

→P 4/21

Check Sheet

Company Name: Farm Land Industries
Permit Number: AC 53-171751
PSD Number: 143
County: Polk
Permit Engineer:
Others involved:

105 0053 - NA - AC

PSD-FL-143
53171751

Application:

- Initial Application
- Incompleteness Letters
- Responses
- Final Application (if applicable)
- Waiver of Department Action
- Department Response
- Other

Intent:

- Intent to Issue
- Notice to Public
- Technical Evaluation
- BACT Determination
- Unsigned Permit
- Correspondence with:
 - EPA
 - Park Services
 - County
 - Other
- Proof of Publication
- Petitions - (Related to extensions, hearings, etc.)
- Other

Final Determination:

- Final Determination
- Signed Permit
- BACT Determination
- Other

Post Permit Correspondence:

- Extensions
- Amendments/Modifications
- Response from EPA
- Response from County
- Response from Park Services
- Other



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

RECEIVED

FEB 12 1990

FEB 16 1990

4APT/APB-PB

DER-BAQM

Mr. C.H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Farmland Industries, Inc. (PSD-FL-143)

Dear Mr. Fancy:

This is to acknowledge receipt of your final determination and permit for the above referenced facility, dated January 31, 1990. We have reviewed the package and concur with your determination.

Thank you for the opportunity to review this package. If you have any questions or comments, please contact Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides and Toxics
Management Division

cc: Mr. Ed Ferking, Farmland

J. Reynolds

B. Andrews

M. Finn

B. Shorrock, SW Dist

C. Shaver, NPS

CHF/JKP/BT

P 938 762 826

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

PS Form 3800, June 1985

Sent to <u>Mr. C. M. Farris, Farmland Ind.</u>	
Street and No. <u>P. O. Box 960</u>	
P.O., State and ZIP Code <u>Bartow, FL 33830</u>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 2-1-90 Permit: AC 53-171751 PSD-FL-143	

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. 2. Restricted Delivery (Extra charge)

<p>3. Article Addressed to:</p> <p><u>Mr. C. M. Farris</u> <u>General Manager</u> <u>Farmland Industries, Inc.</u> <u>P. O. Box 960</u> <u>Bartow, FL 33830</u></p>	<p>4. Article Number</p> <p><u>P 938 762 826</u></p> <p>Type of Service:</p> <p><input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise</p> <p>Always obtain signature of addressee or agent and DATE DELIVERED.</p>
<p>5. Signature - Address</p> <p><u>X Luda Thompson</u></p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature - Agent</p> <p><u>X</u></p>	
<p>7. Date of Delivery</p> <p><u>2/5/90</u></p>	



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION NOTICE OF PERMIT

Mr. C. M. Farris
General Manager
Farmland Industries, Inc.
P. O. Box 960
Bartow, Florida 33830

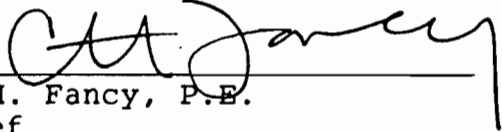
January 31, 1990

Enclosed is construction permit No. AC 53-171751, PSD-FL-143 to construct a 2,000 TPD sulfuric acid plant at your facility near Bartow, Polk County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


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

Copy furnished to:

B. Thomas, SW District
R. Tedder, P.E.
G. Worley, EPA

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 2-1-90.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to
§120.52(9), Florida Statutes, with
the designated Department Clerk,
receipt of which is hereby
acknowledged.

Kend Saben
Clerk

2-1-90
Date

Final Determination

Farmland Industries, Inc.
Green Bay Complex
Bartow, Polk County, Florida

Sulfuric Acid Plant No. 5
Permit No. AC 53-171751
PSD-FL-143

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

January 26, 1990

Final Determination

The construction permit application has been reviewed by the Department. Public Notice of the Department's Intent to Issue was published in the Polk County Democrat on December 25, 1989. The Technical Evaluation and Preliminary Determination were available for public inspection at the Department's Southwest District office in Tampa and the Bureau of Air Regulation in Tallahassee.

No comments were received during the public notice period. Therefore, the final action of the Department will be to issue the construction permit as drafted.



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

PERMITTEE:
Farmland Industries, Inc.
P. O. Box 960
Bartow, FL 33830

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991
County: Polk
Latitude/Longitude: 27°50'37"N
81°56'05"W
Project: Sulfuric Acid Plant
No. 5

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

For the construction of Sulfuric Acid Plant No. 5. The project will be located at the permittee's existing facility near Bartow, Polk County, Florida. The UTM coordinates are Zone 17, 409.5 km East and 3079.5 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.

Attachments are listed below:

1. Application to construct received October 23, 1989.
2. DER's letter of incompleteness dated November 21, 1989.
3. EPA's letter dated November 29, 1989.
4. Koogler & Associates letter dated November 29, 1989.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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.

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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 proscribed 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

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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, 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 construction and operation of the No. 5 sulfuric acid plant shall be in accordance with the capacities and specifications stated in the application.

2. The maximum production rate of the No. 5 sulfuric acid plant shall not exceed 2000 tons per day based on 100% H₂SO₄.

3. Sulfur dioxide emissions shall not exceed:

4 lbs/ton of 100% sulfuric acid produced
333.3 lbs/hr
1460 tons/yr

4. Sulfuric acid mist emissions shall not exceed:

0.15 lb/ton of 100% sulfuric acid produced
12.5 lbs/hr
54.8 tons/yr

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

SPECIFIC CONDITIONS:

5. Nitrogen oxides emissions shall not exceed:
0.12 lb/ton of 1005 sulfuric acid produced
10.0 lbs/hr
43.8 tons/year
6. Visible emissions shall not exceed 10% opacity.
7. Sulfuric acid plants No. 1 and No. 2 shall permanently cease operation within 90 days after the No. 5 sulfuric acid plant begins operation.
8. A continuous emission monitor shall be used to monitor sulfur dioxide, in accordance with F.A.C. Rule 17-2.710. Initial and annual compliance tests shall be conducted using:
EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
DER Method 9 for visible emissions
9. The compliance tests shall be conducted within 30 days after operation begins. The Department's Southwest District office shall be notified in writing 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to that office within 45 days of test completion.
10. 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 date of the permit (F.A.C. Rule 17-4.090).
11. An application for an operation permit must be submitted to the Department's 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 three 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. Rule 17-4.220).

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

Issued this 30 day
of Jan, 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


Dale Twachtmann, Secretary

Best Available Control Technology (BACT) Determination
Farmland Industries, Inc.
Polk County

The applicant proposes to construct a 2,000 tons per day double absorption sulfuric acid plant with cogeneration capability at their existing facility in Polk County. The project involves a sulfuric acid production increase of 400 tons per day since the existing sulfuric acid plants No. 1 and No. 2 will cease operation permanently (1600 tons per day).

The proposed project will result in a significant increase in emissions of SO₂, acid mist, and NO_x. The project is therefore subject to Prevention of Significant Deterioration (PSD) review in accordance with F.A.C. Rule 17-2.500(5).

The BACT review is part of the PSD review requirements in accordance with F.A.C. Rule 17-2.500(5)(c).

Date of Receipt of a BACT application:

October 23, 1989

BACT Determination Requested by the Applicant:

The BACT determination requested by the applicant is presented below:

<u>Control Technology</u>	<u>Double Absorption/Fiber Mist Eliminators</u>
<u>Pollutant</u>	<u>Emission Limits</u>
SO ₂	4 lb/ton of 100% H ₂ SO ₄ produced
Acid Mist	0.15 lb/ton of 100% H ₂ SO ₄ produced
Visible Emissions	10% opacity
NO _x	0.12 lb/ton

Basis of Review:

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

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination will be based on the maximum degree of reduction of each pollutant emitted which the Department (DER), 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.

In addition to the criteria discussed above, the EPA requires that BACT should be determined using the "top-down" approach. The first step in this approach is to determine 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 DER:

<u>Control Technology</u>	Double Absorption/Fiber Mist Eliminators
<u>Pollutant</u>	<u>Emission Limits</u>
SO ₂	4.0 lb/ton of 100% H ₂ SO ₄ produced
Visible Emissions	10% opacity
Acid Mist	0.15 lb/ton of 100% H ₂ SO ₄ produced
NO _x	0.12 lb/ton

BACT Determination Rationale

DER's BACT determination is the same as that proposed by the applicant, determinations 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 SO₂ and acid mist. The emission limits reflect conversion efficiency of around 99.7% of SO₂ to H₂SO₄. High efficiency mist eliminators are considered BACT for 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.

A review of the BACT/LAER Clearinghouse does not indicate any control technologies or emission limits for nitrogen oxides emissions from sulfuric and plants. The proposed emission level, equivalent to 0.03 pounds per million Btu, is well below the BACT levels that are typically established for sources emitting nitrogen oxides and is hence deemed BACT for this facility.

Environmental Impact Analysis

The impact analysis for the BACT determination is based on 8760 hrs/yr operation. The ambient air quality impact analysis resulted in the following for SO₂ and NO_x emissions:

<u>Averaging Time</u>	<u>Predicted Impact (ug/m³)</u>	<u>Deminimus (ug/m³)</u>	<u>Fla. AAQS (ug/m³)</u>
<u>SO₂</u>			
Annual	(less than 0)	N/A	60
24-hr	0.0002	13.0	260
3-hr	0.016	N/A	1300
<u>NO_x</u>			
Annual	3.9	14.0	100

Conclusion

The incremental impact from SO₂ due to the proposed modification is insignificant. For NO_x emissions, the impacts are also well below the standard. As this is the case, the impacts associated with facility supports the Department's determination that the emission limits established herein represent BACT.

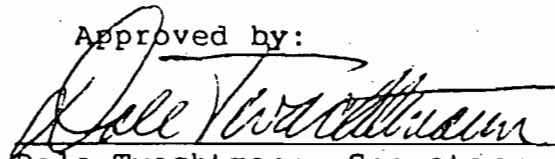
Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

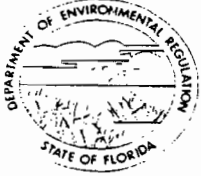
Approved by:


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


Dale Twachtmann, Secretary
Dept. of Environmental Regulation

January 29 1990
Date

30 Jan 1990
Date



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To: _____	Location: _____
To: _____	Location: _____
To: _____	Location: _____
From: _____	Date: _____

Interoffice Memorandum

TO: Dale Twachtmann

FROM: Steve Smallwood *SS*

DATE: January 26, 1990

SUBJ: Approval of Construction Permit No. AC 53-171751
PSD-FL-143, Farmland Industries, Inc.

*Please call
Patty Adams
when signed
8-1344*

Attached for your approval and signature is a permit prepared by the Bureau of Air Regulation for the above mentioned company to construct a 2,000 TPD sulfuric acid plant near Bartow, Florida.

No comments were received during the public notice period.

Day 90, after which this permit will be issued by default is March 28, 1990.

I recommend your approval and signature.

SS/JR/t

attachments

RECEIVED

JAN 29 1990

Office of the Secretary



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

JAN 16 1990

RECEIVED
JAN 22 1990
DER-BAQM

4APT-APB-cdw

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

1-23
~~CHF~~ FYI
PA

RE: Farmland Industries, Inc. (PSD-FL-143)

Dear Mr. Fancy:

This is to acknowledge receipt of your preliminary determination and draft permit for Farmland Industries' proposed sulfuric acid plant, dated December 21, 1989.

We have reviewed this package as requested and concur with your determination.

Thank you for allowing EPA to review this package. If you have any comments please contact Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

cc: Mr. Ed Ferking, Farmland

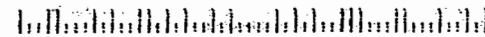
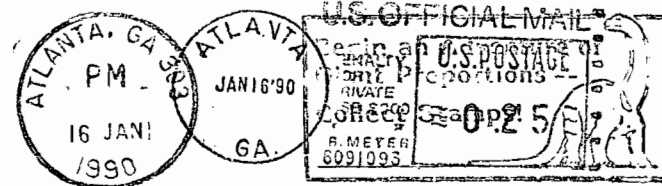
J. Reynolds
B. Andrews
M. Linn
D. Thomas, sub Dist.
CHF/BT

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

AIR-4

Mr. C. H. Fancy, P.E., Chief
~~Bureau of Air Regulation~~
Florida Dept. of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400



JAN 16 1990



FARMLAND INDUSTRIES, INC.

post office box 960 / bartow, florida 33830

RECEIVED

JAN 19 1990

DER-BAQM

January 11, 1990

Mr. Bill Thomas
Department of Environmental Regulation
Air Programs
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Bill,

Pursuant to Section 403.815, Florida Statutes and DER Rule 17.103.150 Florida Administrative Code, the Notice of Intent to Issue has been published in a local newspaper. This news paper is generally circulated in the County in which the project is located. A certified copy of the publication is attached.

If you have any questions, please give me a call.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Gene Meier".

C. Gene Meier
Administrator,
Environmental Services

CGM:dr

pc: Merle Farris
Ed Ferking

CGM-02-90



FARMLAND INDUSTRIES, INC.

post office box 960 / bartow, florida 33830

December 29, 1989

RECEIVED

JAN 2 1990

DER-BAQM

State of Florida Department of Environmental Regulation Notice of Intent to Issue The Department of Environmental Regulation hereby gives notice to its intent to issue a permit to Farmland Industries, Inc. to construct a 2,000 tons per day sulfuric acid plant at their facility near Bartow, 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 new sulfuric acid plant (No. 5) will replace the existing No. 1 and No. 2 sulfuric acid plants. The project will increase total sulfuric acid production at the Farmland facility by approximately 8% and is not expected to result in significant deterioration of the environment. No PSD increment will be consumed since the existing No. 1 and No. 2 sulfuric acid plants will be shut down. 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 fourteen (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;

Mr. Bill Thomas Department of Environmental Regulation Air Programs 2600 Blair Stone Road Tallahassee, Florida 32399-2400

Dear Bill:

Pursuant to Section 403.815, Florida Statutes and DER Rule 17-103.150 Florida Administrative Code, the Notice of Intent to Issue has been published in a local newspaper. This newspaper is generally circulated in the County in which the project is located. A certified copy of the publication is attached.

If you have any questions, please give me a call.

Very truly yours,

[Signature]

C. G. Meier Administrator, Environmental Services

CGM:pm

pc: Merle Farris Ed Ferking

[Handwritten notes: J. Reynolds, B. Thomas, SW Dist., M. Dimentraut, EPA]

FII-5430 (10/79)



FARMLAND INDUSTRIES, INC

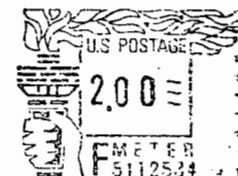
P. O. BOX 960
BARTOW, FLORIDA 33830

Fold at line over top of envelope to the
of the return address

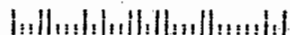
CERTIFIED

P 967 851 830

MAIL



Mr. Bill Thomas
Department of Environmental Regulation
Air Programs
2600 Blair Stone Road
Tallahassee, FL 32399-2400



AFFIDAVIT OF PUBLICATION

THE LEDGER Lakeland, Polk County, Florida

Case No.....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared Stephen DeWitt, who on oath says that he is Controller of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

Notice of Intent

in the matter of

Acid Plant

in the

Court, was published in said newspaper in the issues of

December 29; 1989

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed Stephen P. DeWitt
Controller

Sworn to and subscribed before me this..... 5th

January..... 90
A.D. 19.....

Barbara Thigpen
Notary Public



NOTARY PUBLIC, STATE OF FLORIDA.
My Commission Expires..... NOV. 11, 1990.
BONDED THRU NOTARY PUBLIC UNDERWRITERS.

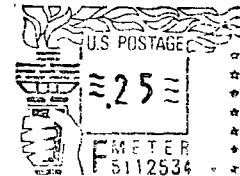
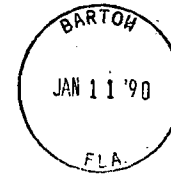
State of Florida
Department of Environmental Regulation
Notice of Intent to Issue
The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Farmland Industries, Inc. to construct a 2000 tons per day sulfuric acid plant at their facility near Barlow, Polk County, 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 new sulfuric acid plant (No. 5) will replace the existing No. 1 and No. 2 sulfuric acid plants. The project will increase total sulfuric acid production at the Farmland facility by approximately 8% and is not expected to result in significant deterioration of the environment. No PSD increment will be consumed since the existing No. 1 and No. 2 sulfuric acid plants will be shut down. 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 420.57, 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 fourteen (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 420.57, 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 420.57, 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 business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at: Department of Environmental Regulation Bureau of Air Regulation 2600 Blair Stone Road Tallahassee, Florida 32399-2400 Department of Environmental Regulation Southwest District Office 4520 Oak Fair Blvd. Tampa, Florida 33610-7347
Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.
K:735 - 1229; 1989

FII-5430 (10/79)

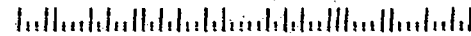


FARMLAND INDUSTRIES, INC.

P. O. BOX 960
BARTOW, FLORIDA 33830



Mr. Bill Thomas
Air Programs
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400



AFFIDAVIT OF PUBLICATION

The Polk County Democrat
Published Semi-Weekly
Bartow, Polk County, Florida

Case No. _____

STATE OF FLORIDA
COUNTY OF POLK

Before the undersigned authority personally appeared _____

S. L. Frisbie, IV _____, who on oath says that (s)he is

Publisher _____ of The Polk County Democrat, a newspaper pub-

lished at Bartow, in Polk County, Florida; that the attached copy of advertisement, being

a n Intent to Issue a Permit _____ in the

matter of FARMLAND INDUSTRIES, INC. _____

in the _____ Court, was published in said newspaper in the issues

of Dec. 25, 1989 _____

Affiant further says that The Polk County Democrat is a newspaper published at Bartow, in said Polk County, Florida, and that said newspaper has heretofore been continuously published in said Polk County, Florida, each Monday and Thursday, and has been entered as second class matter at the post office in Bartow, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm, or corporation any discount, rebate, commission, or refund for the purpose of securing this advertisement for publication in said newspaper.

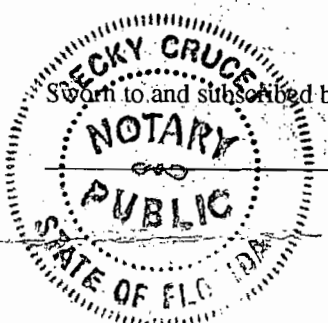
Signed _____

Sworn to and subscribed before me this 26th day of

December, 19 89

Decky Cruet _____

Notary Public



My Commission Expires:
Notary Public, State of Florida at Large
My Commission Expires Dec. 26, 1991

(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 business hours, 8:00 a. m. to 5 p. m., Monday through Friday, except legal holidays, at: Department of Environmental Regulation, Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, Department of Environmental Regulation, Southwest District Office, 4520 Oak Fair Blvd., Tampa, Florida 33610-7347.

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice. Dec. 25, 1989-3991



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

DEC 21 1989

RECEIVED

DEC 26 1989

DER-BAQM

REF: 4APTM/APB/sch

Mr. Clair H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Farmland Industries, Inc. (PSD-FL-143)

Dear Mr. Fancy:

This is to acknowledge receipt of the additional information sent to you on November 29, 1989, by Koogler & Associates. This information provided answers to questions raised by your staff and by EPA.

At this time, we do not have any additional questions concerning this application. Thank you for allowing EPA to review this package. If you have any further questions or comments, please contact Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

A handwritten signature in cursive script that reads "Bruce P. Miller".

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides and Toxics
Management Division

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

AIR-4

Mr. Clair H. Fancy, P.E.
Bureau of Air Regulation
Florida Dept. of Environmental
Regulation

RECEIVED
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DEC 26 1989

DER - BAQM



U.S. OFFICIAL MAIL

PENALTY
OR
PRIVATE
USE \$300
METER
6091093

U.S. POSTAGE

0.25



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

NOV 29 1989

REF: 4APTM/APB/sch

RECEIVED

DEC 04 1989

DER BAQM

Ms. Patricia G. Adams, Planner
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Farmland Industries, Inc. (PSD-FL-143)

Dear Ms. Adams:

This is to acknowledge receipt of the permit application for the above referenced facility, dated November 3, 1989. We have several questions and comments concerning the application.

As of 1977, the existing facility at Farmland Industries apparently consisted of four sulfuric acid plants (SAP), two phosphoric acid plants, two ammonium phosphate plants and one superphosphoric acid plant. In 1982, sulfuric acid plants #3 and #4 were expanded. Did the expansions constitute major modifications to an existing major source? (i.e. greater than 40 tpy increase in SO₂ emissions).

On March 29, 1985, sulfuric acid plant #2 was permanently shut down. Why was the plant shut down? Was the shutdown made federally enforceable? Were the permits for SAP #2 rescinded?

In 1987, a green superphosphoric acid plant (GSPAP) was permitted. Apparently the reduction in NO_x emissions from the shutdown of SAP #2 was used to "net" the new plant out of PSD review. Was there a significant (3 tpy) increase in fluoride emissions from the new facility? Was the shutdown of SAP #2 made federally enforceable at the time of the netting transaction?

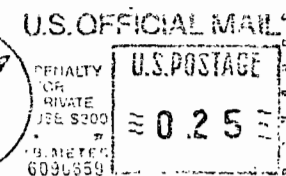
The current application is for the construction of SAP #5 along with an associated cogeneration facility. The applicant wishes to use the shutdown of SAP #2 along with the proposed shutdown of SAP #1 for netting purposes. Although the proposed reductions will not result in the netting out of PSD review, the emissions reductions are combined with the emissions increases from SAP #5 and the GSPAP in modelling the ambient impact.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

AIR-4

Ms. Patricia G. Adams, Planner
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400



What emissions are associated with the proposed cogeneration facility? Will any of the electricity or steam be sold to outside parties? If so, approximately what percent?

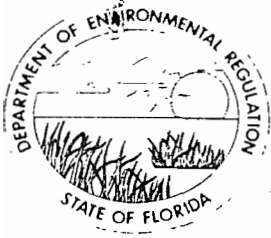
Thank you for the opportunity to review and comment on this package. If you have any questions, please contact Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides and Toxics
Management Division

*copied: J. Reynolds
B. Andrews
M. Linn
B. Thomas, SW Dist
CHF/BT*



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

December 21, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. C. M. Farris
General Manager
Farmland Industries, Inc.
P. O. Box 960
Bartow, Florida 33830

Dear Mr. Farris:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Farmland Industries to construct a 2000 tons per day sulfuric acid plant at their facility near Bartow, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Regulation.

