KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

KA 124-92-02

March 4, 1993

Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: PSD Permit Application
IMC Fertilizer, Inc.
New Wales Operations
Phosphoric Acid Third Train

Dear Mr. Fancy:

Enclosed are six bound copies of the PSD permit application and a check for $1,000 (permit application fee) for the increase in the permitted production rate of the existing phosphoric acid third train at the IMC Fertilizer, Inc., New Wales Operations, in Mulberry, Polk County, Florida.

If you have any questions concerning this application, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:wa
Enc.

c: Mr. C. D. Turley, IMC Fertilizer, Inc.
Q. Reynolds
K. Zhang
B. Thomas, SW Dist.
G. Harper, EPA
G. Bunyak, NPS
Z. Novak, Polk Co.

ne Citizens & Southern
ational Bank
lanta, Dekalb County, Georgia

IMC FERTILIZER, INC.

NEW WALES OPERATIONS
P.O. BOX 1035 • MULBERRY, FLORIDA 33860

IMC FERTILIZER, INC.

64-12/8
611

CHECK NO. 029560

PAY EXACTLY *******1,000.00***

03	15	93
MONTH	DAY	YEAR

OPERATING ACCOUNT

AMOUNT
*******1,000.00

PAY TO THE ORDER OF

FLORIDA DEPT. OF ENVIRONMENTAL
REGULATIONS
2600 BLAIRSTONE RD.
TALLAHASSEE FL 32399

AUTHORIZED SIGNATURE

"029560" :061112788: 011 38 049"

029560 : F53566

IMC FERTILIZER, INC
NEW WALES OPERATIONS • P.O. BOX 1035 • MULBERRY, FLORIDA 33860

IMC FERTILIZER, INC.

VOICE DATE		INVOICE NUMBER	REFERENCE NUMBER	PURCHASE ORDER NO.	INVOICE AMOUNT	DISCOUNT	NET PAYABLE
DAY	YEAR						
10	93	C/R031093	634-626		1000.00		1000.00
					1000.00	.00	1000.00

AN APPLICATION FOR A PSD CONSTRUCTION PERMIT REVIEW

PREPARED FOR:

IMC FERTILIZER, INC.
NEW WALES OPERATIONS
MULBERRY, POLK COUNTY, FLORIDA

FEBRUARY 1993

PREPARED BY:

KOOGLER & ASSOCIATES
4014 N.W. 13TH STREET
GAINESVILLE, FLORIDA 32609
(904) 377-5822

Rec'd 3-16-93
$1,000 pd.
Rcpt. 160838

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT
160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501-5794

AC 53-228026
PSD-FL-201

SOURCE TYPE: Phosphoric Acid Manufacture [ ] New[1] [x] Existing[1]

APPLICATION TYPE: [x] Construction [ ] Operation [x] Modification

COMPANY NAME: IMC Fertilizer, Inc. New Wales Operations COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Phos. Acid 3rd Train Scrubber

SOURCE LOCATION: Street Highway 640 and County Line Road City Mulberry

UTM: East 17, 396.7 km North 3079.4 km

Latitude 27 ° 50 ' 13 "N Longitude 82 ° 02 ' 56 "W

APPLICANT NAME AND TITLE: John A. Brafford, Vice President and General Manager

APPLICANT ADDRESS: P.O. Box 1035, Mulberry, Florida 33860

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of IMC Fertilizer, Inc.

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: John A. Brafford

John A. Brafford, Vice President & Gen. Manager
Name and Title (Please Type)

Date: 03/12/93 Telephone No. (813) 428-2531

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

John B. Koogler, Ph.D., P.E.
Name (Please Type)

Koogler & Associates, Environmental Services
Company Name (Please Type)

4014 N.W. 13th Street, Gainesville, FL 32609
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 2/24/93 Telephone No. (904) 377-5822

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

For the increase in the permitted production rate of the existing Phosphoric Acid Third Train from 2200 to 2500 tons per day acid as P_2O_5. No physical changes to the existing equipment will be required. The project will result in full compliance with the applicable FDER air regulations.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction July 1993 Completion of Construction July 1994

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

NA - Existing equipment

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

FDER Permit No. A053-192132 : Issued 4/26/91 ; Amended 6/24/91 ; Expires 4/25/96

c. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe: 8760 hours/year

d. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? NO

   a. If yes, has "offset" been applied? NA

   b. If yes, has "Lowest Achievable Emission Rate" been applied? NA

   c. If yes, list non-attainment pollutants. NA

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. YES [1]

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. YES [1]

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? YES [1]

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

e. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? NA

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted. NA

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

[1] See attached PSD report.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - ~~lbs/hr~~ tons/day	Relate to Flow Diagram
	Type	% Wt		
Phosphate Rock	Fluorides	3.5	9000	
Sulfuric Acid	NA	NA	7000	

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 16,000 TPD

2. Product Weight (lbs/hr): 2,500 TPD acid as P_2O_5

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

PAD 3rd Train Scrubber :

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/~~hr~~ hr.	T/yr	
Fluoride	2.16	9.4	17-296.800	2.16	2.16	9.4	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) PAD 3rd Train Scrubber :

Name and Type (Model & Serial No.)	Contaminant	Efficiency %	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Davey McKee Crossflow Packed Scrubber	Fluorides	99	NA	Design

E. Fuels NA

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

ercent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

eat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating. NA

nnual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Collected material is discharged to plant recirculation system.

PAD 3rd Train Scrubber :

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 134 ft. Stack Diameter: 4.5 ft.

Gas Flow Rate: 27,300 ACFM 24,200 DSCFM Gas Exit Temperature: 95 °F.

Water Vapor Content: 5.3 % Velocity: 30.4 FPS

SECTION IV: INCINERATOR INFORMATION

NA

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr)_____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr._____

Manufacturer_____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ACFM _____ DSCFM* Velocity: _____FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify)_____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

See Attached Report

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. $ 1000

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

See Attached Report

1. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

2. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

3. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

4. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

E. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

See Attached Report

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^{2}* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

REPORT IN SUPPORT OF AN APPLICATION FOR A PSD CONSTRUCTION PERMIT REVIEW

PREPARED FOR:

IMC FERTILIZER, INC.
NEW WALES OPERATIONS
MULBERRY, POLK COUNTY, FLORIDA

FEBRUARY 1993

PREPARED BY:

KOOGLER & ASSOCIATES
4014 N.W. 13TH STREET
GAINESVILLE, FLORIDA 32609
(904) 377-5822

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1.0 SYNOPSIS OF APPLICATION

1.1 APPLICANT

IMC Fertilizer, Inc.
New Wales Operation
State Road 640
P.O. Box 1035
Mulberry, Florida 33860

1.2 FACILITY LOCATION

IMC Fertilizer, Inc. (IMC), consists of a phosphate chemical fertilizer manufacturing facility approximately seven miles southwest of Mulberry, Florida, on State Road 640 in Polk County. The UTM coordinates of the IMC facility are Zone 17, 396.6 km east and 3078.9 km north.

1.3 PROJECT DESCRIPTION

IMC proposes to increase the phosphoric acid (PAD) production rate of the existing third train from 2200 to 2500 tons per day of phosphoric acid as P_2O_5. This reflects an increase in the PAD production rate of the third train from the current 92 tph P_2O_5 to about 105 tph P_2O_5. The proposed project will not require construction or modification of any process equipment to achieve the production rate increase. The production increase will be achieved by increasing process control and efficiency.

The proposed project will result in a significant net increase (in accordance with Table 212.400-2 of Chapter 17-212, Florida Administrative Code, FAC) in the emission rate of fluorides.

IMC is submitting this report in support of the application to the Florida Department of Environmental Regulation for increasing the phosphoric acid production rate of the existing PAD third train. The report includes a description of the existing chemical complex and the PAD third train, a review of Best Available Control Technology, an ambient air quality analysis and an evaluation of the impact of the proposed modifications on soils, vegetation and visibility.

2.0 FACILITY DESCRIPTION

IMC Fertilizer, Inc. consists of a phosphate chemical fertilizer manufacturing facility located on State Road 640 in Polk County, Florida (See Figures 2-1 and 2-2). The UTM coordinates of the facility are Zone 17, 396.6 km east and 3078.9 km north.

2.1 EXISTING FACILITY

The existing fertilizer complex processes wet phosphate rock into several different fertilizer products. This is accomplished by reacting the phosphate rock with sulfuric acid to produce phosphoric acid and then converting the phosphoric acid to fertilizer products. The chemical complex includes five sulfuric acid plants, three phosphoric acid plants, three diammonium phosphate (DAP) plants, a monoammonium phosphate (MAP) plant, a granular triple superphosphate (GTSP) plant, a Multifos plant, an animal feed ingredients (AFI) plant, a uranium recovery plant, and storage, handling, grinding and shipping facilities for phosphate rock, ammonia, sulfur, and fertilizer products. Figure 2-3, Plot Plan, shows the location of the existing plants. A summary of the plant operation data is provided in Table 2-1.

