



# Florida Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

October 28, 1993

CERTIFIED MAIL-RETURN RECEIPT REQUESTED


Mr. John A. Brafford  
Vice President & General Manager  
IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

Dear Mr. Brafford:

Attached is one copy of the Technical Evaluation and Preliminary Determination, proposed permit and the Best Available Control Technology evaluation for the modifications to the molten sulfur storage and handling facility and the sulfuric acid plant. The facility is at your phosphate fertilizer plant on County Road 676, Nichols, Polk County, Florida.

Please submit any written comments for consideration concerning the Department's proposed action to Mr. Preston Lewis, P.E. at the above address.

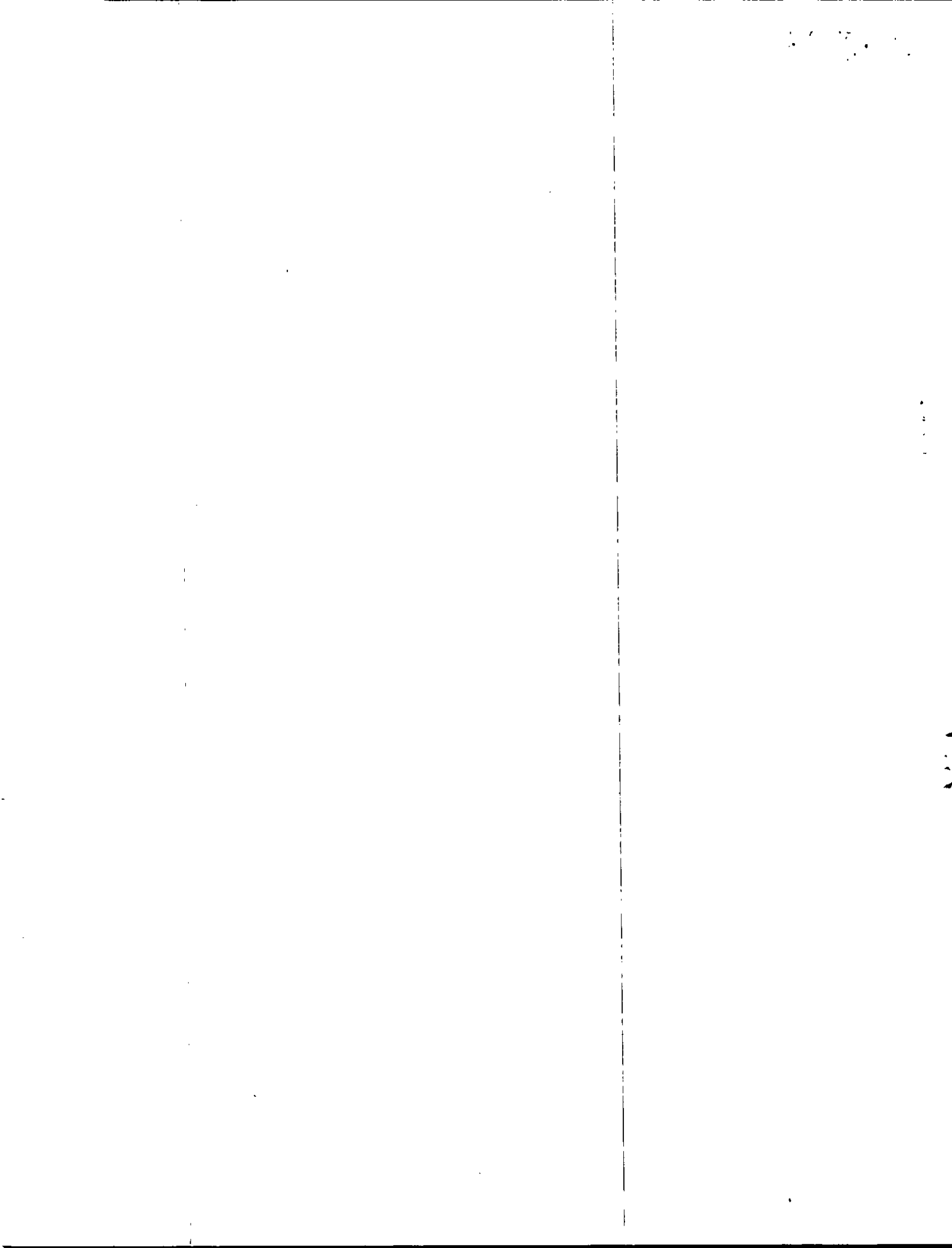
Sincerely,

  
C. H. Fancy, P.E.  
Chief  
Bureau of Air Regulation

CHF/SA/bjb

Attachments

cc: Bill Thomas, SWD  
Jewell Harper, EPA  
John Koogler, P.E.  
John Bunyak, NPS  
*Linda Novak, Polk Co. (11-3-93)*



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- Write "Return Receipt Requested" on the mailpiece below the article number.
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- 1.  Addressee's Address
- 2.  Restricted Delivery

Consult postmaster for fee.

<p>3. Article Addressed to:</p> <p>Mr. John A. Brafford                  Vice President &amp; General Manager                  IMC-Agrico Company                  P. O. Box 1035                  Mulberry, Florida 33860</p>	<p>4a. Article Number                  P 872 562 487</p>
<p>5. Signature (Addressee)</p>	<p>4b. Service Type</p> <p><input type="checkbox"/> Registered      <input type="checkbox"/> Insured</p> <p><input checked="" type="checkbox"/> Certified      <input type="checkbox"/> COD</p> <p><input type="checkbox"/> Express Mail      <input type="checkbox"/> Return Receipt for Merchandise</p>
<p>6. Signature (Agent)</p> <p><i>[Handwritten Signature]</i></p>	<p>7. Date of Delivery</p>
<p>8. Addressee's Address (Only if requested and fee is paid)</p>	<p>8. Addressee's Address (Only if requested and fee is paid)</p>

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P 872 562 487



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PS Form 3800, JUNE 1991

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Street and No. P. O. Box 1035	
P.O., State and ZIP Code Mulberry, Florida 33860	
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Postmark or Date Mailed: 10/29/93 AC53-230355 AC53-232681	

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CERTIFIED MAIL

In the Matter of an  
Application for Permit by:

DEP File No. AC 53-230355  
PSD-FL-204  
Polk County

Mr. John A. Brafford  
IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

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INTENT TO ISSUE

The Department of Environmental Protection gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, IMC-Agrico Company, applied on April 28, 1993, to the Department of Environmental Protection for a permit to modify the molten sulfur storage and handling facility and to modify the sulfuric acid plant at IMC-Agrico Company's phosphate fertilizer manufacturing plant on County Road 676 near Nichols, Polk County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-212 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

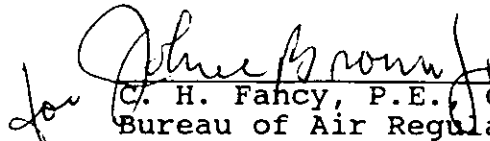
- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by Petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a

waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

*for*   
C. H. Fancy, P.E., Chief  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399  
904-488-1344

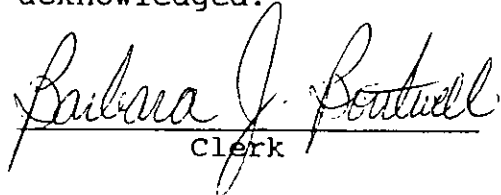
CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 10/29/93 to the listed persons.

Clerk Stamp

**FILING AND ACKNOWLEDGMENT**

FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

  
Clerk 10/28/93  
Date

Copies furnished to:  
Bill Thomas, SWD  
Jewell Harper, EPA  
John Koogler, P.E.  
John Bunyak, NPS

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Protection gives notice of its intent to issue a permit to IMC-Agrico Company, P. O. Box 1035, Mulberry, Florida 33860. The permit will allow the applicant to modify (increase production) at the existing molten sulfur storage and handling facility and the sulfuric acid plant at IMC-Agrico Company's phosphate fertilizer manufacturing plant on County Road 676 near Nichols, Polk County, Florida. The two sources will be consolidated into one permit (AC 53-230355). The modification to the sulfuric acid plant requires a Best Available Control Technology (BACT) determination for sulfur dioxide and acid mist. The ambient air impact of the emissions for sulfur dioxide from this facility are predicted to be less than significant for the annual averaging time; 239 ug/m<sup>3</sup> for the 24-hour averaging time; and 685 ug/m<sup>3</sup> for the 3-hour averaging time. The PSD increments for sulfur dioxide consumed by this facility in the Class II area are predicted to be less than significant for the annual averaging time; 26 ug/m<sup>3</sup> for the 24-hour averaging time or 29% of the available increment; and 100 ug/m<sup>3</sup> for the 3-hour averaging time or 20% of the available increment. The sulfur dioxide emissions from this modification will have no significant impact in the Class I Chassahowitzka National Wilderness Area. These emissions will not cause a violation of any ambient air quality standard or Prevention of Significant Deterioration (PSD) increment. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and

the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection  
Bureau of Air Regulation  
111 S. Magnolia Park Courtyard  
Tallahassee, Florida 32301

Department of Environmental Protection  
Southwest District  
3804 Coconut Palm Drive  
Tampa, Florida 33619-8218

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.



