KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

RECEIVED
JUN 19 1998
BUREAU OF
AIR REGULATION

KA 123-97-01

June 18, 1998

Mr. Syed Arif
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: DAP Emissions Information
North MAP/DAP Plant
Farmland Hydro, L.P.
DEP File No. 1050053-020-AC, PSD-FL-246

Dear Mr. Arif:

This is in response to your telephone conversation with Pradeep Raval today, requesting additional information on DAP emissions from the North MAP/DAP Plant.

The emission comparisons for DAP production are summarized in Tables 1 and 2. The emission calculations are also attached. The results of the comparison indicate that the PSD applicability previously submitted for particulate matter (PM) and fluorides (F), based on MAP production, is more conservative.

Regarding your request for additional supporting information for a F limit during MAP production, the information from a compliance test conducted earlier in the year is presented in Table 3. Based on these data, which indicate a F emission rate of 0.06 lb/ton P2O5, it requested that the F limit on the MAP production mode remain at 0.06 lb/ton P2O5. As explained during your site visit, the pipe reactor system in the MAP plant is very sensitive to process flow changes, and this results in a wider range of emissions than that for DAP production. We are not aware of any other MAP plant currently using a pipe reactor like Farmland's.

If you have any further questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:par

c: Charles Jenkins, Farmland Hydro, L.P.
cc: SWD
Polk Co.
EPA
NPS
C. Holladay, BAR

TABLE 1

CHANGES IN EMISSION RATES
NORTH MAP/DAP PLANT
BASED ON DAP PRODUCTION

| | ALLOWABLE EMISSION RATES | | | |
|---|---|---|---|---|
| | CURRENT (100 TPH DAP) | | PROPOSED (150 TPH DAP) | |
| | lb/hr | tpy | lb/hr | tpy |
| Fluorides | 2.76 | 12.1 | 4.22 | 18.5 |
| Particulates | 16.1 | 70.7 | 21.1 | 92.5 |

**NOTES**:

(1) See attached calculations of emission rates.
(2) The emission rates corresponds to the total for both North Plant stacks combined, when producing DAP.

TABLE 2

NET EMISSION CHANGES(1)
NORTH MAP/DAP PLANT
BASED ON DAP PRODUCTION

| POLLUTANT | EMISSION RATE (tpy) | | | | |
|---|---|---|---|---|---|
| | ACTUALS | PROPOSED | NET CHANGE | SIG.(2) | PSD? |
| Fluorides | 4.1 | 18.5 | 14.4 | 3 | YES |
| Particulates | 15.3 | 92.5 | 79.2 (3) | 25/15 | YES |
| Sulfur Dioxide | 0.04 | 11.1 (4) | 11.1 | 40 | NO |
| Nitrogen Oxides | 9.6 | 31.3 | 21.7 | 40 | NO |
| Carbon Monoxide | 2.4 | 7.8 | 5.4 | 100 | NO |
| Organics, VOCs | 0.2 | 0.2 | 0 | 40 | NO |

(1) See attached emission calculations.

(2) Pursuant to Rule 62-212, FAC. Significant levels for PM and PM10 are 25 and 15 tpy, respectively.

(3) The net increase includes contemporaneous emissions of 2.0 tpy.

(4) SO2 emissions are limited by low sulfur (0.05%) oil usage.

TABLE 3

EMISSION MEASUREMENTS DURING MAP PRODUCTION

# EXECUTIVE SUMMARY

## TOTAL PLANT STACK RESULTS
## FLUORIDE RESULTS

FEBRUARY 11-14, 1998

| RUN # | Dryer Stack F lb/hr | R/G Stack F lb/hr | TOTAL F lb/hr | TOTAL F lb/ton | Permit Limit F lb/ton |
|---|---|---|---|---|---|
| 1 | 0.687 | 1.609 | 2.296 | 0.048 | |
| 2 | 0.505 | 3.375 | 3.880 | 0.062 | |
| 3 | 0.510 | 4.697 | 5.207 | 0.084 | |
| Average | 0.567 | 3.227 | 3.794 | 0.06 | 0.06 |

## PARTICULATE RESULTS

| RUN # | Dryer Stack PM lb/hr | R/G Stack PM lb/hr | TOTAL PM lb/hr | Permit Limit PM lb/hr |
|---|---|---|---|---|
| 1 | 4.810 | 1.599 | 4.810 | |
| 2 | 4.306 | 3.790 | 8.096 | |
| 3 | 6.856 | 3.897 | 10.753 | |
| Average | 5.324 | 3.095 | 8.419 | 22.5 |

EMISSION CALCULATIONS
EMISSION COMPARISONS BASED ON DAP EMISSIONS

NORTH MAP/DAP PLANT
FARMLAND HYDRO, L.P.