Sincerely,

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

CHF/JR/t

Attachments

cc: B. Thomas, SW District
R. Tedder, P.E.
M. Armentrout, EPA

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. (Extra charge) 2. Restricted Delivery (Extra charge)

3. Article Addressed to: Mr. C. M. Farris General Manager Farmland Industries, Inc. P. O. Box 960 Bartow, FL 33830	4. Article Number P 938 762 792 Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature - Addressee <i>* Linda Thompson</i>	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X	
7. Date of Delivery 12/28/89	

PS Form 3811, Mar. 1988 * U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 938 762 792

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
 NOT FOR INTERNATIONAL MAIL
 (See Reverse)

Sent to Mr. C. M. Farris, Farmland	
Street and No. Industries P. O. Box 960	
P. O. State and ZIP Code Bartow, FL 33830	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 12-22-89 Permit: AC 53-171751 PSD-FL-143	

PS Form 3800, June 1985

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Farmland Industries, Inc.
P. O. Box 960
Bartow, Florida 33830

DER File No. AC 53-171751
PSD-FL-143

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Farmland Industries, Inc. applied on October 23, 1989, to the Department of Environmental Regulation for a permit to construct a 2000 tons per day sulfuric acid plant at their facility near Bartow, Polk County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER 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, at the address specified 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 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;

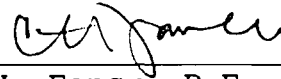
- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) 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 notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application(s) 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 in 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 REGULATION



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

Copies furnished to:

B. Thomas, SW District
R. Tedder, P.E.
M. Armentrout, EPA

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 12-22-89.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to
§120.52(9), Florida Statutes, with
the designated Department Clerk,
receipt of which is hereby
acknowledged.

Kerni Joken
Clerk

12-22-89
Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Farmland Industries, Inc. to construct a 2000 tons per day sulfuric acid plant at their facility near Bartow, 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 new sulfuric acid plant (No. 5) will replace the existing No. 1 and No. 2 sulfuric acid plants. The project will increase total sulfuric acid production at the Farmland facility by approximately 8% and is not expected to result in significant deterioration of the environment. No PSD increment will be consumed since the existing No. 1 and No. 2 sulfuric acid plants will be shut down. 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 fourteen (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 business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southwest District Office
4520 Oak Fair Blvd.
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Technical Evaluation
and
Preliminary Determination

Farmland Industries, Inc.
Green Bay Complex
Bartow, Polk County, Florida

Sulfuric Acid Plant No. 5
Permit No. AC 53-171751
PSD-FL-143

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

December 21, 1989

I. Application

A. Applicant

Farmland Industries, Inc.
Post Office Box 960
Bartow, Florida 33830

B. Request

The Department received an application on October 23, 1989, for a permit to construct a 2,000 TPD sulfuric acid plant (No. 5) at the applicant's phosphate complex near Bartow, Florida. After receiving additional information on November 29, the application was deemed complete on December 1, 1989.

C. Classification/Location

The applicant's facility (SIC Code 2819) is located off State Road 640 near Bartow, Florida, with latitude of 27°50'37"N and longitude of 81°56'05" W. The UTM coordinates of the site are: Zone 17, 409.5 km E and 3079.5 km N.

II. Project Description/Emissions

It is proposed to construct a new 2,000 TPD double absorption sulfuric acid plant (No. 5) to replace the existing No. 1 (800 TPD) and No. 2 (800 TPD) sulfuric acid plants. The new plant will have a 38 megawatt cogeneration facility powered solely by excess steam from the new plant. Plant No. 1 will be shut down permanently. Plant No. 2 was permanently shut down in March of 1985. Plants No. 3 and No. 4, constructed in 1972 and expanded in 1982 with capacities of 1600 TPD each, will continue to operate.

The proposed project will increase the total sulfuric acid capacity at this facility from 4800 TPD to 5200 TPD as shown below:

<u>Plant</u>	<u>Yr Constructed</u>	<u>Type</u>	<u>Capacity</u>	<u>Status</u>
1	1965	Single Absorption	800 TPD	To be shut down
2	1965	Single Absorption	800 TPD	Shut down 1985
3	1972/82	Double Absorption	1600 TPD	Operate
4	1972/82	Double Absorption	1600 TPD	Operate
5	1990	Double Absorption/ Cogeneration	2000 TPD	Operate

Annual emission changes resulting from the new construction and associated shutdowns are summarized in the following table. The existing Green Superphosphoric Acid Plant (GSPA), constructed in 1987, is included in the analysis since its NOx emissions are considered contemporaneous with the increase from the proposed No. 5 sulfuric acid Plant.

	Air Pollutant (tons/yr)			GSPA	Net Increase	Signif. Increase
	Sulfuric Acid	Plants				
	1	2	5			
SO ₂						
Present	700	700				
Proposed	(700)	(700)	1460		60	40
Acid Mist						
Present	7.5	7.5				
Proposed	(7.5)	(7.5)	54.8		39.8	7
NO _x						
Present	25.2	25.2*		64.8		
Proposed	(25.2)	(25.2)	43.4	64.8	57.8	40

*Permanently shut down in 1985 but included for contemporaneous emission changes per F.A.C. Rule 17-2.500(2)(e)3.

III. Rule Applicability

The construction permit application is subject to review under Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The facility is located in an area classified as attainment for each of the regulated air pollutants. The proposed major source is subject to the preconstruction review requirements of F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD). The proposed increases in emissions exceed significant levels set forth in Table 500-2 of F.A.C. Rule 17-2.500. 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 17-2.660, Table 660-1, Section 60.80, and 17-2.700, Table 700-1, apply to this new major source. Emissions will be limited by the federal new source performance standards for sulfur dioxide, acid mist and visible emissions, and the BACT determination for NO_x.

IV. Source Impact Analysis

A. Ambient Air Analysis

Analysis of ambient air impact from the proposed source generally involves assessment of existing air quality, a PSD increment analysis, and an ambient air quality standards analysis. Existing air quality must be established by monitoring data if the emissions from the new source will have an impact equal to or greater than that listed in F.A.C. Rule 17-2.500, Table 500-3, De Minimus Ambient Impacts. However, if it is shown, as here, that the net increase in ambient concentrations of applicable pollutants will be less than the de minimus concentrations listed in Table 500-3, the source is exempt from ambient monitoring as provided by F.A.C. Rule 17-2.500(3)(e). The following table summarizes results of air quality analysis for the proposed project:

	Ambient Impacts (ug/m ³)	Signif. Impact	De Minimus Impact
Sulfur Dioxide			
3-hr	0.016	25.0	N/A
24-hr	0.0002	5.0	13.0
Annual	(less than 0)	1.0	N/A
Nitrogen Oxides (annual)	3.9	1.0*	14.0
Acid Mist (24-hr)	3.7	N/A	4.8**

*The impact is significant as defined by F.A.C. Rule 17-2.100(173) but the impact from all sources surrounding the project site is below 10% of the ambient air quality standard for NOx.

**No de minimus or significant impact levels have been established for acid mist. This figure was calculated based on adjusted threshold limit value (TLV) in order to arrive at an acceptable ambient level (AAL).

The sulfur dioxide modeling data from the Industrial Source Complex-Short Term (ISCST) model indicate that the net impacts of increased emissions from the No. 5 plant, adjusted for the shutdown of the No. 1 and No. 2 plants, are below the de minimus impact levels. Modeling appears to have been carried out in accordance with EPA guidelines using actual emission offsets from the No. 1 and No. 2 plants. Although modeling results indicated that a net annual improvement in the sulfur dioxide ambient concentration will be realized, this is questionable since an additional 60 tons per year will be emitted. However, net impact will be very minor and therefore, a PSD increment analysis is not required.

Nitrogen oxides modeling using the Industrial Source Complex-Long Term (ISCLT) model showed that the No. 5 sulfuric acid plant, together with contemporaneous emissions from the GSPA plant, will have a significant impact as defined by F.A.C. Rule 17-2.100(173) at a distance of 0.3 kilometers from the plant but will not cause an exceedance of the ambient air quality standard. When modeled with all other sources of nitrogen oxides capable of affecting the area, this project is expected to result in a maximum concentration of only 7.6 micrograms per cubic meter (7.6% of the ambient air quality standard) in the project area.

Sulfuric acid mist emissions were evaluated differently since no significant impact levels, PSD increments or ambient air quality standards exist for this pollutant. An acceptable ambient level (AAL) of 4.8 micrograms per cubic meter was derived by adjusting the Threshold Limit Value (TLV) to reflect ambient exposure rather than occupational exposure. The ISCST air quality modeling shows that the maximum expected 24-hour average sulfuric acid mist impact resulting from operation of sulfuric acid plants No. 3, 4 and 5 will be 3.7 micrograms per cubic meter at a distance of 1.5 kilometers from the plants.

B. Impact on Soils, Vegetation, Visibility and Growth

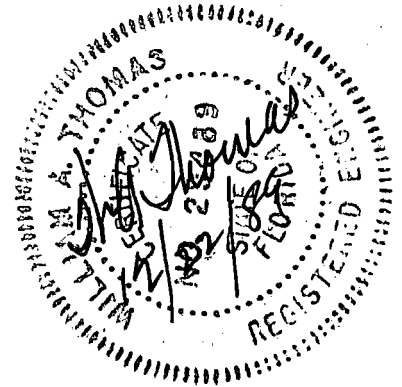
The impact of sulfur dioxide and sulfuric acid mist emissions is predicted to be very minor and therefore, is not expected to have any harmful effects on soils or vegetation. Likewise, the increased NOx emissions are not expected to harm soils, vegetation, or impair visibility of any nearby area. The only growth-related impact is expected to be a slight increase in truck and rail activity associated with the eight percent production increase.

C. Good Engineering Practice Stack Height

The applicant plans to construct a stack that is 150 feet above-grade which is at least 2.5 times the height of nearby structures. This complies with good engineering practice stack height criteria listed in F.A.C. Rule 17-2.270(3).

V. Conclusion

Based on the information provided by Farmland Industries, the Department has reasonable assurance that the proposed No. 5 sulfuric acid plant and cogeneration facility, 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 17-2 of the Florida Administrative Code.



Best Available Control Technology (BACT) Determination
Farmland Industries, Inc.
Polk County

The applicant proposes to construct a 2,000 tons per day double absorption sulfuric acid plant with cogeneration capability at their existing facility in Polk County. The project involves a sulfuric acid production increase of 400 tons per day since the existing sulfuric acid plants No. 1 and No. 2 will cease operation permanently (1600 tons per day).

The proposed project will result in a significant increase in emissions of SO₂, acid mist, and NO_x. The project is therefore subject to Prevention of Significant Deterioration (PSD) review in accordance with F.A.C. Rule 17-2.500(5).

The BACT review is part of the PSD review requirements in accordance with F.A.C. Rule 17-2.500(5)(c).

Date of Receipt of a BACT application:

October 23, 1989

BACT Determination Requested by the Applicant:

The BACT determination requested by the applicant is presented below:

<u>Control Technology</u>	Double Absorption/Fiber Mist Eliminators
<u>Pollutant</u>	<u>Emission Limits</u>
SO ₂	4 lb/ton of 100% H ₂ SO ₄ produced
Acid Mist	0.15 lb/ton of 100% H ₂ SO ₄ produced
Visible Emissions	10% opacity
NO _x	0.12 lb/ton

Basis of Review:

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

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination will be based on the maximum degree of reduction of each pollutant emitted which the Department (DER), 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.

In addition to the criteria discussed above, the EPA requires that BACT should be determined using the "top-down" approach. The first step in this approach is to determine 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 DER:

<u>Control Technology</u>	Double Absorption/Fiber Mist Eliminators
<u>Pollutant</u>	<u>Emission Limits</u>
SO ₂	4.0 lb/ton of 100% H ₂ SO ₄ produced
Visible Emissions	10% opacity
Acid Mist	0.15 lb/ton of 100% H ₂ SO ₄ produced
NO _x	0.12 lb/ton

BACT Determination Rationale

DER's BACT determination is the same as that proposed by the applicant, determinations 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 SO₂ and acid mist. The emission limits reflect conversion efficiency of around 99.7% of SO₂ to H₂SO₄. High efficiency mist eliminators are considered BACT for 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.

A review of the BACT/LAER Clearinghouse does not indicate any control technologies or emission limits for nitrogen oxides emissions from sulfuric and plants. The proposed emission level, equivalent to 0.03 pounds per million Btu, is well below the BACT levels that are typically established for sources emitting nitrogen oxides and is hence deemed BACT for this facility.

Environmental Impact Analysis

The impact analysis for the BACT determination is based on 8760 hrs/yr operation. The ambient air quality impact analysis resulted in the following for SO₂ and NO_x emissions:

<u>Averaging Time</u>	<u>Predicted Impact (ug/m³)</u>	<u>Deminimus (ug/m³)</u>	<u>Fla. AAQS (ug/m³)</u>
<u>SO₂</u>			
Annual	(less than 0)	N/A	60
24-hr	0.0002	13.0	260
3-hr	0.016	N/A	1300
<u>NO_x</u>			
Annual	3.9	14.0	100

Conclusion

The incremental impact from SO₂ due to the proposed modification is insignificant. For NO_x emissions, the impacts are also well below the standard. As this is the case, the impacts associated with facility supports the Department's determination that the emission limits established herein represent BACT.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
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

Dale Twachtmann, Secretary
Dept. of Environmental Regulation

Date 1989

Date 1989



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

PERMITTEE:
Farmland Industries, Inc.
P. O. Box 960
Bartow, FL 33830

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991
County: Polk
Latitude/Longitude: 27°50'37"N
81°56'05"W
Project: Sulfuric Acid Plant
No. 5

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

For the construction of Sulfuric Acid Plant No. 5. The project will be located at the permittee's existing facility near Bartow, Polk County, Florida. The UTM coordinates are Zone 17, 409.5 km East and 3079.5 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.

Attachments are listed below:

1. Application to construct received October 23, 1989.
2. DER's letter of incompleteness dated November 21, 1989.
3. EPA's letter dated November 29, 1989.
4. Koogler & Associates letter dated November 29, 1989.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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.

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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 proscribed 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

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.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

GENERAL CONDITIONS:

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, 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 construction and operation of the No. 5 sulfuric acid plant shall be in accordance with the capacities and specifications stated in the application.

2. The maximum production rate of the No. 5 sulfuric acid plant shall not exceed 2000 tons per day based on 100% H₂SO₄.

3. Sulfur dioxide emissions shall not exceed:

4 lbs/ton of 100% sulfuric acid produced
333.3 lbs/hr
1460 tons/yr

4. Sulfuric acid mist emissions shall not exceed:

0.15 lb/ton of 100% sulfuric acid produced
12.5 lbs/hr
54.8 tons/yr

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

SPECIFIC CONDITIONS:

5. Nitrogen oxides emissions shall not exceed:

0.12 lb/ton of 1005 sulfuric acid produced
10.0 lbs/hr
43.8 tons/year

6. Visible emissions shall not exceed 10% opacity.

7. Sulfuric acid plants No. 1 and No. 2 shall permanently cease operation within 90 days after the No. 5 sulfuric acid plant begins operation.

8. A continuous emission monitor shall be used to monitor sulfur dioxide, in accordance with F.A.C. Rule 17-2.710. Initial and annual compliance tests shall be conducted using:

EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
DER Method 9 for visible emissions

9. The compliance tests shall be conducted within 30 days after operation begins. The Department's Southwest District office shall be notified in writing 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to that office within 45 days of test completion.

10. 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 date of the permit (F.A.C. Rule 17-4.090).

11. An application for an operation permit must be submitted to the Department's 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 three 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. Rule 17-4.220).

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-171751
PSD-FL-143
Expiration Date: Sept. 30, 1991

Issued this _____ day
of _____, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtman, Secretary



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

KA 123-89-01
November 29, 1989

RECEIVED

NOV 30 1989

DER - BAQM

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

Subject: Response to Request for Additional Information
Farmland Industries, Inc.
Proposed Permit No. AC53-171751
PSD-FL-143
Sulfuric Acid Plant No. 5

Dear Mr. Fancy:

This is in response to your letter dated November 21, 1989, and in response to a letter dated November 29, 1989, from EPA, Region IV, both requesting additional information for the review of the subject permit application. Submitted for your review are the enclosed Attachments A and B which respond to the FDER and EPA comments, respectively.

In addition, it is my understanding that the issue of "emission credits" as it applies to Farmland's permit application has been resolved, i.e., both SO₂ and NO_x emission reduction credits from the permanent shutdown of Farmland's sulfuric acid plants No. 1 and 2 can be considered in permitting the subject plant since the emission reductions are federally enforceable.

Please feel free to contact me if you have any additional questions.

Sincerely,

KOGLER & ASSOCIATES

Richard B. Tedder, P.E.

RBT:wa
Enc.

cc: Mr. Ed Ferking, Farmland
Mr. Bill Thomas, FDER, SW District

J. Reynolds
B. Andrews
S. Rogers
M. Aronson, EPA
CHF/BT



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Date: 11/29/89

From (Your Name) Please Print <u>Wagner & Teller</u>		Your Phone Number (Very Important) <u>904-377-5822</u>		To (Recipient's Name) Please Print <u>Mr. C. H. Finny</u>		Recipient's Phone Number (Very Important) <u>480-1311</u>	
Company <u>WGLER & ASSOC</u>		Department/Floor No.		Company <u>FDK Term Term</u>		Department/Floor No.	
Street Address <u>14 NW 13TH ST</u>				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes) <u>2600 Blaine Stone Rd</u>			
City <u>INSVILLE</u>		State <u>FL</u>		City <u>Tallahassee</u>		State <u>FL</u>	
ZIP Required <u>32609</u>		ZIP Required <u>32307</u>					

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PAYMENT: Bill Sender, Bill Recipient's FedEx Acct. No., Bill 3rd Party FedEx Acct. No., Bill Credit Card
 Cash

SERVICES (Check only one box)		DELIVERY AND SPECIAL HANDLING			PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE	OVER SIZE	Emp. No.	Date	Federal Express Use
Priority Overnight Service (Delivery by next business morning) 11 <input type="checkbox"/> YOUR PACKAGING 16 <input type="checkbox"/> FEDEX LETTER 12 <input type="checkbox"/> FEDEX PAK 13 <input type="checkbox"/> FEDEX BOX 14 <input type="checkbox"/> FEDEX TUBE Economy Service (Formerly Standard Air) (Delivery by second business day) 30 <input type="checkbox"/> ECONOMY SERVICE Standard Overnight Service (Delivery by next business afternoon) 51 <input type="checkbox"/> FEDEX LETTER 52 <input type="checkbox"/> FEDEX PAK 53 <input type="checkbox"/> FEDEX BOX 54 <input type="checkbox"/> FEDEX TUBE Heavyweight Service (for Extra Large or any package over 150 lbs.) 70 <input type="checkbox"/> HEAVYWEIGHT 80 <input type="checkbox"/> DEFERRED HEAVYWEIGHT *Declared Value Limit \$100. **Call for delivery schedule.	1 <input type="checkbox"/> HOLD FOR PICK-UP (P.O. Box #) 2 <input checked="" type="checkbox"/> DELIVER W/KEY 3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge) 4 <input type="checkbox"/> DANGEROUS GOODS (Extra charge) 5 <input type="checkbox"/> CONSTANT SURVEILLANCE SVC. (CSS) (Extra charge) (Release Signature Not Applicable) 6 <input type="checkbox"/> DRY ICE _____ lbs. 7 <input type="checkbox"/> OTHER SPECIAL SERVICE _____ 8 <input type="checkbox"/> _____ 9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge) 10 <input type="checkbox"/> _____ 11 <input type="checkbox"/> DESCRIPTION _____ 12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)	Total	Total	Total							Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 8/89 PART #119501 EXEM 9/89 FORMAT 801A 014 © 1989 F.E.C. PRINTED IN U.S.A.
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ATTACHMENT A
RESPONSE TO FDER COMMENTS
DATED NOVEMBER 21, 1989
ON FARMLAND INDUSTRIES, INC.
PROPOSED PERMIT AC53-171751, PSD-FL-143

RECEIVED

NOV 30 1989

DER-BAQM

1. Please submit your air quality modeling output for review. Preferably one hard copy and one copy on 5-1/4 inch floppy diskette. Include a copy of the input files used in the modeling on floppy diskette.

A hard copy of the air quality modeling output and a 5-1/4 inch floppy diskette copy of the input files used for the modeling were sent to you by Federal Express on November 28, 1989. Air quality modeling output on a 5-1/4 inch floppy diskette is not available.

2. Farmland cannot take credit for the emission reductions from the sulfuric acid plants Nos. 1 and 2 for the purposes of net emissions change. Since these sources were previously used to offset the NOx emissions for the green superphosphoric acid plant and it is a permit condition that these sources would be permanently shut down in that permit, these sources are no longer creditable for the construction of the new No. 5 plant. As a result, the net emissions increase is determined by the No. 5 H2SO4 plant only. All modeling must be redone and the question of preconstruction monitoring and the modeling of background sources reevaluated.

This confusion is a result of changes in the permit conditions for the green superphosphoric acid plant (GSPA) when the Operating Permit was issued and an error in subject permit application.

At the time the GSPA plant construction permit was issued, the available data indicated that the NOx emissions would be 90.0 tons per year. At that time, Farmland committed to permanently shutting down sulfuric acid plants No. 1 and No. 2 prior to the start-up of



the GSPA plant and that was made a condition of the construction permit. NOx offsets from the permanent shutdown of sulfuric acid plants No. 1 and No. 2 when netted with expected NOx emissions from the GSPA plant resulted in a less than significant increase in the annual NOx emissions (39.6 tpy) and, thus, a PSD review was not required.

When the operating permit (A053-157886) for the GSPA plant was applied for, additional stack test data indicated that the NOx emission estimates used in the construction permit application were high. In addition, Farmland was experiencing a sulfuric acid shortage due to the shutdown of sulfuric acid plants No. 1 and No. 2 and an unexpected increase in fertilizer demand. After negotiating with the Florida Department of Environmental Regulation, the operating permit for the GSPA plant was issued with a revised NOx emission limit of 64.8 tons per year. This revised NOx emission limit was based on best available emission test data and did not include any offset from the shutdown of sulfuric acid plants No. 1 or No. 2. Farmland had agreed, however, to permanently shutdown sulfuric acid plant No. 2; resulting in a net reduction in NOx emissions of 25.2 tons per year. The shutdown of sulfuric acid plant No. 2 and the reduction in permitted emissions from the GSPA plant resulted in a less than significant increase in the annual NOx emissions (again, 39.6 tpy) and, therefore, a PSD review was not required.



Modeling for NO_x in Farmland's new sulfuric acid plant No. 5 construction permit application was based on maximum allowable emissions from the GSPA plant (64.8 tpy), estimated emissions from the new sulfuric acid plant No. 5 (43.4 tpy), and offsets from the permanent shutdown of sulfuric acid plants No. 1 and No. 2 (2 x 25.2 tpy). On page 22 of the report supporting a PSD review of Farmland's new sulfuric acid plant, Note 2 incorrectly states that the permitted emission rates for the GSPA plant included an offset from the permanent shutdown of sulfuric acid plant No. 2. As has already been stated, the permitted emission rates for the GSPA plant were based upon best available data for actual emission rates and did not include an offset from the permanent shutdown of sulfuric acid plant No. 2. As a result, the modeling efforts performed for the new sulfuric acid plant are based upon best available estimates of actual NO_x emissions from the GSPA plant and the proposed No. 5 sulfuric acid plant and offsetting NO_x emissions from the No. 1 and No. 2 sulfuric acid plants.

