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.

IMC FERTILIZER, INC.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 11, 1991

Mr. W.C. Thomas,P.E.
Florida Department of Environmental
Regulation
4520 Oak Fair Blvd.
Tampa Fl. 33610-7343

Dear Bill:

Enclosed please find the results of the compliance test on the New Wales #1 DAP Plant, Operating permit A053-185648.

If you have any questions, please notify me.

Very truly yours,

J. M. Baretincic

JMB:jrb
(b:comprpt2.env)

Enclosure:

cc: J.A. Brafford - New Wales
A.L. Girardin - New Wales

I HAVE REVIEWED THIS REPORT AND IT (~~DOES~~ DOES NOT) INDICATE COMPLIANCE WITH THE PERMIT FOR THIS SOURCE.

DATE 11-27-91 BY

IMC Fertilizer, Inc., New Wales Operations, P.O. Box 1035, Mulberry, Florida 33860, (813) 428-2531

IMC FERTILIZER, INC.

To the best of my knowledge, all applicable field and analytical procedures comply with FDER requirements and all test data and plant operating data are true and correct.

SIGNATURE, OWNER or AUTHORIZED REPRESENTATIVE

J. M. Baretincic - Manager Environmental Services

NAME and TITLE

P.O. Box 1035

ADDRESS

Mulberry, Fl 33860

CITY **STATE** **ZIP**

11-11-91 (813) 428-2531

DATE **TELEPHONE NO.**

SUMMARY OF EMISSION MEASUREMENTS
#1DAP
I.M.C. Fertilizer, Inc.
NEW WALES OPERATIONS
POLK COUNTY, FLORIDA

November 11, 1991

INTRODUCTION

The New Wales Operations of IMC is a phosphate fertilizer facility located in western Polk county Fl. At this facility phosphoric acid is produced as an intermediate product in the production of phosphate fertilizer products. DAP is produced by reacting 54% phosphoric acid and ammonia in a granulation circuit. A wet granular product is produced which is then dried, screened, cooled, and sent to storage. This report details the particulate and fluoride emission measurements conducted on the #1 DAP Plant Scrubber on October 22 & 23, 1991. The purpose of the measurements was to show compliance with FDER standards.

During the period of testing , the plant was operating at a production rate of 84 tons/hour. This production rate was determined from acid slurry gpm and from lab analyses.

The allowable emission rate for gaseous and water soluble fluoride on the #1 DAP plant scrubber is 2.43 lbs/hr. (Operating Permit #AO53-185648). The allowable emission rate of particulate on the #1 DAP Plant Scrubber is 28.6 lbs/hr. During the period of testing, the emission rate of gaseous and water soluble fluoride was 1.14 lbs/hr with an emission rate of particulate at 12.0 lbs/hr.

A visible emission test was performed on the #1 DAP Plant Scrubber on October 22, 1991. The opacity was determined to be 5%. The maximum allowed opacity is 20%.

It can be concluded from the emission measurements made on October 22 & 23, 1991 that the #1 DAP plant scrubber meets the emission limiting requirements set forth on Operating Permit #AO53-185648.

LOCATION OF SAMPLING PORTS

Two sampling ports for emission measurements are located in the 84 inch diameter stack 22.25 feet below the top of the stack and 49 feet above the point where the tail gases enter the stack. The ports are located in the stack wall 90 degrees to one another.

Using criteria established by EPA Test Method 1 (40 CFR 60, appendix A) it was determined that a total of 12 sampling points would be required; six sampling points on each of the two perpendicular diameters. A diagram of the stack and table listing the distance to the stack wall to each sampling point is included in this report.

FIELD and ANALYTICAL PROCEDURES

Emission measurements for particulate and fluoride were performed using EPA Reference Method 5. All other test were performed in accordance with the Florida Administrative Code, Chapter 17-2.

The test was modified to determine fluoride emission as has been done in the past. The front half catch consisting of the probe wash and filtered particulate were combined with the impinger water and analyzed for fluoride content. The recoverable fluoride in the particulate was then used to calculate fluoride emissions by relating it back to the standard volume of gas sampled.

Prior to performing the actual emission measurements, preliminary stack and stack gas measurements were made. These measurements included the velocity head, wet and dry bulb stack gas temperatures, and the dimensions of the stack at the point where the test were to be made. The moisture content of the stack gas, using lbs. of dry air from the psychrometric chart, was assumed to be 7.6%.

Each of the three replicate test runs consisted of sampling for a specific time at each traverse point. An "S" type pitot tube, connected to the sampling probe, was used so that the velocity head could be measured at each traverse point and the sampling rate adjusted to assure isokinetic sampling.

The field and laboratory data sheets for the three test runs are included in this report.