Technical Evaluation  
and  
Preliminary Determination

IMC-Agrico Company  
Nichols, Polk County, Florida

SULFURIC ACID PRODUCTION MODIFICATION

Molten Sulfur Storage and Handling Facility

File No.: AC 53-230355 (PSD-FL-204)

Department of Environmental Protection  
Division of Air Resources Management  
Bureau of Air Regulation

October 27, 1993

## I. General Information

### A. Applicant

IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

### B. Request

On April 28, 1993, IMC-Agrico Company submitted an application for permits to construct (modify) their existing molten sulfur storage and handling facility (SIC 2819) and to construct (modify) the existing sulfuric acid plant (SIC 2819). This application was considered complete on August 3, 1993, when the Department received Koogler & Associates' letter providing the additional information on the project requested by the Department. All of these sources are located at the applicant's phosphate fertilizer manufacturing plant on County Road 676 near Nichols, Polk County, Florida 33841. The UTM coordinates for this facility are Zone 17, 398.4 km E and 3084.2 km N.

### C. Project

The applicant proposes to increase the production of the sulfuric acid plant from 2000 TPD to 2500 TPD. The basic sulfuric acid process is not being changed. No additional air pollution control equipment will be installed on the plant. The proposed project will involve an increase in the amount of catalyst utilized in the process without any equipment changes.

The molten sulfur storage and handling facility consists of a railcar receiving pit, a truck receiving pit, a north storage tank, a south storage tank, and associated piping, pumps, etc. Additional sulfur will be required to increase the production of the sulfuric acid plants. The sulfur throughput rate to the existing molten sulfur storage and handling facility will increase from 275,000 tons per year to 365,000 tons per year. Up to 41 TPH will be handled by the system. Approximately 10% of this sulfur will be brought to the plant in trucks. The remaining sulfur will be delivered by rail. No physical modifications to the system are needed to handle the additional sulfur.

### D. Emissions

The molten sulfur storage and handling facility will increase its throughput from 275,000 to 365,000 TPY. Table I summarizes the estimated emissions from the sulfur storage and handling facility. Table II summarizes the net emission increase from the sulfur facility.

Table I  
Molten Sulfur Storage and Handling Facility

Pollutant/Emission Factor	Source Emissions							
	Rail Pit		Truck Pit		North Tank		South Tank	
	Max. lbs/hr	TPY	Max. lbs/hr	TPY	Max. lbs/hr	TPY	Max. lbs/hr	TPY
PM/PM <sub>10</sub> 0.4 gr/cu. ft.	0.2	0.6	0.3	0.48	0.2	0.6	0.2	0.48
Sulfur Particulate (SP) 0.2 gr/cu. ft.	0.1	0.24	0.1	0.24	0.1	0.24	0.1	0.24
Sulfur Dioxide 0.515 gr/cu. ft.	0.2	0.6	0.5	0.48	0.2	0.6	0.1	0.48
TRS as H <sub>2</sub> S 0.303 gr/cu. ft.	0.1	0.36	0.1	0.24	0.1	0.36	0.1	0.24
VOC 5.224E-5 lbs/cu. ft.	0.2	0.48	0.3	0.36	0.1	0.36	0.1	0.36

Table II  
Molten Sulfur Storage and Handling Facility

Pollutant	PM/PM <sub>10</sub>	SP	SO <sub>2</sub>	TRS/H <sub>2</sub> S	VOC
Proposed Emission (TPY)	2.2	1.0	2.2	1.2	1.6
Present Emission (TPY)	1.8	0.8	1.8	1.0	1.3
Net Increase (TPY)	0.4	0.2	0.4	0.2	0.3

SP = Sulfur Particulate

The sulfuric acid plant will increase its allowable production from 2000 to 2500 TPD of 100% acid. Table III summarize the changes in emissions from the sulfuric acid plant.

Table III  
Sulfuric Acid Plant Emissions

	Production (TPD)	Sulfur Dioxide			Acid Mist			NO <sub>x</sub> TPY
		lbs			lbs			
		Ton Acid	lbs/hr	TPY	Ton Acid	lbs/hr	TPY	
Proposed	2500	4	416.8	1825.6	0.15	15.6	68.5	54.8
Present	2000	3.52	293.5	1232.9	0.038	3.2	13.4	42.0
Increase	500	0.48	123.3	592.7	0.112	12.4	55.1	12.8

\* Actual

From the previous three tables, it can be seen that the increase in emissions resulting from this project are: 0.4 TPY PM/PM<sub>10</sub>; 0.2 TPY sulfur particulate; 593.1 TPY SO<sub>2</sub>; 0.2 TPY TRS; 0.2 TPY VOC; 55.1 TPY acid mist; and 12.8 TPY NO<sub>x</sub>. The increase in emissions of sulfur dioxide and acid mist exceed the significant emissions rates listed in Table 212.400-2 of F.A.C. Rule 17-212.

## II. Rule Applicability

The proposed projects, modification of the molten sulfur storage and handling facility and the sulfuric acid plant at a phosphate fertilizer plant, are subject to preconstruction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 17-209 through 17-297, Florida Administrative Code (F.A.C.).

The sources are in Polk County, an area designated attainment for all criteria pollutants (F.A.C. Rule 17-275.400).

The facility (SIC 2874) is a major source of particulate matter, sulfur dioxide, and fluorides because the potential emissions of each of these pollutants exceeds 100 TPY. Chemical process plants are listed in Table 212.400-1, Major Facility Categories.

The proposed project is subject to the Prevention of Significant Deterioration Regulations, F.A.C. Rule 17-212.400, because the contemporaneous emissions increases of sulfur dioxide and acid mist from the sulfuric acid plants exceed the significant emission rates listed in Table 212.400-2 of F.A.C. Rule 17-212. The emission limits for these pollutants for the sulfuric acid plants will be established by a Best Available Control Technology (BACT) determination pursuant to F.A.C. Rule 17-212.410. The applicant is also subject to the other preconstruction review requirements listed in F.A.C. Rule 17-212.400.

In addition, the proposed modifications are subject to 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants, and F.A.C. Rule 17-296.411, Sulfur Storage and Handling Facilities.

## III. Technical Evaluation

The applicant assumes that the increased throughput for the molten sulfur storage and handling facility will cause a proportional increase in air emissions. These emissions will comply with the applicable regulations.

The emission limits proposed as BACT for the sulfuric acid plants and accepted by the Department are equivalent to the new source performance standards listed in 40 CFR 60, Subpart H. Emission test results on a similar modified plant showed that it had met these emission limits.

#### IV. Air Quality Analysis

##### a. Introduction

The production rate increases due to the proposed project will result in emissions increases which are projected to be greater than the PSD significant rates for SO<sub>2</sub> and sulfuric acid mist. Therefore, the project is subject to the PSD review requirements contained in F.A.C. Rule 17-212.400. Part of these requirements is an air quality impact analysis for these pollutants, which includes:

- o An analysis of existing air quality.
- o A PSD increment analysis for SO<sub>2</sub>.
- o An Ambient Air Quality Standards (AAQS) analysis.
- o An analysis of impacts on soils, vegetation, visibility, and growth-related air quality impacts.
- o A Good Engineering Practice (GEP) stack height determination

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses are based on air quality dispersion modeling completed in accordance with EPA guidelines. Based on these required analyses, the Department has reasonable assurance that the projected production rate increases, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or AAQS. A brief description of the modeling method used and results of the required analyses follow. A more complete description is contained in the permit application on file.

##### b. Analysis of the Existing Air Quality

Preconstruction ambient air quality monitoring may be required for pollutants subject to PSD review. However, an exemption to the monitoring requirement can be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. The predicted maximum concentration increase for SO<sub>2</sub> is given below:

PSD de minimus concentration (ug/m <sup>3</sup> )	13
Averaging Time	24-hr
Maximum Predicted Impact (ug/m <sup>3</sup> )	8

There are no monitoring de minimus concentrations for H<sub>2</sub>SO<sub>4</sub> mist. As shown above, the predicted impact is less than the corresponding de minimus concentration; therefore, no preconstruction monitoring is necessary for either pollutant subject to PSD review.

However, the Department determined background SO<sub>2</sub> concentrations for use in the AAQS analysis. Background SO<sub>2</sub> values of 183 ug/m<sup>3</sup>, 3-hr average and 48 ug/m<sup>3</sup>, 24-hr average were obtained from 1992 data collected at the Department's SO<sub>2</sub> monitor in Nichols.

c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST2) dispersion model was used by the applicant to predict the impact of the proposed project on the surrounding ambient air. All recommended EPA default options were used. Five years of sequential hourly surface and mixing depth data from the Tampa, Florida National Weather Service collected during 1985 through 1989 were used in this model. Since five years of data were used, the highest-second high, short-term predicted concentrations are compared with the appropriate ambient air quality standards or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

d. Modeling Results

The applicant first evaluated the potential increase in ambient ground-level concentrations associated with the project to determine if these predicted ambient concentration increases would be greater than the specified PSD significant impact levels for SO<sub>2</sub>. Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed source at the following downwind distances: 0.25, 0.5, 0.75, 1.0, 1.5, 2.0, 3.0, and 4.0 km. The receptor ring at 0.25 km corresponds to the nearest property boundary. The results of this modeling showed that the increases in ambient ground-level concentrations for the 3-hour and 24-hour averaging times are greater than the PSD significant impact levels for SO<sub>2</sub>, thus requiring the applicant to do a full impact analysis for these averaging times for comparison with the AAQS and the PSD Class II SO<sub>2</sub> increments. The significant impact area extended to 2.0 km. The results of these analyses for SO<sub>2</sub> are shown below:

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AAQS Analysis (ug/m<sup>3</sup>)

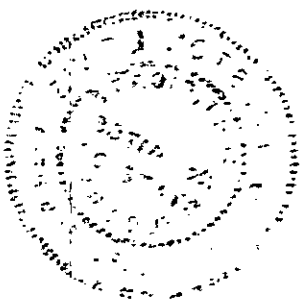
<u>Avg. Time</u>	<u>3-hr</u>	<u>24-hr</u>
Maximum Predicted Impact	685	239
AAQS	1300	260
Includes Background	183	48

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PSD Class II Increment Analysis (ug/m<sup>3</sup>)

<u>Avg. Time</u>	<u>3-hr</u>	<u>24-hr</u>
Maximum Predicted Impact	100	26
Allowable Increment	512	91

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The maximum predicted SO<sub>2</sub> concentrations are all less than the appropriate AAQS and PSD Class II increments.