TABLE 2-1

PAD PLANT EMISSION DATA SUMMARY (1)
PHOSPHORIC ACID THIRD TRAIN

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Plant Operation Parameter	1991		1992	AVG.
	2/91	8/91	4/92	
Feed Rate (tons/day)	2028	2028	2441	2166
Production Rate (tons/day)	1886	1886	2271	2014
Fluoride Emissions (1)				
(lbs/ton feed)	0.002	0.003	0.01	0.005
(lbs/hr)	0.15	0.29	0.97	0.47

(1) Includes acid clarifier fluoride emissions allocation of 2 lbs/day.

FIGURE 2-1

AREA LOCATION MAP

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

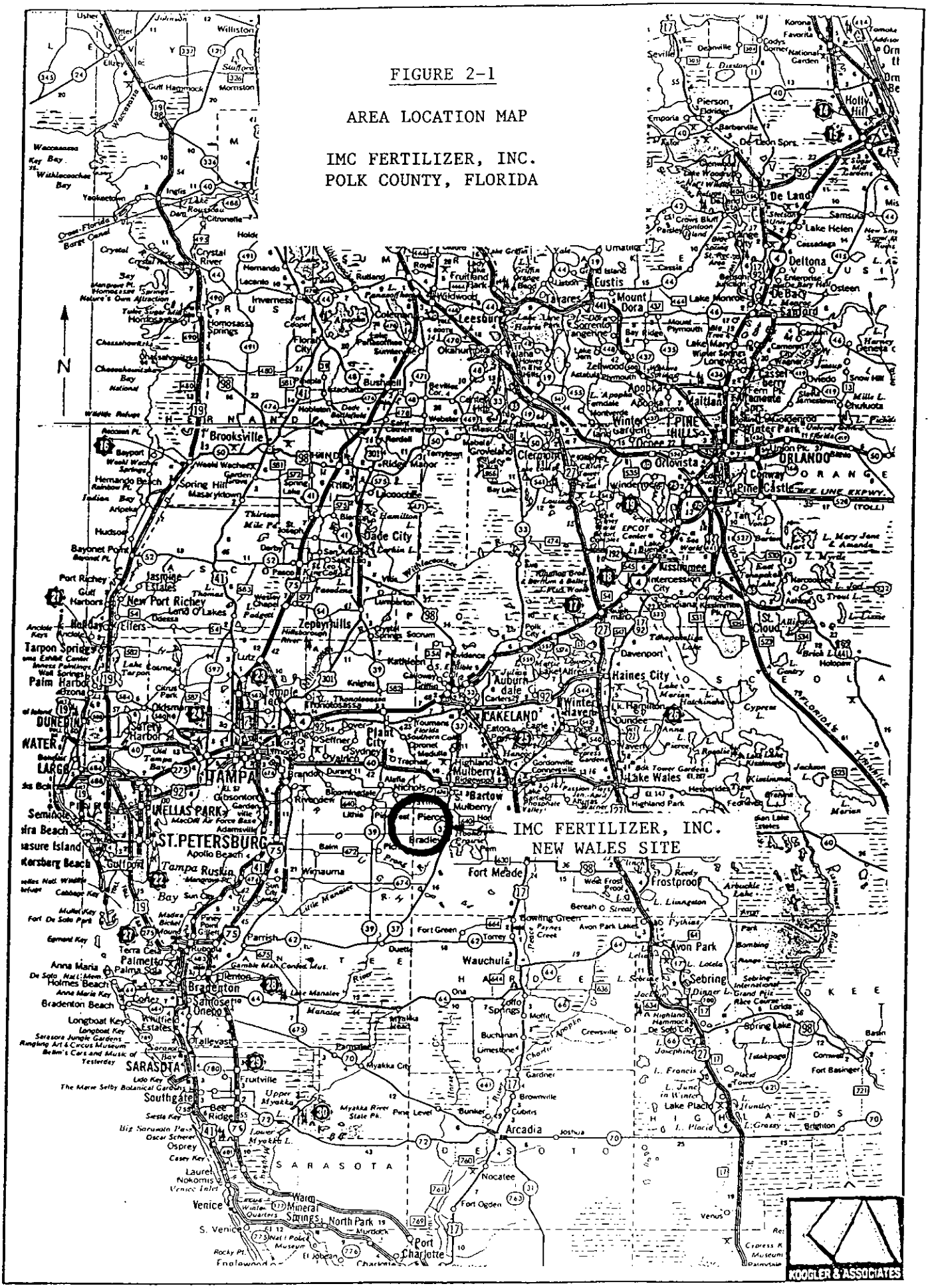
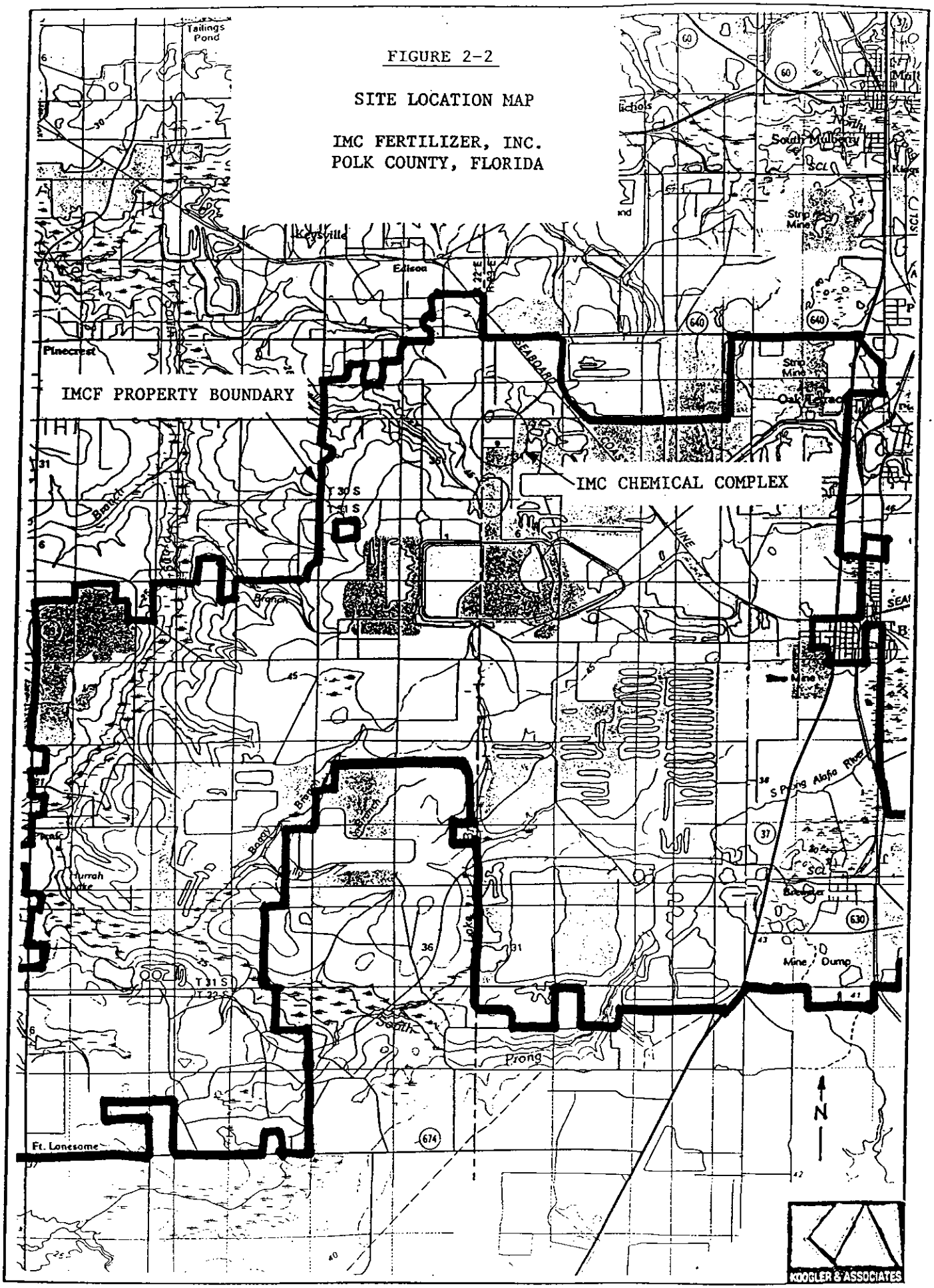
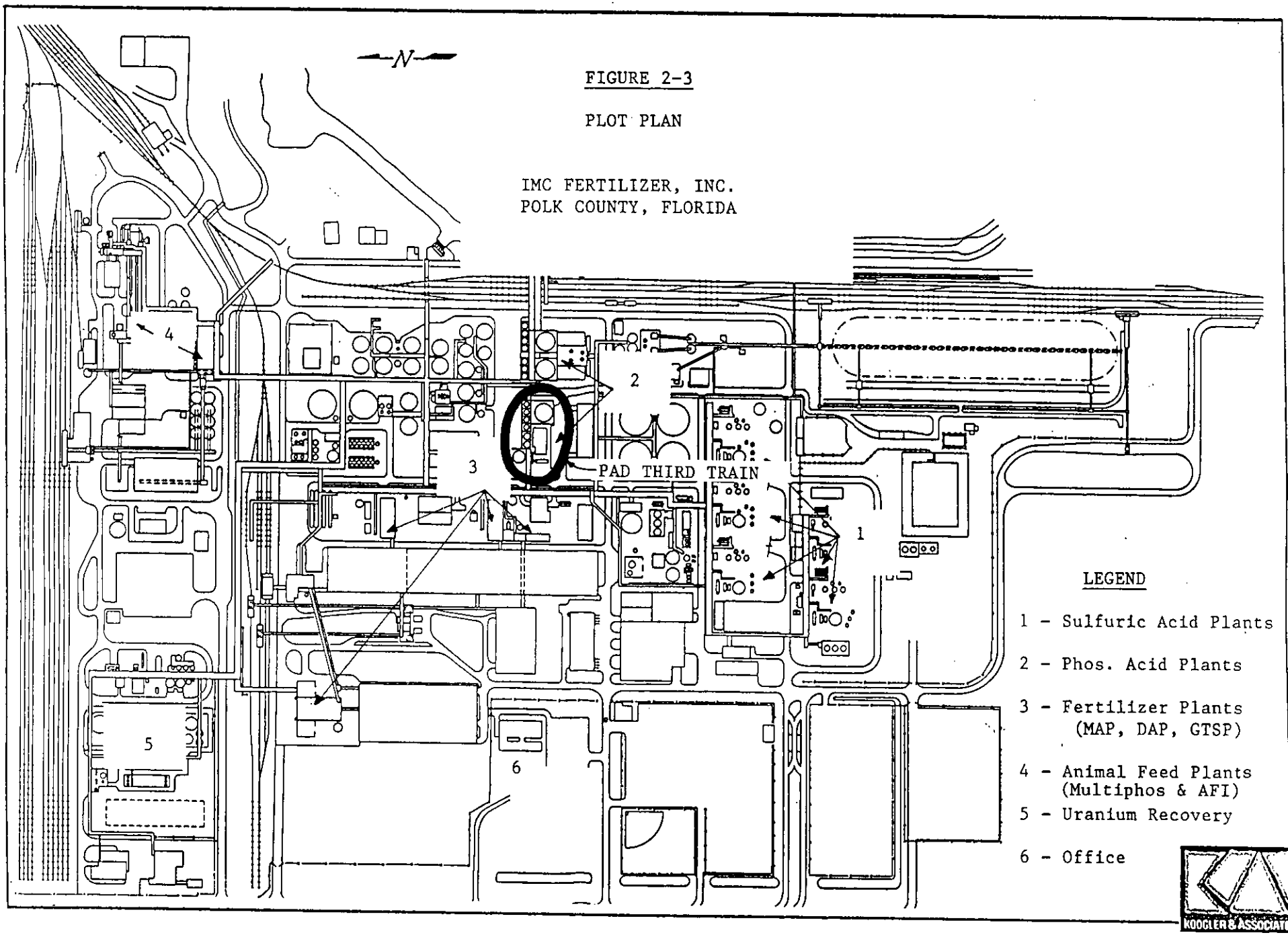


