + 250)^{.3067} \times 9.377$
- 14) Allowable Lbs. Fluoride/Hour -  $((M / 24) \times 0.4)$

Where A - Orion 901 Meter Readout PPM  
B - Liquid Sample Volume  
C - Sample Aliquot  
D - Total Mg Fluoride  
E - Gas Sample Volume DSCF  
F - Gas Sample Volume TSCF  
G - Mg Fluoride TSCF  
H - Volumetric Flow Rate of Stack, SCFM  
I - Specific Gravity of Feed Acid  
J - % P2O5 of Feed Acid  
K - Acid Feed G.P.M.  
L - Pounds of Fluoride/Day  
M - P2O5 Input Tons/Day  
N - Net Sample Weight  
O - Mg Particulate TSCF  
P - Pounds of Particulate/Day  
Q - Production Rate DAP Tons/Day  
R - Sample Dilution