The nearest PSD Class I area is the Chassahowitzka National Wilderness Area located 93 km northwest of the facility. The impact of all of the increment consuming sources on this Class I area was evaluated in the most recent application in Polk County using both ISCST2 and the long range transport model MESOPUFF II. ISCST2 modeling predicted exceedances of the 24-hour Class I SO<sub>2</sub> increment. IMC's impacts were evaluated using the MESOPUFF II model to determine whether IMC was predicted to have significant impacts on days and at receptors where the Class I increments were predicted to be violated. The results of this evaluation showed that the impact of increased SO<sub>2</sub> emissions from the project on days of predicted exceedances of the SO<sub>2</sub> increments is less than the National Park Service's proposed significant impact levels of 0.07 ug/m<sup>3</sup>, 24-hour average and 0.48 ug/m<sup>3</sup>, 3-hour average.

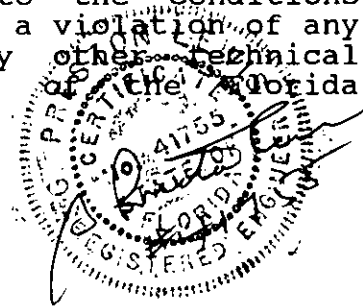
Sulfuric acid mist is a non-criteria pollutant, which means that neither a national AAQS nor a PSD increment has been defined for this pollutant. However, the Department does have a draft Air Toxics Reference Concentration of 2.4 ug/m<sup>3</sup>, 24-hour average for sulfuric acid mist. The Department used the same modeling procedure described above to evaluate the maximum ground level concentration of sulfuric acid mist due to the facility. The result was 4.7 ug/m<sup>3</sup>, which is above the air toxics reference concentration. Even though the maximum predicted acid mist ground-level concentration due to the facility is greater than the reference concentration, the sulfuric acid plant is subject to federal New Source Performance Standards and stringent "top-down" BACT emission limits for controlling the emissions of sulfuric acid mist. The use of double absorption technology and high efficiency mist eliminators is representative of the best sulfuric acid mist control available.

#### e. Additional Impacts Analysis

The applicant did an air quality related values (AQRV) analysis for both the PSD Class II area near the plant and for the Chassahowitzka Class I area located 93 km to the northwest. The increased emissions from the project are not expected to impact the AQRVs of either area. The AQRV analysis includes impacts on vegetation, soils, wildlife and visibility. In addition, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

#### V. Conclusion

Based on the information provided by IMC-Agrico Company the Department has reasonable assurance that the proposed projects, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-209 through 17-297 of the Florida Administrative Code.







# Florida Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

**PERMITTEE:**  
IMC-Agrico Company  
Post Office Box 1035  
Mulberry, Florida 33860

**Permit Number:** AC 53-230355  
PSD-FL-204  
**Expiration Date:** Jan. 1, 1995  
**County:** Polk  
**Latitude/Longitude:** 27°52'51"N  
82°01'55"W  
**Project:** Sulfuric Acid Plant and  
Molten Sulfur Storage  
and Handling System

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 272, 296 and 297; and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the modifications to increase the sulfuric acid plant production to 2500 TPD 100% sulfuric acid and sulfur throughput rate to a maximum of 1000 TPD and 365,000 TPY for the molten sulfur storage and handling facility. The sulfur facility consists of a rail and truck unloading system; one 2430 short ton (ST) molten sulfur north storage tank; one 1125 ST molten sulfur south storage tank; one 195 ST rail pit; one 165 ST truck pit; and the associated transfer pumps and piping. The modifications do not involve physical change to these plants. The sources are located at the IMC-Agrico Nichol's facility on CR 676 near Nichols, Polk County, Florida. The UTM coordinates of this facility are Zone 17, 398.4 km E and 3084.2 km N.

\*This permit is void if construction does not commence within 18 months of its issuance, if construction is discontinued for more than 18 months, or if construction is not completed and the modified plant placed in operation within a reasonable time.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. IMC-Agrico's application received April 28, 1993.
2. DEP's letter dated May 26, 1993.
3. IMC-Agrico's letter dated June 4, 1993.
4. Koogler & Associates' letter dated July 30, 1993.

**PERMITTEE:**  
**IMC-Agrico Company**

**Permit Number: AC53-230355**  
**PSD-FL-204**  
**Expiration Date: January 1, 1995**

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or

**PERMITTEE:**  
IMC-Agrico Company

**Permit Number:** AC53-230355  
PSD-FL-204  
**Expiration Date:** January 1, 1995

**GENERAL CONDITIONS:**

auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source

PERMITTEE:  
IMC-Agrico Company

Permit Number: AC53-230355  
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Expiration Date: January 1, 1995

**GENERAL CONDITIONS:**

arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application

**PERMITTEE:**  
IMC-Agrico Company

**Permit Number:** AC53-230355  
PSD-FL-204  
**Expiration Date:** January 1, 1995

**GENERAL CONDITIONS:**

for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SPECIFIC CONDITIONS:**

1. The maximum production rate of the sulfuric acid plant shall not exceed 2500 tons per day based on 100% sulfuric acid (H<sub>2</sub>SO<sub>4</sub>).
2. Sulfur dioxide (SO<sub>2</sub>) emissions from the plant shall not exceed 4 lbs/ton of 100% H<sub>2</sub>SO<sub>4</sub>, 416.8 lbs/hr, and 1825.6 tons/yr.
3. H<sub>2</sub>SO<sub>4</sub> mist emissions from the plant shall not exceed 0.15 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> produced, 15.6 lbs/hr, and 68.5 tons/yr.
4. Nitrogen oxides, (NO<sub>x</sub>) emissions from the plant shall not exceed 0.12 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> produced, 12.5 lbs/hr, and 54.8 tons/yr.
5. Visible emissions (VE) from the H<sub>2</sub>SO<sub>4</sub> plant shall not exceed 10% opacity. VE shall not exceed 20% opacity from any source in the molten sulfur system.

PERMITTEE:  
IMC-Agrico Company

Permit Number: AC53-230355  
PSD-FL-204  
Expiration Date: January 1, 1995

**SPECIFIC CONDITIONS:**

6. A continuous emission monitor shall be used to monitor SO<sub>2</sub> emissions from the H<sub>2</sub>SO<sub>4</sub> plant in accordance with 40 CFR 60, Subpart H (July 1, 1992), Standards of Performance for Sulfuric Acid Plants. Initial compliance tests shall be conducted using: EPA Method 7E for NO<sub>x</sub>, EPA Method 8 for SO<sub>2</sub> and acid mist, and EPA Method 9 for visible emissions as described in 40 CFR 60, Appendix A (July 1, 1993).

7. Testing of emissions shall be conducted with the source operating at capacity. Capacity is defined as 90-100% of permitted capacity (2250 - 2500 TPD sulfuric acid production). If it is impracticable to test at capacity, then sources may be tested at less than capacity. In this case subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. The Department's Southwest District office shall be notified in writing 15 days prior to source testing. Written reports of the tests shall be submitted to that office within 45 days of test completion.

8. The sulfuric acid plant and the molten sulfur storage and handling facility shall be allowed to operate continuously (i.e., 8760 hours/year).

9. The maximum molten sulfur throughput rate shall exceed neither 1000 tons per day (TPD), nor 365,000 tons per year (TPY).

10. The permittee shall employ proper operation and maintenance procedures to minimize emissions from the molten sulfur system pursuant to the applicable requirements of F.A.C. Rule 17-296.411 [Molten Sulfur Storage and Handling Facilities]. The permittee shall also comply with other applicable provisions of F.A.C. Chapters 17-210, 212, 275, 296, 297; and 17-4.

11. No objectionable odors shall be allowed, in accordance with F.A.C. Rule 17-296.200(123) [Objectionable Odor Prohibited].

12. Initial compliance tests for the molten sulfur system shall be conducted in accordance with the July 1, 1993, version of 40 CFR 60, Appendix A, using EPA Method 9, for visible emissions. Test run duration shall not be less than 30 minutes. The tests for the vents of the storage tanks and sulfur pits shall be conducted while the tanks and pits are being filled (filling does not have to be continuous during the entire test). Routine VE tests shall be at the frequency specified in any permit to operate this facility issued by the Southwest District.

PERMITTEE:  
IMC-Agrico Company

Permit Number: AC53-230355  
PSD-FL-204  
Expiration Date: January 1, 1995

**SPECIFIC CONDITIONS:**

13. Any change in the method of operation, equipment or operating hours which would reasonably be expected to result in an increase in emissions shall be submitted to DEP's Southwest District office for approval.