3. Show your calculations for determining the GEP stack height. That is, include the dimensions of all nearby structures.

Stack height calculations are shown in the attached Table 1. No existing structure at the facility is considered a nearby structure and hence, will not affect GEP stack height or be a factor in plume downwash. The structures associated with the proposed No. 5 sulfuric acid plant will likewise not result in plume downwash or affect GEP stack height calculations.

The maximum GEP stack height (by rule) is 213 feet while the maximum building wake height is 140 feet. The proposed stack height for the No. 5 sulfuric acid plant is 150 feet.

TABLE 1

GOOD ENGINEERING PRACTICE STACK HEIGHT ANALYSIS

FARMLAND INDUSTRIES, INC.
GREEN BAY, FLORIDA

BUILDING	-H- BUILDING HEIGHT (FT)	BUILDING LENGTH X WIDTH (FT)	-PW- PROJECTED WIDTH (1) (FT)	-L- LESSER OF H or PW (FT)	5L (2) (FT)	DISTANCE FROM BUILDING TO H2SO4 #5 (FT)	H + 1.5L (3) (FT)
DAP/MAP	109	161 x 102	145	109	545	1008	>5L (4)
Shipping	111	107 x 86	108	108	540	1085	>5L
Fert Stg	69	370 x 161	275	69	345	1085	>5L
Phos Acid #1 Filter Bldg	76	225 x 107	175	76	380	733	>5L
Phos Acid #2 Filter Bldg	76	75 x 75	85	76	380	687	>5L
Laboratory	15	86 x 75	91	15	75	611	>5L
Warehouse/ Maintenance	22	209 x 107	169	22	110	474	>5L
SPA	15	43 x 27	38	15	75	555	>5L
H2SO4 #3 & #4	80	-	150 (5)	80	400	516	>5L
H2SO4 #5	80	16 x 80 (6)	40	40	200	0	140 (7)
Cooling Towers	26	170 x 50	104	26	130	300	>5L
Electrical Bldg	20	20 x 30	28	20	100	180	>5L
Oxide Bldg	40	88 x 90	100	40	200	280	>5L

(1) Projected Width = $(4/\pi \times \text{Bldg Width} \times \text{Bldg Length})^{1/2}$.

(2) 5 x L is distance from a building within which wake effect is observed.

(3) H (Bldg Height) + 1.5L (Lesser of H or PW) is stack height necessary to eliminate downwash.

(4) Distance from structure to H2SO4 #5 is greater than 5L; therefore, no wake effect.

(5) There is no single structure associated with H2SO4 plants #3 and #4 that is of significant size. The projected width is a nominal width of all structures associated with the two plants.

(6) Most significant group of structures associated with H2SO4 #5 is the interpass tower, final absorption tower and drying tower.

(7) Stack height of H2SO4 #5 will be 150 ft.; therefore, downwash will not be a factor.

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NOV 30 1989

DER - BAQM

ATTACHMENT B

RESPONSE TO EPA, REGION IV COMMENTS
DATED NOVEMBER 29, 1989
ON FARMLAND INDUSTRIES, INC.
PROPOSED PERMIT AC53-171751, PSD-FL-143

1. As of 1977, the existing facility at Farmland Industries apparently consisted of four sulfuric acid plants (SAP), two phosphoric acid plants, two ammonium phosphate plants and one superphosphoric acid plant. In 1982, sulfuric acid plants #3 and #4 were expanded. Did the expansions constitute major modifications to an existing major source? (i.e., greater than 40 tpy increase in SO₂ emissions).

The expansions were not considered major modifications to existing major sources. Both plants were modified from single absorption 1100 tons per day plants to double absorption 1600 ton per day plants. For each plant, the permitted sulfur dioxide emissions decreased from 10 pounds per ton of 100 percent acid (458 lb/hr) to four pounds per ton of 100 percent acid (267 lb/hr) and the permitted acid mist emissions decreased from 0.3 pounds per ton of 100 percent acid (13.8 lb/hr) to 0.15 pounds per ton of 100 percent acid (10.0 lb/hr). Though records are no longer available, it is believed that the actual emissions from the original 1100 ton per day sulfuric acid plants were near that of the permitted emission rates. Additionally, the annual operating times of the plants before and after modification were essentially the same. Thus, the actual sulfur dioxide and acid mist emissions decreased due to the expansion and the modifications of plants No. 3 and No. 4 were not subject to a PSD review.



2. On March 29, 1985, sulfuric acid plant #2 was permanently shut down. Why was the plant shut down? Was the shutdown made federally enforceable? Were the permits for SAP #2 rescinded?

Sulfuric acid plant No. 2 was originally shutdown due to a prolonged period of low demand for fertilizer products. In the negotiations for the green superphosphoric acid (GSPA) plant permit, Farmland agreed to permanently shutdown sulfuric acid plant No. 2. The shutdown of sulfuric acid plant No. 2 was made federally enforceable by requiring the shutdown prior to the start-up of the GSPA plant in Specific Condition No. 9 of the construction permit (AC53-138041) and, also, in Specific Condition No. 13 of the operating permit (A053-157886) for the GSPA plant. The permit for sulfuric acid plant No. 2 was surrendered by Farmland.

3. In 1987, a green superphosphoric acid plant (GSPAP) was permitted. Apparently the reduction in NOx emissions from the shutdown of SAP #2 was used to "net" the new plant out of PSD review. Was there a significant (3 tpy) increase in fluoride emissions from the new facility? Was the shutdown of SAP #2 made federally enforceable at the time of the netting transaction?

The green superphosphate acid plant did not result in a significant increase in fluoride emissions for the facility. It was estimated that the maximum fluoride emissions from the GSPA plant would be no more than 0.4 tons per year. Most of the fluorine in the phosphoric acid is evolved in the early evaporation stages and captured in fluosilicic acid absorbers to be sold as product. As a result, fluoride emissions from the GSPA plant are low.



As has been stated, the shutdown of sulfuric acid plant No. 2 was made federally enforceable by being required as permit conditions in both the construction permit and the operating permit for the GSPA plant.

4. What emissions are associated with the proposed cogeneration facility? Will any of the electricity or steam be sold to outside parties. If so, approximately what percent?

The only emissions from the proposed cogeneration facility are those associated with the new sulfuric acid plant No. 5. The turbine for the cogeneration facility will be driven by excess steam from the new sulfuric acid plant.

It is estimated that approximately 15 to 20 percent of the electricity generated by the cogeneration facility will be sold to outside parties.



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

November 21, 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. C. M. Farris
General Manager
Farmland Industries, Inc.
P. O. Box 960
Bartow, Florida 33830

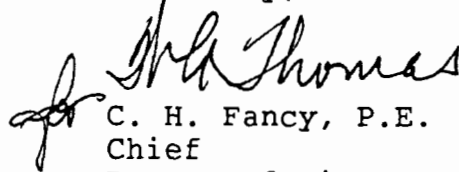
Dear Mr. Farris:

Re: Proposed Permit No. AC 53-171751, PSD-FL-143
No. 5 H₂SO₄ Plant

This is to provide notice that additional information is required for preliminary review of the above application. The Bureau of Air Monitoring and Assessment requests a redetermination of air quality modeling using revised emission estimates (see attached memo). Also, the EPA faxed several questions received today (see attached).

If you have any questions, please call John Reynolds at (904) 488-1344 or write to me at the above address.

Sincerely,



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

CHF/JR/plm

Attachment

cc: M. Armentrout, EPA
B. Thomas, SW District
R. Tedder, P.E.

P 938 762 758

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

PS Form 3800, June 1985

Sent to Mr. C. M. Farris, Farmland	
Street and No. P. O. Box 960	Ind.
P.O., State and ZIP Code Bartow, Florida 33830	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 11-21-89 Permit: AC 53-171751	

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. (Extra charge) 2. Restricted Delivery (Extra charge)

<p>3. Article Addressed to:</p> <p>Mr. C. M. Farris, Gen. Mgr. Farmland Industries, Inc. Green Bay Complex P. O. Box 960 Bartow, FL 33830</p>	<p>4. Article Number</p> <p>P 938 762 758</p> <p>Type of Service:</p> <p><input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise</p> <p>Always obtain signature of addressee or agent and <u>DATE DELIVERED</u>.</p>
<p>5. Signature - Address</p> <p>X <i>Jean Hicks</i></p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature - Agent</p> <p>X</p>	
<p>7. Date of Delivery</p> <p><i>11/27/89</i></p>	



Best Available Copy

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To _____	Location _____
To _____	Location _____
To _____	Location _____
From _____	Date _____

Interoffice Memorandum

TO: John Reynolds

FROM: Tom Rogers *TR*

DATE: November 21, 1981

SUBJECT: Farmland Industries, Inc. -- Incompleteness Questions
AC53-171751, PSD-FL-143

I have the following incompleteness questions regarding Farmland's permit application to construct a new sulfuric acid plant (H_2SO_4 No. 5).

1. Please submit your air quality modeling output for review. Preferably, one hard copy and one copy on 5 1/4 inch floppy diskette. Include a copy of the input files used in the modeling on floppy diskette.
2. Farmland can not take credit for the emission reductions from the sulfuric acid plants No. 1 and 2 for the purposes of net emissions change. Since these sources were previously used to offset the NOx emissions for the green superphosphoric acid plant, and it is a permit condition that these sources would be permanently shut down in that permit, these sources are no longer creditable for the construction of the new No. 5 plant. As a result, the net emissions increase is determined by the No. 5 H_2SO_4 plant only. All modeling must be redone and the question of preconstruction monitoring and the modeling of background sources reevaluated.
3. Show your calculations for determining the GEP stack height. That is include the dimensions of all nearby structures.

Best Available Copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION IV
345 Courtland Street, N.E.
ATLANTA, GA 30308

FACSIMILE TRANSMISSION SHEET

DATE: 11/21/89 NUMBER OF PAGES: 5 (Included Cover Sheet)

TO: Barry Andrews PHONE: _____

ADDRESS: FL DER FAX NUMBER: _____

FROM: Wayne Ironson PHONE: _____

If the following message is received poorly, Please call _____
in our office at FTS 257-_____ or commercial (404) 347-_____

SPECIAL INSTRUCTIONS: EPA Review not complete.
Letter forthcoming.

PLEASE NUMBER ALL PAGES

The facility as it existed prior to PSD regulations appears to be:

Sulfuric Acid Plants (SIC 2819)

- #1 constructed 1965
- #2 constructed 1965
- #3 constructed 1972
- #4 constructed 1972

Phosphoric Acid Plants (SIC 2874)

- #1
- #2

AMMONIUM Phosphate Plants (SIC 2874)

DAP

MAP

SUPERPHOSPHORIC ACID PLANTS (SIC 2874)

SPA

After 1977, the chronology appears to be as follows:

1982: SAP #3 + #4 are expanded
- apparently No PSD permit is issued.
question: Did the expansions constitute major modifications to an existing major source?
(ie., >40 tpy SO₂ or >74 tpy SAM)

shut down.

question: Why was #2 shut down?

1987: A Green Superphosphoric acid plant is permitted. Apparently the emissions reductions from the shutdown of SAP #2 were used to net the GSPPA out of PSD.

question: ① Was there a significant increase of fluorides (3 tpy)?

② Was the shut down of #2 made federally enforceable?

③ Should the GSPPA have received a PSDp

Nov 1989: Application to construct SAP #5 and cogeneration facility.

The applicant ~~is~~ wishes to use the shutdown of SAP #2 and the proposed shutdown of SAP #1 for netting purposes.

The modelling uses the decrease from #1 and #2 SAP along with the increases of GSPPA and SAP #5

questions:

① what emissions are associated with the proposed cogeneration facility?

② Will any of the electricity generated ^{or steam} by the co-gen be sold to outside parties? If so, approximately what percent

other questions

electricity or steam
ask for clarification

were permits rescinded for #2
emissions not carried in
inventory
"banked emissions"

"federally enforceable"?



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

November 3, 1989

Mr. Wayne Aronson, Chief
Program Support Section
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: Farmland Industries, Inc.
Sulfuric Acid Plant No. 5
AC 53-171751
PSD-FL-143

Enclosed for you review and comment is the permit application for the above referenced project. Please direct any comments or questions to John Reynolds, Barry Andrews, or Tom Rogers at the above address or (904)488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

PGA/kt

enclosures



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

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OCT 25 1989

DER-BAQM

KA 123-89-01

October 22, 1989

Ms. Patty Adams
Division of Air Resources
Management
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Application for a PSD Construction Permit Review
Farmland Industries, Inc.
Bartow, Polk County, Florida

Dear Ms. Adams:

Enclosed are three (3) copies of the Application for a PSD Construction Permit Review, prepared for Farmland Industries, Inc. in Bartow, Polk County, Florida.

The enclosed applications have been signed and sealed by Richard B. Tedder, P.E.; however, the applicant's signature (Page 1) has been copied.

If you have any questions or if I can be of any assistance, please do not hesitate to give me a call.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:mab

cc: Mr. Ed Ferking, Farmland Industries, Inc.



KOGLER & ASSOCIATES

ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 123-89-01

October 20, 1989

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1989 OCT 23 PM 1:01

RECEIVED
OCT 23 1989
DER-BAQM

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

Subject: Sulfuric Acid Air Construction Permit Application
Farmland Industries, Inc.
Bartow, Polk County, Florida

Dear Mr. Fancy:

Enclosed are four (4) copies of an air application to construct a 2000 ton-per-day double absorption sulfuric acid plant at the Farmland Industries' Green Bay Complex in Polk County. A check in the amount of \$5000.00, made payable to the Florida Department of Environmental Regulation, is also enclosed.

Since the sulfuric acid plant will be classified as a New Major Source, it will therefore be subject to the full review required of a PSD construction permit application. Attached to each application is a report which includes the PSD information needed for your review, including a determination of the Best Available Control Technology, an Air Quality Review and an evaluation of impacts on soils, vegetation and visibility.

If you have any questions regarding the content of this application, please feel free to contact me.

Sincerely,

KOGLER & ASSOCIATES

Richard B. Tedder
Richard B. Tedder, P.E.

RBT:mab

cc: Mr. Ed Ferking, Farmland Industries, Inc.
Mr. Gene Meier, Farmland Industries, Inc.

Copies: J. Heron
B. Andrews
S. Rogers
B. Thomas, SW Dist
D. Aronson, EPA



FARMLAND INDUSTRIES, INC.
 GREEN BAY PLANT
 P.O. Box 960
 Bartow, Florida 33830

CHECK NO. 69957428

80-95
 1012

CHECK AMOUNT
 *****5,000.00
 VOID AFTER 180 DAYS

16 69 F0346 10-10-89
 CO. BR. VEND. NO. CHECK DATE

PAY EXACTLY *****5,000 DOLLARS AND 00 CENTS

UNITED MISSOURI BANK OF
 CARTHAGE, MO.

FARMLAND INDUSTRIES, INC.

PAY
 TO THE ORDER OF
 Florida Department of
 Environmental Regulation
 2600 Blair Stone Road
 Tallahassee, FL 32399

A. J. Simpson

R. H. Hollingsworth

2600 Blair Stone Road
 Tallahassee, FL 32399-2400

Subject: Sulfuric Acid Air Construction Permit Application
 Farmland Industries, Inc.
 Bartow, Polk County, Florida

Dear Mr. Fancy:

Enclosed are four (4) copies of an air application to construct a 2000 ton-per-day double absorption sulfuric acid plant at the Farmland Industries' Green Bay Complex in Polk County. A check in the amount of \$5000.00, made payable to the Florida Department of Environmental Regulation, is also enclosed.

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If you have any questions regarding the content of this application, please feel free to contact me.

Sincerely,

KOGLER & ASSOCIATES

Richard B. Tedder
 Richard B. Tedder, P.E.

RBT:mab

cc: Mr. Ed Ferking, Farmland Industries, Inc.
 Mr. Gene Meier, Farmland Industries, Inc.

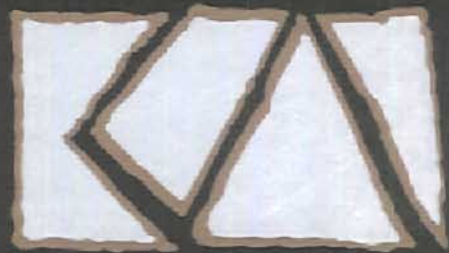
1031

AN APPLICATION FOR A PSD
CONSTRUCTION PERMIT REVIEW

PREPARED FOR:

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

OCTOBER 20, 1989



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

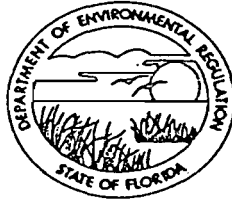
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ■ FAX 377-7158

#5000 pd.
10-23-89
Receipt # 117669

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED



AC 53-171751
PSD-FL-143

OCT 23 1989

DER-BAQM

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Double Absorption Sulfuric Acid Plant [X] New¹ [] Existing¹

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Sulfuric Acid Plant No. 5

SOURCE LOCATION: Street State Road 640 West City Bartow

UTM: East 17-409.5 km North 3079.5 km

Latitude 27 ° 50 ' 37 "N Longitude 81 ° 56 ' 05 "W

APPLICANT NAME AND TITLE: C. M. Farris, General Manager, Phosphate Fertilizer Manufacture

APPLICANT ADDRESS: P.O. Box 960, Bartow, Florida 33830

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Farmland Industries, Inc.

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

*Attach letter of authorization

Signed: C. M. Farris
C. M. Farris, General Manager
Name and Title (Please Type)

Date: 10/10/89 Telephone No. (813) 533-1141

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

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

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

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

Signed Richard B. Tedder

Richard B. Tedder, P.E.

Name (Please Type)

Koogler & Associates, Environmental Services

Company Name (Please Type)

4014 N.W. 13th Street, Gainesville, Florida 32609

Mailing Address (Please Type)



Florida Registration No. 38846 Date: 10-20-89 Telephone No. (904) 377-5822

SECTION II: GENERAL PROJECT INFORMATION

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

See Section 1.3 of attached report. All plants will operate in full compliance with applicable regulations.

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

Start of Construction January 1, 1990 Completion of Construction January 1, 1991

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

Absorbing towers for SO2 emissions are considered part of the production process rather than pollution control devices. Acid mist is controlled by Monsanto Enviro-Chem high efficiency mist eliminators which cost \$93,951 including material, labor and engineering costs.

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

See page 2a.

EXISTING PERMITS FOR
FARMLAND INDUSTRIES, INC.
SULFURIC ACID PLANTS AND
GREEN SUPERPHOSPHORIC ACID PLANT

Plant	Permit No.	Issue Date	Expiration Date
No. 1	A053-99016	3/08/85	9/30/90
No. 2*	A053-99018	3/08/85	Terminated
No. 3	A053-138909	10/16/87	10/12/92
No. 4	A053-138910	10/16/87	10/12/92
GSPA	A053-157886	2/27/89	2/13/94

*Sulfuric Acid Plant No. 2 was permanently shutdown on March 29, 1985.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 521 ;
if power plant, hrs/yr _____ ; if seasonal, describe: _____

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

1. Is this source in a non-attainment area for a particular pollutant? NO
a. If yes, has "offset" been applied? NA
b. If yes, has "Lowest Achievable Emission Rate" been applied? NA
c. If yes, list non-attainment pollutants. NA

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

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

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

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

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

a. If yes, for what pollutants? NA

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

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

(1) Additional information is supplied in the attached report.

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Sulfur	Ash	0.005	54660	Burner of Figure 3-1 (See attached report)

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

1. Total Process Input Rate (lbs/hr): 54660 as sulfur

2. Product Weight (lbs/hr): 169200 as 98.5% H₂SO₄

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

Name of Contaminant	Emission ¹		Allowed Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/xx hr	T/yr	
O ₂	333.3	1460	17-2.600(2)(b)	333.3	2500	10950	*
NO _x	9.9	43.4	17-2.630	9.9	9.9	43.4	*
acid Mist	12.5	54.8	17-2.600(2)(b)	12.5	125	548	*
VE	10%	-	"	10%	-	-	*

*Stack of Figure 3-1. (See attached report).
¹See Section V, Item 2.

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

²Calculated from operating rate and applicable standard.

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

⁴Potential SO₂ emissions are based on a 97.7 % absorption efficiency for single absorption plant and acid mist emissions are based on a 90 % overall mist eliminator efficiency.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Dual Absorption Towers	SO ₂	99.7%	NA	Design & Test
High Efficiency Mist Eliminators	Acid Mist	95-98%	1 - 3 microns	Design & Test
	Acid Mist	85-95%	0.75 - 1 microns	Design & Test
	Acid Mist	70-85%	0.5 - 0.75 microns	Design & Test

E. Fuels NOT APPLICABLE

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

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

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

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

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

Annual Average NA Maximum _____

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

None

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

Stack Height: 150 ft. Stack Diameter: 8 ft.
 Gas Flow Rate: 95519 ACFM 78803 @ 68°F DSCFM Gas Exit Temperature: 180 °F.
 Water Vapor Content: 0 % Velocity: 31.7 FPS

SECTION IV: INCINERATOR INFORMATION
 NOT APPLICABLE

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

Description of Waste _____

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

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

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

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

Type of pollution control device: Cyclone Wet Scrubber Afterburner
 Other (specify) _____

Brief description of operating characteristics of control devices: _____

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

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
(SEE SECTION IIIB)
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
(SEE ATTACHED REPORT)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
(SEE ATTACHED REPORT)
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) (SEE ATTACHED REPORT)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). (SEE SECTION IIID AND ATTACHED REPORT)
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. (SEE FIGURE 3-1 IN ATTACHED REPORT)
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
(SEE FIGURES 2-1 AND 2-2 IN ATTACHED REPORT)
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
(SEE FIGURES 3-1 AND 3-2 IN ATTACHED REPORT)

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

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

SEE ATTACHED REPORT

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

Yes No

Contaminant

Rate or Concentration

_____	_____
_____	_____
_____	_____

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

Yes No

Contaminant

Rate or Concentration

_____	_____
_____	_____
_____	_____

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

Contaminant

Rate or Concentration

_____	_____
_____	_____
_____	_____

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

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

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height:

ft.

b. Diameter:

ft.

c. Flow Rate:

ACFM

d. Temperature:

°F.

e. Velocity:

FPS

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

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:¹

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

1 Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant	Rate or Concentration
_____	_____
_____	_____
_____	_____

(8) Process Rate:¹

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant	Rate or Concentration
_____	_____
_____	_____
_____	_____

(8) Process Rate:¹

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION
SEE ATTACHED REPORT

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ () SO₂* _____ Wind spd/dir

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

Other data recorded _____

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? Yes No
- b. Was instrumentation calibrated in accordance with Department procedures?
 Yes No Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____ / _____ / _____ to _____ / _____ / _____
month day year month day year
2. Surface data obtained from (location) _____
3. Upper air (mixing height) data obtained from (location) _____
4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

1. _____ Modified? If yes, attach description.
2. _____ Modified? If yes, attach description.
3. _____ Modified? If yes, attach description.
4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

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

E. Emission Data Used in Modeling

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

F. Attach all other information supportive to the PSD review.

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

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

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

PREPARED FOR:

FARMLAND INDUSTRIES, INC.
POLK COUNTY
BARTOW, FLORIDA

OCTOBER 20, 1989

PREPARED BY:

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

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1.0 SYNOPSIS OF APPLICATION

1.1 Applicant

Farmland Industries, Inc.
Green Bay Complex
State Road 640 West
P.O. Box 960
Bartow, Florida 33830

1.2 Facility Location

Farmland Industries, Inc., Green Bay Complex, operates a phosphate chemical fertilizer manufacturing facility approximately six miles southwest of Bartow, Florida, on State Road 640 in Polk County. The complex occupies approximately 2400 acres and the UTM coordinates are Zone 17, 409.5 km east and 3079.5 km north.