**MAXIMUM ALLOWABLE EMISSION RATES**

The maximum F and PM emissions during DAP Production:

| | | |
|---|---|---|
| F | = | 2.76 lb/hr; 12.1 tpy |
| PM/PM10 | = | 16.1 lb/hr; 70.7 tpy |

**ACTUAL EMISSION RATES**

Based on 1995 and 1996 (same period used for MAP) compliance tests conducted during DAP production:

| Year | Hours Operated | Compliance Test Emission Rate (lb/hr) | |
|---|---|---|---|
| | | F | PM |
| 1995 | 7413 | 1.34 | 4.77 |
| 1996 | 7738 | 0.82 | 3.30 |
| AVERAGE | 7576 | 1.08 | 4.04 |

Actual F and PM/PM10 emissions can be estimated from the annual hours of operation and the DAP compliance test data. Estimated emissions of SO2, NOx, CO and VOCs are the same as previously submitted.

| | | |
|---|---|---|
| F | = | 1.08 lb/hr x 7576 hrs/yr x ton/2000 lbs |
| | = | 4.1 tpy |
| PM/PM10 | = | 4.04 lb/hr x 7576 hrs/yr x ton/2000 lbs |
| | = | 15.3 tpy |

**PROPOSED ALLOWABLE EMISSION RATES**

MAXIMUM PROCESS RATE: Based on maximum DAP production capacity and 98% conversion efficiency,

| | | | |
|---|---|---|---|
| | P2O5 INPUT | = | 150 tph DAP x 0.46 x 1/0.98 conversion |
| | (For DAP) | = | 70.4 tph P2O5 |
| NOTE: | P2O5 INPUT | = | 200 tph MAP x 0.52 x 1/0.98 conversion |
| | (For MAP) | = | 106.1 tph P2O5 |

| | | |
|---|---|---|
| F (DAP) | = | 70.4 tph P205 x 0.06 lb F/ton P205 |
| | = | 4.22 lb/hr |
| | x | 8760 hrs/yr x ton/2000 lbs |
| | = | 18.5 tpy |
| PM/PM10 (DAP) | = | 70.4 tph P205 x 0.3 lb PM/ton P205 |
| | = | 21.1 lb/hr |
| | x | 8760 hrs/yr x ton/2000 lbs |
| | = | 92.5 tpy |

**NET EMISSIONS INCREASES**

Net emissions = Proposed + Contemporaneous - Actual

Based on site permitting history, the following contemporaneous emissions would need to be included in the calculations.

| | | |
|---|---|---|
| F | = | 0 tpy |
| PM/PM10 | = | 2.0 tpy |

The net emissions increases associated with the proposed project can be estimated as follows:

| | | |
|---|---|---|
| F (DAP) | = | (18.5 + 0 - 4.1) tpy |
| | = | 14.4 tpy |

(NOTE: The net F increase projected under MAP mode was 23.4 tpy)

| | | |
|---|---|---|
| PM/PM10 (DAP) | = | (92.5 + 2.0 - 15.3) tpy |
| | = | 79.2 tpy |

(NOTE: The net PM increase projected under MAP mode was 97.3 tpy)

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345


IN REPLY REFER TO:

April 15, 1998


RECEIVED
APR 20 1998
BUREAU OF
AIR REGULATION


PSD-FL-246

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy: 1050053-020-AC
PSD-FL-246

Our Air Quality Branch has reviewed the additional information provided in the March 3, 1998, letter from Koogler & Associates to Mr. Syed Arif, Florida Department of Environmental Protection, and forwarded to us by your Department regarding Farmland Hydro, L.P.'s proposal to increase the monoammonium phosphate (MAP) and diammonium phosphate production rate at its phosphate fertilizer manufacturing facility in Polk County, Florida. In a January 28, 1998, letter and technical review document we requested that Farmland be required to meet lower emissions rates than those proposed for fluorides and particulate matter. In its March 3 letter, Farmland presented compliance test information to support their assertion that they could not meet our requested fluoride emission rate of 0.0417 lb/ton P2O5. Our Air Quality Branch has reviewed this test information, and their comments are summarized below.

Results from Farmland's past compliance tests appear inconsistent, particularly for fluoride emissions. For example, all tests from February 1994 to May 1996 demonstrated that very low emission rates were achievable for the MAP Reactor/Granulator. Significantly higher emission rates were observed in March 1997, skewing the average emission rates. Please require Farmland to submit information explaining the higher March 1997 results.