14. For emission inventory and PSD purposes, the estimated maximum emissions from the sources in the molten sulfur storage and handling facility are:

Source		Estimated Emissions				
		PM/PM <sub>10</sub>	SP	SO <sub>2</sub>	TRS/H <sub>2</sub> S	VOC
North Tank	lb/hr (max)	0.2	0.1	0.2	0.1	0.1
	TPY	0.6	0.24	0.6	0.36	0.36
South Tank	lb/hr (max)	0.2	0.1	0.1	0.1	0.1
	TPY	0.48	0.24	0.48	0.24	0.36
Truck Pit	lb/hr (max)	0.3	0.1	0.5	0.1	0.3
	TPY	0.48	0.24	0.48	0.24	0.36
Rail Pit	lb/hr (max)	0.2	0.1	0.2	0.1	0.2
	TPY	0.6	0.24	0.6	0.36	0.48

15. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

16. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. The operation permit application shall include a set of conditions acceptable to the Department for sequential startup/shutdown of the permittee's sulfuric acid plants. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

PERMITTEE:  
IMC-Agrico Company

Permit Number: AC53-230355  
PSD-FL-204  
Expiration Date: January 1, 1995

Issued this \_\_\_\_\_ day  
of \_\_\_\_\_, 1993

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

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Virginia B. Wetherell, Secretary



Best Available Control Technology (BACT) Determination  
IMC-Agrico Company  
Polk County

The applicant proposes to increase sulfuric acid production to 2500 tons per day for the sulfuric acid plant that is located at the Nichols phosphate fertilizer manufacturing facility on CR 676 near Nichols, Polk County, Florida.

The proposed project will result in a significant increase in emissions of sulfur dioxide (SO<sub>2</sub>) and sulfuric acid mist. The project is therefore subject to Prevention of Significant Deterioration (PSD) review in accordance with F.A.C. Rule 17-212.400.

The BACT review is part of the PSD review requirements in accordance with F.A.C. Rule 17-212.410.

Date of Receipt of a BACT Application: April 28, 1993.

The BACT determination requested by the applicant is presented below:

Control Technology                      Double Absorption/Fiber Mist Eliminators

<u>Pollutant</u>	<u>Emission Limits</u>
SO <sub>2</sub>	4 lb/ton of 100% H <sub>2</sub> SO <sub>4</sub> produced
Sulfuric Acid Mist	0.15 lb/ton of 100% H <sub>2</sub> SO <sub>4</sub> produced
Visible Emissions	10% opacity

Basis of Review:

This determination was based upon input from the applicant, EPA Region IV, and the Bureau of Air Regulation.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-212, Air Pollution, this BACT determination is 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. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

- (b) All scientific, engineering, and technical material and other information available to the Department.
- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Determined by DEP:

<u>Control Technology</u>	Double Absorption/Fiber Mist Eliminators
<u>Pollutant</u>	<u>Emission Limits</u>
SO <sub>2</sub>	4.0 lb/ton of 100% H <sub>2</sub> SO <sub>4</sub> produced
Sulfuric Acid Mist	0.15 lb/ton of 100% H <sub>2</sub> SO <sub>4</sub> produced
Visible Emissions	10% opacity

BACT Determination Rationale

DEP's BACT determination is the same as that proposed by the applicant, determination completed by other states, and Standards of Performance for Sulfuric Acid Plants, 40 CFR 60 Subpart H, (double absorption process). The process in itself is the control technology for SO<sub>2</sub>. The emission limits reflect conversion efficiency of around 99.7% of SO<sub>2</sub> to H<sub>2</sub>SO<sub>4</sub>. High efficiency mist eliminators are considered BACT for sulfuric acid mist. A review of BACT/LAER Clearinghouse indicates that the double absorption technology and the use of high efficiency mist eliminators is representative of BACT using the top-down approach.

Environmental Impact Analysis

The impact analysis for the BACT determination is based on 8,760 hours/year operation. The increment impact analysis and the ambient air quality analysis resulted in the following for SO<sub>2</sub> emissions:

<u>Avq Time</u>	<u>Increment Impact (ug/m<sup>3</sup>)</u>	<u>Increment (ug/m<sup>3</sup>)</u>	<u>Predicted Ambient Air Quality Impact (ug/m<sup>3</sup>)</u>	<u>Fla. AAQS (ug/m<sup>3</sup>)</u>
24-hr	26	91	239	260
3-hr	100	512	685	1300

Conclusion

The incremental impact and the ambient air quality impact from SO<sub>2</sub> emissions due to the proposed modification is in compliance with all air pollution regulations. The impacts associated with the proposed increase in production support the Department's determination that the emission limits established herein represent BACT.

Details of the Analysis May be Obtained by Contacting:

Douglas G. Outlaw, BACT Coordinator  
Department of Environmental Protection  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Recommended by:

Approved by:

\_\_\_\_\_  
C. H. Fancy, P.E., Chief  
Bureau of Air Regulation

\_\_\_\_\_  
Virginia B. Wetherell, Secretary  
Dept. of Environmental Protection

\_\_\_\_\_  
Date 1993

\_\_\_\_\_  
Date 1993



# Florida Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

October 28, 1993

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. John A. Brafford  
Vice President & General Manager  
IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

Dear Mr. Brafford:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for IMC-Agrico Company to increase the production rate of the Diammonium Phosphate plant at their facility in Nichols, Florida.

Please submit any written comments to be considered concerning the Department's proposed action to Mr. Preston Lewis at the above address.

Sincerely,

*for John Fancy*  
O. H. Fancy, P.E.  
Chief  
Bureau of Air Regulation

CHF/SA/bjb

Attachments

cc: Bill Thomas, SWD  
Jewell Harper, EPA  
John Koogler, P.E.  
John Bunyak, NPS  
*Linda Rossak, Polk Co.*

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CERTIFIED MAIL

In the Matter of an  
Application for Permit by:

DEP File No. AC 53-232681  
PSD-FL-204  
Polk County

Mr. John A. Brafford  
IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

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INTENT TO ISSUE

The Department of Environmental Protection gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, IMC-Agrico Company, applied on April 28, 1993, to the Department of Environmental Protection for a permit to increase the production rate of the Diammonium Phosphate plant at their facility in Nichols, Polk County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-212 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

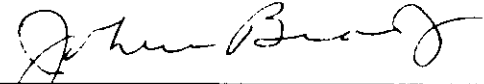
If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a

waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

for

  
C. H. Fancy, P.E., Chief  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399  
904-488-1344

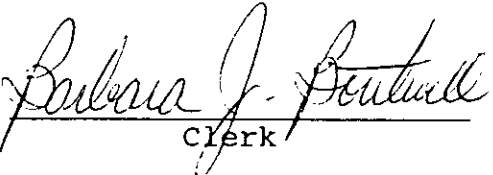
CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 10/29/93 to the listed persons.

Clerk Stamp

**FILING AND ACKNOWLEDGMENT**

FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

  
Clerk 10/28/93  
Date

Copies furnished to:  
Bill Thomas, SWD  
Jerry Campbell, EPCHC  
Jewell Harper, EPA  
John Koogler, P.E.  
John Bunyak, NPS

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Protection gives notice of its intent to issue a permit to IMC-Agrico Company, P. O. Box 1035, Mulberry, Florida 33860 to increase the production rate of the Diammonium Phosphate plant at their facility in Nichols, Polk County, Florida. A determination of Best Available Control Technology (BACT) was required. The proposed project is subject to Prevention of Significant Deterioration regulations and federal new source performance standards. The project will increase total allowable diammonium phosphate production at the IMC-Agrico Company facility by 25% and is not expected to result in significant deterioration of the environment. No PSD Class I or II increments are consumed by this project. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.



If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection  
Bureau of Air Regulation  
111 S. Magnolia Park Courtyard  
Tallahassee, Florida 32301

Department of Environmental Protection  
Southwest District  
3804 Coconut Palm Drive  
Tampa, Florida 33619-8218

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.

Technical Evaluation  
and  
Preliminary Determination

IMC-Agrico Company  
Polk County  
Nichols, Florida

Diammonium Phosphate Plant  
Production Modifications

Permit No. AC 53-232681  
PSD-FL-204

Department of Environmental Protection  
Division of Air Resources Management  
Bureau of Air Regulation

October 27, 1993

I. Application Information

A. Applicant

IMC-Agrico Company  
P. O. Box 1035  
Mulberry, Florida 33860

B. Request

The Department received an application on April 28, 1993, for a permit to increase the production rate of the diammonium phosphate (DAP) plant at the applicant's phosphate complex in Nichols, Florida. After receiving additional information on August 3, 1993, the application was deemed complete.

C. Classification/Location

The applicant's facility (SIC Code 2874) is located on County Road 676 near Nichols, Polk County, with latitude of 27°52'51"N and longitude of 82°01'55"W. The UTM coordinates of the site are: Zone 17, 398.4 km E and 3084.2 km N.

D. Project Description/Emissions

It is proposed to increase the production rate of the DAP plant from 80 TPH to 100 TPH. The rise in production will be accomplished by better process flow control and operation efficiency. No changes to the process equipment will be necessary.