1.3 Project Description

Farmland Industries, Inc. is proposing to construct a Monsanto Enviro-Chem double absorption sulfuric acid plant and a cogeneration facility which will use export steam from the new sulfuric acid plant to generate electrical power. The new sulfuric acid plant (Plant No. 5) will have a rated capacity of 2000 short tons per day of 100 percent H_2SO_4 . The cogeneration facility will be rated at 38 megawatts of electrical power.

Farmland has four existing sulfuric acid plants on-site. Plants No. 1 and No. 2 are single absorption plants with ammonia scrubbers. Each has a rated capacity of 800 short tons per day of 100 percent H_2SO_4 . Plant No. 2 was permanently shutdown on March 29, 1985. Plant No. 1 will be permanently shutdown when Plant No. 5 is operational. Plants No. 3 and No. 4 are double absorption plants each having a rated capacity of 1600 short tons per day of 100 percent H_2SO_4 . Both plants will continue to operate when Plant No. 5 is operational. The proposed changes will result in a total increase of sulfuric acid capacity from 4800 tons per day to 5200 tons per day.

While not part of this proposed project, a green superphosphoric acid (GSPA) plant permitted in November 1987 is addressed in this application as nitrogen oxides emissions from the plant represent a contemporaneous emission increase. This emission increase is addressed in conjunction with emission increases and decreases associated with the sulfuric acid plants.

The requested emission changes, coupled with contemporaneous emission increases from the GSPA plant, will result in a decrease in the hourly emission rate of sulfur dioxide and an increase in hourly emissions of nitrogen dioxides and acid mist. The total annual emissions of sulfur dioxide, acid mist and nitrogen dioxides are all expected to increase significantly.

Farmland is submitting the material herein to support an application to the Florida Department of Environmental Regulation for constructing a new sulfuric acid plant. This report includes a description of the existing facility, a description of the proposed new sulfuric acid plant, a review of Best Available Control Technology, an air quality review and an evaluation of the impact of the proposed modifications on soils, vegetation and visibility.

2.0 DESCRIPTION OF EXISTING FACILITY

Farmland Industries, Inc. Green Bay Complex operates a phosphate chemical fertilizer manufacturing facility approximately six miles southwest of Bartow, Florida, on State Road 640 in Polk County (See Figures 2-1 and 2-2). The complex occupies approximately 2400 acres and the UTM coordinates are Zone 17, 409.5 km east and 3079.5 km north.

The existing fertilizer complex consists of four sulfuric acid plants, two phosphoric acid plants, two ammonium phosphate plants producing monoammonium and diammonium phosphates (MAP and DAP), one superphosphoric acid plant, one green superphosphoric acid plant, auxiliary steam boilers and storage and shipping facilities for phosphate rock and the fertilizer products. The plot plan of Figure 2-3 shows the location of the existing plants and the proposed new sulfuric acid plant. The proposed new sulfuric acid plant with cogeneration will result in a net increase in sulfuric acid production. This production rate increase will be used to replace current sulfuric acid purchases and will not affect the operation of the other plants. The Farmland complex has an overall production capacity of approximately 600,000 tons per year of P_2O_5 .

2.1 Sulfuric Acid Plants

There are four existing sulfuric acid plants at the Farmland Green Bay complex. Plants No. 1 and No. 2 were permitted in 1965 and are rated at 800 tons per day of 100 percent H_2SO_4 each. The plants are single

absorption with emissions controlled by ammonia scrubbers. The sulfur dioxide and sulfuric acid mist emission limits for these plants are established by Rule 17-2.600(2)(a)2, FAC. The emission limits are:

Sulfur Dioxide	10 pounds per ton of 100 percent acid
Acid Mist	0.3 pounds per ton of 100 percent acid
Visible Emissions	10 percent opacity

Plant No. 2 was permanently shutdown on March 29, 1985. Plant No. 1 will be shutdown after the new sulfuric acid plant is operational.

Plants No. 3 and No. 4 were permitted in 1972 and expanded in 1982. These plants are rated at 1600 tons per day of 100 percent H_2SO_4 each and are both double absorption plants with the acid mist controlled by high efficiency mist eliminators. These plants are subject to Federal New Source Performance Standards as set forth in 40 CFR 60, Subpart H. The emission limiting standards for these plants are:

Sulfur Dioxide	4 pounds per ton of 100 percent acid
Acid Mist	0.15 pounds per ton of 100 percent acid
Visible Emissions	10 percent opacity.

The State of Florida has identical emission limiting standards for new sulfuric acid plants as set forth in Rule 17-2.600(2)(b), FAC. None of the proposed changes will affect the existing operations of the No. 3 and No. 4 sulfuric acid plants. They will continue to operate at their current rated capacities.

The actual emission rates of sulfur dioxide and acid mist from Plants No. 1 and No. 2 were determined from a review of emission measurements and production data from the past five years. The maximum measured sulfur dioxide emission rate was 6.50 pounds per ton of 100 percent H₂SO₄ produced and the maximum measured acid mist emission rate was 0.07 pounds per ton of 100 percent H₂SO₄ produced. The maximum annual acid production from the two plants (used to calculate annual emissions) was 430,516 tons per year (see Appendix 3-B for documentation of these data). These values will be used in evaluating the requested increases (or decreases) in emissions.

Nitrogen oxide emissions from the sulfuric acid plants were estimated from an emission factor of 2.1×10^{-6} pounds of nitrogen oxides per cubic foot of stack gas discharged from a sulfuric acid plant and typical stack gas flow rates for each of the plants.

2.2 Phosphoric Acid Plants

Farmland operates two phosphoric acid plants. One plant is an isothermal reactor design which is permitted at a maximum rate of 1850 tons per day of P₂O₅. The other plant is a Prayon phosphoric acid plant design and

consists of two trains. The two trains produce approximately 1056 tons per day of P_2O_5 . The production rate of these plants will not be affected by the production rate increase requested for the sulfuric acid plants.

2.3 Ammonium Phosphate Plants

Farmland operates two granular fertilizer plants. The diammonium phosphate plant (DAP) is permitted to operate at 82 tons per hour and produces approximately 600,000 tons per year of DAP with a nominal NPK grade of 18-46-0. The monoammonium phosphate (MAP) plant is permitted to operate at 60 tons per hour and produces approximately 400,000 tons per year of MAP with a nominal NPK grade of 11-52-0. The MAP plant is also permitted to produce granular triple superphosphate (GTSP) and DAP at rates of 33.2 tons per hour and 50 tons per hour respectively. The change in sulfuric acid production will not affect these plants.

2.4 Superphosphoric Acid Plants

Approximately 100,000 tons per year of P_2O_5 (as 52 percent phosphoric acid) are evaporated to a concentration of 68 percent P_2O_5 in Farmland's superphosphoric acid (SPA) plant. SPA at a maximum rate of 27 tons per hour is further processed at Farmland's new green superphosphoric acid plant (GSPA). The production rate of these plants will not be affected by the proposed increase in sulfuric acid production.

The GSPA plant emits nitrogen oxides and fluorine. Fluorine emissions are not a factor in sulfuric acid production. The GSPA plant has permitted maximum nitrogen oxides emission rates of 29.1 pound per hour and 64.8 tons per year. The permitted annual value includes an offset from the permanent shutdown of sulfuric acid plant No. 2. Emissions from the GSPA plant will be included in the nitrogen oxide assessment of emissions from the sulfuric acid plants.

2.5 Other Operations

The Farmland Green Bay complex also includes an auxiliary boiler to provide steam when there is an insufficient amount of export steam available from the sulfuric acid plants and includes storage and shipping facilities for phosphate rock and fertilizer products. None of these operations will be affected by the production rate increase requested for the sulfuric acid plants.

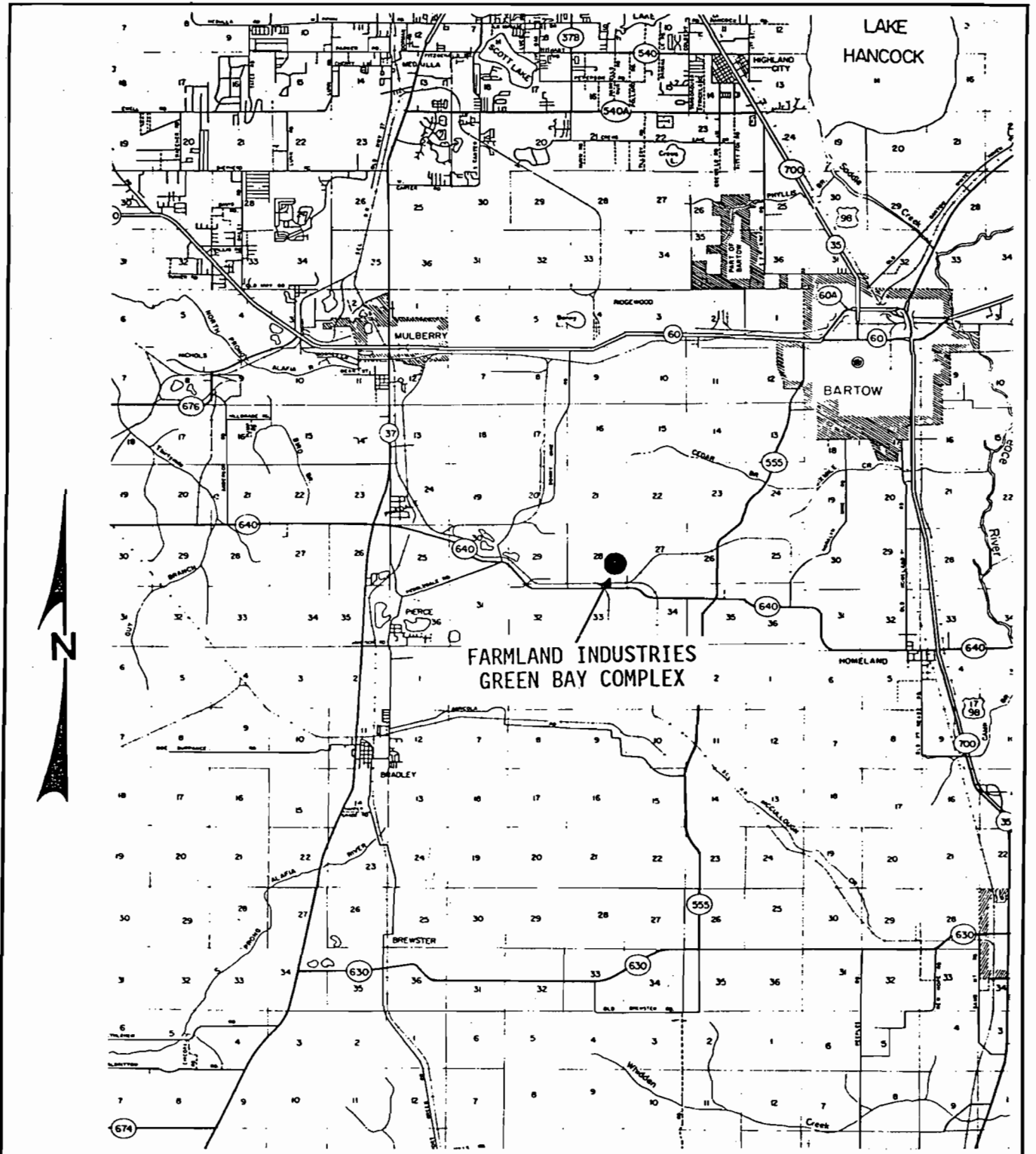


FIGURE 2-1
 AREA LOCATION MAP
 FARMLAND INDUSTRIES, INC.



BRADLEY JUNCTION, FLA.

N2745-W8152.5/7.5

1949
PHOTOREVISED 1972
AMS 4639 IV SW-SERIES V847

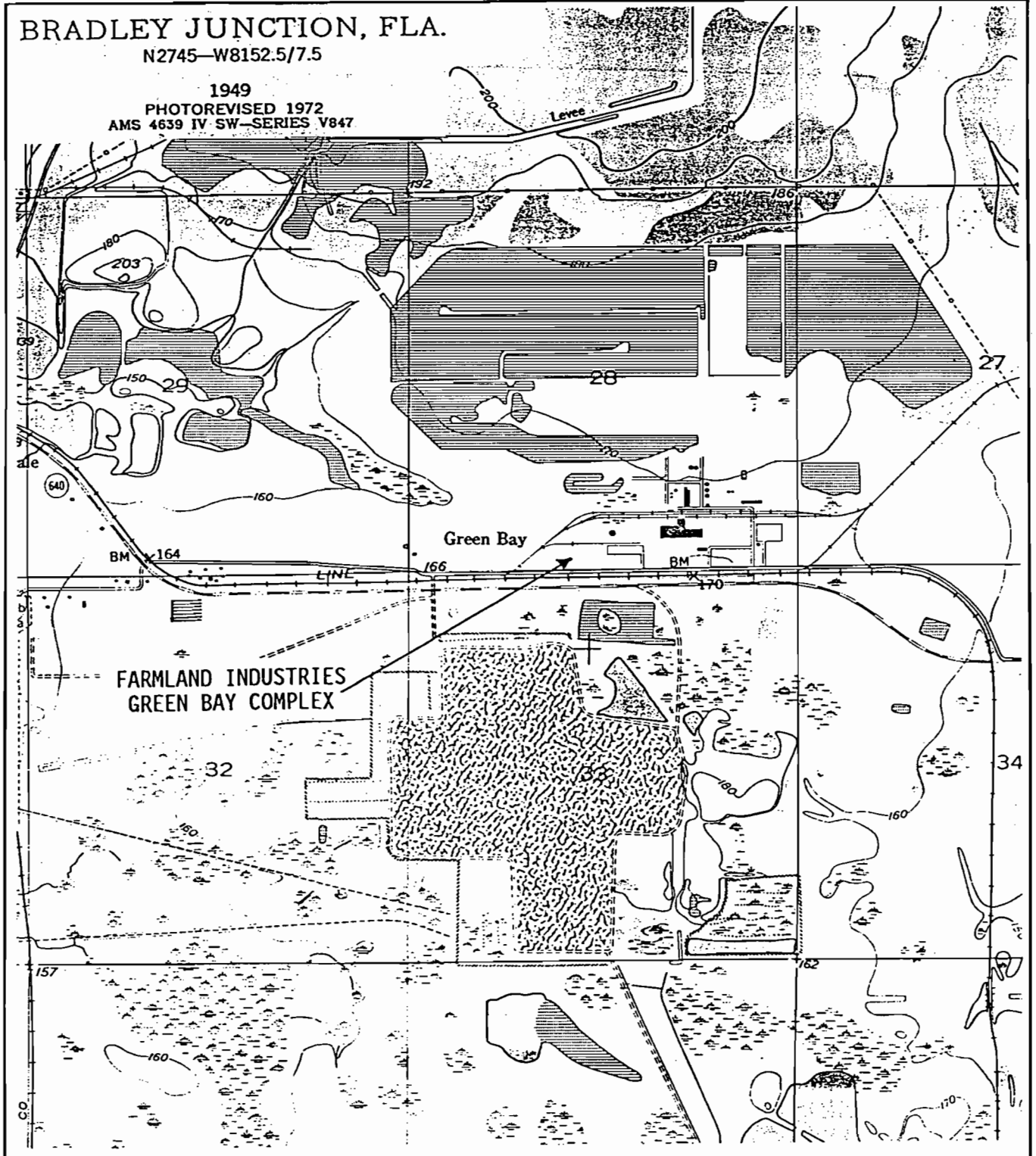
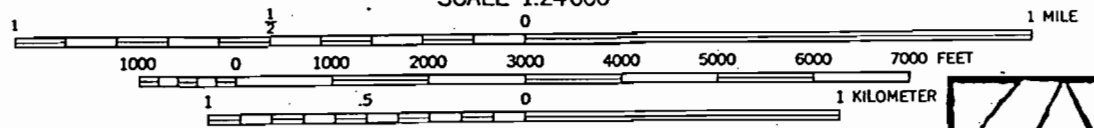
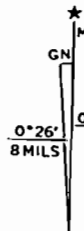


FIGURE 2-2

SITE LOCATION MAP
FARMLAND INDUSTRIES, INC.

SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL



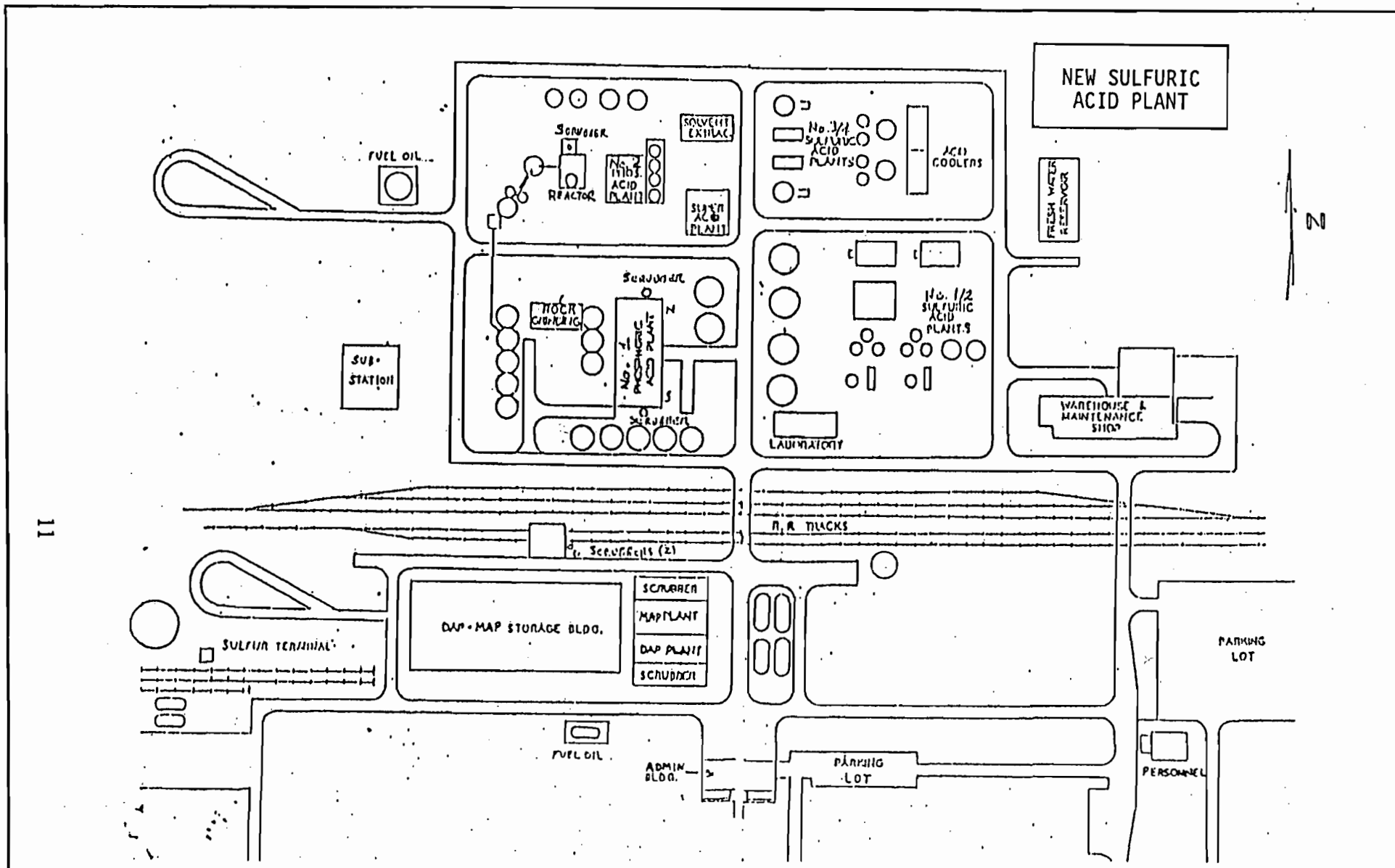


FIGURE 2-3
 PLOT PLAN
 FARMLAND INDUSTRIES, INC.



3.0 PROPOSED PROJECT

Farmland is proposing to construct a double absorption sulfuric acid plant (Plant No. 5) rated at 2000 tons per day of 100 percent H_2SO_4 . This plant will also have cogeneration capabilities to generate 38 megawatts of electrical power with excess steam from the new sulfuric acid plant. A typical process flow diagram for double absorption sulfuric acid plants is presented in Figure 3-1. Figure 3-2 shows the major equipment locations for the new plant.

When the new plant is operational, sulfuric acid plant No. 1, rated at 800 tons per day of 100 percent H_2SO_4 , will be permanently shutdown. The emission limits for Plant No. 5 will be the Federal New Source Performance Standards as set forth in Rule 17-2.600(2)(b), FAC, i.e., the sulfur dioxide and acid mist emission limits will be 4.0 pounds per ton of 100 percent sulfuric acid and 0.15 pounds per ton of 100 percent sulfuric acid respectively.

Table 3-1 summarizes the permitted, actual and proposed conditions at which sulfuric acid plants No. 1, No. 2, and No. 5 presently operate and will operate. These are the only sulfuric acid plants at Farmland which will experience changes. In Table 3-2, the annual air pollutant emission rate changes, based on present, actual and proposed operating conditions, are summarized for the three affected sulfuric acid plants and for the green superphosphoric acid (GSPA) plant. The GSPA plant contributes to

the nitrogen oxides emissions from the Farmland complex. The emission reductions from the shutdown of sulfuric acid plant No. 2 were taken into consideration in establishing the emission limits for the GSPA plant.