If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

H Dale Hall

for Sam D. Hamilton
Regional Director

cc: S. Arif, BAR
SWD
EPA
Polk Co.
Koogler & Assoc.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 123-97-01

April 9, 1998

RECEIVED
APR 13 1998
BUREAU OF
AIR REGULATION

Mr. Syed Arif
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Additional Information
North MAP/DAP Plant
Farmland Hydro, L.P.
DEP File No. 1050053-020-AC, PSD-FL-246

Dear Mr. Arif:

This is in response to FDEP's letter dated April 3, 1998, requesting additional information on the fluorides compliance test data for the North Plant reviewed by the U.S. Fish & Wildlife Service (FWS).

The data submitted to FDEP are based on actual compliance tests conducted in accordance with applicable testing requirements under normal operating conditions. The variability in fluoride emissions is typical for the North Plant. As can be expected, there is greater variability in emissions from individual plant sections than the total plant emissions. This shows how the fluoride emissions distribution within the plant can vary; a characteristic of phosphate fertilizer plants accounted for by EPA when promulgating the NSPS.

In our opinion, the higher R/G fluoride emissions in the March 1997 test can be explained by the fluorides distribution within the plant at the time of the test and the fact that the plant was operating at the highest material processing rate tested.

If you have any further questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

cc: File
SWD
Polk Co
Cleve Holladay, BAR
EPA
NPS

JBK:par

c: Charles Jenkins, Farmland Hydro, L.P.

# Department of
# Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

April 3, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. C. M. Farris, Vice President, Operations
Farmland Hydro, L.P.
Post Office Box 960
Bartow, Florida 33831

Re: DEP File No. 1050053-020-AC (PSD-FL-246)
Green Bay Facility, MAP/DAP Production Increases

Dear Mr. Farris:

Enclosed are the comments we received by fax from the Air Quality Branch of the Fish and Wildlife Service in response to your March 3, 1998 information addressing our letter dated January 23, 1998. We will send you a copy of the signed version from the Fish and Wildlife Service when we receive it. Please respond to their question about the compliance test information which was submitted in response to question No. 2 of the January 23, 1998 letter.

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call me at (850)488-1344.

Sincerely,

for Syed Arif, P.E.

SA/ch/t

Enclosure

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Joe King, Polk County
John Koogler, P.E.

**U.S.FISH&WILDLIFE SERVICE**
**AIR QUALITY BRANCH**
*P.O. BOX 25287, Denver, CO 80225-0287*

# FACSIMILE COVER SHEET

*Date: April 2, 1998*

*Telephone: (303) 969-2617*
*Fax: (303) 969-2822*

*To: FDEP*
*Through: Cleve Holladay*

*From: Ellen Porter*

*Subject: Farmland Hydro MAP/DAP Plant. Response to Koogler & Assoc. March 3 letter to FDEP.*

*We question the results of Farmland's past compliance tests, particularly for fluoride. For example, all tests from Feb 94 to May 96 demonstrated that very low levels were achievable for the R/G. Higher rates were observed in Mar 97, skewing the average. Please have Farmland provide information explaining why the Mar 97 results were significantly higher than those from previous tests.*

*Number of Pages:* 3
*(Including this cover sheet)*

*Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235*

P 265 659 326

US Postal Service
**Receipt for Certified Mail**
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

| | |
|---|---|
| Sent to Mr CM Farris | |
| Street & Number Farmland Hydro | |
| Post Office, State, & ZIP Code P.O. Box 960, Bartow, FL | |
| Postage | $ |
| Certified Fee | |
| Special Delivery Fee | |
| Restricted Delivery Fee | |
| Return Receipt Showing to Whom & Date Delivered | |
| Return Receipt Showing to Whom, Date, & Addressee's Address | |
| TOTAL Postage & Fees | $ |
| Postmark or Date 1056053-020-AC 4-3-98 PSD-FI-946 | |

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

**SENDER:**
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. R. M. Farris, VP
Farmland Hydro
P.O. Box 960
Bartow, FL 33831

4a. Article Number
P 265 659 326

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
APR - 7 1998

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*
X 960

6. Signature: *(Addressee or Agent)*
X Jean Hicks

PS Form 3811, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 123-97-01

March 3, 1998

RECEIVED
MAR 06 1998
BUREAU OF
AIR REGULATION

Mr. Syed Arif
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Additional Information
North MAP/DAP Plant
Farmland Hydro, L.P.
DEP File No. 1050053-020-AC, PSD-FL-246

Dear Mr. Arif:

This is in response to FDEP's letter dated January 23, 1998, requesting additional information on the above referenced project. The responses are in the order of the questions raised by FDEP and the U.S. Fish & Wildlife Service (FWS). Where the same issues were raised by both agencies, a single response has been provided.