Annual emission changes resulting from the increased production rate are summarized in the following table:

EMISSIONS (TONS/YR)

Pollutant	Actual	Proposed	Net Increase
PM/PM <sub>10</sub>	30.2	144.1	113.9
SO <sub>2</sub>	24.1	35.6	11.5
Fluorides	3.1	12.7	9.6
NO <sub>x</sub>	6.7	10.1	3.4
CO	1.7	2.5	0.8
VOC	0.007	0.1	0.003

The increase in emissions of PM/PM<sub>10</sub> and Fluorides exceed the significant rates listed in Table 212.400-2 of FAC 17-212.

## II. Rule Applicability

The construction permit application is subject to review under Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-209 through 17-297 and 17-4. The facility is located in an area designated attainment for all criteria pollutants (F.A.C. Rule 17-275.400). The proposed project is subject to the preconstruction review requirements of F.A.C. Rule 17-212.400, Prevention of Significant Deterioration (PSD). The proposed increase in PM/PM<sub>10</sub> and Fluoride emissions exceeds the significant levels set forth in Table 17-212.400 of F.A.C. Rule 17-212. Preconstruction review must include a determination of Best Available Control Technology (BACT), good-engineering practice stack height, ambient impact analysis, impact on soils, vegetation, and visibility. F.A.C. Rules 17-296.800, Table 296.800-1, Section 60.220, and 17-297.300, Table 297.330-1, apply to this production increase. PM/PM<sub>10</sub> and Fluoride emissions will be limited by the BACT determination. Fluoride emissions will also be limited by the federal new source performance standards, 40 CFR 60, Subpart V.

## III. Technical Evaluation

The applicant is proposing to increase DAP production from 80 to 100 TPH. The increase in production will be achieved through better process flow control and operation efficiency. No changes to the process equipment will be necessary. The facility will be restricted to the same fluoride emission factor of 0.041 lb Fluoride emissions/ton equivalent P<sub>2</sub>O<sub>5</sub> feed, and the allowable emissions for particulate matter will be reduced from 32.9 lbs/hr to 19.5 lbs/hr. The ammonia (NH<sub>3</sub>) emissions were not based on actual test data but were a conservative estimate. The facility will be required to do ammonia emissions testing using an EPA draft method.

## IV. Air Quality Analysis

### a. Introduction

The production rate increases due to the project will result in actual emissions increases which are projected to be greater than the PSD significant rates for PM/PM<sub>10</sub> and Fluoride. Therefore, the project is subject to the PSD review requirements contained in F.A.C. Rule 17-212.400. Part of these requirements is an air quality impact analysis for these pollutants, which includes:

- o An analysis of existing air quality.
- o A PSD increment analysis for PM/PM<sub>10</sub>.
- o An Ambient Air Quality Standards (AAQS) analysis.
- o An analysis of impacts on soils, vegetation, visibility, and growth-related air quality impacts.
- o A Good Engineering Practice (GEP) stack height determination

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses are based on air quality dispersion modeling completed in accordance with EPA guidelines. Based on these required analyses, the Department has reasonable assurance that the project, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or AAQS. A brief description of the modeling method used and results of the required analyses follow. A more complete description is contained in the permit application on file.

#### b. Analysis of the Existing Air Quality

Preconstruction ambient air quality monitoring may be required for pollutants subject to PSD review. However, an exemption from the monitoring requirement can be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration.

The BACT determined by the Department for the project will result in a reduction of federally enforceable PM/PM<sub>10</sub> emissions from 32.9 lbs/hr to 19.5 lbs/hr, which will result in a net reduction of PM/PM<sub>10</sub> impacts. Therefore no preconstruction monitoring for PM/PM<sub>10</sub> will be required. For non-criteria pollutants such as Fluorides, EPA's general position is to not require monitoring data, but to base the analysis of existing air quality on modeled impacts. In addition, there are no EPA-approved monitoring methods for Fluoride.

#### c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST2) dispersion model was used by the applicant to predict the impact of increased Fluoride emissions from the proposed project on the surrounding ambient air. No PM/PM<sub>10</sub> modeling was done since the BACT determined by the department will result in a reduction of federally enforceable PM/PM<sub>10</sub> emissions from 32.9 lbs/hr to 19.5 lbs/hr. All recommended EPA default options were used. The potential for building downwash was also assessed. Five years of sequential hourly surface and mixing depth data from the Tampa, Florida National Weather Service collected during 1985 through 1989 were used in this model. The highest predicted yearly average was compared with the standards.

#### d. Modeling Results

Fluoride is a non-criteria pollutant, which means that neither national AAQS nor PSD increments have been defined for this pollutant. However, the Department does have draft Air Toxics Reference Concentrations of 25 ug/m<sup>3</sup>, 8-hour average and 6 ug/m<sup>3</sup>, 24-hour average for Fluoride, which are guideline values.

Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed source at the following downwind distances: 120, 150, 250, 500, 1000 and 1500 m. The Department supplemented the applicant's modeling and used the Fluoride values determined by the Department's BACT analysis for emissions input into the ISCST2 model. The following results are based on the Department's modeling: 28.0 ug/m<sup>3</sup> for the 8-hour averaging time and 15.6 ug/m<sup>3</sup> for the 24-hour averaging time. These values compare with the reference concentrations of 25 ug/m<sup>3</sup>, 8-hour average and 6 ug/m<sup>3</sup>, 24-hour average. Even though the maximum predicted Fluoride ground-level concentrations due to the facility are greater than the reference concentrations, the Department is not requiring any more stringent limitations for the project than those set by the Department's BACT. The BACT determination for this project is the most stringent in the Florida.

In addition, NH<sub>3</sub> is emitted by the DAP Plant. Although NH<sub>3</sub> is not a regulated pollutant, the Department's draft Air Toxics Permitting Strategy defines an annual air reference concentration (ARC) for NH<sub>3</sub> of 100 ug/m<sup>3</sup>. The applicant provided NH<sub>3</sub> modeling results for comparison with the ARC. However, these results were not based on reliable emissions data. Therefore, IMC-Agrico will be required to perform testing to determine NH<sub>3</sub> emissions from the DAP plant. Based on a review of data from similar plants, the IMC-Agrico DAP plant should be able to comply with the NH<sub>3</sub> ARC, and a permit condition has been included to ensure compliance with the ARC.

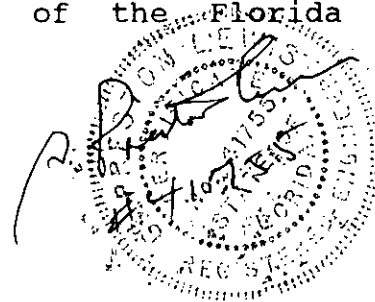
#### e. Additional Impacts Analysis

A Level-1 screening analysis using the EPA model, VISCREEN was used to determine any potential adverse visibility impacts on the Class I Chassahowitzka National Wilderness Area located 93 km away. Based on this analysis, the maximum predicted visual impacts due to the proposed project are less than the screening criteria both inside and outside the Class I area.

Because there is a proposed decrease in PM/PM<sub>10</sub> emissions, no harmful effect on soils and vegetation is expected. In addition, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

#### VI. Conclusion

Based on the information provided by IMC-Agrico Company, the Department has reasonable assurance that the proposed project, as proposed herein, will not cause or contribute to a violation of an ambient air quality standard, PSD increment, or any other technical provisions of Chapter 17-209 through 17-297 of the Florida Administrative Code.





# Florida Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

**PERMITTEE:**  
**IMC-Agrico Company**  
P. O. Box 1035  
Mulberry, Florida 33860

**Permit Number: AC53-232681**  
**PSD-FL-204**  
**Expiration Date: Jan. 1, 1995**  
**County: Polk**  
**Latitude/Longitude: 27°52'51"N**  
**82°01'55"W**  
**Project: Diammonium**  
**Phosphate Plant - Production**  
**Increase to 100 TPH**

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 272, 275, 296, 297; and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached and specifically described as follows:

For an increase in production to 100 TPH in the diammonium phosphate plant. This source is located at the permittee's existing facility in Nichols, Polk County, Florida. The UTM coordinates are Zone 17, 398.4 km East and 3084.2 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

\*This permit is void if construction does not commence within 18 months of its issuance, if construction is discontinued for more than 18 months, or if construction is not completed and the modified plant placed in operation within a reasonable time.

Attachments are listed below:

1. IMC-Agrico's application received April 28, 1993.
2. DEP's letter dated May 26, 1993.
3. IMC-Agrico's letter dated June 4, 1993.
4. Koogler & Associates' letter dated July 30, 1993.

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**IMC-Agrico Company**

**Permit Number: AC 53-232681**  
**PSD-FL-204**  
**Expiration Date: January 1, 1995**

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.



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**GENERAL CONDITIONS:**

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

- a. Have access to and copy any records that must be kept under the conditions of the permit;
- b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- a. A description of and cause of non-compliance; and
- b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111,

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Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement,

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report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SPECIFIC CONDITIONS:**

1. Maximum permitted production rate for the No. 5 diammonium phosphate plant (DAP) shall be 100 TPH. The maximum production shall not exceed 48 tons/hr of 100 percent phosphoric acid (P<sub>2</sub>O<sub>5</sub>) input.