The information tabulated in Tables 3-1 and 3-2 for the sulfuric acid plants shows there will be a net reduction in the hourly emission rate of sulfur dioxide but an increase in hourly acid mist emission rate. The data also show that there will be a significant increase in the annual sulfur dioxide and acid mist emissions. Nitrogen oxides data indicate a net reduction in both hourly and annual emissions from the sulfuric acid plants; but a significant increase in both hourly and annual emissions when the green superphosphoric acid plant is included.

There are no other air pollution sources associated with the requested changes at Farmland Industries, Inc. that would have to be considered in this permit application.

3.1 Rule Applicability

The existing sulfuric acid plants No. 1 and No. 2 are subject to the limits specified for existing plants in Rule 17-2.600(2)(a)2, FAC. The plants cease to be regulated, however, when they are permanently shutdown and the permits are surrendered. Sulfuric acid plant No. 2 was permanently shutdown on March 29, 1985.

Sulfuric acid plant No. 5 will be classified as a new major source subject to both State and Federal regulations as set forth in Rule 17-2.600(2)(b). The proposed increases in sulfur dioxide, acid mist and nitrogen oxides emissions are all significant as defined by Rule 17-2.500(2)(e)2, FAC. The construction of the new acid plant will therefore be subject to the full review required of a PSD construction permit application. This will include a determination of Best Available Control technology, an air quality review, and an evaluation of impacts on soils, vegetation and visibility.

The following sections of the application address the changes requested for constructing the new sulfuric acid plant and include all information required for the PSD review. The air quality review will look at impacts of sulfur dioxide emissions, acid mist emissions and nitrogen oxides emissions. The review will focus on the changes to be expected from operating the new sulfuric acid plant and ceasing operations of sulfuric acid plants No. 1 and No. 2. The evaluation of nitrogen oxides on air quality will also include emissions from the GSPA plant.

TABLE 3-1

EXISTING PRODUCTION RATES AND
EMISSION RATES AFFECTED BY PROPOSED
SULFURIC ACID PLANT CHANGES (1)

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

	Sulfuric Acid Plant		
	1	2	5
Date Permitted	1965	1965	NA
<u>Current Permit Conditions</u>			
Rate (TPD)	800	800	0
SO ₂ (lb/ton)	10.0	10.0	0
(lb/hr)	330	330	0
(TPY)	1460	1460	0
Mist (lb/ton)	0.30	0.30	0
(lb/hr)	9.9	9.9	0
(TPY)	43.8	43.8	0
Operating Factor	1.0	1.0	0
<u>Actual Conditions</u>			
Rate (TPD)	800	800	0
SO ₂ (lb/ton)	6.5	6.5	0
(lb/hr)	216.7	216.7	0
(TPY)	700	700	0
Mist (lb/ton)	0.07	0.07	0
(lb/hr)	2.3	2.3	0
(TPY)	7.5	7.5	0
Operating Factor	0.737	0.737	0
<u>Proposed Conditions</u>			
Rate (TPD)	0	0	2000
SO ₂ (lb/ton)	0	0	4.0
(lb/hr)	0	0	333.3
(TPY)	0	0	1460
Mist (lb/ton)	0	0	0.15
(lb/hr)	0	0	12.5
(TPY)	0	0	54.8
Operating Factor	0	0	1.0

(1) See Appendix 3-A for calculations of emission rates.

TABLE 3-2

ANNUAL AIR POLLUTANT EMISSION CHANGES RESULTING
FROM THE PROPOSED SULFURIC ACID PLANT CHANGES(1)

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

Pollutant Tons/year	Sulfuric Acid Plants			GSPA
	1	2	5	
S02				
Present (actual)	700	700	0	0
Proposed	0	0	1460	0
Change	(700)	(700)	1460	0
Subtotal			60	
Significant Increase (2)			40	
MIST				
Present (actual)	7.5	7.5	0	0
Proposed	0	0	54.8	0
Change	(7.5)	(7.5)	54.8	0
Subtotal			39.8	
Significant Increase (2)			7	
NOX				
Present (actual)	25.2	25.2	0	0
New	0	0	0	64.8
Proposed	0	0	43.4	NA
Change	(25.2)	(25.2)	43.4	64.8
Subtotal			57.8	
Significant Increase (2)			40	

(1) Based on differences between present, actual and proposed operating conditions. See Appendix 3-A for calculation of emission rates.

(2) Defined in 17-2.500(2)(e)2, FAC.

NOTE: Rate changes in () represent decreases in annual emissions.

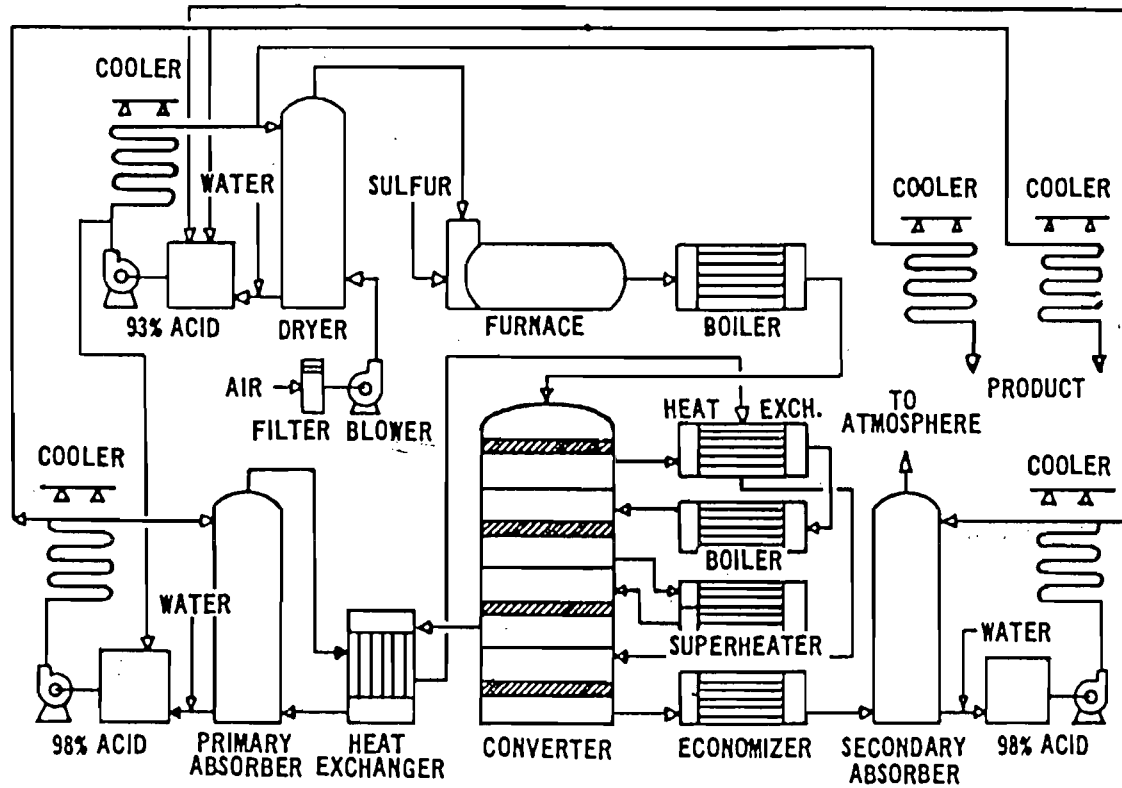
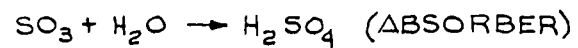
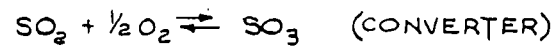
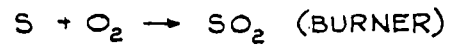
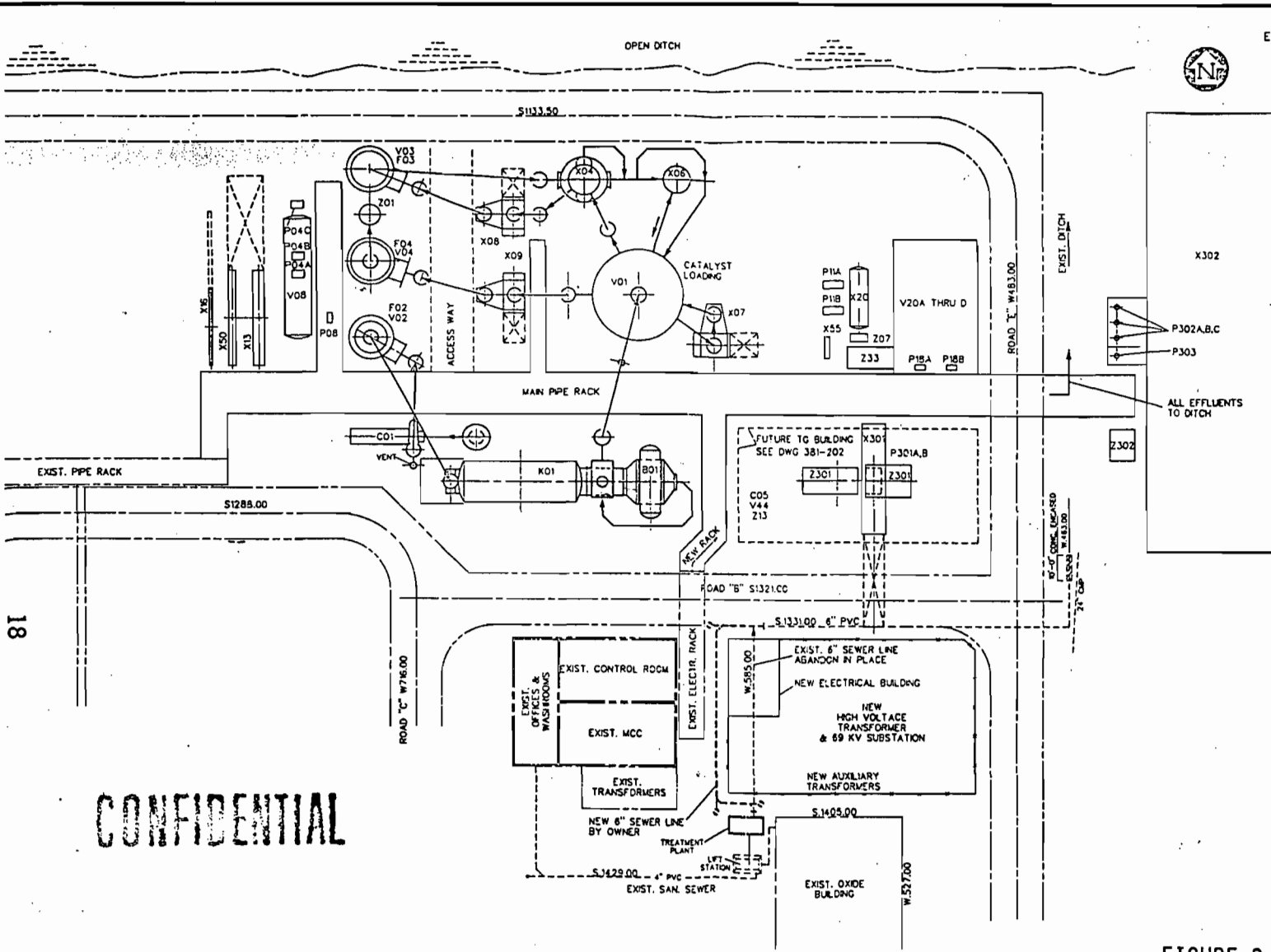


FIGURE 3-1
TYPICAL SULFURIC ACID
DOUBLE ABSORPTION PLANT
PROCESS FLOW DIAGRAM



CONFIDENTIAL



EQUIPMENT LIST (MAJOR EQUIPMENT ONLY)

NO.	NAME
B01	WASTE HEAT BOILER
C01	MAIN COMPRESSOR
C05	INSTRUMENT AIR COMPRESSOR
F02	DRYING TOWER MIST ELIM.
F03	INTERPASS TOWER MIST ELIM.
F04	FINAL TOWER MIST ELIMINATOR
K01	SULFUR BURNER
M P01A,B	SULFUR FEED PUMPS
P04A,B,C	ACID CIRCULATION PUMPS
P08	ACID COOLER DRAIN PUMP
P11A,B	BOILER FEED WATER PUMPS
P18A,B	TREATED WATER PUMPS
M P26A,B	PHOS ACID CONDENSATE PUMPS
P301A,B	TG CONDENSATE PUMPS
P302A,B,C	TG COOLING WATER PUMPS
P303	PLANT COOLING WATER PUMP
V01	CONVERTER
V02	DRYING TOWER
V03	INTERPASS TOWER
V04	FINAL TOWER
V08	ACID PUMP TANK
V20A THRU D	TREATED WATER ST. TANKS
V44	INSTRUMENT AIR RECEIVER
M V50	PHOS ACID COND. SURGE TANK
X04	COLD INTERPASS HEAT EXCH.
X06	HOT INTERPASS HEAT EXCH.
X07	SUPER-HEATER 1B
X08	ECONOMIZER 3B
X09	SUPER-HEATER 4A/ ECONOMIZER 4A/4C
X13	COMMON ACID COOLER
X16	98% PRODUCT COOLER
X20	DEAERATOR
X50	BOILER FEED WTR PRE-HEATER
X55	PHOS ACID COND. COOLER
X301	STEAM CONDENSER
X302	COOLING TOWER
Z01	PLANT STACK
Z07	BOILER CHEM. FEED SYSTEM
Z13	INSTRUMENT AIR DRYER
Z17	INLET AIR SILENCER
Z33	CONDENSATE POLISHER
Z301	TURBINE GENERATOR
Z302	COOLING TWR. C. F. SYSTEM

LEGEND

- NEW ITEMS
- EXISTING ITEMS

**FIGURE 3-2
PLANT LAYOUT FOR NEW
2000 TPD SULFURIC ACID PLANT**

SOURCE: MONSANTO ENVIRO-CHEM SYSTEMS, INC.



APPENDIX 3-A
EMISSION RATE CALCULATIONS

EMISSION RATE CALCULATIONS

SULFURIC ACID PLANTS NO. 1 AND NO. 2

PERMITTED: 800 tons per day 100% acid
SO₂ - 10 lb/ton, 330 lb/hr
Mist - 0.30 lb/ton, 9.9 lb/hr
Operating Factor - 1.0
(Based on Permits No. A053-99016 and A053-99018)

ACTUAL: 800 tons per day 100% acid
SO₂ - 6.50 lb/ton
Mist - 0.07 lb/ton
Operating Factor - 0.737, Annual, based on historic
production data documented in Appendix 3-B

PROPOSED: Both plants to be permanently shutdown

NOX: 111,547 dscf per ton of 100% acid (See Appendix 3-B)
2.1 x 10⁽⁻⁶⁾ lb NOX per dscf (See IMC-New Wales PSD
application for third train expansion)

EMISSION RATES (each plant)

Actual

SO₂: Hourly = 6.50 lb/ton x 800/24 ton/hr
= 216.7 lb/hr
Annual = 216.7 lb/hr x 8760 hr/yr x 1/2000 ton/lb
x 0.737
= 700 TPY

MIST: Hourly = 0.07 lb/ton x 800/24 ton/hr
= 2.3 lb/hr
Annual = 2.3 lb/hr x 8760 hr/yr x 1/2000 ton/lb
x 0.737
= 7.5 TPY

NOX Hourly = 800 ton/day x 111547 dscf/ton
x 2.1 x 10⁽⁻⁶⁾ lb/dscf x 1/24 day/hr
= 7.8 lb/hr
Annual = 7.8 lb/hr x 8760 hr/yr x 1/2000 ton/lb
x 0.737
= 25.2 TPY (5.75 lb/hr, equivalent annual average
for modeling purposes)

NOTE: No other air pollutants are discharged from Sulfuric Acid Plants No. 1 and No. 2.

EMISSION RATE CALCULATIONS

SULFURIC ACID PLANT NO. 5

PROPOSED: 2000 tons per day 100% acid
SO₂ - 4.0 lb/ton
Mist - 0.15 lb/ton
Operating Factor - 1.0

NOX: 56739 dscf per ton of 100% acid (Based on Monsanto Enviro-
Chem Systems, Inc. design)
2.1 x 10⁽⁻⁶⁾ lb NOX per dscf (See IMC-New Wales PSD
application for third train expansion)

EMISSION RATES

Proposed

SO₂: Hourly = 2000 ton/day x 4.0 lb/ton x 1/24 day/hr
= 333.3 lb/hr
Annual = 333.3 lb/hr x 8760 hr/yr x 1/2000 ton/lb x 1.0
= 1460 TPY

MIST: Hourly = 2000 ton/day x 0.15 lb/ton x 1/24 day/hr
= 12.5 lb/hr
Annual = 12.5 lb/hr x 8760 hr/yr x 1/2000 ton/lb
x 1.0
= 54.8 TPY

NOX Hourly = 2000 ton/day x 56739 dscf/ton
x 2.1 x 10⁽⁻⁶⁾ lb/dscf x 1/24 day/hr
= 9.9 lb/hr
Annual = 9.9 lb/hr x 8760 hr/yr x 1/2000 ton/lb
x 1.0
= 43.4 TPY

NOTE: No other air pollutants are discharged from Plant No. 5.

EMISSION RATE CALCULATIONS

GREEN SUPERPHOSPHORIC ACID PLANT

PERMITTED: 27 tons per hour of 68% P2O5 SPA Feed
NOX - 29.1 lb/hr, 64.8 TPY
F - 0.2 lb/hr, 0.4 TPY
Operating Factor - 4448 hr/yr
(Based on Permit No. A053-157886)
Emission Factor - 1.5 lb/ton SPA

EMISSION RATES

Short-Term

Maximum Hourly = 29.1 lb/hr

Long-Term

Annual = 64.8 TPY
x 1/(8760 hr/yr/2000 lb/ton)
= 14.8 lb/hr *

* Used for long-term modeling

- NOTES: (1) Fluorine emissions are not a factor in the operation of sulfuric acid plants and need not be considered.
- (2) The permitted emission rates include an offset from the permanent shutdown of Sulfuric Acid Plant No. 2.

APPENDIX 3-B

DOCUMENTATION OF ACTUAL EMISSION RATES
AND OPERATING FACTORS FOR
SULFURIC ACID PLANTS NO. 1 AND NO. 2

SUMMARY OF ACTUAL EMISSIONS
 BASED ON TEST DATA FROM
 SULFURIC ACID PLANTS NO. 1 AND NO.2

Plant	Test Date	Rate (TPH)	Stack Gas Flow Rate (DSCF/Ton)	S02 (lb/ton)	Acid Mist lb/ton
1	2/01/84	37.8	102,557	4.85	0.14
2	5/10/84	31.9	108,925	6.01	0.06
1	10/30/84	30.9	116,508	7.15	0.04
2	11/01/84	26.4	<u>118,198</u>	<u>7.98</u>	<u>0.07</u>
AVERAGE			111,547	6.50	0.07

SUMMARY OF ANNUAL OPERATING FACTORS FOR
SULFURIC ACID PLANTS NO. 1 AND NO. 2
BASED ON 1984 DATA

(Developed for and the basis of Permit AC53-138041)

Plant	Hours of Operation (hr/yr)	Acid Production (TPY)
1	8,467	236,650
2	8,372	193,866
TOTAL	16,839	430,516

Annual Operating Factor
Based on Operating Time = $(16839 \text{ hr/yr}) / (2 \text{ plants} \times 8760 \text{ hr/yr})$
= 0.961

Annual Operating Factor
Based on Production = $(430.516 \text{ TPY}) / (2 \text{ Plants} \times 800 \text{ TPD} \times 365 \text{ D/Y})$
= 0.737

SUNMARY SHEET

PLANT: SAD
 STACK: #2 STACK
 TEST DATE: NOV. 1, 1984

PERMIT # A053-67055

	RUN NO. 1	RUN NO. 2	RUN NO. 3
	-----	-----	-----
STACK DIAMETER (FT)	4.500	4.500	4.500
NOZZLE DIAMETER (FT)	0.015	0.015	0.015
SAMPLING TIME (MIN)	80.000	80.000	80.000
STACK TEMP (R)	544.000	544.000	544.000
STACK MOISTURE (%)	4.320	4.490	4.421
VOLUME SAMPLED (ACF)	48.779	47.026	48.566
VOLUME SANPLED (SCF)	48.719	46.790	47.555
STACK VELOCITY (F/S)	59.424	56.757	58.864
VOLUMETRIC FLOWRATE (ACFM)	56705.879	54160.977	56171.578
VOLUMETRIC FLOWRATE (SCFM)	53015.695	50546.383	52460.699
ACID MIST (MG. COLL.)	3.640	1.860	3.510
SULF. DIOXIDE (MG. COLL.)	1371.100	608.400	1536.000
ACID MIST (LBS/HR)	0.524	0.266	0.512
SULF. DIOXIDE (LBS/HR)	197.394	86.953	224.174
STACK GAS MOL. WEIGHT	28.525	28.506	28.514
ISOKINETIC VARIATION %	96.176	96.880	94.871
PRODUCTION RATE (TPH, P205)	26.400	26.400	26.400
EMISSIONS 1 (LB/HR/TON)	0.020	0.010	0.019
EMISSIONS 2 (LB/HR/TON)	7.477	3.294	8.491

SUMMARY SHEET

PLANT: SAD
 STACK: #1 STACK
 TEST DATE: OCT.30,1984

PERMIT # A053-67053

	<u>RUN NO. 1</u>	<u>RUN NO. 2</u>	<u>RUN NO. 3</u>
STACK DIAMETER (FT)	4.500	4.500	4.500
NOZZLE DIAMETER (FT)	0.015	0.015	0.015
SAMPLING TIME (MIN)	80.000	64.000	64.000
STACK TEMP (R)	550.000	550.000	550.000
STACK MOISTURE (%)	4.346	4.161	4.268
VOLUME SAMPLED (ACF)	54.755	42.911	48.603
VOLUME SAMPLED (SCF)	53.906	42.311	47.536
STACK VELOCITY (F/S)	66.097	64.925	72.984
VOLUMETRIC FLOWRATE (ACFM)	63074.133	61955.074	69645.375
VOLUMETRIC FLOWRATE (SCFM)	58268.660	57345.703	64391.410
ACID MIST (MG. COLL.)	7.620	6.820	9.610
SULF. DIOXIDE (MG. COLL.)	1512.700	1198.900	1293.300
ACID MIST (LBS/HR)	1.090	1.223	1.722
SULF. DIOXIDE (LBS/HR)	216.326	214.975	231.776
STACK GAS MOL. WEIGHT	28.522	28.542	28.530
ISOKINETIC VARIATION %	96.822	96.524	96.576
PRODUCTION RATE (TPH,P205)	30.900	30.900	30.900
EMISSIONS 1 (LB/HR/TON)	0.035	0.040	0.056
EMISSIONS 2 (LB/HR/TON)	7.001	6.957	7.501

SUMMARY SHEET

PLANT: SAD
 STACK: 2
 TEST DATE: MAY 10, 1984

PERMIT # A053-67055

	<u>RUN NO. 1</u>	<u>RUN NO. 2</u>	<u>RUN NO. 3</u>
STACK DIAMETER (FT)	4.500	4.500	4.500
NOZZLE DIAMETER (FT)	0.014	0.014	0.014
SAMPLING TIME (MIN)	96.000	64.000	64.000
STACK TEMP (R)	546.000	546.000	546.000
STACK MOISTURE (%)	6.366	6.472	6.513
VOLUME SAMPLED (ACF)	48.935	40.725	39.218
VOLUME SAMPLED (SCF)	48.286	39.477	39.210
STACK VELOCITY (F/S)	64.015	70.374	66.918
VOLUMETRIC FLOWRATE (ACFM)	61087.180	67154.719	63857.145
VOLUMETRIC FLOWRATE (SCFM)	55298.531	60722.203	57715.063
ACID MIST (MG. COLL.)	11.600	4.800	15.200
SO2 (MG. COLL.)	1325.600	1017.800	857.800
ACID MIST (LBS/HR)	1.758	0.977	2.960
SO2 (LBS/HR)	200.848	207.123	167.048
STACK GAS MOL. WEIGHT	28.300	28.288	28.284
ISOKINETIC VARIATION %	90.434	100.998	105.542
PRODUCTION RATE (TPH, P205)	31.900	31.900	31.900
EMISSIONS 1 (LB/HR/TON)	0.055	0.031	0.093
EMISSIONS 2 (LB/HR/TON)	6.296	6.493	5.237

SUMMARY SHEET

PLANT: SULFURIC
 STACK: 1
 TEST DATE: FEB 1, 1984

PERMIT # A053-67053

	RUN NO. 1 -----	RUN NO. 2 -----	RUN NO. 3 -----
STACK DIAMETER (FT)	4.500	4.500	4.500
NOZZLE DIAMETER (FT)	0.014	0.014	0.014
SAMPLING TIME (MIN)	64.000	48.000	48.000
STACK TEMP (R)	544.000	544.000	544.000
STACK MOISTURE (%)	3.714	4.873	4.830
VOLUME SAMPLED (ACF)	43.451	32.780	33.997
VOLUME SAMPLED (SCF)	43.226	32.550	32.853
STACK VELOCITY (F/S)	71.651	71.926	74.840
VOLUMETRIC FLOWRATE (ACFM)	68373.992	68636.203	71417.289
VOLUMETRIC FLOWRATE (SCFM)	64179.668	63650.500	66259.305
SO2 (MG. COLL.)	911.710	725.510	686.990
ACID MIST (MG. COLL.)	15.650	7.020	40.520
SO2 (LBS/HR)	179.090	187.693	183.308
ACID MIST (LBS/HR)	3.074	1.816	10.812
STACK GAS MOL. WEIGHT	28.591	28.464	28.469
ISOKINETIC VARIATION %	105.288	106.594	103.348
PRODUCTION RATE (TPH,P2O5)	37.850	37.850	37.850
EMISSIONS 1 (LB/HR/TON)	4.732	4.959	4.843
EMISSIONS 2 (LB/HR/TON)	0.081	0.048	0.286

183.364
 / 5.234

4.845

4.0 BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from modification to the major emitting facilities if the modification results in significant increase in the emission rate of regulated pollutants. The significance of an emission rate increase is defined by Rule 17-2.500(2)(e)(2), FAC.