1. **Please provide the process flow diagram for this project indicating the scrubbers at each process step and any minor modifications required to facilitate the increase in production rates for MAP/DAP. Also, provide information on the scrubbers, what type, efficiencies, etc.**

RESPONSE:

The proposed project does not involve any planned changes in the plant equipment. Some minor changes may be made, if required, to pumps, piping, ducting, etc. The requested information is presented in Attachment 1.

2. **Please note that a previous BACT for IMC-Agrico DAP Plant (PSD-FL-204) was determined to be 0.0417 lb/ton P205 for fluoride emissions. This was based on the historical compliance test results for fluoride emissions at their DAP plant. Please provide similar data of compliance test results (last five years) for the MAP/DAP plants. Indicate by statistical analyses the most stringent BACT limit (lb/ton P205) that can be established based on the compliance test results. Provide the same analysis for particulate matter emissions.**

RESPONSE:

The requested compliance test information is presented in Attachment 2. The statistical analysis of past compliance tests on the North MAP/DAP Plant indicates that the most stringent fluorides emissions limit, at a 99 percent confidence level, is 0.054 pound per ton P2O5 feed. This limit would be more stringent than the 0.06 pound per ton P2O5 proposed by Farmland. On the other hand the proposed particulate matter limit, of 0.288 pound per ton P2O5, is more restrictive than the statistically derived limit.

**3. Tables 3-1 and 3-2 of the application gives changes in emission rates and net emission changes for MAP production. Please provide the same information for DAP production.**

RESPONSE:

The requested information, based on DAP production, is included in Attachment 2. It should be noted that the PSD applicability determination is the same for either set of emissions data.

**4. The current air operating permit required emissions test from each stack (main stack and Reactor-Granulator stack) for ammonia during MAP/DAP production. Please provide the results for these tests, and indicate the percent loss of ammonia from the process.**

RESPONSE:

The information on ammonia tests results, shown below, indicates a negligible process loss (0.3 percent) by way of stack emissions.

| STACK | PRODUCT | AMMONIA FEED (tph) | AMMONIA EMISSIONS (lb/hr) | | | |
|---|---|---|---|---|---|---|
| | | | Run 1 | Run 2 | Run 3 | Avg. |
| R/G | MAP | 14.5 | 9.64 | 19.97 | 18.63 | 16.08 |
| DRYER | MAP | | 0.25 | 0.41 | 0.97 | 0.54 |
| R/G | DAP | 19.7 | 78.82 | 197.05 | 40.05 | 105.31 |
| DRYER | DAP | | 3.10 | 2.27 | 2.88 | 2.75 |

5. **The highest modeled concentration due to the proposed project is greater than the 24-hour PM10 Class II significant impact level; therefore, a full impact analysis to determine impacts on the ambient air quality standard (AAQS) and PSD Class II increment is required for the 24-hour PM10 averaging time.**

RESPONSE:

The particulate matter significant impact analysis (SIA) has been revised, based on discussions with Mr. Cleve Holladay, using an emissions rate from the plant of 30.6 pounds per hour, or 0.288 lb/ton P205 input. The SIA results indicate that the maximum predicted ambient air impacts are less than significant. A summary of the revised modeling analysis is presented in Attachment 3.

Issues Raised By U.S. Fish & Wildlife Service

6. **What are the control efficiencies of the scrubbers used in the North MAP/DAP Plant?**

RESPONSE:

Farmland's existing scrubber system combination is based on optimum process design. This design is inherently optimum for air pollution control also (see Attachment 1). Therefore, it is meaningful to address the overall system performance. As discussed in PSD-FL-186, reviewed by the NPS/FWS, the overall system is designed to achieve 99.9 percent control of fluorides.

7. **An explanation should be provided for the "0.52" factor used in the calculations.**

RESPONSE:

The factor of 0.52 used in the calculations represents the conversion of ton of MAP to tons of P205. The "tons of P205 input" reference, used in state and federal rules, is a convenient basis for comparing phosphate fertilizer plant capacities and emissions.

8. **Will other existing emission units be affected by the proposed project? All affected plants should be addressed in the PSD applicability. Modification of the MAP/DAP and SAP plants within the two years dictates that they be considered a single project.**

RESPONSE:

As discussed in the individual applications, all affected plants are addressed in the PSD applicability. The two PSD applications were submitted separately to FDEP as they are unrelated projects.

The sulfuric acid plant project was contemplated in order to increase reliability of sulfuric acid supply. Farmland is hoping to offset its current sulfuric acid purchases, and associated dependence on the unpredictable acid availability on the market, with the construction of the new plant.