FIGURE 2-2

SITE LOCATION MAP

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA




N
FIGURE 2-3
PLOT PLAN
IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA
PAD THIRD TRAIN
1
2
3
4
5
6
LEGEND
1 - Sulfuric Acid Plants
2 - Phos. Acid Plants
3 - Fertilizer Plants (MAP, DAP, GTSP)
4 - Animal Feed Plants (Multiphos & AFI)
5 - Uranium Recovery
6 - Office
KOOGLER & ASSOCIATES

3.0 PROPOSED PROJECT

3.1 PROJECT DESCRIPTION

IMC proposes to increase the phosphoric acid (PAD) production rate of the existing third train from 2200 to 2500 tons per day PAD as P_2O_5. The corresponding increase in the equivalent P_2O_5 feed to the third train will be from 2366 to 2688 tons per day P_2O_5. The proposed project will not require construction or modification of any process equipment to achieve the production rate increase. The production increase will be achieved by increasing process control and efficiency. A process flow diagram of the PAD third train is presented in Figure 3-1.

The allowable fluoride emission limit for the PAD plant corresponds to the Standards of Performance for Wet-Process Phosphoric Acid Plants, 40CFR60 Subpart T, of 0.02 pound fluoride per ton of equivalent P_2O_5 feed. The proposed project will result in an increase in the allowable fluoride emissions of about 0.3 pound per hour, 6.5 pounds per day, and 1.2 tons per year.

IMC has historically traded/sold phosphoric acid to other fertilizer manufacturers. The additional P_2O_5 produced will simply increase IMC's trading flexibility. The sulfuric acid plants will supply the additional sulfuric acid required for the PAD production increase and will continue to operate within the conditions of the PSD permit issued by DER. This project is not expected to affect the operations or the air permits of any other plant in the complex.

3.2 RULE REVIEW

The following are the state and federal air regulatory requirements that apply to new or modified sources subject to a Prevention of Significant Deterioration (PSD) review.

In accordance with EPA and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) are subject to preconstruction review. Florida's State Implementation Plan (SIP), approved by the EPA, authorizes the Florida Department of Environmental Regulation (FDER) to manage the air pollution program in Florida.

The PSD review determines whether or not significant air quality deterioration will result from a new or modified facility. Federal PSD regulations are contained in 40CFR52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations which are essentially identical to the federal regulations and are contained in Chapter 17-212 of the Florida Administrative Code (FAC). All new major facilities and major modifications to existing facilities are subject to control technology review, source impact analysis, air quality analysis and additional impact analyses for each pollutant subject to a PSD review. A facility must also comply with the Good Engineering Practice (GEP) stack height rule.

A major facility is defined in the PSD rules as any one of the 28 specific source categories (see Table 3-3) which has the potential to emit 100 tons

per year (tpy) or more, or any other stationary facility which has the potential to emit 250 tpy or more, of any pollutant regulated under the CAA. A major modification is defined in the PSD rules as a change at an existing major facility which increases the actual emissions by greater than significant amounts (see Table 3-4).

3.2.1 Ambient Air Quality Standards

The EPA and the State of Florida have developed/adopted ambient air quality standards, AAQS (see Table 3-5). Primary AAQS protect the public health while the secondary AAQS protect the public welfare from adverse effects of air pollution. Areas of the country have been designated as attainment or nonattainment for specific pollutants. Areas not meeting the AAQS for a given pollutant are designated as nonattainment areas for that pollutant. Any new source or expansion of existing sources in or near these nonattainment areas are usually subject to more stringent air permitting requirements. Projects proposed in attainment areas are subject to air permit requirements which would ensure continued attainment status.

3.2.2 Control Technology Evaluation

The PSD control technology review requires that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to the source. The BACT requirements are applicable to all regulated pollutants subject to a PSD review.

BACT is defined in Chapter 17-212, FAC as an emission limitation, including a visible emission standard, based on the maximum degree of

reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead, to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation. Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The reason for evaluating the BACT is to minimize as much as possible the consumption of PSD increments and to allow future growth without significantly degrading air quality. The BACT review also analyzes if the most current control systems are incorporated in the design of a proposed facility. The BACT, as a minimum, has to comply with the applicable New Source Performance Standard for the source. The BACT analysis requires the evaluation of the available air pollution control methods including a cost-benefit analysis of the alternatives. The cost-benefit analysis includes consideration of materials, energy, and economic penalties

associated with the control systems, as well as environmental benefits derived from the alternatives.

EPA determined that the bottom-up approach (starting at NSPS and working up to BACT) was not providing the level of BACT originally intended. As a result, in December 1987, EPA strongly suggested changes in the implementation of the PSD program including the "top-down" approach to BACT. The top-down approach requires an application to start with the most stringent control alternative, often Lowest Achievable Emission Rate (LAER), and justify its rejection or acceptance as BACT. Rejection of control alternatives may be based on technical or economical infeasibility, physical differences, locational differences, and environmental or energy impact differences when comparing a proposed project with a project previously subject to that BACT.