The emission rate increases and decreases resulting from the activities proposed by Farmland have been summarized in Table 3-2. The activities include the construction of a new 2,000 ton per day double absorption sulfuric acid plant, the retirement of two existing 800 ton per day single absorption sulfuric acid plants with ammonia scrubbers and the recent construction (1987) of a green superphosphoric acid plant; the latter being a source of nitrogen oxides. From Table 3-2 it will be noted that sulfuric dioxide and sulfuric acid mist emissions from the new sulfuric acid plant will represent a significant increase over emissions from the two existing 800 ton per day plants. There will also be a significant increase in nitrogen oxides emissions as a result of the emission increases and decreases associated with the sulfuric acid plants and the increase associated with the green superphosphoric acid plant.

Sulfur dioxide and acid mist are present in the tail gas from all contact processed sulfuric acid plants. In a typical plant with the single absorption system, the sulfur dioxide in the tail gas is approximately 30 pounds per ton of acid produced and the acid mist is approximately four pounds per ton of acid produced. The nitrogen oxides that are present in the tail gas are formed in the sulfur burners as a result of the fixation of atmospheric nitrogen. Measurements have indicated that the concentration of nitrogen oxides in the tail gas and sulfuric acid plant is in the range of 18-20 parts per million (volume).

4.1 Emission Standards for Sulfuric Acid Plants

Federal New Source Performance Standards (NSPS) for sulfuric acid plants became effective on August 17, 1971. These standards are codified in 40 CFR 60, Subpart H and require sulfur dioxide emissions to be limited to no more than 4.0 pounds per ton of 100 percent acid produced and require that sulfuric acid mist emissions be limited to no more than 0.15 pounds per ton of 100 percent acid produced. Additionally, the standards limit the opacity of the emissions from new sulfuric acid plants to less than 10 percent. There are no emission standards for nitrogen oxides.

When EPA reviewed the New Source Performance Standards for sulfuric acid plants in 1985 (EPA-450/3-85-012), it was concluded that because of variations in sulfur dioxide emissions as a function of catalyst age, "... the level of SO₂ emissions as specified in the current NSPS (should) not be changed at this time." Regarding the NSPS for sulfuric acid mist,

EPA concluded, "Making the acid mist standard more stringent is not believed to be practical at this time because of the need to provide a margin of safety due to in-plant operating fluctuations, which introduce variable quantities of moisture into the sulfuric acid production line."

A review of BACT/LAER determinations published in the EPA Clearinghouse indicates that no new control alternatives have been applied to sulfuric acid plants since 1985 that would result in a consistent reduction in sulfur dioxide emission below 4.0 pounds per ton of acid nor would result in a consistent reduction of sulfuric acid mist emissions below 0.15 pounds per ton of acid. No control technologies for nitrogen oxides are discussed in either the NSPS review or in BACT/LAER determinations.

4.2 Control Technologies

The control of sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants can be achieved by various processes. The process of choice for sulfur dioxide control has been dual absorption and the process of choice for controlling sulfuric acid mist emission has been one of the various types of fiber mist eliminators. These processes have been selected based on cost, product recovery, the formation of no undesirable by-products and the fact that neither introduces operating processes that are foreign to plant personnel.

EPA published a review of NSPS for sulfuric acid plants in March 1985 (EPA-450/3-85-012). Another review of NSPS by EPA is currently due but probably will not be published before the early 1990's. In the 1985 report, EPA reviewed 46 sulfuric acid plants built between 1971 and 1985. Of these 46 plants, 40 used the dual absorption process for sulfur dioxide control with the remaining six using some type of acid gas scrubbing. All 46 plants used the high efficiency mist eliminators for acid mist control. The control of nitrogen oxides in sulfur acid plants has not been addressed to date because of the low concentration of nitrogen oxides in the tail gases of sulfuric acid plants. The nitrogen oxide concentration in the tail gas stream of a typical sulfuric acid plant is in the range of 20 parts per million. This equates to a mass emission rate of nitrogen oxide of approximately 10 pounds per hour or approximately 0.03 pounds per million Btu. As a point of comparison, NSPS for fossil fuel fired steam generators limit nitrogen oxides emissions to 0.1-0.8 pounds per million Btu heat input, depending upon the type of fuel used.

In the March 1985 review (EPA-450/3-85-012), EPA reviewed the control technologies that had been used to control sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants. The alternatives included the dual absorption process, ammonia scrubbing, sodium sulfite-bisulfite scrubbing, and molecular sieves for sulfur dioxide control and filter type mist eliminators and electrostatic precipitators for sulfuric acid mist control. A review of the EPA BACT/LAER Clearinghouse information indicated that no other control alternatives have been considered for

sulfuric acid plants. No control alternatives were addressed for nitrogen oxides control in either the 1985 EPA NSPS review or in the BACT/LAER Clearinghouse.

4.2.1 Sulfur Dioxide Control

The control alternatives for sulfur dioxide have been summarized based upon information compiled by EPA in the 1985 NSPS review for sulfur acid plants. As stated earlier, EPA is due to review these standards again but will probably not publish the results of their review until sometime in the early 1990's.

4.2.1.1 Dual Absorption Process

The dual absorption process has become the SO₂ control system of choice within the sulfuric acid industry since the promulgation of NSPS in 1971. Of the 46 new sulfuric acid plants constructed between 1971 and 1985, 40 employed this process for sulfur dioxide control. The process offers the following advantages over other SO₂ control technologies:

1. 99.4 percent of the sulfur is converted to sulfuric acid compared with 97.7 percent conversion with a single absorption plant followed by scrubbing;
2. there are no by-products produced;

3. there are no new operating processes that plant personnel must become familiar with;
4. the process permits higher inlet sulfur dioxide concentrations resulting in a reduction in equipment size;
5. there is no reduction in overall plant operating time efficiency; and
6. there is no increase in manpower requirements.

The dual absorption process is capable of reducing sulfur dioxide emission rates to less than 4.0 pounds per ton of acid as required by New Source Performance Standards. The information reviewed by EPA indicates that even lower sulfur dioxide emission levels occur with new catalyst but as the catalyst ages, the conversion efficiency drops and sulfur dioxide emission rates begin to approach the 4.0 pound per ton limit.

4.2.1.2 Sodium Sulfite-Bisulfite Scrubbing

Between 1971 and 1985, two sulfuric acid plants were constructed employing sodium sulfite-bisulfite scrubbing to control sulfur dioxide emissions. One of the plants was subsequently converted to ammonia scrubbing and the second plant has never been used. As a result, sodium sulfite-bisulfite scrubbing is not considered a demonstrated sulfur dioxide control alternative.

4.2.1.3 Ammonia Scrubbing

Ammonia scrubbing uses anhydrous ammonia and water in a scrubbing system to convert sulfur dioxide to ammonium sulfate. Depending upon the market, the ammonium sulfate can be converted to a fertilizer grade product.

Five sulfuric acid plants constructed between 1971 and 1985 use ammonia scrubbing for sulfur dioxide control. The process has proved effective for reducing sulfur dioxide emissions to below 4.0 pounds per ton and also for controlling sulfuric acid mist emissions.

The major disadvantages of the ammonia scrubbing system, when compared with the dual absorption process are:

1. a waste by-product is produced unless there is a market for fertilizer grade ammonium sulfate;
2. the scrubbing system introduces a process that is foreign to sulfuric acid plant operators;
3. the scrubbing system is a high maintenance item and requires additional manpower for operation; and
4. no sulfuric acid plant size reduction benefits are achieved with the scrubbing system.

4.2.1.4 Molecular Sieves

A molecular sieve was installed at one sulfuric acid plant in Florida for sulfur dioxide control. Extensive operating problems were experienced as the molecular sieve absorbed nitrogen oxides as well as sulfur dioxide. The regeneration of these gases resulted in the formation of nitric acid within the sulfuric acid plant. The nitric acid/sulfuric acid mixture resulted in severe corrosion problems which caused the molecular sieve system to be scrapped. As a result, molecular sieves are not considered a viable alternative for sulfur dioxide control in the sulfuric acid industry.

4.2.2 Sulfuric Acid Mist Control

Control alternatives that were reviewed by EPA in the 1985 New Source Performance Standards review are summarized in the following sections.

4.2.2.1 Fiber Mist Eliminators

The 46 new sulfuric acid plants constructed between 1971 and 1985, all used the fiber type mist eliminators for sulfuric acid mist control. Operations demonstrated that these types of mist eliminators can control sulfuric acid mist emissions to less than 0.15 pounds per ton of sulfuric acid.

The mist eliminators are the choice of control for sulfuric acid mist within the sulfuric acid industry because they require very little operation and maintenance attention and because of the small space requirement associated with these devices. The disadvantage of this type of mist eliminator is that the pressure drop across the elements varies from five to 15 inches of water; resulting in an increase in operating utility costs.

4.2.2.2 Electrostatic Precipitators

The electrostatic precipitators have the potential for controlling sulfuric acid mist emissions from sulfuric acid plants; however, there is no demonstrated application of precipitators. The disadvantages associated with precipitators, and hence, the reason they have not been used, include the initial cost, size requirements, operating and maintenance requirements and the potential for corrosion. The advantage of the precipitator is that it would operate at a low pressure drop; approximately 0.5 inches of water.

4.3 Cost Analysis

In reviewing the cost analyses presented in this section, it should be recognized that the two control alternatives that have been analyzed for sulfur dioxide achieved about the same degree of efficiency; i.e, there is no advantage of one system over the other from the standpoint of the level of sulfur dioxide control that can be achieved. The same holds true

for the control alternatives evaluated for sulfuric acid mist; both alternatives (fiber mist eliminators and electrostatic precipitators) are capable of achieving approximately the same degree of acid mist control.

Hence, the choice of the control alternative for sulfur dioxide and the control alternative for sulfuric acid mist can be made on the basis of cost, operating familiarity and operating convenience.

In Tables 4-1 and 4-2, the capital costs and annual costs of controlling sulfur dioxide emissions by dual absorption and by ammonia scrubbing are presented. In Table 4-3 and 4-4, similar costs are presented for controlling sulfuric acid mist emissions by fiber mist eliminators and electrostatic precipitators. The cost data are based upon analyses presented in EPA-450/3-85-012 and in EPA-450/3-76-014 (Capital and Operating Costs of Selected Air Pollution Control Systems); both updated to 1989 costs. The capital recovery in the annual cost calculation is based upon a 10 percent rate of return and a 10 year equipment life.

The cost analyses demonstrate that the annual cost of the dual absorption process for sulfur dioxide is less than half the annual cost for ammonia scrubbing. Similarly the annual cost for sulfuric acid mist with the fiber type mist eliminators is approximately one-fourth the annual cost of controlling acid mist with electrostatic precipitators. As the two control alternatives for sulfur dioxide and the two control alternatives for sulfuric acid mist are capable of the same level of control, it is evident why the dual absorption and the fiber type mist eliminators have

been the control alternatives of choice for sulfur dioxide and sulfuric acid mist, respectively.

4.4 Conclusion

Based upon the analysis presented in previous sections, the dual absorption process had been selected by Farmland as the control alternative for sulfur dioxide control and the fiber type high efficiency mist eliminator has been selected for sulfuric acid mist control. The dual absorption system will be operated with catalyst screening and make up every three to five years as is typical in the industry.

There is no effective and demonstrated technology for controlling nitrogen oxides emissions from sulfuric acid plants. Farmland will minimize these emissions by operating the sulfur burner of the No. 5 sulfuric acid plant within the limits established by the designer.

TABLE 4-1

COST ANALYSIS FOR SO2 CONTROL BY DUAL ABSORPTION
2000 TPD CONTACT SULFURIC ACID PLANT

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

CAPITAL COST

Direct			
Absorber	1,039,000		
Pumps	208,000		
Piping	312,000		
Heat Exchanger	<u>520,000</u>		
			\$2,079,000
Indirect			
Engineering and Supervision	208,000		
Construction	116,000		
Contractor	125,000		
Contingency	<u>249,000</u>		
			<u>698,000</u>
TOTAL CAPITAL COST			\$2,777,000

ANNUAL COST

Direct			
Operating Labor and Supervision	8,000		
Maintenance Labor	6,500		
Maintenance Materials	6,500		
Utilities	2,216,000		
Catalyst	<u>30,000</u>		
			\$2,267,000
Indirect			
OH	8,000		
Payroll	<u>4,000</u>		
			12,000
Capital Recovery			453,000
Insurance and Taxes			111,000
Credit for Acid Recovery			<u>(850,000)</u>
TOTAL ANNUAL COST			\$1,993,000

TABLE 4-2

COST ANALYSIS FOR SO₂ CONTROL BY AMMONIA SCRUBBING
2000 TPD CONTACT SULFURIC ACID PLANT

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

CAPITAL COST

Direct			
Scrubber and Auxiliaries			\$3,168,000
Indirect			
Engineering and Supervision	317,000		
Construction	253,000		
Contractor	190,000		
Contingency	<u>380,000</u>		
			<u>1,140,000</u>
TOTAL CAPITAL COST			\$4,308,000

ANNUAL COST

Direct			
Operating Labor and Supervision	540,000		
Maintenance Labor	80,000		
Maintenance Materials	80,000		
Utilities	230,000		
Chemicals	<u>1,944,000</u>		
			\$2,874,000
Indirect			
OH	310,000		
Payroll	<u>124,000</u>		
			434,000
Capital Recovery			702,000
Insurance and Taxes			<u>172,000</u>
TOTAL ANNUAL COST			\$4,182,000

TABLE 4-3

COST ANALYSIS FOR ACID MIST CONTROL BY FIBER TYPE MIST ELIMINATORS
2000 TPD CONTACT SULFURIC ACID PLANT

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

CAPITAL COST		
Direct		\$ 64,000
Indirect		<u>30,000</u>
TOTAL CAPITAL COST		\$ 94,000
ANNUAL COST		
Direct		
Utilities		\$ 146,000
Indirect		
Capital Recovery	15,000	
Insurance and Taxes	<u>4,000</u>	
		19,000
Credit for Acid Recovery		<u>(95,000)</u>
TOTAL ANNUAL COST		\$ 70,000

TABLE 4-4

COST ANALYSIS FOR ACID MIST CONTROL BY ELECTROSTATIC PRECIPITATOR
2000 TPD CONTACT SULFURIC ACID PLANT

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

CAPITAL COST

Direct		
Collector	318,000	
Auxiliaries	<u>110,000</u>	\$ 428,000
Indirect		
Engineering and Supervision	43,000	
Construction	34,000	
Contractor	26,000	
Contingency	<u>51,000</u>	<u>154,000</u>
TOTAL CAPITAL COST		\$ 582,000

ANNUAL COST

Direct		
Operating Labor and Supervision	23,000	
Maintenance Labor	20,000	
Maintenance Materials	30,000	
Utilities	<u>50,000</u>	\$ 123,000
Indirect		
OH	21,000	
Payroll	<u>9,000</u>	30,000
Capital Recovery		95,000
Insurance and Taxes		<u>23,000</u>
TOTAL ANNUAL COST		\$ 271,000

5.0 IMPACTS ON SOILS, VEGETATION AND VISIBILITY

The land-use in the vicinity of Farmland Industries, Inc. is a mixture of unimproved land, pasture land and land which has been mined for phosphate rock. The town of Bartow is located about six miles northeast of the site and Mulberry is located about eight miles northwest of the site. Additionally, there are scattered residences between Farmland and the two population centers. The proposed new sulfuric acid plant is not expected to have any significant impact on activities in the area. Air quality modeling has demonstrated that sulfur dioxide levels which will exist after the proposed modifications will not differ significantly from current levels. Also, modeling has indicated that there will not be a significant impact from either sulfuric acid mist or nitrogen oxides emissions. Thus it is expected that the proposed expansion will not adversely impact soils, vegetation and visibility in the area.

The proposed modification will require a minimal increase in personnel to operate the cogeneration facility. Also, the proposed eight percent increase in sulfuric acid production may cause a slight increase in truck deliveries of molten sulfur. Both of these changes will have a slight impact on traffic in the area but when compared with traffic levels that presently exist, the increases will not be significant.

6.0 GOOD ENGINEERING PRACTICE STACK HEIGHT

The criteria for good engineering practice stack height in Rule 17-2.270 states that the height of a stack should not exceed the greater of 65 meters (213) feet or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion.

Based on this policy, the limiting height for the new sulfuric acid plant stack is 213 feet. Farmland intends to construct a stack which will be 150 feet in height above-grade. This stack will satisfy the good engineering practice stack height criteria and will not result in excessive concentrations of air pollutants as a result of plume downwash as the stack will be at least 2.5 times the height of nearby structures.

7.0 AIR QUALITY REVIEW

The air quality review required of a PSD construction permit application potentially requires both air quality modeling and air quality monitoring. The air quality monitoring is required when the impact of air pollutant emission increases and decreases associated with a proposed project exceed the de minimis impact levels defined by Rule 17-2.500(3)(e)1, FAC or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. The air quality modeling is required to provide assurance that the increases and decreases in air pollutant emissions associated with the project, combined with all other applicable air pollutant emission rate increases and decreases associated with new sources affecting the project area, will not cause or contribute to an exceedance of the applicable PSD increments (defined by Rule 17-2.310, FAC). Additionally, the air quality modeling is required to provide assurance that the emissions from the proposed project, together with the emissions of all other air pollutants in the project area, will not cause or contribute to a violation of any ambient air quality standard.

The de minimis impact levels of the air pollutants associated with the proposed project are:

Sulfur Dioxide	-	13.0 micrograms per cubic meter, 24-hour average
Nitrogen Oxides	-	14.0 micrograms per cubic meter, annual average

Sulfuric Acid Mist - NA

The modeling that has been conducted demonstrates that the net impact of the sulfur dioxide and nitrogen oxides emissions increases and decreases addressed in this application are less than the de minimis impact levels defined by Rule 17-2.500(3)(e)1, FAC and summarized above. Furthermore, the applicant does not intend to define existing ambient sulfur dioxide and nitrogen oxides levels by air quality monitoring. Hence, air quality monitoring is not a requirement of this application.

The air quality modeling that has been conducted demonstrates that the net impact sulfur dioxide emissions from the sulfuric acid plants (increased emissions from proposed Plant No. 5 and the decrease in emissions resulting from the shut-down of Plants 1 and 2) is not significant for the three-hour, 24-hour or annual periods. Significant, as used in this instance, is defined by Rule 17-2.100(171)(a), FAC. The modeling also demonstrates that the net impact of nitrogen oxides emissions is significant (Rule 17-2.100(171)(c), FAC) but the impact of emissions from all sources impacting the project site is less than the ambient air quality standard for nitrogen oxides. The modeling further shows the net impact of sulfuric acid mist emissions associated with the proposed project is approximately one-tenth of the Acceptable Ambient Level (AAL) defined as a multiple of the Threshold Limit Value for sulfuric acid mist and that acid mist emissions from the three sulfuric acid plants that will operate at Farmland will result in an impact that is less than the AAL.

In the following sections, the air quality modeling for sulfur dioxide, nitrogen oxides and sulfuric acid mist is described.

7.1 Air Quality Modeling for Sulfur Dioxide

The net change in the emissions rate of sulfur dioxide associated with the proposed project is defined as the emission rate increase associated with new sulfuric acid Plant No. 5 minus the actual sulfur dioxide emissions associated with the shut-down of existing sulfuric acid Plants 1 and 2. These emission rates are addressed in Section 3.0 of this application.