On the other hand, the North MAP/DAP Plant just recently reached a point where Farmland felt comfortable with the existing plant's potential for higher operation rate based on the operation experience over the past few years. Some of the phosphoric acid shipped off-site, is proposed to be diverted to the North MAP/DAP Plant to increase production.

The two projects have not been combined into a single PSD project as they are independent projects. The request for an increase in fertilizer production will rely on the readily available phosphoric acid, not on any changes in sulfuric acid production. In past conversations with EPA staff, it was explained that to be considered together, the projects should be dependent projects. As explained above, the one project does not depend on the other.

**9. Provide supporting documentation for the cost estimates on the system using neutralized process water. Also, the latest version of the EPA Cost Control Manual now recommends a 7% interest rate.**

RESPONSE:

Most of the information, regarding cost estimates for a system using neutralized process water, was based on conversations with phosphate industry contractors in Florida. No written cost proposals were forthcoming from the contractors as the initial information was sufficient for them to establish that the system would not be cost effective for control of fluorides.

The interest rate of 7 percent, mentioned by the FWS for use in determining capital recovery, is based on EPA guidance. EPA also allows a sensitivity determination for an appropriate interest rate. Acceptable rates range from 3 percent, typically associated with consumables such as food and clothing, to 10 percent, associated with equipment such as plant machinery. The rate of 10 percent, in Farmland's case, also includes lost investment opportunity given the current investment market trends.

**10. Emission limits for fluorides and particulate matter should not exceed the emission limits required by other FDEP permits.**

RESPONSE:

The definition of BACT includes the consideration of numerous site specific factors on a case-by-case basis. This is evident in FDEP's current review and the RBLC information attached by the FWS.

We appreciate the prompt review and request for additional information from all parties involved in the review of the proposed project. If you have any further questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:par
Enc.

c: Charles Jenkins, Farmland Hydro, L.P.

cc: File
EPA
NPS
SWD
Polk Co
Cleve Holladay, BAC

## ATTACHMENT 1

PROCESS FLOW DIAGRAM

## LIST AND TYPE OF PLANT SCRUBBERS

REACTOR/GRANULATOR

| | | |
|---|---|---|
| HI-MOL SCRUBBER | : | HORIZONTAL SPRAY, CYCLONIC SEPARATOR |
| LO-MOL SCRUBBER | : | VENTURI, CYCLONIC SEPARATOR |
| BFL SCRUBBER | : | VAPORIZER/CONDENSER/SCRUBBER |

DRYER

| | | |
|---|---|---|
| DRYER SCRUBBER | : | VERTICAL SPRAY, CYCLONIC SEPARATOR |
| CROSS-FLOW SCRUBBER | : | CROSS-FLOW |