3.2.3 Air Quality Monitoring

An application for a PSD permit requires an analysis of ambient air quality in the area affected by the proposed facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate.

Ambient air monitoring for a period of up to one year, but no less than four months, is required. Existing ambient air data for a location in the vicinity of the proposed project is acceptable if the data meet FDER

quality assurance requirements. If not, additional data would need to be gathered. There are guidelines available for designing a PSD air monitoring network in EPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration."

FDER may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause air quality impacts less than the de minimis levels (see Table 3-4).

3.2.4 Ambient Impact Analysis

A source impact analysis is required for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate. Specific atmospheric dispersion models are required in performing the impact analysis. The analysis should demonstrate the project's compliance with AAQS and allowable PSD increments. The impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significant impact levels.

Typically, a five-year period is used for the evaluation of the highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors. The second-highest concentration is considered because short-term AAQS specify that the

standard should not be exceeded at any location more than once a year. If less than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor is normally used.

3.2.5 Additional Impact Analysis

The PSD rules also require analyses of the impairment to visibility and the impact on soils and vegetation that would occur as a result of the project. A visibility impairment analysis must be conducted for PSD Class I areas. Impacts due to commercial, residential, industrial, and other growth associated with the source must be addressed.

3.2.6 Good Engineering Practice Stack Height

In accordance with Chapter 17-210, FAC, the degree of emission limitation required for control of any pollutant should not be affected by a stack height that exceeds GEP, or any other dispersion technique. GEP stack height is defined as the highest of:

1. 65 meters (m), or
2. A height established by applying the formula:

   $Hg = H + 1.5\ L$

   where:

   Hg - GEP stack height,

   H - Height of the structure or nearby structure, and

   L - Lesser dimension, height or projected width of nearby structure(s)
3. A height demonstrated by a model or field study.

The GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height. The actual stack height may be higher or lower.

3.3 RULE APPLICABILITY

The proposed PAD third train's production increase is classified as a major modification to a major facility subject to both state and federal regulations as set forth in Chapter 17-212, FAC. The facility is located in an area classified as attainment for each of the regulated air pollutants. The proposed project will result in a significant increase in fluoride emissions as defined by Rule 17-212, FAC, and will therefore be subject to PSD preconstruction review requirements. This will include a determination of Best Available Control Technology, an air quality review, Good Engineering Practice stack height analysis and an evaluation of impacts on soils, vegetation and visibility.

TABLE 3-1

CHANGES IN PRODUCTION AND EMISSION RATES (1)
PHOSPHORIC ACID THIRD TRAIN

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Permit Allowable Conditions		
Feed Rate	(TPD)	2366
Production Rate	(TPD)	2200
Fluorides	(lb/ton feed)	0.02
	(lb/day)	47.3
	(TPY)	8.64
Operating Hours	(hrs/yr)	8760
Actual Conditions (1991-1992 avg.)		
Feed Rate	(TPD)	2166
Production Rate	(TPD)	2014
Fluorides	(lb/ton feed)	0.005
	(lb/day)	11.36
	(TPY)	1.8
Operating Hours	(hrs/yr)	7739
Proposed Conditions		
Feed Rate	(TPD)	2688
Production Rate	(TPD)	2500
Fluorides	(lb/ton feed)	0.02
	(lb/day)	53.76
	(TPY)	9.8
Operating Hours	(hrs/yr)	8760

(1) See Appendix for calculations of emission rates.
(2) Fluoride emissions presented above include the 2 lbs/day allocation to the acid clarifier.

TABLE 3-2

NET EMISSION INCREASES(1)
PHOSPHORIC ACID THIRD TRAIN

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

	ANNUAL FLUORIDE EMISSIONS (TPY)
Present (actual)	1.8
Proposed	9.8
Change	8.0
Significant Increase (2)	3.0

(1) See Appendix for emission calculations.
(2) Presented in Table 212.400-2, Chapter 17-212, FAC.

TABLE 3-3
MAJOR FACILITY CATEGORIES

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Fossil fuel fired steam electric plants of more than 250 MMBTU/hr heat input
Coal cleaning plants (with thermal dryers)
Kraft pulp mills
Portland cement plants
Primary zinc smelters
Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators capable of charging more than 250 tons of refuse per day
Hydrofluoric acid plants
Sulfuric acid plants
Nitric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants
Fossil fuel boilers (or combinations thereof) totaling more than 250 million BTU/hr heat input
Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
Taconite ore processing plants
Glass fiber processing plants
Charcoal production plants

TABLE 3-4
REGULATED AIR POLLUTANTS - SIGNIFICANT EMISSION RATES

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Pollutant	Significant Emission Rate tons/yr	De Minimis Ambient Impacts μg/m3
CO	100	575 (8-hour)
NOx	40	14 (NO2, Annual)
SO2	40	13 (24-hour)
Ozone	40 (VOC)	-
PM (TSP)	25	10 (24-hour)
PM10	15	10 (24-hour)
TRS (including H2S)	10	0.2 (1-hour)
H2SO4 mist	7	-
Fluorides	3	0.25 (24-hour)
Vinyl Chloride	1	15 (24-hour)
	pounds/yr	
Lead	1200	0.1 (Quarterly avg)
Mercury	200	0.25 (24-hour)
Asbestos	14	-
Beryllium	0.8	0.001 (24-hour)

TABLE 3-5
AMBIENT AIR QUALITY STANDARDS

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Pollutant	FDER (State)		USEPA (National)			
			Primary		Secondary	
	µg/m3	PPM	µg/m3	PPM	µg/m3	PPM
SO_2, 3-hour	1,300	0.5	-	-	1300	0.5
24-hour	260	0.1	365	0.14	-	-
Annual	60	0.02	80	0.03	-	-
PM10, 24-hour	150	-	150	-	150	-
Annual	50	-	50	-	50	-
CO, 1-hour	40,000	35	40,000	35	-	-
8-hour	10,000	9	10,000	9	-	-
Ozone, 1-hour	235	0.12	235	0.12	235	0.12
NO_2, Annual	100	0.05	100	-	100	-
Lead, Quarterly	1.5	-	1.5	-	1.5	-