The impact of the net change in sulfur dioxide emissions was assessed with the Industrial Source Complex - Short Term (ISC-ST) air quality model. The modeling was conducted in accordance with guidelines established by EPA and published in the document, Guideline for Air Quality Modeling, (Revised), July 1986. The meteorological data used with the model were for Orlando, Florida and represented the period 1974-1978.

The sulfur dioxide emissions associated with the project included the increase in emissions associated with the new No. 5 sulfuric acid plant and the decrease in emissions associated with the shut-down of existing Plants 1 and 2. The sulfur dioxide emissions from new Plant No. 5 were based upon a sulfur dioxide emission limit of 4.0 pounds per ton of 100 percent sulfuric acid and a production rate of 2,000 tons of 100 percent acid per

day. This resulted in an hourly sulfur dioxide emission rate of 333.3 pounds per hour. For modeling purposes, it was assumed that the plant would operate 8,760 hours a year.

The decreases in sulfur dioxide emissions were defined as the decrease in actual sulfur dioxide emissions from existing sulfuric acid Plants 1 and 2. These emission rates (see Section 3.0) were based on a sulfuric acid production rate of 800 tons of 100 percent sulfuric acid per day for each of the two plants, a sulfur dioxide emission rate of 6.5 pounds per ton of 100 percent acid produced and an annual production-based operating factor of 0.737. These conditions result in a decrease in actual sulfur dioxide emissions of 216.7 pounds per hour and 25.2 tons per year from each of the two plants. Plant characteristics used for the modeling are summarized in Table 7-1.

The modeling conducted with the ISC-ST air quality model was conducted in accordance with EPA guidelines and included receptors established by the polar grid system extending to 15.0 kilometers from the plant. Twelve sets of receptor rings were placed at distances ranging from 0.1 to 15.0 kilometers from the plant with receptors placed at 10 degree intervals on each receptor ring.

The results of the air quality modeling, summarized in Table 7-2, demonstrate that the impact of the proposed project is not significant for the three-hour, 24-hour or annual time periods. Modeling shows that there will be a net improvement in air quality on an annual basis; that the

maximum sulfur dioxide increase for the 24-hour period will be less than 0.0002 micrograms per cubic meter (at a distance of 400 meters from the plant); and that the maximum sulfur dioxide increase for the three-hour period will be less than 0.02 micrograms per cubic meter (also at 400 meters from the plant). As the net impact of the sulfur dioxide emission rate changes resulting from the proposed project are not significant for any time period, no further air quality modeling is required for sulfur dioxide.

7.2 Air Quality Modeling for Nitrogen Oxides

The nitrogen oxides emissions associated with the project include the increase in emissions associated with proposed sulfuric acid Plant No. 5 and the decrease in emissions associated with the shut-down of existing Plants 1 and 2. Additionally, there is a nitrogen oxides emissions increase associated with the green superphosphoric acid plant that has been permitted within the past five years.

As summarized in Table 3-2, the increase in nitrogen oxides emissions associated with the No. 5 sulfuric acid plant is 43.4 tons per year while the decrease in nitrogen oxides emissions associated with the shut-down of existing Plants 1 and 2 total 50.4 tons per year; or a net decrease of 7.0 tons per year in nitrogen oxides emissions. The increase in nitrogen oxides emissions associated with the green superphosphoric acid plant permitted in November 1987 is 64.8 tons per year. This increase, combined with emission increases and decreases associated with the sulfuric acid

plants, results in a nitrogen oxides emissions increase for the past five years of 57.8 tons per year. This increase exceeds the de minimis emission rate increase defined by Rule 17-2,500(2)(e)2, FAC (40 tons per year).

As a result of the net increase in nitrogen oxides emissions over the past five years, air quality modeling has been conducted for nitrogen oxides. The modeling was conducted in accordance with the guidelines used for the sulfur dioxide modeling and described in Section 7.1. The only departure from the sulfur dioxide modeling procedures was that the modeling was conducted only for the annual period as there is only an annual air quality standard for nitrogen oxides; hence, the Industrial Source Complex - Long Term (ISC-LT) model was used. Three receptor grids were used with the ISC-LT; all centered at the plant site:

7 x 7 at 1.0 km spacing,
9 x 9 at 0.5 km spacing, and
6 x 6 at 0.2 km spacing.

The results of the air quality modeling are summarized in Table 7-3. These results show that there will be a net improvement in ambient air quality over the annual period if only the net nitrogen oxides emissions rate changes associated with sulfuric acid plants are considered. This is to be expected as there will be a net emission reduction of 7.0 tons per year of nitrogen oxides associated with the construction of the new No. 5 sulfuric acid plant and the shut-down of the existing Plants 1 and 2.

Combining the emission rate increases associated with the green superphosphoric acid plant with the emission rate changes associated with the sulfuric acid plants results in a net increase of 3.9 micrograms per cubic meter, annual average, at a distance of 0.3 kilometers from the plant. This impact compares with a significant impact (Rule 17-2.100(171)(c), FAC) of 1.0 micrograms per cubic meter, a de minimis impact (Rule 17-2.500(3)(e)1, FAC) of 14.0 micrograms per cubic meter and an air quality standard of 100.0 micrograms per cubic meter, annual average.

As the net impact of new sources at the Farmland facility was significant, additional modeling was conducted, including all sources of nitrogen oxides expected to impact the project area, to demonstrate that the ambient air quality standard of 100 micrograms per cubic meter was not exceeded.

The sources included in the nitrogen oxides modeling, including the Farmland sources, are listed in Table 7-4. The nitrogen oxides emission rates were determined from permit conditions, from emission factors or measurements on similar plants, or from actual test data.

The results of the nitrogen oxides modeling to demonstrate compliance with ambient air quality standards are also summarized in Table 7-3. These results show that the maximum expected impact of all sources will be 7.6 micrograms per cubic meter and will occur 0.5 kilometers from the Farmland facility. This impact compares with an air quality standard of 100 micrograms per cubic meter, annual average.

7.3 Air Quality Modeling for Sulfuric Acid Mist

No ambient air quality standards, PSD increments or significant impact levels have been established for sulfuric acid mist. For purposes of this permit application, an Acceptable Ambient Level (AAL) was developed by dividing the Threshold Limit Value of 1,000 micrograms per cubic meter by 210. The factor of 210 consists of a factor of 4.2 to convert the eight-hour per day, five day per week exposure allowed by the Threshold Limit Value to a 24-hour per day, seven day per week exposure; that is, $(24 \times 7)/(8 \times 5)$. In addition to this factor, a safety factor of 50 was applied to reduce the exposure established for the working population to an exposure that is applicable to the general population. The factor of 50 was selected as sulfuric acid mist is not considered a highly toxic material. The 24-hour AAL that has been established based upon these factors is 4.8 micrograms per cubic meter.

The air quality modeling that was conducted to evaluate the impact of sulfuric acid mist emissions from the Farmland facility on was conducted with ISC-ST air quality model using the guidelines used for sulfuric acid modeling and described in Section 7.1 of this application. The receptor grid used was identical to the polar coordinate system used in the sulfur dioxide modeling.

The modeling was conducted to determine the net impact of the emission increases and decreases associated with the proposed project and also to determine the impact of sulfuric acid mist emissions from existing sulfuric

acid Plants 3 and 4 plus the emissions from new Plant 5. The latter assessment was to determine the impact of sulfuric acid mist emissions from the three sulfuric acid plants that will operate at Farmland once the proposed project is completed.

The results of the air quality modeling are summarized in Table 7-5. The result of the modeling demonstrate that the maximum expected increase in ambient sulfuric acid mist levels associated with the proposed project will be approximately 0.4 micrograms per cubic meter over a 24-hour period. The modeling results also show that the maximum expected sulfuric acid mist impact resulting from the operations of Plants 3, 4 and 5 will be approximately 3.7 microgram per cubic meter, 24-hour average, at a distance of 1.5 kilometers from the plants. These impacts compare with the AAL for sulfuric acid mist of 4.8 micrograms per cubic meter, 24-hour average.

The impact of sulfuric acid mist emissions from sources outside the Farmland chemical complex were not included in the air quality review based upon an engineering judgment. It was estimated that because of the expected magnitude of the sulfuric acid mist emissions from other sources and the distances of these sources from Farmland, it would be very unlikely that any of the sources, individually or collectively, will result in a significant contribution to ambient acid mist levels in the project area.

TABLE 7-1

PLANT CHARACTERISTICS USED FOR AIR QUALITY MODELING

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

PLANT	STACK		STACK GAS		EMISSION RATES (1)					
	Ht	Dis	Vel	Temp	SO ₂		Acid Mist		NO _x	
	(ft)	(ft)	(FPS)	(°F)	(lb/hr)	(TPY)	(lb/hr)	(TPY)	(lb/hr)	(TPY)
H2S04 #1	100	4.5	66.2	100	216.7	700	2.3	7.5	7.8	25.2
H2S04 #2	100	4.5	66.2	100	216.7	700	2.3	7.5	7.8	25.2
H2S04 #5	150	8.0	31.6	180	333.3	1460	12.5	54.8	9.9	43.4
GSPA	65	1.0	14.7	120	0	0	0	0	29.1	64.8

(1) Annual emission rates are based on the following assumptions:

- (a) H2S04 #1 and #2 - An annual operating factor, based on production, of 0.737.
- (b) H2S04 #5 - Operating time will be 8760 hours/year.
- (c) GSPA - Annual operating time will be 4448 hours/year.

TABLE 7-2
SUMMARY OF SULFUR DIOXIDE IMPACT ANALYSIS

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	SULFUR DIOXIDE IMPACT ($\mu\text{g}/\text{m}^3$)		
	ANNUAL	3-HOUR	24-HOUR
1974	< 0	0.016	0.0002
1975	< 0	0.004	< 0.0001
1976	< 0	0.010	0.0001
1977	< 0	0.001	< 0.0001
1978	< 0	0.001	0.0001
Significant Impact (17-2.100(171)(a), FAC	1.0	25.0	5.0
De minimis Impact 17-2.500(3)(e)1, FAC	NA	NA	13.0

TABLE 7-3
SUMMARY OF NITROGEN OXIDES IMPACT ANALYSES

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	ANNUAL NOX IMPACT ($\mu\text{g}/\text{m}^3$)		
	H2SO4 PLANTS	H2SO4 PLANTS AND GSPA	ALL SOURCES (1)
1974-1978 Star Summary	< 0	3.9	7.6
Air Quality Std		100.0	
Significant Impact (17-2.100(171)(c),FAC		1.0	
De minimis Impact (17-2.500(3)(e)1,FAC		14.0	

(1) See Tables 7-1 and 7-4.

TABLE 7-4

LISTING OF SIGNIFICANT SOURCES OF NITROGEN OXIDES IN POLK COUNTY

FARMLAND INDUSTRIES, INC.
POLK COUNTY, FLORIDA

Source Number	Location		Ht. (m)	Temp. (deg k)	Vel. (m/s)	Dia. (m)	NOX (g/s)	Identification
	X (m)	Y (m)						
1	388076	3116011	27.44	316.0	19.69	1.52	3.20	CPI A & B H2SO4
2	388155	3116034	60.52	352.0	16.40	2.44	5.16	CPI C & D H2SO4
3	387858	3115904	28.66	322.0	7.20	3.05	2.00	CPI A DAP
4	387890	3115918	54.88	322.0	9.79	2.79	2.00	CPI Z DAP
5	387813	3116041	54.88	325.0	10.55	2.79	6.00	CPI X & Y GTSP
6	408500	3083000	63.40	347.0	6.90	2.10	2.41	CF BARTOW #5,6 & 7 H2SO4
7	408500	3083000	34.50	319.0	20.00	1.30	2.12	CF BARTOW #3 & 4 H2SO4
8	408109	3081800	38.60	341.0	11.00	2.19	4.50	CF BARTOW DAP
9	407380	3071700	38.10	328.0	14.60	3.10	5.30	AGRICO DAP/GTSP
10	407520	3071240	45.70	350.0	9.90	2.70	6.33	AGRICO #10,11 & 12 H2SO4
11	394850	3069770	30.50	334.0	7.26	1.82	5.00	AMAX BIG 4 DRYER
12	398400	3084200	45.70	352.0	10.30	2.30	2.08	CONSERVE H2SO4
13	398400	3084200	10.00	533.0	11.00	0.80	1.80	CONSERVE
14	398400	3084200	24.40	330.0	5.00	1.70	1.70	CONSERVE
15	414700	3080300	13.70	330.0	40.40	1.22	3.30	IMC NORALYN
16	398200	3075700	21.30	344.0	12.90	2.10	1.16	IMC KINGSFORD
17	396550	3078640	60.70	349.7	15.55	2.60	13.88	NEW WALES H2SO4
18	396830	3079430	52.40	319.1	7.10	2.40	17.04	NEW WALES MULTIPHOS/AFI
19	396450	3079150	36.60	319.1	20.80	1.80	9.83	NEW WALES DAP/GTSP
20	398000	3085300	25.90	339.0	16.00	2.30	12.40	MOBIL DRYERS
21	406700	3085200	61.00	360.0	12.20	2.13	2.30	ROYSTER H2SO4
22	406800	3085200	31.10	322.0	8.26	2.67	2.10	ROYSTER DAP/GTSP
23	415920	3068890	28.40	314.0	9.33	1.45	3.10	USSAC FT. MEADE-GTSP
24	415860	3068550	15.90	336.0	11.04	1.83	4.40	USSAC FT. MEADE-DRYER
25	413200	3086300	40.40	314.0	14.50	2.13	2.10	USSAC BARTOW - DAP
26	416120	3068620	53.40	355.0	15.91	2.59	5.64	USSAC FT. MEADE-H2SO4
27	409700	3086000	61.00	346.0	7.30	2.80	3.02	WR GRACE
28	409700	3086000	45.70	322.0	16.70	1.50	1.38	WR GRACE
29	409700	3086000	61.00	346.0	25.90	1.50	2.38	WR GRACE
30	408500	3105800	76.20	354.0	19.70	4.90	176.40	LAKELAND - MCINTOSH
31	408500	3105800	45.70	420.0	24.00	2.74	176.40	LAKELAND - MCINTOSH
32	409000	3102000	50.30	422.0	3.40	3.10	10.60	LAKELAND - LARSEN 7
33	409500	3079500	30.48	355.0	9.27	2.29	2.82	FARMLAND - 3 & 4 H2SO4
34	409500	3079500	30.00	322.0	7.31	2.09	2.00	FARMLAND - DAP
35	409500	3079500	30.48	311.0	20.18	1.37	-1.45	FARMLAND - 1 & 2 H2SO4
36	409500	3079500	45.72	355.0	9.65	2.44	1.25	FARMLAND - 5 H2SO4
37	409500	3079500	19.81	322.0	4.48	0.30	1.86	FARMLAND - GSPA

TABLE 7-5
 SUMMARY OF ACID MIST IMPACT ANALYSIS
 FARMLAND INDUSTRIES, INC.
 POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	24-HR ACID MIST IMPACT ($\mu\text{g}/\text{m}^3$)	
	PLANTS 1, 2 & 5	PLANTS 3, 4 & 5
1974	0.33	3.73
1975	0.37	3.05
1976	0.40	3.26
1977	0.39	3.58
1978	0.41	3.53
AAL (1)	4.8	4.8

(1) AAL = TLV/210, 24-Hour Average



Interoffice Memorandum

TO: District Managers
John Ruddell
John Gentry

THRU: Randy Armstrong *RA*
Howard Rhodes
Richard Wilkins *RAW*

FROM: C H. Fancy *CF*

DATE: October 20, 1987

SUBJECT: Final Air Stripper Review Procedures

For Routing To Other Than The Addressee	
To: _____	Location: _____
To: _____	Location: _____
To: _____	Location: _____
From: _____	Date: _____

Attached is the Bureau of Air Quality Management's (BAQM) final policy on the air quality analysis of air strippers. In 1986, the BAQM held a rule workshop regarding a similar approach, but the participants objected to this being a rule since the BAQM was trying to develop a toxic rule. The participants did, however, agree to the BAQM setting guidelines and procedures to allow evaluation of emissions and ambient impacts. A final draft was distributed in December, 1986.

A large number of air strippers operating in Florida will be portable units. These units may operate for a couple years and then may be transferred to another location. These portable units will be exempt from the standard permitting procedure but will be subject to the limitations outlined in this package. Each portable air stripper will be evaluated with the enclosed worksheet. This will expedite the review of these units.

As the Division of Waste Management is responsible for the contracts and approvals of these units, the personnel in the Division should evaluate each air stripper using the enclosed procedures and form. Any conditions that are required to ensure that the acceptable ambient concentrations are met must be written in the approval document.

Upon completion of the review, a copy of the worksheet should be sent to Barry Andrews in the BAQM and to the district office and local program. The list of specific individuals is attached. If information is needed on TLVs, contact John Glunn, Air Toxics Specialist, in the BAQM. If additional modeling is required, contact Larry George or Tom Rogers in the BAQM. On other issues regarding this procedure, contact Barry Andrews or Clair Fancy in the BAQM.

Memorandum
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October 20, 1987

If an air stripper will be a permanent installation at a facility, then an air construction/operation permit will be required. The district office air staff should permit these under normal procedures. However, if the permanent unit is at a facility with emissions over 100 tons per year, it should be permitted by Central Air Permitting.

CHF/ks

cc: District Air Engineers
Local Program Air Engineers

attachments

Air Stripping

Abstract

Air stripping, a process by which contaminated water is cleansed in a tower (packed or unpacked) with a counter-current flow of air, is gaining widespread popularity and use in the State of Florida. Many of Florida's groundwater supplies have been contaminated with volatile organic compounds (VOCs) resulting from storing and using pesticides, petroleum based products and other chemicals. The air stripping process releases to the air a high percentage of the VOCs contained in the water supplies. Some of these VOCs are potential human carcinogens, have relatively long atmospheric residence times, and could pose public health risks if they are released in sufficient quantities during a long period of time. The Bureau of Air Quality Management is concerned about the emissions resulting from air stripping operations. This paper addresses the subject of air stripping and outlines the Bureau's policy on how air impacts from air strippers should be evaluated.

Introduction

Ninety-two percent of Florida's residents depend on groundwater for their drinking water. Many of Florida's aquifers lie very close to the surface and are overlain by porous surfaces, thus being very susceptible to contamination. There are 40,000 underground storage tanks in service stations alone, and over 60,000 statewide in all locations. Many of these are believed to be leaking.

In order to meet the stringent groundwater protection rules and standards that have been adopted by the state, it is necessary to purify the contaminated supplies. Although there are many ways to treat contaminated groundwater, with today's technology there are essentially only two ways that are effective in removing volatile organic compounds. These methods are carbon adsorption and air stripping.

Granulated activated carbon adsorption is often used when organic contaminants need to be removed to nondetectable levels, and should be a part of the process if nonvolatile contaminants are present. Air stripping is capable of 95-99 percent reduction of volatile contaminants and can be a cost effective treatment technology if nondetectable contaminant levels are not required. Due to the cost effectiveness of air stripping the trend is toward increased use of this technology.

Air Stripping Technology

Air stripping is a simple and effective method of removing VOCs from water. Contaminated water is dispersed in a stripping tower through a bed of packing which provides large void volumes and a large surface area. At the same time, air is counter flowed through the column from the bottom in a forced draft.

Due to the large surface area, the water disperses into a thin layer over the packing. This enhances the efficiency of the air stripping process by providing increased contact time. Even though packed towers are the preferred method, some do not have the packing, but instead use water sprays spraying countercurrent to the air flows.

Emissions

The quantity and type of VOC emissions from air stripping operations are dependent largely upon the nature of the contaminated supply and the throughput to the air stripper. Both the concentration of the contaminants (VOCs) and throughput rate are needed to determine the emission rate to the atmosphere. It is not unusual for the emissions from a small portable unit (capacity of 10 gallons per minute) cleansing a very contaminated supply (1,000 ppm) to be much greater than that of a large stationary system (42,000 gallons per minute) cleansing a slightly contaminated supply (10 ppb). Assuming a typical removal efficiency of 96% and 24 hours per day operation, the VOC emissions from the two operations described would be approximately 115 lbs/day and 5 lbs/day respectively.

The calculation of the 115 lbs/day unit is shown as follows:

$$(1,000 \text{ ppm}) \times (1 \frac{\text{mg}}{\text{liter}}) \times (3.785 \frac{\text{liters}}{\text{gal}}) \times (\frac{1 \text{ gram}}{1,000 \text{ mg}}) \times (\frac{1 \text{ lb}}{453.6 \text{ grams}}) \times (10 \frac{\text{gal}}{\text{min}}) \times (60 \frac{\text{min}}{\text{hr}}) \times (24 \frac{\text{hr}}{\text{day}}) \times (.96) = 115.4 \frac{\text{lbs}}{\text{day}}$$

The various VOCs in a contaminated water supply are not removed with the same efficiency. Highly volatile compounds with very low solubility in water are most easily stripped.

Acceptable Ambient Concentration (AAC)

It is not uncommon for air stripping operations to emit VOCs which are listed as being very toxic or are known or suspected to

be carcinogenic. Because of this, each air stripper needs to be evaluated to insure that adverse air impacts do not occur.

The Bureau of Air Quality Management has developed a list of substances not regulated by National or State Ambient Air Quality Standards. The list is divided into two categories (A and B). Category A (CAT-A) consists of substances which are known or suspected to be carcinogenic or are considered highly toxic. Category B (CAT-B) consists of moderately toxic substances. Both lists will be updated periodically by the Bureau of Air Quality Management.

The Acceptable Ambient Concentration (AAC) for a contaminant on a presumed 168 hour per week operation is calculated as follows:

$$\text{AAC (mg/m}^3\text{)} = 0.238 \text{ (TLV/A) Where: } \begin{array}{l} A=100 \text{ (CAT A)} \\ A= 50 \text{ (CAT B)} \end{array}$$

The TLV values for a number of compounds are enclosed. If a compound that is not listed in the attachment will be stripped from a water supply, the Air Toxics Specialist in the Bureau of Air Quality Management should be contacted so an Acceptable Ambient Concentration can be established for that compound.

For chemicals with TLVs which are criteria pollutants and have a national ambient air quality standard, the limitation will be set equal to the NAAQS. For the criteria pollutant particulates and hydrocarbons, the specific chemical species of each pollutant would have an acceptable ambient concentration limitation.

Calculation of Maximum Ambient Concentration

In order to expedite the approval of air strippers, the following equation can be used to obtain a conservative estimate of the maximum ambient concentration resulting from the air stripping operation.

$$\text{Maximum Ambient Concentration (mg/m}^3\text{)} = \text{ACH}^b$$

Where $A = 327.84$

$C = \text{emission rate (lb/hr)}$

$H = \text{stack height (Ft.)}$

$b = -2.264$

The equation above was derived by assuming that the plume rise from air strippers is negligible, which is a valid assumption for these units since stack velocities are low and stack temperature is essentially the same as the ambient temperature. The result obtained from the equation should be directly compared to the appropriate factor of the TLV for the contaminant being evaluated.