2. The DAP plant may operate 8,760 hours per year.

3. The maximum emissions for fluoride and particulate (PM/PM<sub>10</sub>) are stated in Table 1.

TABLE 1

EMISSIONS

<u>Source</u>	<u>Lbs/Hr</u>	<u>Fluorides</u>		<u>Lbs/Hr</u>	<u>Particulate</u>	
		<u>Lbs/TP205</u>	<u>Ton/Yr</u>		<u>Lbs/TP205</u>	<u>Ton/Yr</u>
Reactor/ Granulator	1.70	0.0354	7.5	8.2	0.17	35.7
Dryer	0.19	0.0040	0.8	9.5	0.20	41.3
Cooler	<u>0.11</u>	<u>0.0023</u>	<u>0.5</u>	<u>1.8</u>	<u>0.04</u>	<u>8.0</u>
Total	2.00	0.0417	8.8	19.5	0.41	85.0

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**SPECIFIC CONDITIONS:**

4. Testing for PM/PM<sub>10</sub> and fluoride shall be done on all three stacks within a 36 hour period without changing the production and raw materials rates. Testing of emissions shall be conducted with the source operating at capacity. Capacity is defined as 90-100% of rated capacity. If it is impracticable to test at capacity, then sources may be tested at less than capacity; in this case subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. The Department's Southwest District office shall be notified in writing 15 days prior to source testing. Written reports of the tests shall be submitted to that office within 45 days of test completion.
5. Compliance testing using the enclosed EPA draft method shall be conducted on all three stacks within a 36 hour period without changing the production rates or raw materials to determine NH<sub>3</sub> emissions in ppm and lb/hr from the DAP plant. The Department shall be provided with the test results, and a professional engineer's evaluation shall be required using NH<sub>3</sub> emission data from the tests and FDEP/EPA-approved modeling procedures to confirm that the NH<sub>3</sub> ambient impacts from the DAP plant will not exceed the NH<sub>3</sub> annual air reference concentration (ARC) of 100 ug/m<sup>3</sup>.
6. Only natural gas or No. 2 fuel oil shall be used in the drying operation. The No. 2 fuel oil shall contain no more than 0.5% sulfur, by weight. The maximum heat input rate to the dryer is limited to 16 MMBtu/hr.
7. Visible emissions shall be less than 20% opacity.
8. Fugitive emissions from the process, conveying and storage equipment shall be controlled by sealing and/or venting all particulate matter and fumes from the equipment to the pollution abatement system.
9. Pursuant to 40 CFR 60.223, the permittee shall comply with the following requirements for the monitoring of the DAP plant:
  - (a) The permittee shall 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.
  - (b) The permittee shall maintain a daily record of equivalent P<sub>2</sub>O<sub>5</sub> feed by first determining the total mass rate in tons/hour of phosphorus-bearing feed using a monitoring device for

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**SPECIFIC CONDITIONS:**

measuring mass flow rate which meets the requirements of Paragraph (a) above and then by processing according to §60.224(b)(3).

- (c) The permittee shall calibrate, maintain and operate a monitoring device which continuously measures and permanently records the liquid flow rate and total pressure drop across each scrubber system. The monitoring device shall have an accuracy of  $\pm 5\%$  over its operating range.10. Before the construction permit expires, the DAP plant shall be sampled for PM/PM<sub>10</sub>, and fluoride emissions. Test procedures shall be in accordance with EPA reference methods 1, 2, 3, 4, 5, 9, and 13A or 13B as published in 40 CFR 60, Appendix A. Ammonia emissions shall be determined using the enclosed EPA Draft Method.

10. Before the construction permit expires, the DAP plant shall be tested for PM/PM<sub>10</sub>, fluoride, and visible emissions. Test procedures shall be in accordance with EPA reference methods 1, 2, 3, 4, 5, 9, and 13A or 13B as published in 40 CFR 60, Appendix A, (July, 1993). Ammonia emissions shall be determined using the enclosed EPA Draft Method.

11. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

12. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this \_\_\_\_\_ day  
of \_\_\_\_\_, 1993

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

\_\_\_\_\_  
Virginia B. Wetherell, Secretary

01  
DETERMINATION OF AMMONIA

OBTAINED FROM FOSTON CURTIS,  
EPA, R.T.P., N.C.  
919/541-1063

1. Principle and Applicability

1.1 Principle. A gas sample is *extracted* from the stack and the ammonia is collected in impingers containing sulfuric acid solution. The collected ammonia is reacted to form a colored complex whose intensity is measured by a spectrophotometer.

1.2 This method is applicable for the determination of ammonia emissions from nitrogen fertilizer plants. The minimum detectable ammonia concentration is 30  $\mu\text{g/l}$ . The upper limit is 5000  $\mu\text{g/l}$ , but this may be extended by diluting the sample.

Possible interferences are calcium, magnesium, iron and sulfide.

2. Apparatus

2.1 Sampling. The sampling train is shown in Figure 1 and component parts are discussed below.

The tester has the option of determining  $\text{NH}_3$  simultaneously with particulate matter and moisture determination by replacing the water in a Method 5 impinger system with 1.0 N sulfuric acid.

2.1.1 Probe. Borosilicate glass, or stainless steel (other materials of construction may be used, subject to the approval of the Administrator), approximately 6-mm inside diameter, with a heating system to prevent water condensation and a filter (either in-stack or heated out-stack) to remove particulate matter, including sulfuric acid mist. A plug of glass wool is a satisfactory filter.

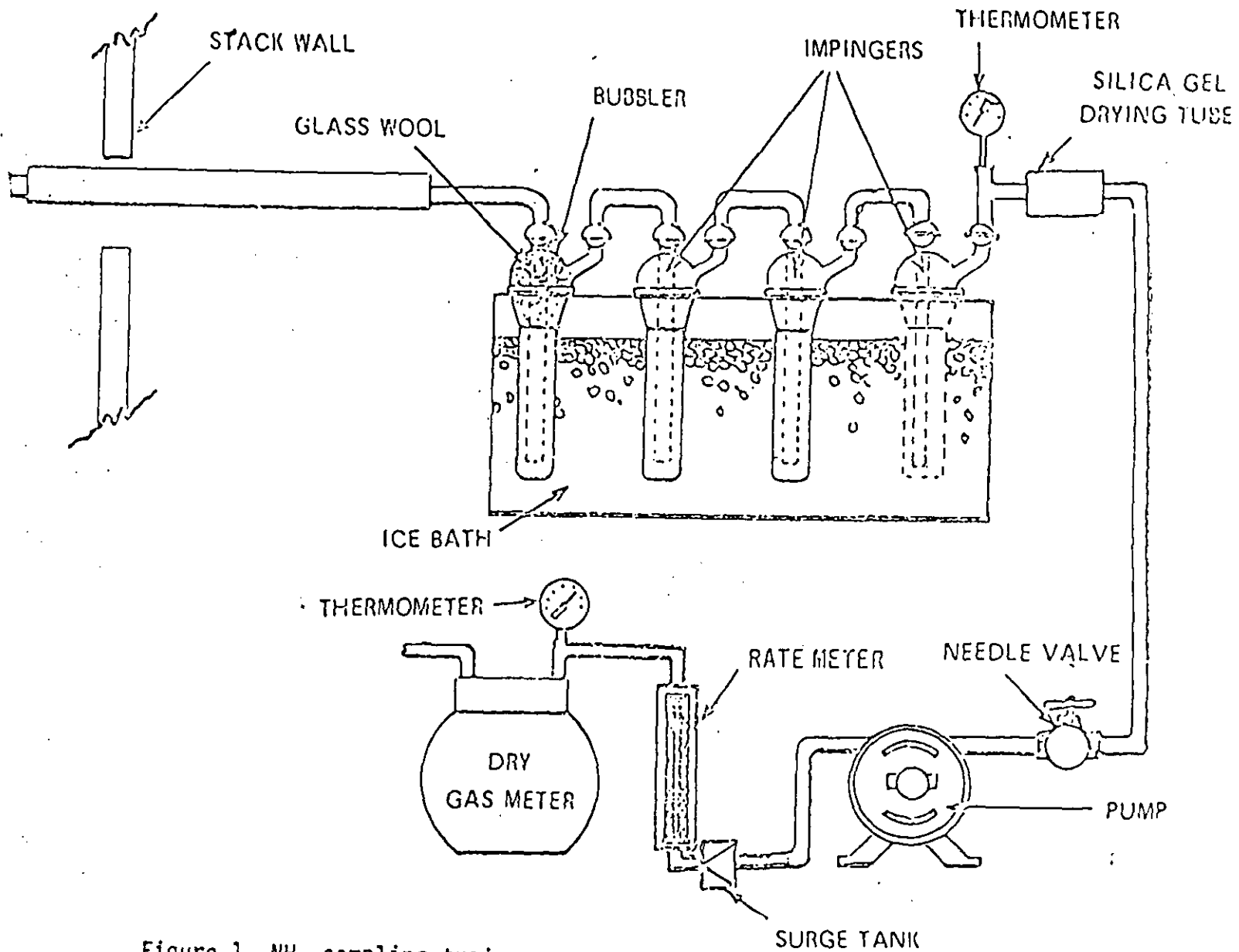


Figure 1,  $\text{NH}_3$  sampling train.

2.1.2 Impingers. Four 30-ml midget impingers.<sup>1</sup> The midget impingers must be connected in series with leak-free glass connectors. Silicone grease may be used, if necessary, to prevent leakage.

Other collection absorbers and flow rates may be used, but are subject to the approval of the Administrator. Also, collection efficiency must be shown to be at least 99 percent<sup>2</sup> for each test run and must be documented in the report. If the efficiency is found to be acceptable after a series of three tests, further documentation is not required. To conduct the efficiency test, an extra absorber must be added and analyzed separately. This extra absorber must not contain more than 1 percent of the total  $\text{NH}_3$ .