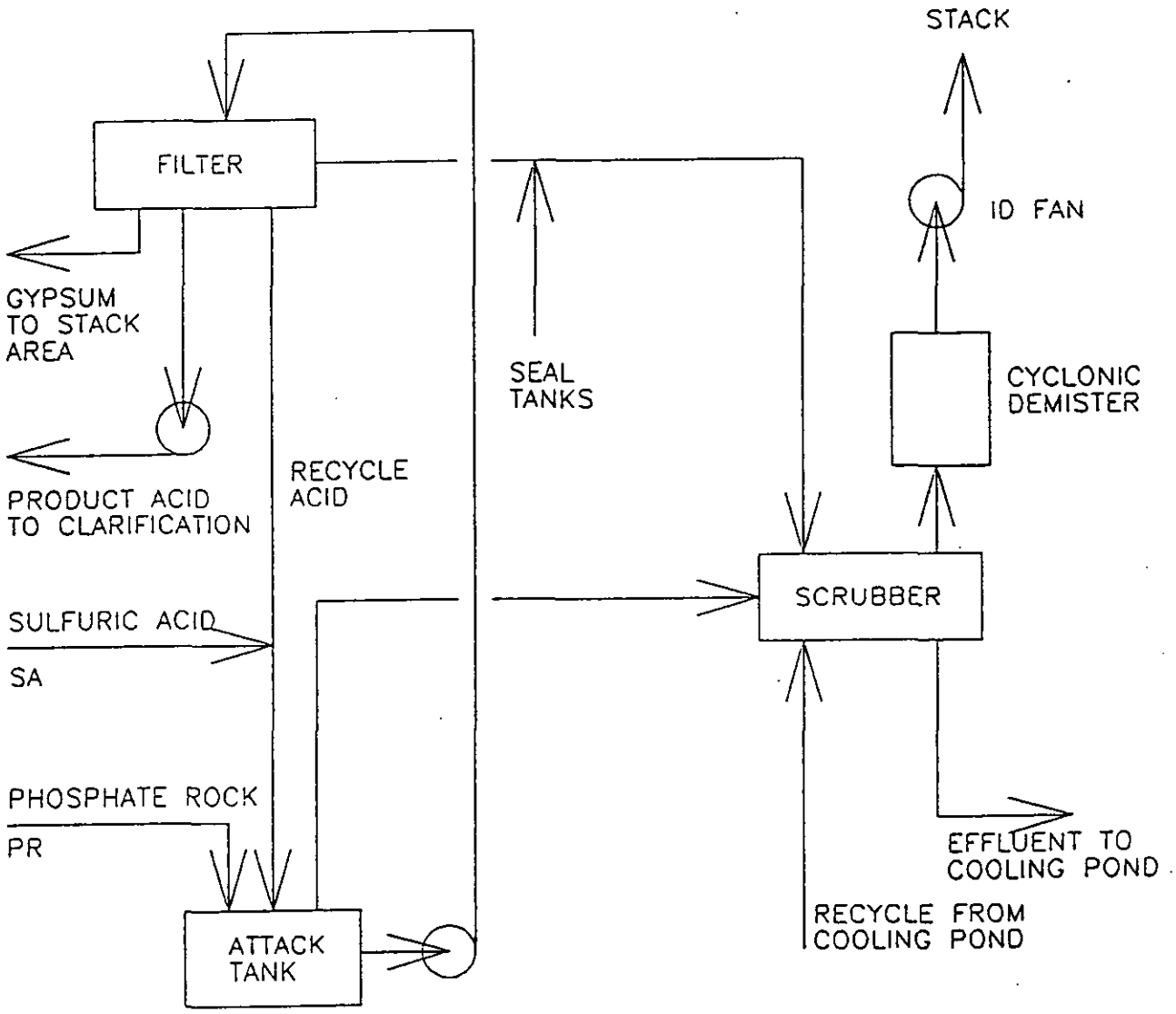
TABLE 3-6
PSD INCREMENTS

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Pollutant	Allowable PSD Increments (State/National) Class I μg/m3	Class II μg/m3	Class III μg/m3
TSP, Annual	5	19	37
24-hour	10	37	75
SO2, Annual	2	20	40
24-hour	5	91	182
3-hour	25	512	700
NO2, Annual	2.5	25	50

FIGURE 3-1

PROCESS FLOW DIAGRAM
PHOSPHORIC ACID PLANT



PREPARED: CDT	TITLE: PHOSPHORIC ACID TRAIN NO. 3	IMC FERTILIZER, INC.	
DATE: 1/23/91	w/SCRUBBER FLOW DIAGRAM	LOCATION: NEW WALES	FILE: NWALES02
REVISED:		SCALE: NONE	DRAWING NO.: L10

4.0 BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from modification to the major emitting facilities if the modification results in significant increase in the emission rate of regulated pollutants (see Table 3-5 for significant emission levels). The emission rate increase proposed by IMC has been summarized in Table 3-2. The fluoride emissions increase from the proposed project will represent a significant increase. A BACT analysis is therefore required for fluorides.

4.1 EMISSION STANDARDS FOR PAD PLANTS

Federal New Source Performance Standards (NSPS) have been promulgated for wet-process PAD plants. These standards became effective on October 22, 1974 and are codified in 40CFR60, Subpart T and require fluoride emissions to be limited to no more than 0.02 pound per ton of P_2O_5 feed. There has been no change in EPA philosophy or the fluoride standard related to PAD plants since that time.

A review of BACT/LAER determinations published in the EPA Clearinghouse indicates that no new control alternatives have been applied to PAD plants as of 1991 that would result in a consistent reduction in fluoride emissions below 0.02 pound per ton of P_2O_5 feed.

4.2 FLUORIDES CONTROL TECHNOLOGY

Fluoride emissions occur during the addition of the ground phosphate rock slurry to the sulfuric acid in the attack tanks; at the filters used for

separating phosphoric acid from the gypsum precipitate; in the evaporators used for concentrating the phosphoric acid; and from the acid clarifier.

The acid clarifier emissions are controlled by a scrubber which is permitted under A053-199497. No changes to that permit are requested.

The condensate (with the captured fluorides from the evaporators) is added to the plant's recirculating water system.

The acid attack tank and filter hood are exhausted to a scrubber system consisting of a cross-flow packed bed scrubber with a wet cyclonic demister. The fluorides are emitted to the atmosphere through a 134 ft stack.

At all the PAD plants wet scrubbing equipment is conventionally applied for removal of fluorides from the effluent gas streams because of high moisture content. The high concentration of water in the gas stream poses problems in the use of fabric collectors and, to a lesser extent, in the use of mechanical or electrostatic collectors.

Typically the scrubbing medium is pond water. The availability of pond water as a scrubbing medium and the gypsum pond as a settling basin for collected solids are ideal features for wet scrubbers.

Generally, individual plants are designed with a combination of wet scrubbers most suited for its process and emission control requirements.

Scrubbing efficiencies in the newer PAD plants are expected to meet the current federal standard for fluorides of 0.02 lb/ton P_2O_5 feed.

The use of once-through fresh water, in place of pond water, would enhance the fluorides controlled by the scrubber. However, the use of fresh water raises several environmental and chemical process related issues which need to be addressed.

The IMC facility is located in a sensitive water management area. IMC has adopted a strict water reduction and conservation program required by the Water Management District. The use of once-through fresh water would result in a significant increase in the amount of fresh water consumed by the facility contradicting the facility's commitment to seek ways to reduce IMC's current fresh water requirements. The additional scrubber water discharge will result in an increase in the water entering the pond system and within a short period of time exceed the pond's surge capacity requirements. The increased fresh water usage will also adversely affect the delicate water balance of the complex eventually forcing a plant shut down. A dedicated fresh water recirculation system could be constructed with a dedicated pond and distribution system at considerable expense ($16433 per ton of fluoride removed , estimated for a similar project). This system would still require makeup fresh water, raising the same issues discussed above.

In consideration of the above adverse impacts, the use of fresh water over pond water for a marginal increase in fluoride removal does not seem

justified.

4.3 CONCLUSION

Based upon the analysis presented in previous section, the existing scrubber arrangement, limiting the emissions of fluorides from the PAD third train to 0.02 lb/ton P_2O_5 feed, represents BACT.

5.0 AIR QUALITY REVIEW

The air quality review required of a PSD construction permit application potentially requires both air quality modeling and air quality monitoring. The air quality monitoring is required when the impact of air pollutant emission increases and decreases associated with a proposed project exceed the de minimis impact levels defined by Rule 17-212, FAC, or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. The air quality modeling is required to provide assurance that the emissions from the proposed project, together with the emissions of all other air pollutants in the project area, will not cause or contribute to a violation of any ambient air quality standard.

5.1 AIR QUALITY MODELING FOR FLUORIDES

The air quality review for the proposed project evaluated the fluoride emissions increase associated with the production increase of the PAD third train. The emission rates of fluorides used for air quality modeling purposes were the currently permitted and the proposed maximum allowable emission rate for the PAD third train. The EPA approved SCREEN model was used to evaluate the ambient air quality impacts from the proposed project. As the conservative SCREEN modeling results indicated acceptable impact levels, further refined modeling was not deemed necessary.

The SCREEN modeling associated with this review demonstrated that the ambient air impact of fluoride emission increases would be 1.03 micrograms

per cubic meter, 24-hour average (this represents the difference between the maximum predicted ambient air impacts of the proposed and existing fluoride emission rates). While this impact is higher than the de minimis impact level of 0.25 micrograms per cubic meter (24-hour average), it is below the FDER No-Threat Level (NTL) permitting guidelines for fluorides of 25 micrograms per cubic meter, 8-hour average; and 6 micrograms per cubic meter, 24-hour average. There is no FDER NTL for the annual period for fluorides. There are no ambient air quality standards for fluorides to compare the proposed impacts with.

Table 5-1 contains modeling input parameters used in the ambient air quality impacts analysis. Table 5-2 provides a summary of the SCREEN modeling results.

Since the modeling demonstrates that the net impact of the fluoride emissions increases addressed in this application are only slightly higher than the de minimis impact levels defined by Rule 17-212, FAC (presented in Table 3-4), and since the impacts are below the FDER No-Threat-Level permitting guidelines, no additional refined air quality modeling or air quality monitoring is deemed necessary.

TABLE 5-1

AIR QUALITY MODELING PARAMETERS

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

Stack	Emission E (g/s)	Stack Parameters H (m)	Dia (m)	Vel (mps)	Temp (°K)	Building Dimensions H (m)	L (m)	W (m)
01 Scrubber Existing	0.215	40.85	1.37	12.2	310.8	40.9	50.0	50.0
02 Scrubber Proposed	0.272	40.85	1.37	12.2	310.8	40.9	50.0	50.0

TABLE 5-2

SUMMARY OF FLUORIDES AMBIENT AIR IMPACT ANALYSIS
SCREEN MODELING RESULTS

IMC FERTILIZER, INC.
POLK COUNTY, FLORIDA

	FLUORIDE IMPACT ($\mu g/m^3$)		
	ANNUAL	8-HOUR	24-HOUR
EXISTING PAD 3	0.97	6.82	3.90
PROPOSED PAD 3	1.23	8.62	4.93
NET INCREASE	0.26	1.80	1.03
De minimis Impact 17-212, FAC	NA	NA	0.25
FDER No-Threat Levels (Permitting Guidelines)	NA	25.0	6.0

NOTE: The maximum predicted impact occur at the nearest property boundary at a distance of 1350 meters from the source.