Approval Criteria

If the maximum ambient concentration is less than the Acceptable Ambient Level, then the air stripper is approvable. If, on the other hand, it is higher, then one of the following five measures needs to be taken.

1. Additional Modeling. As the assumptions in the simplified equations are conservative, the utilization of more detailed modeling may result in lower calculated maximum ambient concentrations. The Modeling and Data Analysis Section in The Bureau of Air Quality will assist in this should the need arise.
2. Reduction in Hours of Operation: The AAC can be increased by assuming an operating schedule of less than 168 hrs/wk by using the following formula:

$$AAC = \frac{40}{\text{hrs weekly}} \times TLV/A =$$

where:

the hours of weekly operation cannot be less than 40
A is 100 for CAT A or 50 for CAT B
TLV is the Threshold Limit Value

3. Reduce Water Flow to Air Stripper. The maximum ambient concentration can be reduced by a reduction in the flow of contaminated water to the air stripper.
4. Elevation of Stack Height. The maximum ambient concentration can be reduced by raising the point of air discharge from the air stripper by raising the stack height.
5. Addition of Carbon Absorption to Air Stripper Discharge.

In the event that the four above measures cannot bring the maximum ambient impact values below the acceptable ambient concentration, then add on air pollution controls must be considered. These controls, if required, must be specified in the approval document. This is a last resort method, as the addition of carbon absorption approximately doubles the cost of the air stripper.

AIR STRIPPING EVALUATION WORKSHEET

Source Identification	_____	Maximum Influent Flow Rate (GPM)	_____
Source Location	_____	Maximum Air Flow Rate (CFM)	_____
Manufacturer	_____	Emission Point Height (Ft)	_____
Model Number	_____	Maximum Hours of Operation (Hrs/Wk)	_____

Contaminant Name	Max. Conc. (ppb)	Max. Emission Rate (lb/hr) (1)	Max. Ambient Impact (mg/m ³) (2)	TLV (mg/m ³)	Category (A or B)	AAC (mg/m ³)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						

(1) Calculated on reverse side of this worksheet (Equation (1)).

(2) Calculated on reverse side of this worksheet (Equation (2)).

Calculation of Emission Rate

_____ ppb x (_____ ppm) (mg/liter) (60 min) (_____ lb) x (_____ 1 gram) x
10³ppb ppm hr 453.6 g 1000 mg

(3.785 liter) x _____ Influent flow Rate = _____ lb/hr
gal (GPM)

or _____ ppb x _____ GPM x 5x10⁻⁷ = _____ lb/hr (1)

Calculation of Maximum Ambient Impact

Maximum Ambient Concentration =

(_____ lb/hr) x (327.84) x [_____]^{-2.264} _____ mg/m³ (2)
Stack
Height
(Feet)

Calculation of Acceptable Ambient Impact (AAC)

0.238 (TLV/A) = _____ mg/m³ (3)

Where A = 100 for CAT-A substances
= 50 for CAT-B substances

Do the impacts from any of the contaminants exceed the AAC? _____
If yes, list the contaminants which have exceedances.

List the conditions to be incorporated into approval document to insure that the AAC will not be exceeded.

Reviewed by: _____

Title: _____

Date: _____

Phone: _____

Organization _____
Unit: _____

Signature: _____

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Category A High Toxicity Air Contaminants

<u>Compound Chemical Name</u>	<u>CAS Registry Number</u>	<u>Threshold Value(1) PPM</u>	<u>Limit (TLV's) mg/m³</u>
Acrolein	107-02-8	0.1	0.25
Acrylonitrile	107-13-1	2.0	4.5
Aldicarb	116-06-3	-	-
p-Aminodiphenyl	92-67-1	-	-
Arsenic	7440-38-2	-	0.2
Arsenic pentoxide	1303-28-2	-	-
Arsenic trioxide	1327-53-3	-	-
Asbestos (5)	1332-21-4	2 Fibers >	5 um/cc
Auramine	2465-27-2	-	-
Benzene	71-43-1	1 0	3 0
Benzidine	92-87-5	-	-
Beryllium oxide (As Beryllium.)	1304-56-9	-	.002
Beryllium sulfate	13510-49-1	-	.002
Cadmium (dust and salts) as Cd	7440-43-9	-	0.05
Cadmium oxide	1306-19-0	-	0.05
Cadmium sulfate	10124-36-4	-	0.005
Carbon tetrachloride	56-23-5	5	30
bis-Chloromethyl ether	542-88-1	0.001	0.005
Chromium VI Compounds (note: CAS listed assigned to metallic chromium)	7440-47-3	-	0.05
Dibromoethane (Ethylene dibromide)	106-93-4	-	-
3,3'-Dichlorobenzidine	91-94-1	-	-

High Toxicity Air Contaminants (cont.)

<u>Compound Chemical Name</u>	<u>CAS Registry Number</u>	<u>Threshold Value(1) PPM</u>	<u>Limit (TLV's) mg/m³</u>
Dimethyl sulfate	77-78-1	0.1	0.5
Ethyleneimine	151-56-4	0.5	1.0
Ethylene oxide	75-21-8	1.0	2.0
Formaldehyde	50-00-0	1	1.5
Hydrazine and its acid salts	302-01-2	0.1	0.1
Lead arsenate	7784-40-9	-	0.15
Methylene bisphenyl isocyanate, (Diphenylmethane-4, 4-diisocyanate) (DMI)	101-68-8	CO.02	CO.2 ⁽⁷⁾
Methyl isocyanate(MIC)	624-83-9	0.02	0.05
B-Naphthylamine	91-59-8	-	-
Nickel (metal and insoluble compounds)	7440-02-2	-	1.0
Nickel carbonyl	13463-39-3	0.05	0.35
Nickel oxide	1313-99-1	-	1.0
Nickel sulfide, as Ni	12035-72-2	-	1.0
4-Nitrodiphenyl	92-93-3	-	-
Nitrogen mustard	51-75-2	-	-
Nitrosodimethylamine (dimethylnitrosoamine)	62-75-9	-	-
Parathion	56-38-2	-	0.1
Polychlorinated biphenyls (PCBs) (TLV assigned to Aroclor 1254)	1336-36-3	-	0.5
Polycyclic Organic Matter (8) (includes Benzo(a)Pyrene)	50-32-8	-	-

High Toxicity Air Contaminants (cont.)

<u>Compound Chemical Name</u>	<u>CAS Registry Number</u>	<u>Threshold Limit Value(1) PPM</u>	<u>(TLV's) mg/m³</u>
2,3,7,8-Tetrachloro- dibenzofuran	51207-31-0	-	-
Total Tetrachlorinated dibenzo-p-dioxins (includes 2,3,7,8TCDD)	1745-01-7	-	-
Toluene-(2,4)-diisocyanate (TDI)	584-84-0	0.005	0.04
Vinyl chloride (Chloroethylene)	75-01-4	-	-
Vinylidene chloride (1,1-Dichloroethylene)	75-35-4	5	20

Footnotes:

1 1984-85 ACGIH values.

3 (HAZ) - "Human Carcinogens. Substances, or substances associated with industrial processes recognized to have carcinogenic potential without an assigned TLV... for (these note) substances,... no exposure or contact by any route - respiratory, skin or oral, as detected by the most sensitive methods - shall be permitted." From: "TLV's, Threshold Limit Values for Chemical Substances...ACGIH for 1984-85", Appendix A - Carcinogens, Table Alb., page 41.

4 No chemical specific TLV or AAL available at this time, see "High Toxicity Air Contaminants," pages 2 and 3, for guidance.

5 OSHA Temporary Standard: 0.5 fibers per c.c. (see Fed. Reg., 48, No. 215, page 51086, 1983). Not applicable to sources subject to NESHAPS.

- 6 Interim formaldehyde AAL of 5 ug/m^3 calculated from AG-a guidance for High Toxicity Air Contaminants, section I, paragraph B, page 3. This interim value replaces previously listed AAL of 2.0 ug/m^3 . NYSDOH to provide a chemical specific formaldehyde AAL by 4/1/86.
- 7 "C" denotes ACGIH TLV-C, "ceiling limit". The concentration that should not be exceeded even instantaneously".
- 8 Containing large amounts of naphthalene, fluorene, anthracene, and acridine.
- 9 NOTE: NYSDON has determined that for "AAL's for dioxins... Basing an acceptable ambient level on only total TCDD's as is now done in 'Air Guide-1' (1984 and earlier editions) does not adequately represent public health risks for the dixin compounds... Health risks posed by emissions of chlorinated dioxins and the closely related chlorinated furans should be evaluated on a case by case basis taking into consideration specific isomers of each family of compounds."

Based on the above satement by NYSDOH; noting the legislative mandate for DOH to develop resource recovery related standards (including TCDD & TCDF); and DOH's April 1, 1986 deadline for such standards, DEC is withdrawing the $9.2 \times 10^{-8} \text{ ug/m}^5$, "hernandez," TCDD interim AAL* at this time.

Emission sources of chlorinated dibenzofurans and dibenzodioxins will be reviewed on a case by case basis by DOH until the standards are promulgated. Direct all inquiries on this matter to the Toxics Management Section of DEC.

* EPA's Interim Evaluation of Health Risks Associated with Emissions of Tetrachlorinated Dioxins from Municipal Waste Recovery Facilities, November 1981.

DRAFT

Category A Moderate Toxicity Air Contaminants

Compound (ORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Acetaldehyde	75-07-0	100	180
Acetamide	60-35-5	-	-
Acetic anhydride	108-24-7	C5 (4)	C20
2-Acetylaminofluorene	53-96-3	-	-
Acrylamide	79-06-1	-	0.3
Acrylic acid	79-10-3	10	30
Allyl chloride (3-Chloro-1-Propene)	107-05-1	1	3
Aniline	62-53-3	2	10
p-Anisidine	104-94-9	0.1	0.5
Arsine	7784-42-1	0.05	0.2
Benzyl chloride	100-44-7	1	5
Biphenyl	92-52-4	0.2	1.5
Butanethiol	109-79-9	0.5	1.5
n-Butylamine	109-73-9	C5	C15
Carbon black	1333-86-4	-	3.5
Carbon disulfide	75-15-0	10	30
Chlordane	57-74-9	-	0.5
Chlordecone (Kepone)	143-50-0	-	-
-Chloroacetophenone (Phenacyl chloride)	532-27-4	0.05	0.3
p-Chloroaniline	106-47-8	-	-
Chlorobenzene (monochlorobenzene)	108-90-7	75	350
Chloroform	67-66-3	10	50

Category A Moderate Toxicity Air Contaminants

Compound (B ORGANICS) <u>Chemical Name</u>	CAS Registry Number	Threshold Limit Value(1) (TLV's)	
		<u>PPM</u>	<u>mg/m³</u>
p-Chloronitrobenzene	100-00-5	(see p-Nitrochloro- benzene below)	
o-Cresol	95-48-7	5.0	22
m-Cresol	108-39-4	5.0	22
p-Cresol	106-44-5	5.0	22
Cyanamide	420-04-2	-	2
Cyanides (As CN)	57-12-5	-	5
Cyanic acid (Sodium Salt)	917-61-3	see Cyanogen below	
Cyanic acid (Potassium Salt)	590-28-3	see Cyanogen below	
Cyanoacetamide	107-91-5	see Cyanides above	
Cyanogen (Oxalonitrile)	460-19-5	10	20
Diallylamaleate	999-21-3	-	-
2,5-Diamino toluene	95-70-5	-	-
Diazomethane	334-88-3	0.2	0.4
o-Dichlorobenzene	95-50-1	C50	C300
1,2-Dichloroethane (Ethylene Dichloride)	107-06-2	10	40
Dichloromethane (Methylene Chloride)	75-09-2	100	350
Diethyl phthalate	84-66-2	-	5
Diisodecyl phthalate	26761-40-0	see Diethyl phthalate above	
3,3'-Dimethoxybenzidine (o-Dianisidine)	119-90-4	-	-
4-Dimethylaminoazobenzene	60-11-7	-	-

Category Moderate Toxicity Air Contaminants

Compound (M ORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Dimethyl carbamoyl chloride	79-44-7	-	-
1,1-Dimethyl hydrazine	57-14-7	0.5	1
m-Dinitrobenzene	99-65-0	0.15	1
Diethyl phthalate (DOP)	117-81-7	see Diethylphthalate above	
p-Dioxane	123-91-1	25	90
Diphenyl hydrazine	122-66-7	see Dimethyl hydrazine above	
Epichlorohydrin (1-Chloro-2,3-epoxy propane)	106-89-8	2	10
Epoxypropane (Propylene oxide)	75-56-9	20	50
Ethanethiol (Ethyl mercaptan)	75-08-1	0.5	1
Ethanolamine	141-43-5	3	8
Ethyl benzene	100-41-4	100	435
Ethyleneglycol Monopropyl ether	2807-30-9	-	-
Formamide	75-12-7	20	30
Formic acid	64-18-6	5	9
Furfural	98-01-1	2	8
Furfuryl alcohol	98-00-0	10	40
Glycidaldehyde	765-34-4	-	-
Heptachlor	76-44-8	-	0.5
Hexachlorobenzene	118-74-1	-	-
Hexachlorobutadiene	87-68-3	0.02	0.24
Hexachlorocyclohexane (1,2,3,4,5,6, Hexachlorocyclohexane)	319-84-6	See a Lindane, page 36	

Category A Moderate Toxicity Air Contaminants

Compound (IN ORGANICS) <u>Chemical Name</u>	CAS Registry Number	Threshold Limit Value(1) PPM	(TLV's) mg/m ³
Hexachlorocyclopentadiene	77-47-4	0.01	0.1
Hexachloronaphthalene	1335-87-1	-	0.2
Hexamethyl phosphoramidate	680-31-9	-	-
Hydrogen cyanide (Hydrocyanic acid)	74-90-8	C10	C10
Hydrogen Fluoride	7664-39-3	C3	C2.5
Hydroquinone	123-31-9	-	2
Isophorone	78-59-1	C5	C25
Isopropyl Alcohol ⁽⁵⁾	67-63-0	400	980
Isopropylamine	75-31-0	5	12
Ketene	463-51-4	0.5	0.9
α-Lindane	319-84-6	-	0.5
γ-Lindane	58-89-9	-	0.5
Malathion	121-75-5	-	10
Maleic anhydride	108-31-6	0.25	1
Mercury (organic) (nonNESHAPS sources)	7439-97-6	-	0.05
2-Methoxyethanol (Methyl cellosolve)	109-86-4	5	16
Methylamine	74-89-5	10	12
Methyl chloromethylether	107-30-2	-	-
4,4'-Methylene dianiline	101-77-9	0.1	0.8
Methylethyl ketone (MEK)	78-93-3	200	590

Category A Moderate Toxicity Air Contaminants

Compound (ORGANICS) <u>Chemical Name</u>	CAS Registry Number	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Methyl hydrazine (monomethyl hydrazine)	60-34-4	0.2	0.35
Methyl isobutyl ketone	108-10-1	50	205
Methyl mercaptan	74-93-1	0.5	1.0
Methyl methacrylate	80-62-6	100	410
Mirex	2385-85-5	-	-
Monochlorobenzene	108-90-7	see chlorobenzene above	
Monomethyl hydrazine	60-34-4	see methyl hydrazine above	
Naphthalene	91-20-3	10	50
a-Naphthylamine	134-32-7	-	-
Nitrilotriacetic acid	139-13-9	-	-
p-Nitroaniline	100-01-6	-	3
Nitrobenzene	98-95-3	1	5
Nitroglycerine	55-63-0	0.5	0.5
p-Nitrochlorobenzene	100-00-5	-	1
p-Nitrophenol	100-02-7	-	-
1-Nitropropane	108-03-2	25	90
Nitroso-n-methylurea	684-93-5	-	-
p-Nitrosophenol	104-91-6	-	-
p-Nitrotoluene	99-99-0	2	11
Octachloronaphthalene	2234-13-1	-	0.1
Oil Mist (Mineral)	8012-95-1	-	5 (6)
Oxalic acid	144-62-7	-	1

Category A Moderate Toxicity Air Contaminants

Compound (IN ORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Paraquat	1910-42-5	-	0.1
Pentachlorophenol	87-86-5	-	0.5
Perchloroethylene	127-18-1	see tetrachloroethylene below	
Petroleum distillates	8002-05-9	-	-
Phenol	108-95-2	5	19
p-Phenylene diamine	106-50-3	-	0.1
Phenylhydrazine	100-63-0	5	20
Phosgene	75-44-5	0.1	0.4
Phosphine	7803-51-2	0.3	0.4
Picric acid	88-89-1	-	0.1
Propane sultone	1120-71-4	-	-
B-Propiolactone	57-57-8	0.5	1.5
Pyrethrin	121-29-9	See Pyrethrum	
Pyrethrum	8003-34-7	-	5.
Quinoline	91-22-5	-	-
Quinone	106-51-4	0.1	0.4
Rotenone (commercial)	83-79-4	0	5
Styrene, monomer	100-42-5	50	215
1,1,2,2-Tetrachloroethane	79-34-5	1	7
Tetrachloroethylene (Perchloroethylene)	127-18-4	50	335
Thiourea	62-56-6	-	-
Toluene-(2,4)-diamine	95-80-7	-	-

Category A Moderate Toxicity Air Contaminants

<u>Compound (ORGANICS)</u> <u>Chemical Name</u>	<u>CAS</u> <u>Registry</u> <u>Number</u>	<u>Threshold Limit</u> <u>Value(1)</u> <u>PPM</u>	<u>(TLV's)</u> <u>mg/m³</u>
o-Toluidine	95-53-4	2	9
Toxaphene (chlorinated camphene)	8001-35-2	-	0.5
1,2,4-Trichlorobenzene	120-82-1	C5	C40
1,1,2-Trichloroethane	79-00-5	10	45
Trichloroethylene	79-01-6	50	270
Urethane (Carbamic acid)	51-79-6	-	-
Vinylbromide	593-60-2	5	20
Vinyl fluoride	75-02-2	see Vinyl bromide	
o-Xylene (note: CAS 1300-20-7 assigned to mixed isomer xylenes)	95-47-6	100	435
m-Xylene	108-38-3	100	435
p-Xylene	106-42-3	100	435
Xylidine	1300-73-8	2.0	10

Category A Moderate Toxicity Air Contaminants

Compound (INORGANICS) <u>Chemical Name</u>	CAS Registry Number	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Ammonium bromide	12124-97-9	-	-
Antimony	7440-36-0	-	0.5
Antimony trioxide	1309-64-4	-	0.5
Barium	7440-39-3	-	0.5
Barium Sulfate	7727-43-7	-	-
Bromine	7726-95-6	0.1	0.7
Cadmium chloride (as Cd salt)	10108-64-2	-	0.05
Chlorine	7782-50-5	1	3
Chlorine dioxide	10049-04-4	0.1	0.3
Cobalt	7440-48-4	-	0.1
Cobalt oxide	1307-96-6	-	-
Cobalt sulfide	1317-42-6	-	-
Fluorine	7782-41-4	1	2
Lead acetate	1335-32-6	-	-
Mercury (inorganic) (non-NESHAPS sources)	7439-97-6	-	0.1
Phosphorous (yellow)	7723-14-0	-	0.1
Selenium	7782-49-2	-	0.2
Selenium sulfide	7488-56-4	-	0.2
Thallium(7)	7440-28-0	-	0.1
Thallium oxide	1314-32-5	-	0.1

Category A Moderate Toxicity Air Contaminants

Compound (INORGANICS) <u>Chemical Name</u>	CAS Registry Number	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Thallium (I) selenite	12039-52-0	-	0.1
Thallium sulfate	7446-18-6	-	0.1
Zinc bromide	7699-45-8	-	-
Zinc chloride (fume)	7646-85-7	-	1
Zinc oxide (fume)	1314-13-2	-	5

(1) 1984-85 ACGIH values

(3) (DM) denotes "de minimus" Interim AAL of 0.03 ug/m³ is recommended for use with Appendix A screening methodology. No chemical specific TLV or AAL is available at this time.

(4) "C" denotes ACGIH TLV-C, "ceiling limit". "The concentration that should not be exceeded even instantaneously."

(5) The higher degree of toxicity is due to isopropyl oil, a common manufacturing by-product.

(6) Oil Mist (mineral) as sampled by a method which does not collect vapor.

(7) The TLV of 0.1 mg/m³ is for soluble thallium compounds, as Tl. Thallium readily oxidizes in air at room temperature.

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CAT B

Category B Low Toxicity Air Contaminants

Compound (ORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Limit Value(1) PPM	(TLV's) mg/m ³
Acetone	67-64-1	750	1780
Acetonitrile	75-05-8	40	70
n-Butyl acetate	123-86-4	150	710
n-Butyl alcohol	71-36-3	C50 (3)	C150
Butyl benzyl phthalate	85-68-7	-	5 (4)
Chloromethane (Methyl chloride)	74-87-3	50	105
Cyclohexane	110-82-7	300	1050
Diethyl ether (1,1'-Oxybis-ethane)	60-29-7	(See Ethyl ether, below)	
Diethyl sebacate	122-62-3	-	-
Ethyl acetate	141-78-6	400	1400
Ethyl chloride	75-00-3	1000	2600
Ethyl ether (Diethyl ether, ethers)	60-29-7	400	1200
Glycerin Mist (5)	56-81-5	-	10
Glycol monoethylether (2-Ethoxyethanol)	110-80-5	5	9
n-Heptane	142-82-5	400	1600
Isoamyl acetate	123-92-2	100	525
Isoamyl alcohol	123-51-3	100	360
Isobutyl acetate	110-19-0	150	700
Pyridine	110-86-1	5	15
Resorcinol	108-46-3	10	45

Category B Low Toxicity Air Contaminants

Compound (ORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Tetrahydrofuran	109-99-9	200	590
Toluene (Toluol)	108-88-3	100	375
1,1,1-Trichloroethane (Methylchloroform)	71-55-6	350	1900
Turpentine	8006-64-2	100	560
Urea	57-13-6	-	-

* NOTE: 1000 ug/m³ = 1 mg/m³

Category B Low Toxicity Air Contaminants

Compound (INORGANICS) <u>Chemical Name</u>	CAS Registry <u>Number</u>	Threshold Value(1) PPM	Limit (TLV's) mg/m ³
Ammonia	7664-41-7	25	18
Copper, (fume)	7440-50-8	-	0.2
Copper, (dusts and mists, as Cu)	7440-50-8	-	1
Hydrogen bromide	10035-10-6	C3	C10
Hydrogen chloride	7647-01-0	C5	C7
Iodine	7553-56-2	C0.2	C1
Nitric acid	7697-37-2	2	5
Zinc	7440-66-6	-	-

NOTE: If you need categories for other compounds not found in these lists please call Ligia Mora-Applegate or Barry Andrews. SunCom 278-1344.

Reference: New York State Air Guide -1

Guidelines For the Control of Toxic Ambient Air Contaminants

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