SCREEN/MILLS

| | | |
|---|---|---|
| S/M SCRUBBER | : | VERTICAL SPRAY, CYCLONIC SEPARATOR |
| CROSS-FLOW SCRUBBER | : | CROSS-FLOW |

COOLER

| | | |
|---|---|---|
| COOLER SCRUBBER | : | VENTURI, CYCLONIC SEPARATOR |

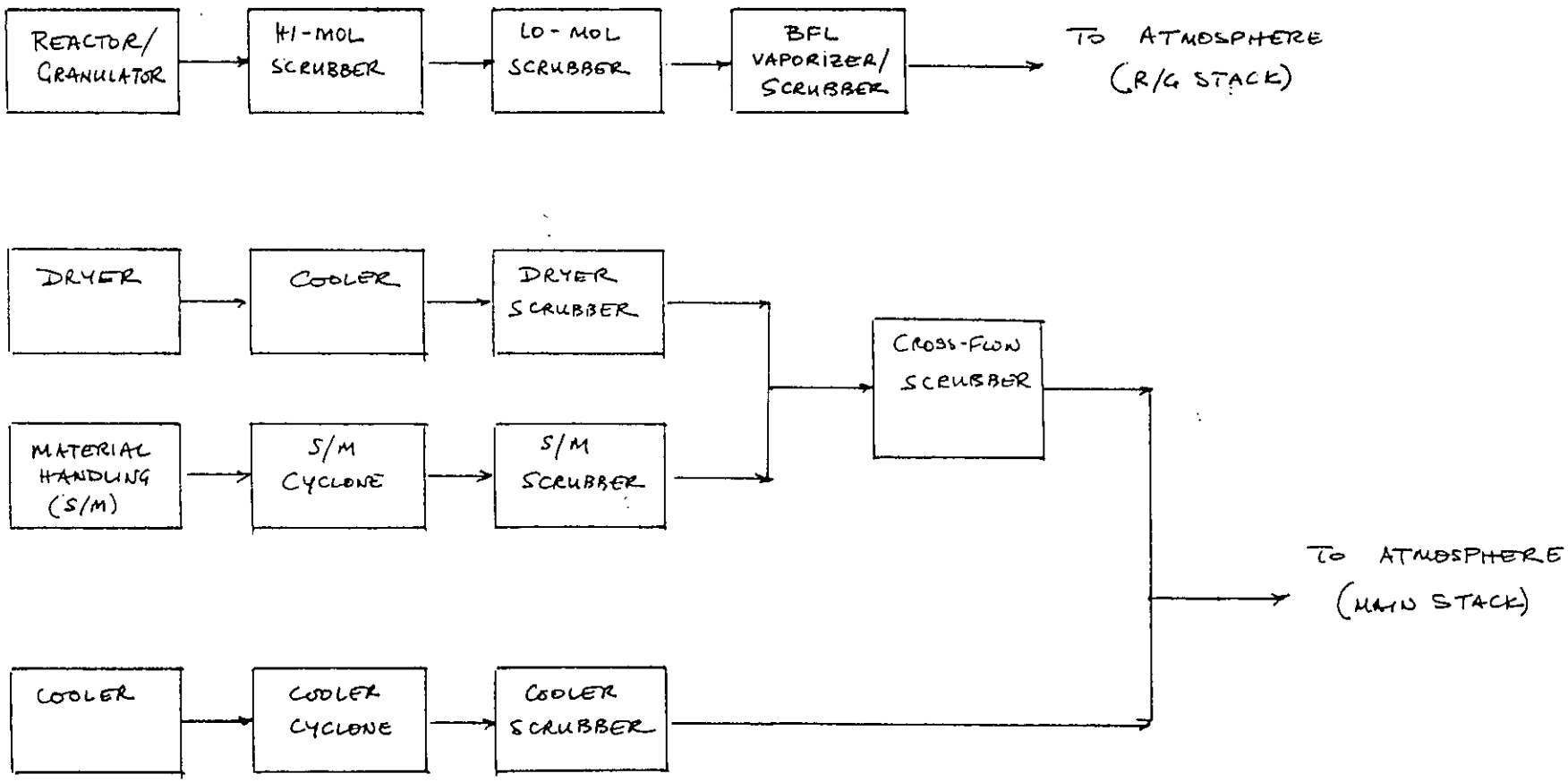
PLEASE SEE ATTACHED SCRUBBER PROCESS FLOW DIAGRAM FOR OVERALL ARRANGEMENT.

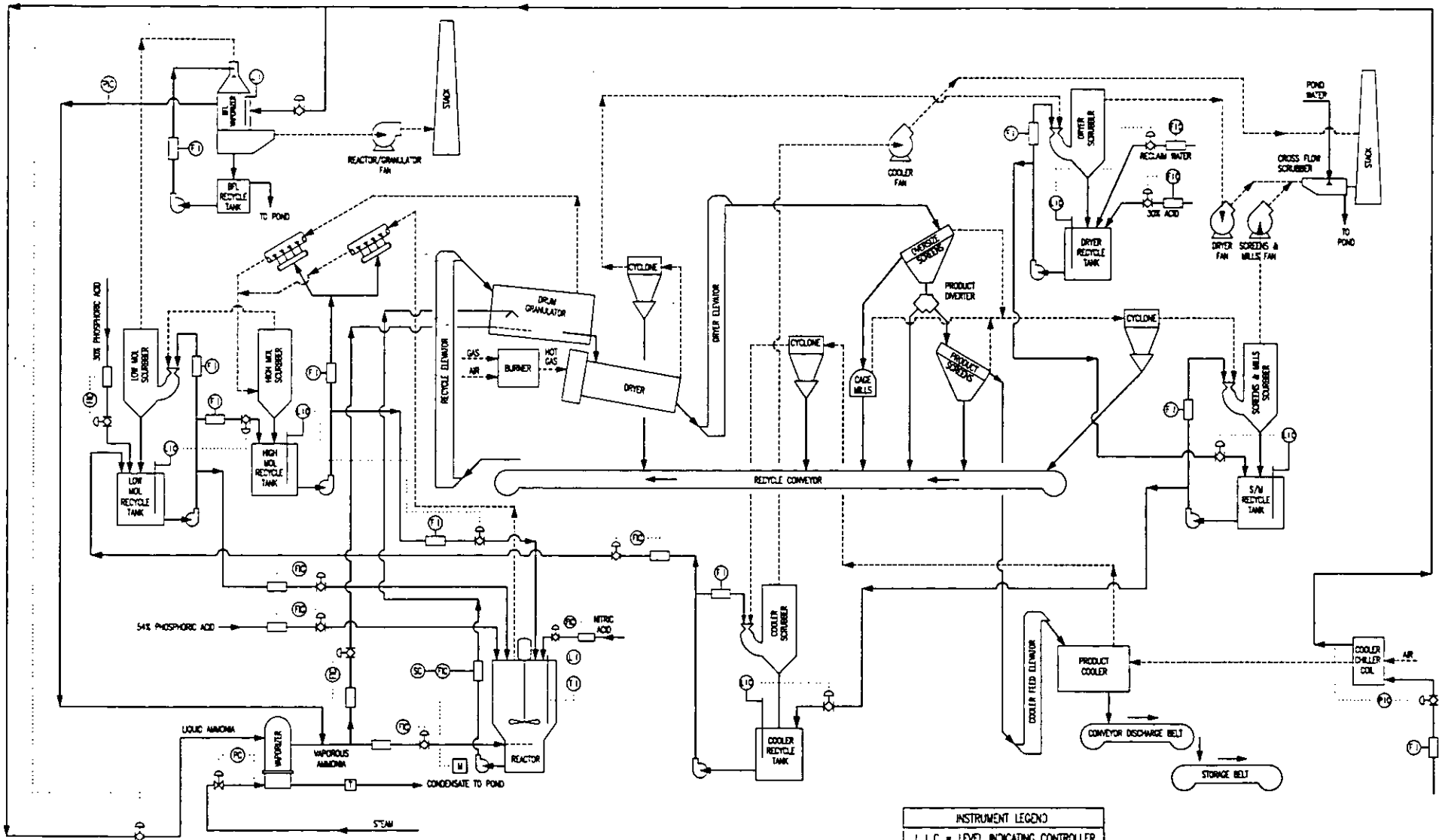
# PROCESS FLOW - CONTROLS (APC)