6.0 GOOD ENGINEERING PRACTICE STACK HEIGHT

The criteria for good engineering practice stack height in Rule 17-210, FAC, states that the height of a stack should not exceed the greater of 65 meters (213 feet) or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion.

IMC's PAD third train scrubber stack is less than 213 feet in height above-grade (134 feet in height). This will satisfy the good engineering practice (GEP) stack height criteria.

It should be noted that building effects were considered in the SCREEN modeling using the worst-case building dimensions of the PAD third train building.

7.0 IMPACTS ON SOILS, VEGETATION AND VISIBILITY

7.1 IMPACT ON SOILS AND VEGETATION

The U. S. Environmental Protection Agency was directed by Congress to develop primary and secondary ambient air quality standards. The primary standards were to protect human health and the secondary standards were to:

> "... protect the public welfare from any known or anticipated adverse effects of a pollutant."

The public welfare was to include soils, vegetation and visibility.

As a basis for promulgating the air quality standards, EPA undertook studies related to the effects of all major air pollutants and published criteria documents summarizing the results of the studies. The studies included in the criteria documents were related to both acute and chronic effects of air pollutants. Based on the results of these studies, the criteria documents recommended air pollutant concentration limits for various periods of time that would protect against both chronic and acute effects of air pollutants with a reasonable margin of safety. EPA has not promulgated ambient air quality standards for fluorides.

The air quality modeling that has been conducted as a requirement for the PSD application demonstrates that the levels of fluorides expected as a result of the proposed project will be below the FDER No-Threat-Level permitting guidelines. It is reasonable to conclude that there will be no adverse effect to the soils, vegetation or visibility of the area.

7.2 GROWTH RELATED IMPACTS

The proposed modification will require no increase in personnel to operate the PAD third train. Therefore, no additional growth impacts are expected as a result of the proposed project.

7.3 VISIBILITY IMPACTS

The proposed project will result in an increase in fluoride emissions which are not expected to have adverse impacts on visibility.

8.0 CONCLUSION

It can be concluded from the information in this report that the proposed increase in production rate of IMC's PAD third train as described in this report will not cause or contribute to a violation of any air quality standard, PSD increment, or any other provision of Chapter 17-212, FAC.

APPENDIX

PROPOSED EMISSION CALCULATIONS
IMC PAD THIRD TRAIN MODIFICATION
DECEMBER 1992

I. ACTUAL EMISSIONS - 1991/1992 AVERAGE

Operating Hours (1991) = 7739 hrs/yr

Fluoride Emissions, PAD 3 Scrubber (Tests on 2/91, 8/91, and 4/92):

F = (0.07 + 0.21 + 0.89) lb/hr / 3

= 0.39 lb/hr

x 7739 hrs/yr x ton/2000 lbs

= 1.5 tons/yr

Fluoride Emissions, Acid Clarifier based on permit allocation:

F = 2 lbs/day

x day/24 hrs

= 0.083 lb/hr

x 7739 hrs/yr x ton/2000 lbs

= 0.32 ton/yr

Total PAD Fluoride Emissions:

Hourly F = (0.39 + 0.083) lb/hr

= 0.47 lb/hr

Annual F = (1.5 + 0.32) tons/yr

= 1.8 tons/yr

II. PROPOSED EMISSIONS

Fluoride Emissions - Based on 0.02 lb/ton P_2O_5 feed (NSPS)

Total F = 2688 ton P_2O_5 feed/day x 0.02 lb/ton feed

= 53.8 lbs/day

As the clarifier allocation is 2 lbs/day, the allowable fluoride emissions from the PAD third train scrubber are:

F = (53.8 - 2) lbs/day

= 51.8 lbs/day

x day/24 hrs

= 2.16 lbs/yr

x 8760 hrs/yr x ton/2000 lbs

= 9.4 tons/yr

The total fluoride emissions from the No. 3 PAD train, including the clarifier allocation, are 53.8 lbs/day and 9.82 tons/yr.

III. NET ANNUAL EMISSION CHANGES

Net Emission Changes = Proposed Emissions - Actual Emissions

Fluoride Emission Changes

Net Annual Fluorides = (9.8 - 1.8) tons/yr

= 8.0 tons/yr

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347

Lawton Chiles, Governor 813-623-5561 Carol M. Browner, Secretary

PERMITTEE:
IMC Fertilizer, Inc.
New Wales Operations
P.O. Box 1035
Mulberry, Florida 33860

PERMIT/CERTIFICATION
Permit No: AO53-192132
County: Polk
Expiration Date: 04/25/96
Issued: 04/26/91
Amended: 06/24/91
Project: Phos Acid Train
No. 3 w/Scrubber

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of the 2,200 ton per day phosphoric acid train No. 3 (only). Phosphoric acid train No. 3 is part of the IMC New Wales phosphoric acid facility which also includes phosphoric acid train east and phosphoric acid train west. All three phosphoric acid trains share a common acid clarifier. Fluoride emissions from phosphoric acid train No. 3 are controlled by a 25,000 ACFM Davy McKee Crossflow Packed Scrubber (using cooling pond water) followed by a cyclonic demister.

Location: Highway 640 & County Line Road, Mulberry, FL.

UTM: 17-396.7 E 3079.4 N NEDS NO: 0059 Point ID: 39

Replaces permit number: AO53-116101

PERMITTEE:
IMC Fertilizer, Inc.
New Wales Operations
P.O. Box 1035
Mulberry, Florida 33860

PERMIT/CERTIFICATION
Permit No: AO53-192132
County: Polk
Expiration Date: 04/25/96
Project: Phos Acid Train No. 3 w/Scrubber

SPECIFIC CONDITIONS:

1. A part of this permit is the attached 15 General Conditions.

2. For the phosphoric acid train No. 3, IMC Fertilizer, Inc. shall comply with all the requirements of 40 CFR 60, Subpart T - Standards of Performance for the Phosphate Fertilizer Industry: Wet-Process Phosphoric Acid Plants. [AC53-99108].

3. Visible emissions shall not be equal to or greater than 20% opacity. [Rule 17-2.610(2)(a), F.A.C.].

4. Total fluorides emissions shall not exceed 0.019 pound per ton of "equivalent P_2O_5 feed", and shall not exceed 41 pounds per day. [AC53-99108, Rule 17-2.660, F.A.C., and 40 CFR 60 Subpart T].

5. The "equivalent P_2O_5 feed" shall not exceed 2,366 tons per day. [AC53-99108].

6. The product rate shall not exceed 92 tons per hour of acid as P_2O_5, and shall not exceed 2,200 tons per day of acid as P_2O_5. [Permit AC53-99108].

7. IMC Fertilizer, Inc. shall not cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rules 17-2.620(2) and 17-2.100, F.A.C.].

8. This source is permitted to operate 8,760 hours per year.

9. Test the emissions for the following pollutants on an annual basis, within 30 days of the date March 19. Submit a copy of the test data to the Air Section of the Southwest District Office of the Department within 45 days of testing.
[Rules 17-2.700(2) and 17-2.700(7), F.A.C.].

(X) Fluorides
(X) Opacity

10. Compliance with specific condition #3 shall be demonstrated using EPA Method 9. Compliance with specific condition #4 shall be demonstrated by the test methods and procedures specified in 40 CFR 60.204.

PERMITTEE:
IMC Fertilizer, Inc.
New Wales Operations
P.O. Box 1035
Mulberry, Florida 33860

PERMIT/CERTIFICATION
Permit No: AO53-192132
County: Polk
Expiration Date: 04/25/96
Project: Phos Acid Train No. 3 w/Scrubber

SPECIFIC CONDITIONS:

11. Compliance testing shall be conducted while operating within ±10% of the maximum permitted "equivalent P_2O_5 feed" rate of 2,366 tons per day. A compliance test submitted at an operating rate less than 90% of the maximum permitted rate will automatically constitute an amended permit at the lesser rate until another test demonstrating compliance at a higher rate is submitted. Failure to submit the "equivalent P_2O_5 feed" rate or operating at conditions during testing which do not reflect normal operating conditions may invalidate the test. [Rule 17-4.070(3), F.A.C.].