2.1.3 Glass Wool. Borosilicate or quartz.

2.1.4 Stopcock Grease. Acetone-insoluble, heat-stable silicone grease may be used, if necessary.

2.1.5 Temperature Gauge. Dial thermometer, or equivalent, to measure temperature of gas leaving impinger train to within  $1^\circ\text{C}$  ( $2^\circ\text{F}$ ).

2.1.6 Drying Tube. Tube packed with 6- to 16-mesh indicating-type silica gel, or equivalent, to dry the gas sample and to protect the meter and pump. If the silica gel has been used previously, dry at  $175^\circ\text{C}$  ( $350^\circ\text{F}$ ) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to approval of the Administrator.

2.1.7 Valve. Needle valve, to regulate sample gas flow rate.

<sup>1</sup> As per Foston Curtis. EPA, R.T.P., N.C., standard impingers are allowed.

<sup>2</sup> See efficiency calculation within Report.



2.1.8 Pump. Leak-free diaphragm pump, or equivalent, to pull gas through the train. Install a small surge tank between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter.

2.1.9 Rate Meter. Rotameter, or equivalent, capable of measuring flow rate to within 2 percent of the selected flow rate of about 1000 cc/min.<sup>3</sup>

2.1.10 Volume Meter. Dry gas meter, sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions actually encountered during sampling, and equipped with a temperature gauge (dial thermometer, or equivalent) capable of measuring temperature to within 3°C (5.4°F).

2.1.11 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases the barometric reading may be obtained from a nearby national weather service station, in which case the station value (which is the absolute barometric pressure) shall be requested and an adjustment for elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice versa for elevation decrease.

2.1.12 Vacuum Gauge and Rotameter. At least 760 mm Hg (30 in. Hg) gauge and 0-40 cc/min rotameter to be used for leak check of the sampling train.

2.2 Sample Recovery.

<sup>3</sup> Sampled isokinetically for 30 minutes.

2.2.1 Wash Bottles. Polyethylene or glass, 500 ml, two.

2.2.2 Storage Bottles. Polyethylene, 100 ml, to store impinger samples (one per sample).

2.3 Analysis.

2.3.1 Pipettes. Volumetric type 0.5-ml, 1-ml, 2-ml, 5-ml, 8.0-ml, 10.0-ml, 20-ml (one per sample), and 25-ml sizes.

2.3.2 Volumetric Flasks. 100-ml size (one per sample), 1000-ml size, and 25-ml size.

2.3.3 Graduated Cylinder. 100-ml size.

2.3.4 Spectrophotometer. To measure absorbance at 405 nanometers.

2.3.5 Sample Cells. Two matched absorbance cells to fit the spectrophotometer.

### 3. Reagents

Unless otherwise indicated, all reagents must conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society. Where such specifications are not available, use the best available grade.

3.1 Sampling.

3.1.1 Water. Deionized, distilled to conform to ASTM specification D1193-74, Type 3. At the option of the analyst, the  $KMnO_4$  test for oxidizable organic matter may be omitted when high concentrations of organic matter are not expected to be present.

3.1.2 Sulfuric Acid, 1.0 N. Dilute 28 ml of concentrated, ACS grade sulfuric acid to 1 liter with deionized, distilled water.

3.2 Sample Recovery.

3.2.1 Water. Deionized, distilled, as in 3.1.1.

3.2.2 Sulfuric Acid, 1.0 N. As in 3.1.2.

### 3.3 Analysis.

3.3.1 Water. Deionized, distilled, as in 3.1.1.

3.3.2 Anhydrous Mercuric Iodide ( $HgI_2$ ). ACS grade.

3.3.3 Potassium Iodide (KI). ACS grade.

3.3.4 Sodium Hydroxide (NaOH). ACS grade.

3.3.5 Stock Standard Ammonium Chloride Solution. Dissolve 3.141 g of ammonium chloride ( $NH_4Cl$ ) in 1.0N  $H_2SO_4$  in a 1-liter volumetric flask and dilute to exactly 1 liter with 1.0N  $H_2SO_4$ . One milliliter of this solution contains 1.0 mg of ammonia ( $NH_3$ ).

3.3.6 Working Standard Ammonium Chloride Solution. Dilute 10 ml of the stock standard solution to 1 liter with 1.0 N  $H_2SO_4$  in a 1-liter volumetric flask. One milliliter of this solution contains 10  $\mu g$  of ammonia ( $NH_3$ ).

3.3.7 Sodium Hydroxide, 10 N. Dissolve 40 grams of NaOH in a 100-ml volumetric flask and dilute exactly to 100-ml with deionized distilled water.

3.3.8 Nessler Reagent. Dissolve 160 g of NaOH in 500 ml of deionized distilled water in a 1-liter volumetric flask. Allow to cool. Dissolve 100 g of mercuric iodide and 70 g of potassium iodide in a small volume of deionized distilled water and while stirring add to the sodium hydroxide solution. Dilute to exactly 1 liter with deionized, distilled water. This reagent is stable up to 1 year.

## 4. Procedure

### 4.1 Sampling.

4.1.1 Preparation of Collection Train. Measure 15 ml<sup>4</sup> of 1.0 N sulfuric acid into each of the first three midget impingers. Leave the final midget impinger dry. Assemble the train as shown in Figure 1. Adjust the probe heater to a temperature sufficient to prevent water condensation. Place crushed ice and water around the impingers.

4.1.2 Leak-check Procedure. A leak check prior to the sampling run is optional; however, a leak check after the sampling run is mandatory. The leak-check procedure is as follows:

Temporarily attach a suitable (e.g., 0-40 cc/min) rotameter to the outlet of the dry gas meter and place a vacuum gauge at or near the probe inlet. Plug the probe inlet, pull a vacuum of at least 250 mm Hg (10 in. Hg), and note the flow rate as indicated by the rotameter. A leakage rate not in excess of 2 percent of the average sampling rate is acceptable. Note: carefully release the probe inlet plug before turning off the pump.

It is suggested (not mandatory) that the pump be leak-checked separately, either prior to or after the sampling run. If done prior to the sampling run, the pump leak-check shall precede the leak check of the sampling train described immediately above; if done after the sampling run, the pump leak-check shall follow the train leak-check. To leak check the pump, proceed as follows: Disconnect the drying tube from the probe-impinger assembly. Place a vacuum gauge at the inlet to either the drying tube or the pump, pull a vacuum of 250 mm (10 in.) Hg, plug or pinch off the outlet of the flow meter and then turn off the pump. The vacuum should remain stable for at least 30 seconds.

<sup>4</sup> 100 ml was used in the first three impingers.

4.1.3 Sample Collection. Record the initial dry gas meter reading and barometric pressure. To begin sampling, position the tip of the probe at the sampling point, connect the probe to the bubbler, and start the pump. Adjust the sample flow to a constant rate of approximately 1.0 liter/min as indicated by the rotameter. Maintain this constant rate ( $\pm 10$  percent) during the entire sampling run. Take readings (dry gas meter, temperatures at dry gas meter and at impinger outlet and rate meter) at least every 5 minutes. Add more ice during the run to keep the temperature of the gases leaving the last impinger at 20°C (68°F) or less. At the conclusion of each run, turn off the pump, remove probe from the stack, and record the final readings. Conduct a leak check as in Section 4.1.2. (This leak check is mandatory.) If a leak is found, void the test run. Use procedures acceptable to the Administrator to adjust the sample volume for the leakage.

4.2 Sample Recovery. Disconnect the impingers after purging. Pour the contents of the midget impinger into a leak-free polyethylene bottle for shipment. Rinse the impinger and connecting glassware with deionized distilled water and add the washings to the same storage container. Mark the fluid level. Seal and identify the sample container.

4.3 Sample Analysis. Note the level of the liquid in the container and confirm whether or not any sample was lost during shipment; note this on the analytical data sheet. If a noticeable amount of leakage has occurred either void the sample or use methods, subject to the approval of the Administrator, to correct the final results.

Quantitatively transfer the contents of the shipping container to a 1-liter volumetric flask. Rinse the container and cap with several portions of 1.0N sulfuric acid and transfer to the flask. Dilute to exactly 1 liter with 1.0N sulfuric acid. Pipet 10 ml of the sample from the 1-liter flask into a 500 ml-volumetric flask and dilute to exactly 500 ml with 1.0 N  $H_2SO_4$ . Pipet 20 ml of this solution into a 25-ml volumetric flask. Add 10 N sodium hydroxide dropwise to the flask until the pH is between eight and ten. Then add 0.5 ml of Nessler reagent and dilute to exactly 25 ml with deionized distilled water. Mix well and allow to stand for the same amount of time as the standards used for calibration. Measure the absorbance at 405 nm using the blank solution as a zero reference. Dilute the sample and the blank with equal amounts of deionized distilled water if the absorbance exceeds that of the  $100 \mu g NH_3$  solution.

## 5. Calibration

### 5.1 Metering System.

5.1.1 Initial Calibration. Before its initial use in the field, first leak check the metering system (drying tube, needle valve, pump, rotameter, and dry gas meter) as follows: place a vacuum gauge at the inlet to the drying tube and pull a vacuum of 250 mm (10 in.) Hg; plug or pinch off the outlet of the flow meter, and then turn off the pump. The vacuum shall remain stable for at least 30 seconds. Carefully release the vacuum gauge before releasing the flow meter end.