DAP #1 STACK COMPLIANCE TEST 10/22 & 10/23, RATES AND CONDITIONS SUMMATION

DAP #1 P2O5 FEED TO PLANT

ACID STRENGTH(LAB)	SpG(LAB)	GPM(PLANT)	P2O5 TONS/HR
26.60	1.32	190.00	16.69
53.80	1.72	103.00	23.85
TOTAL P2O5 FEED			40.54

FLUORIDE ALLOWABLE BY P2O5 INPUT(P2O5 * 0.06)LBS/HR. 2.43 58.38 LBS/DAY

PRODUCTION RATE TONS/HR. 84.24

PARTICULATE ALLOWABLE BY PERMIT AGREEMENT LBS/HR. 28.60

10/22/91

SC5/COMPSUM.CAL/ALG

COMPLIANCE REPORT

PLANT: #1 DAP

PERMIT NO.:A053-185648

TEST DATE: OCTOBER 22 & 23, 1991

PLANT RATE: 84 TONS PER HOUR (40.54 TPH P2O5 FEED)

TEST AVERAGE, LBS.\HR (WHERE APPLICABLE)	ACTUAL - ALLOWABLE
FLUORIDE:	1.14 - 2.43
PARTICULATE:	12.02 - 28.6
SO2 (LBS./TON)	-
ACID MIST: (LBS./TON)	-
V.E.	5% - 20%
REPORT DATE:	11-11-91

IMC FERTILIZER, INC.
SOURCE SAMPLING CALCULATION REPORT

TEST ON #1DAP STACK AT NEW WALES PLANT, FL CONDUCTED ON 10/22/91

DATA SUMMATIONS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
BAROMETER PRESSURE	IN OF HG	29.96	29.96	29.95
STATIC PRESSURE	IN OF HOH	0.53	0.53	0.46
STACK PRESSURE	IN OF HG	30.00	30.00	29.98
AVERAGE SQR. DELTA P	IN HOH1/2	0.950	0.950	0.895
AVERAGE DELTA H	IN OF HOH	1.23	1.23	1.08
AVERAGE METER TEMP.	DEGREES F	92	93	85
AVERAGE STACK TEMP.	DEGREES F	118	118	116
METERED SAMPLE VOL.	CUBIC FT.	37.70	37.70	35.50
STD. METER VOLUME	CUBIC FT.	35.69	35.62	34.01
PITOT COFFICIENT	UNITY	0.84	0.84	0.84
NOZZLE DIAMETER	IN	0.200	0.200	0.200
STACK AREA	SQUARE FT	38.48	38.48	38.48
TRAVERSE POINTS	UNITY	12	12	12
SAMPLING TIME	MINUTES	60	60	60
MOL. WT. OF GAS	LB/LB-MOLE	28.10	28.09	28.04
ACT. STK. VELOCITY	FT/SEC	56.5	56.5	53.2
ACT. STK. GAS FLOW	CU-FT/MIN	130,420	130,386	122,795
STD. GAS FLOW	CU-FT/MIN.	109,677	109,515	102,952
PART. EMISSION	LB/DAY	290.5	302.4	272.7
FLUORIDE EMISSION	LB/DAY	26.7	27.8	27.9
ISOKINETIC RATE	%	95.7	95.6	97.1

STACK CALCULATION - DATA SHEET

Stack #1DAP Date 10/22/91 Time 13:35

RUN = 1

MD=0.44(%CO2)+0.32(%O2)+0.28(%N2+%CO) = 29.0

Diameter = 7.00 Ft., Area=3.14159D^2/4= 38.48 Sq. Ft.

DRY BULB TEMP.= 118 F
WET BULB TEMP.= 118 F
M = .07633 # H2O/#Dry air from Psychrometer Chart
BWO = M/(M+(18/MD))= 0.1095 Actual:BWO= 0.0817
MS = 18(BWO)+MD(1-BWO)= 27.80 MS= 28.10

PB = 29.96 IN. HG
PV = 0.53 IN. H2O
PS = PB+(-)(PV/13.6)= 30.00 IN. HG
DELTA H = 1.23 IN. H2O
PM = PB+(DELTA H/13.6) = 30.05 IN. HG

TS = 118 F
TM = 92 F
SQR. DELTA P = 0.950
VM = 37.70 CF
CP = 0.84

W1 0.0298 G. PARTICULATES

W4 0.0027 G. F
W5 5 % OPACITY

VS = 85.49(CP)(AVG. SQR. DELTA P)(SQR.(TS/PS*MS))= 56.5 FPS
QA = 60(A)(VS) = 130,420 ACFM
QS = 17.64(QA)(PS/TS)(1-BWO) = 109,677 DSCFM
VMS = 17.64(VM)(PM/TM)(MCF) = 35.69 SCF