12. The following scrubber operating parameters shall be monitored during any compliance test and a summary of this data shall be included in any emissions test report. [AC53-99108].

(X) Water Pressure
(X) Volumetric Liquid Water Flow Rate
(X) Gas Pressure Drop

13. IMC Fertilizer, Inc. shall notify the Southwest District Office of the Department at least 15 days prior to the date on which each formal compliance test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted. [Rule 17-2.700(2)(a)9., F.A.C.].

14. IMC Fertilizer, Inc. shall install, calibrate, maintain, and operate a monitoring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The monitoring device shall have an accuracy of ±5% over its operating range. [Rule 17-2.660, F.A.C. and 40 CFR 60.203(a)].

15. IMC Fertilizer, Inc. shall maintain a daily record of "equivalent P_2O_5 feed" according to the procedure specified in 40 CFR 60.203(b). [Rule 17-2.660, F.A.C. and 40 CFR 60.203(b)].

16. IMC Fertilizer, Inc. shall install, calibrate, maintain, and operate a monitoring device which continuously measures and permanently records the total pressure drop across the process scrubbing system. The monitoring device shall have an accuracy of ±5% over its operating range.
[Rule 17-2.660, F.A.C. and 40 CFR 60.203(c)].

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Expiration Date: 04/25/96
Project: Phos Acid Train No. 3 w/Scrubber

SPECIFIC CONDITIONS:

17. Records documenting compliance with specific conditions #5 and #6 shall be kept for a minimum of 2 years. [AC53-99108].

18. To provide reasonable assurance of continuous compliance with specific condition #4, IMC Fertilizer, Inc. shall create and keep a record log of the scrubber operating parameters. The record log shall contain, at a minimum, the volumetric liquid water flow rate, the gas pressure drop, the date and time of the measurements, and the person responsible for performing the measurements. A record log entry shall be made at least once for every 8 hour shift that the phosphoric acid train No. 3 operates. The record log shall be maintained at the facility and shall be retained at least three years from the date of measurement.
[Rules 17-4.070(3), 17-4.160(14)(b), and 17-4.160(14)(c), F.A.C.].

19. IMC Fertilizer, Inc. may, at its option, substitute continuous monitoring and strip chart recordings for the manual recordkeeping required by specific condition #18. If this option is exercised, then all calibration and maintenance records and all original strip chart recordings shall be retained at least three years.
[Rules 17-4.070(3), 17-4.160(14)(b), and 17-4.160(14)(c), F.A.C.].

20. When phosphoric acid train No. 3 is operating, the volumetric liquid water flow rate to the scrubber shall not fall below 90% of the rate reported during the most recent satisfactory compliance test. [Rule 17-4.070(3), F.A.C.].

21. When phosphoric acid train No. 3 is operating, the gas pressure drop across the scrubber shall not fall below 90% of the rate reported during the most recent satisfactory compliance test. [Rule 17-4.070(3), F.A.C.].

22. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information pursuant to Section 403.061(13), Florida Statutes.

(A) Annual amount of materials and fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

PERMITTEE:
IMC Fertilizer, Inc.
New Wales Operations
P.O. Box 1035
Mulberry, Florida 33860

PERMIT/CERTIFICATION
Permit No: AO53-192132
County: Polk
Expiration Date: 04/25/96
Project: Phos Acid Train
No. 3 w/Scrubber

SPECIFIC CONDITIONS:

23. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provision in Rule 17-2.610(3), F.A.C. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alterations, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

24. Issuance of this permit does not relieve the permittee from complying with applicable emission limiting standards or other requirements of Chapter 17-2, or any other requirements under federal, state, or local law. [Rule 17-2.210, F.A.C.].

25. An application for renewal of this operation permit shall be submitted to the Southwest District Office of the Department of Environmental Regulation by February 24, 1996.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

For Dr. Richard D. Garrity
Director of District Management
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347
Phone (813) 623-5561

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347

Lawton Chiles, Governor 813-623-5561 Carol M. Browner, Secretary

PERMITTEE:
IMC Fertilizer, Inc.
P.O. Box 1035
Mulberry, FL 33860

PERMIT/CERTIFICATION:
Permit No: AO53-199497
County: Polk
Expiration Date: 8/2/96
Project: Phosphoric Acid Clarification and Storage Area

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of the phosphoric acid clarification and storage area which consists of the following:

3 - 30% acid tanks
3 - 40% acid clarifiers with aging tanks
1 - 40% acid storage tank
3 - 54% acid tanks
1 - East 54% ROP acid tanks
1 - West 54% ROP acid tanks
2 - 40% acid filters

The maximum design P_2O_5 input rate from the phosphoric acid plant is 5,400 tons/day.

Emissions from the East and West 54% ROP tanks are passed through a common venturi pre-scrubber and then combined with emissions from the remaining areas and vented through a vertical packed bed scrubber which utilizes contaminated cooling pond water. The primary purpose of the scrubbers is to control fluoride emissions.

Location: New Wales Operations, Highway 640 and County Line Road south of Mulberry

UTM: 17-396.7 E 3078.9 N **NEDS No:** 0059 **Point ID No:** 53

Replaces Permit No.: AO53-123674

PERMITTEE
IMC Fertilizer, Inc.
P.O. Box 1035
Mulberry, FL 33860
(New Wales Operations)

PERMIT/EXPIRATION
Permit No.: AO53-199497
County: Polk
Expiration Date: 8/2/96
Project: Phosphoric Acid Clarification & Storage Area

Specific Conditions:

1. A part of this permit is the attached 15 General Conditions.

2. Fluoride emissions from the packed bed scrubber stack shall not exceed 0.67 pounds per hour or 16 pounds per day.
[As requested by the permittee on December 5, 1984 as part of the allocation of allowable fluoride emissions for the phosphoric acid production facility that this clarifier/storage area is a part of. Rule 17-2.600(3)(b), F.A.C.].

3. The sources covered by this permit are allowed to operate continuously (8,760 hours per year).
[Construction Permit No. AC53-40085].

4. Test the emissions from the packed bed scrubber for fluorides at intervals of 6 months ± 2 weeks from the date April 25, 1991 and submit a copy of the test data to the Air Section of the Southwest District Office within 45 days of such testing.
[Rules 17-2.700(2) and 17-2.700(7), F.A.C.].

5. Compliance with the emission limitations of Specific Condition No. 2 shall be determined using EPA Methods 1, 2, 4, and 13A or 13B as contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

6. The permitted phosphoric acid feed rate for these operations is 5,040 tons/day of P_2O_5 from the phosphoric acid plants based on the rate at which the April 25, 1991 test was conducted. Testing of emissions to show compliance shall be conducted within 10% of the permitted rate. A compliance test submitted at an operating rate less than 90% of the permitted rate will automatically constitute an amended permit at the lesser rate until another test, showing compliance at a higher rate, is submitted. Any time the permitted rate of the source is exceeded by more than 10% a compliance test shall be performed within 30 days of initiation of the higher rate and the test results shall be submitted to the Department within 45 days of testing. Acceptance of the test by the Department will constitute an amended permit at the higher rate. Emission limitations are not automatically adjusted above the allowable limitations established by this permit. Failure to submit the process rate and actual operating conditions may invalidate the test. [Rule 17-4.070(3), F.A.C.].

PERMITTEE
IMC Fertilizer, Inc.
P.O. Box 1035
Mulberry, FL 33860
(New Wales Operations)

PERMIT/EXPIRATION
Permit No.: AO53-199497
County: Polk
Expiration Date: 8/2/96
Project: Phosphoric Acid Clarification & Storage Area

Specific Conditions:

7. The permittee shall notify the Southwest District Office of the Department at least 15 days prior to the date on which each formal compliance test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted. [Rule 17-2.700(2)(a)9., F.A.C.].

8. Submit to the Southwest District Office of the Department each calendar year on or before March 1, an emission report for this source for the preceding calendar year containing the following information pursuant to Subsection 403.061(13), F.S.:

(A) Annual amount of materials and/or fuels utilized;
(B) Annual emissions (note calculation basis);
(C) Any changes in the information contained in the permit.

9. Issuance of this permit does not relieve the permittee from complying with applicable emission limiting standards or other requirements of Chapter 17-2, or any other requirements under federal, state or local law. [Rule 17-2.210, F.A.C.].

10. Four applications to renew this operating permit shall be submitted to the Southwest District Office of the Department at least 60 days prior to the expiration date of this permit (i.e by June 4, 1996). [Rule 17-4.090(1), F.A.C.].