Next, calibrate the metering system (at the sampling flow rate specified by the method) as follows: connect an appropriately sized

Wet test meter (e.g., 1 liter per revolution) to the inlet of the drying tube. Make three independent calibration runs, using at least five revolutions of the dry gas meter per run. Calculate the calibration factor, Y (wet test meter calibration volume divided by the dry gas meter volume, both volumes adjusted to the same reference temperature and pressure), for each run, and average the results. If any Y value deviates by more than 2 percent from the average, the metering system is unacceptable for use. Otherwise, use the average as the calibration factor for subsequent test runs.

5.1.2 Post-Test Calibration Check. After each field test series, conduct a calibration check as in Section 5.1.1 above, except for the following variations: (a) the leak check is not to be conducted, (b) three, or more revolutions of the dry gas meter may be used, and (c) only two independent runs need be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in Section 5.1.1), then the dry gas meter volumes obtained during the test series are acceptable. If the calibration factor deviates by more than 5 percent, recalibrate the metering system as in Section 5.1.1, and for the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

5.2 Thermometers. Calibrate against mercury-in-glass thermometers.

5.3 Rotameter. The rotameter need not be calibrated, but should be cleaned and maintained according to the manufacturer's instruction.

5.4 Barometer. Calibrate against a mercury barometer.

### 5.5 Determination of Spectrophotometer Calibration Factor K.

Add 0.0, 1.0, 2.0, 5.0, 8.0, and 10.0 ml of working standard ammonium chloride solution to a series of six 25-ml volumetric flasks. Adjust the total volume of solution in each to 20 ml using 1.0 N  $H_2SO_4$ . Adding 10 N NaOH dropwise, adjust the pH to between 8 and 10. Pipette exactly 0.5 ml of Nessler reagent into each flask and dilute to exactly 25 ml with deionized distilled water. Mix well and allow each to stand for 10 to 30 minutes for color development. Note the time allowed for color development of the standards and use the same time for the samples. Measure the absorbance of each standard at 405 nm. The calibration procedure must be repeated each day that samples are analyzed. Calculate the spectrophotometer calibration factor as follows:

$$K_c = 100 \frac{A_1 + 2A_2 + 5A_3 + 8A_4 + 10A_5}{A_1^2 + A_2^2 + A_3^2 + A_4^2 + A_5^2}$$

Where:

$K_c$  = Calibration factor.

$A_1$  = Absorbance of the 10  $\mu$ g standard.

$A_2$  = Absorbance of the 20  $\mu$ g standard.

$A_3$  = Absorbance of the 50  $\mu$ g standard.

$A_4$  = Absorbance of the 80  $\mu$ g standard.

$A_5$  = Absorbance of the 100  $\mu$ g standard.

### 6. Calculation

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculation.



## 6.1 Nomenclature.

A = Absorbance of sample.

$C_{NH_3}$  = Concentration of ammonia dry basis corrected to standard condition, mg/dscm (lb/dscf).

F = Dilution factor (i.e., 25/5, 25/10, etc. required only if sample dilution was needed to reduce the absorbance into the range of calibration).

$K_c$  = Spectrophotometer calibration factor.

m = Mass of ammonia in gas sample,  $\mu$ g.

$P_{bar}$  = Barometric pressure at the exit orifice of the dry gas meter, mm Hg (in. Hg).

$P_{std}$  = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

$T_m$  = Average dry gas meter absolute temperature,  $^{\circ}$ K ( $^{\circ}$ R).

$T_{std}$  = Standard absolute temperature, 293 $^{\circ}$ K (528 $^{\circ}$ R).

$V_a$  = Volume of sample aliquot analyzed, ml.

$V_m$  = Dry gas volume as measured by the dry gas meter, dcm (dcf).

$V_{m(std)}$  = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (dscf).

$V_{soln}$  = Total volume of solution in which the ammonia sample is contained, 1000 ml.

Y = Dry gas meter calibration factor.

## 6.2 Dry sample gas volume, corrected to standard conditions:

$$V_{m(std)} = V_m Y \frac{T_{std}}{T_n} \frac{P_{bar}}{P_{std}} = K_1 Y \frac{V_m P_{bar}}{T_m}$$

Equation 2

Where:

$$K_1 = 0.3858 \text{ }^\circ\text{K/mm Hg for metric units.}$$

$$= 17.64 \text{ }^\circ\text{R/in. Hg for English units.}$$

6.3 Total  $\mu\text{g NH}_3$  per sample.

$$m = 2 K_c AF \frac{V_a}{V_{soln}} \quad \text{Equation 3}$$

6.4 Sample concentration, dry basis, corrected to standard condition:

$$C = K_2 \frac{m}{V_{sc}}$$

Where:

$$K_2 = 10^3 \frac{\text{mg/m}^3}{\mu\text{g/ml}} \text{ for metric units.}$$

$$= 6.243 \times 10^{-5} \frac{\text{lb/scf}}{\mu\text{g/ml}} \text{ for English units.}$$

## 7. Bibliography

1. Patton, W. F. and J. A. Brink, Jr. New equipment and Techniques for Sampling Chemical Process Gases. Air Pollution Control Association. 13:162, 1963.
2. Rom, J. J. Maintenance, Calibration, and Operation of Isokinetic Source Sampling Equipment. Office of Air Programs, Environmental Protection Agency. Research Triangle Park, N. C. APTD-0576, March, 1972.
3. Standard Methods for the Examination of Water and Wastewater, 13th Edition. American Public Health Association, Washington, D.C., 1974. pp. 226-232.

Best Available Control Technology (BACT) Determination  
IMC-Agrico Company  
Polk County

The applicant proposes to increase diammonium phosphate (DAP) production from 80 tons/hour to 100 tons/hour at their DAP plant on County Road 676 in Polk County.

The proposed project will result in a significant increase in emissions of fluorides and particulate matter (PM/PM<sub>10</sub>). The project is therefore subject to Prevention of Significant Deterioration (PSD) review in accordance with F.A.C. Rule 17-212.400.

The BACT review is part of the PSD review requirements in accordance with F.A.C. Rule 17-212.410.

Date of Receipt of a BACT Application:

April 28, 1993

BACT Determination Requested by the Applicant:

The BACT determination requested by the applicant is presented below:

Control Technology:	Venturi acid scrubbing/packed section pond water scrubbing
Pollutant:	Emission Limits:
PM/PM <sub>10</sub>	0.68 lb/ton Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) (32.9 lb/hr, 144.1 TPY)
Fluoride	0.06 lb/ton Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) (2.9 lb/hr, 12.7 TPY)
Visible Emissions	Not Specified

Basis of Review:

This determination was based upon input from the applicant, EPA Region IV, and the Bureau of Air Regulation.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-212, Air Pollution, this BACT determination is 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. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

- (b) All scientific, engineering, and technical material and other information available to the Department.
- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Determined by the Department:

Control Technology	Venturi acid scrubbing/packed section pond water scrubbing
Pollutant:	Emission Limits:
PM/PM <sub>10</sub> *	0.41 lb/ton P <sub>2</sub> O <sub>5</sub> (19.5 lb/hr, 85 TPY)
Fluoride*	0.0417 lb/ton P <sub>2</sub> O <sub>5</sub> (2.0 lb/hr, 8.8 TPY)
Visible Emissions	20% opacity

\* The emissions are prorated among the granulator, dryer, and cooler stacks based on the test data submitted in Table 2-2 of the application.

TABLE 1  
EMISSIONS

<u>Source</u>	<u>Lbs/Hr</u>	<u>Fluorides</u> <u>Lbs/TP205</u>	<u>Ton/Yr</u>	<u>Lbs/Hr</u>	<u>Particulate</u> <u>Lbs/TP205</u>	<u>Ton/Yr</u>
Reactor/ Granulator	1.70	0.0354	7.5	8.2	0.17	35.7
Dryer	0.19	0.0040	0.8	9.5	0.20	41.3
Cooler	<u>0.11</u>	<u>0.0023</u>	<u>0.5</u>	<u>1.8</u>	<u>0.04</u>	<u>8.0</u>
Total	2.00	0.0417	8.8	19.5	0.41	85.0

BACT Determination Rationale

The Department's BACT determination is more stringent than that proposed by the applicant and is consistent with compliance test results for the DAP plant done between 1980 - 1993. The Department's proposed fluoride emission limit is also more stringent than prior BACT limits set for other diammonium phosphate plants. The proposed particulate matter emission limit reflects a particulate removal efficiency of over 90%. A review of BACT/LAER Clearinghouse indicates that the use of venturi scrubbers followed by pond water scrubbing in a packed section is representative of BACT using the top-down approach. No. 2 fuel oil sulfur content has been limited at 0.5%, by weight in similar BACT determinations for modifications of existing facilities. Therefore, the Department is in agreement with the applicant's proposed sulfur content.

Conclusion

The impacts associated with the proposed increase in production support the Department's determination that the emission limits established herein represent BACT.

Details of the Analysis May be Obtained by Contacting:

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Bureau of Air Regulation  
2600 Blair Stone Road  
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Recommended by:

Approved by:

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C. H. Fancy, P.E., Chief  
Bureau of Air Protection

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Virginia B. Wetherell, Secretary  
Dept. of Environmental Protection

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Date 1993

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Date 1993