E = 3.172(QS/VMS) = 9,749

E1 = 291 LB./DAY PARTICULATES
E4 = 26.7 LB./DAY F

PLANT RATE
ISOKINETIC = 95.7 %

COMMENTS:

IMC FERTILIZER, INC.
SOURCE SAMPLING DATA VERIFICATION REPORT

TEST ON #1DAP STACK AT NEW WALES PLANT, FL CONDUCTED ON 10/22/91

RUN # 1

ELAP TIME (MIN)	METER VOLUME	DEL P	DEL H	STK T	METER T IN	METER T OUT	STK VELOCITY (FT/SEC)	ISOKINETIC RATE (PERCENT)
0	566.00							
5	569.00	0.82	1.10	118	90	90	53.8	96.2
10	572.10	0.86	1.20	118	91	91	55.1	96.9
15	575.20	0.86	1.20	118	91	91	55.1	96.9
20	578.30	0.88	1.20	118	91	91	55.8	95.8
25	581.50	0.95	1.30	118	92	92	58.0	95.0
30	584.80	0.98	1.30	118	92	92	58.9	96.5
35	587.80	0.85	1.20	117	92	92	54.8	94.1
40	590.90	0.88	1.20	118	93	93	55.8	95.5
45	594.00	0.88	1.20	118	93	93	55.8	95.5
50	597.20	0.92	1.30	118	93	93	57.0	96.4
55	600.40	0.96	1.30	118	94	94	58.3	94.2
60	603.70	1.00	1.30	117	94	94	59.4	95.1

STACK CALCULATION - DATA SHEET

Stack #1DAP Date 10/22/91 Time 14:47

RUN # 2

MD=0.44(%CO2)+0.32(%O2)+0.28(%N2+%CO) = 29.0

Diameter = 7.00 Ft., Area=3.14159D^2/4= 38.48 Sq. Ft.

DRY BULB TEMP.= 118 F
WET BULB TEMP.= 118 F
M = .07633 # H2O/#Dry air from Psychrometer Chart
BWO = M/(M+(18/MD))= 0.1095 Actual:BWO= 0.0831
MS = 18(BWO)+MD(1-BWO)= 27.80 MS= 28.09

PB = 29.96 IN. HG
PV = 0.53 IN. H2O
PS = PB+(-)(PV/13.6)= 30.00 IN. HG
DELTA H = 1.23 IN. H2O
PM = PB+(DELTA H/13.6) = 30.05 IN. HG

TS = 118 F
TM = 93 F
SQR. DELTA P = 0.950
VM = 37.70 CF
CP = 0.84

W1 0.0310 G. PARTICULATES

W4 0.0028 G. F
W5 5 % OPACITY

VS = 85.49(CP)(AVG. SQR. DELTA P)(SQR.(TS/PS*MS))= 56.5 FPS
QA = 60(A)(VS) = 130,386 ACFM
QS = 17.64(QA)(PS/TS)(1-BWO) = 109,515 DSCFM
VMS = 17.64(VM)(PM/TM)(MCF) = 35.62 SCF

E = 3.172(QS/VMS) = 9,754

E1 = 302 LB./DAY PARTICULATES
E4 = 27.8 LB./DAY F

PLANT RATE 84.24 TONS/HOUR
ISOKINETIC = 95.6 %

COMMENTS:

IMC FERTILIZER, INC.
SOURCE SAMPLING DATA VERIFICATION REPORT

TEST ON #1DAP STACK AT NEW WALES PLANT, FL CONDUCTED ON 10/22/91

RUN # 2

ELAP TIME (MIN)	METER VOLUME	DEL P	DEL H	STK T	METER T IN	METER T OUT	STK VELOCITY (FT/SEC)	ISOKINETIC RATE (PERCENT)
0	604.50							
5	607.50	0.83	1.10	118	92	92	54.2	95.4
10	610.60	0.85	1.20	118	92	92	54.8	97.4
15	613.70	0.86	1.20	118	92	92	55.2	96.9
20	616.80	0.88	1.20	117	93	93	55.7	95.5
25	620.00	0.95	1.30	118	93	93	58.0	95.0
30	623.30	0.98	1.30	117	93	93	58.8	96.3
35	626.40	0.85	1.20	118	94	94	54.8	97.1
40	629.50	0.88	1.20	117	94	94	55.7	95.3
45	632.60	0.90	1.20	118	94	94	56.4	94.3
50	635.80	0.92	1.20	117	94	94	57.0	96.2
55	639.00	0.95	1.30	118	94	94	58.0	94.8
60	642.20	0.98	1.30	118	94	94	58.9	93.3