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Richard D. Garrity, Ph.D.
Director of District Management
Southwest District

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATION REPORT FORM FOR AIR EMISSION SOURCES

For each permitted emission point, please submit a separate report for calendar year 1991 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: IMC Fertilizer, Inc., New Wales Operations
2. Permit Number: AO53-192132
3. Source Address; P. O. Box 1035, Mulberry, FL 33860
4. Description of Source: # 3 phosphoric acid plant with cross flow packed bed scrubber.

II ACTUAL OPERATING HOURS: 24 hrs/day, 7 days/wk, 52 wks/yr

Total operating hours 7739

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr.

Raw Material	Input Process Wt.	
Phosphate rock	2.18×10^6	tons/yr
Sulfuric acid	1.69×10^6	tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

Phosphoric acid (as P_2O_5)	6.23×10^5	tons/yr
		tons/yr
		tons/yr

V TOTAL FUEL USAGE

Na _____ 10^6 cubic feet of Natural Gas

Na _____ 10^3 gallons # Oil, _____ %S

ATTACHMENT A

PROCESS WEIGHT CALCULATION

Year	Tons In		Product Tons Acid as P205	Hours
	Phos Rock	Sulfuric Acid		
1990	2150000	1690000	618000	7697
1991	2180000	1690000	623000	7739

MASS EMISSION DATA AND CALCULATION

Phosphoric Acid Train No. 3 w/Scrubber

Date	Feed (tpd)	Prod (tpd)	Lb/Hr	Allow	Lb/Ton
02/21/91	2028	1886	0.07	1.52	0.0008
08/13/91	2028	1886	0.21	1.52	0.0024
03/08/92	2441	2271	0.89	1.71	0.0088

```
 *** SCREEN-1.1 MODEL RUN ***
 *** VERSION DATED  88300 ***

IMC PAD 3 - PROPOSED

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE              =    POINT
   EMISSION RATE (G/S)      =    .2720
   STACK HEIGHT (M)         =   40.85
   STK INSIDE DIAM (M)      =    1.37
   STK EXIT VELOCITY (M/S)=     12.20
   STK GAS EXIT TEMP (K)    =  310.80
   AMBIENT AIR TEMP (K)     =  293.00
   RECEPTOR HEIGHT (M)      =     .00
   IOPT (1=URB,2=RUR)       =    2
   BUILDING HEIGHT (M)      =   40.90
   MIN HORIZ BLDG DIM (M)   =   50.00
   MAX HORIZ BLDG DIM (M)   =   50.00

BUOY. FLUX =    3.21 M**4/S**3;  MOM. FLUX =   65.84 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF     0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST      CONC                  U10M    USTK   MIX HT    PLUME    SIGMA    SIGMA
   (M)   (UG/M**3)   STAB       (M/S)   (M/S)     (M)    HT (M)   Y (M)    Z (M)  DWASH
-------  ----------  ----      ------  ------  -------   -------  -------  ------  -----
  1350.    12.32       6         1.0     2.2   5000.0     43.5     44.5    39.0    SS
  1400.    11.93       6         1.0     2.2   5000.0     43.5     46.0    39.1    SS
  1500.    11.22       6         1.0     2.2   5000.0     43.5     49.0    39.4    SS
  1600.    10.60       6         1.0     2.2   5000.0     43.5     52.0    39.6    SS
  1700.    10.04       6         1.0     2.2   5000.0     43.5     54.9    39.9    SS
  1800.    9.532       6         1.0     2.2   5000.0     43.5     57.9    39.8    SS
  1900.    9.086       6         1.0     2.2   5000.0     43.5     60.8    40.1    SS
  2000.    8.682       6         1.0     2.2   5000.0     43.5     63.7    40.3    SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND  1350. M:
  1350.    12.32       6         1.0     2.2   5000.0     43.5     44.5    39.0    SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)     =    46.27          CONC (UG/M**3)     =    46.27
  CRIT WS @10M (M/S) =     2.89          CRIT WS @10M (M/S) =     2.89
  CRIT WS @ HS (M/S) =     3.83          CRIT WS @ HS (M/S) =     3.83
  DILUTION WS (M/S)  =     1.92          DILUTION WS (M/S)  =     1.92
  CAVITY HT (M)      =    54.26          CAVITY HT (M)      =    54.26
  CAVITY LENGTH (M)  =    62.66          CAVITY LENGTH (M)  =    62.66
  ALONGWIND DIM (M)  =    50.00          ALONGWIND DIM (M)  =    50.00

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION          MAX CONC     DIST TO    TERRAIN
  PROCEDURE          (UG/M**3)     MAX (M)     HT (M)
--------------       ----------    --------    ------
SIMPLE TERRAIN         12.32         1350.        0.

BUILDING CAVITY-1      46.27           63.        --   (DIST = CAVITY LENGTH)
BUILDING CAVITY-2      46.27           63.        --   (DIST = CAVITY LENGTH)

*****************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
*****************************************************
```

Using FDER multipliers, the 8-hr (0.7x), 24-hr (0.4x) and Annual (0.1x) ambient impacts are:

F, 8-HR = 8.62 $\mu g/m^3$

F, 24-HR = 4.93 mg/m^3

F, Annual = 1.23 mg/m^3

```
 *** SCREEN-1.1 MODEL RUN ***
 *** VERSION DATED  88300 ***

IMC PAD 3 - EXISTING

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE              =     POINT
   EMISSION RATE (G/S)      =     .2150
   STACK HEIGHT (M)         =     40.85
   STK INSIDE DIAM (M)      =      1.37
   STK EXIT VELOCITY (M/S)=     12.20
   STK GAS EXIT TEMP (K)    =    310.80
   AMBIENT AIR TEMP (K)     =    293.00
   RECEPTOR HEIGHT (M)      =       .00
   IOPT (1=URB,2=RUR)       =      2
   BUILDING HEIGHT (M)      =     40.90
   MIN HORIZ BLDG DIM (M) =     50.00
   MAX HORIZ BLDG DIM (M) =     50.00


BUOY. FLUX =    3.21 M**4/S**3;  MOM. FLUX =   65.84 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF     0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST      CONC                    U10M    USTK   MIX HT    PLUME    SIGMA    SIGMA
   (M)   (UG/M**3)   STAB   (M/S)   (M/S)    (M)    HT (M)   Y (M)    Z (M)   DWASH
-------  ----------  ----  ------  ------  ------   ------   ------   ------   -----
  1350.     9.741      6     1.0     2.2   5000.0    43.5     44.5     39.0     SS
  1400.     9.432      6     1.0     2.2   5000.0    43.5     46.0     39.1     SS
  1500.     8.872      6     1.0     2.2   5000.0    43.5     49.0     39.4     SS
  1600.     8.379      6     1.0     2.2   5000.0    43.5     52.0     39.6     SS
  1700.     7.940      6     1.0     2.2   5000.0    43.5     54.9     39.9     SS
  1800.     7.534      6     1.0     2.2   5000.0    43.5     57.9     39.8     SS
  1900.     7.182      6     1.0     2.2   5000.0    43.5     60.8     40.1     SS
  2000.     6.862      6     1.0     2.2   5000.0    43.5     63.7     40.3     SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND  1350. M:
  1350.     9.741      6     1.0     2.2   5000.0    43.5     44.5     39.0     SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)      =    36.57         CONC (UG/M**3)      =    36.57
  CRIT WS @10M (M/S) =     2.89         CRIT WS @10M (M/S) =     2.89
  CRIT WS @ HS (M/S) =     3.83         CRIT WS @ HS (M/S) =     3.83
  DILUTION WS (M/S)  =     1.92         DILUTION WS (M/S)  =     1.92
  CAVITY HT (M)      =    54.26         CAVITY HT (M)      =    54.26
  CAVITY LENGTH (M)  =    62.66         CAVITY LENGTH (M)  =    62.66
  ALONGWIND DIM (M)  =    50.00         ALONGWIND DIM (M)  =    50.00

      ****************************************
      *** SUMMARY OF SCREEN MODEL RESULTS ***
      ****************************************

  CALCULATION          MAX CONC     DIST TO     TERRAIN
   PROCEDURE         (UG/M**3)     MAX (M)      HT (M)
---------------     -----------    --------    -------
SIMPLE TERRAIN         9.741         1350.        0.

BUILDING CAVITY-1     36.57           63.        --  (DIST = CAVITY LENGTH)
BUILDING CAVITY-2     36.57           63.        --  (DIST = CAVITY LENGTH)


**********************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**********************************************
```

Using FDER multipliers, the 8-hr (0.7x), 24-hr (0.4x) and Annual (0.1x) ambient impacts are:

$F_{8\text{-hr}} = 6.82$ mg/m³

$F_{24\text{-hr}} = 3.90$ mg/m³

$F_{Annual} = 0.97$ mg/m³