FARMLAND HYDRO, L.P.

MAP/DAP NORTH PLANT

(PROPOSED LAYOUT)





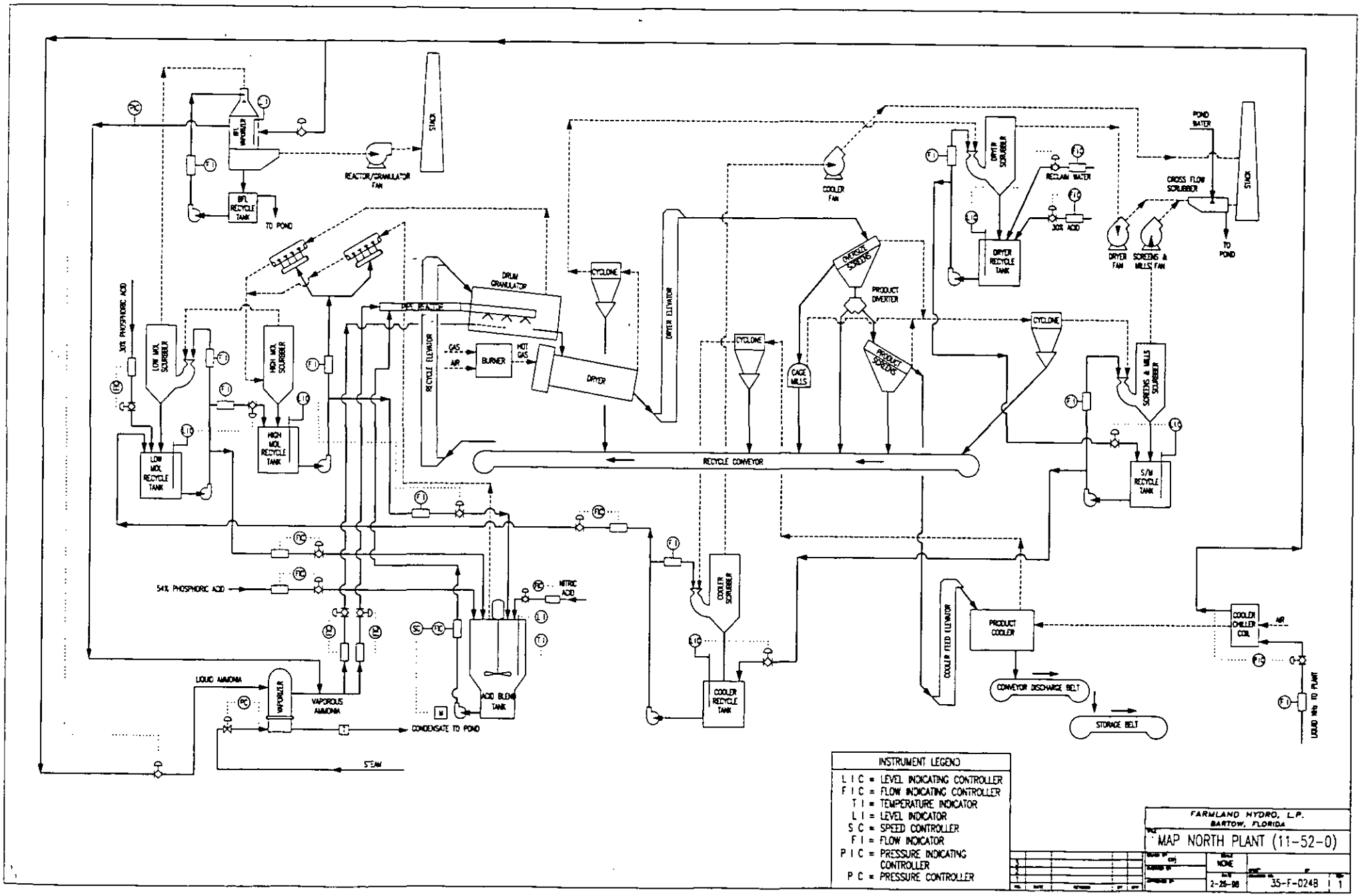

| INSTRUMENT LEGEND | |
|---|---|
| L I C | = LEVEL INDICATING CONTROLLER |
| F I C | = FLOW INDICATING CONTROLLER |
| T I | = TEMPERATURE INDICATOR |
| L I | = LEVEL INDICATOR |
| S C | = SPEED CONTROLLER |
| F I | = FLOW INDICATOR |
| P I C | = PRESSURE INDICATING CONTROLLER |
| P C | = PRESSURE CONTROLLER |

FARMLAND HYDRO, L.P.
BARTOW, FLORIDA

DAP NORTH PLANT (18-46-0)

| | | | |
|---|---|---|---|
| DRAWN BY | T.C. ADAMS | SCALE | NONE |
| DATE | 7-26-93 | DRAWING NO. | 35-F-024 |
| REV | 2 | | |

PLOTTED 2-26-98




| INSTRUMENT LEGEND | |
|---|---|
| L I C | = LEVEL INDICATING CONTROLLER |
| F I C | = FLOW INDICATING CONTROLLER |
| T I | = TEMPERATURE INDICATOR |
| L I | = LEVEL INDICATOR |
| S C | = SPEED CONTROLLER |
| F I | = FLOW INDICATOR |
| P I C | = PRESSURE INDICATING CONTROLLER |
| P C | = PRESSURE CONTROLLER |

FARMLAND HYDRO, L.P.
BARTOW, FLORIDA

MAP NORTH PLANT (11-52-0)

SCALE NONE
DATE 2-26-98
35-F-0248 1 1

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

KA 123-92-01

June 17, 1992

Mr. Willard Hanks
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Farmland Hydro, LP
MAP/DAP North Plant Permit Application

Dear Mr. Hanks:

Attached is information provided to Mr. Stan Kukier of EPA Region IV regarding the above project. This information will also serve to update your file on the project.

If you have any questions, please do not hesitate to call me.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep A. Raval

PAR:wa
Enc.

file

Faxed to Stan Kukier, EPA. PR 6/11/92

MEMORANDUM

TO: Mr. Willard Hanks
FDER, Tallahassee

FROM: Pradeep Raval Raval

DATE: April 20, 1992

SUBJECT: Additional Information on Farmland Hydro, L.P.
North Plant MAP/DAP Modification

This is in response to your request to identify the overall fluoride control in the proposed MAP/DAP North Plant project.

The fluorides in the feed to the North plant under DAP and MAP production mode will be 114.54 and 91.65 pounds fluoride/per ton of $P_2O_5$, respectively.

Based on the proposed fluoride emission limit of 0.06 pound per ton of $P_2O_5$, the overall process control efficiency can be estimated as follows:

MAP Mode:

Fluoride Control Eff. = (91.65 - 0.06)/91.65 x 100

= 99.9%

DAP Mode:

Fluoride Control Eff. = (114.65 - 0.06)/114.65 x 100

= 99.9%

It is anticipated that this response will satisfy the only remaining question you had on the proposed project.

If you have any additional questions, please do not hesitate to give me a call.

# ATTACHMENT 2

## COMPLIANCE TEST INFORMATION

**MAP Production - Fluoride Emissions**

| DATE | Rate TPH-P2O5 | Dryer F- lb/hr | Dryer F - lb/ton | Rate TPH-P2O5 | R/G F- lb/hr | R/G F - lb/ton | Combined F - lb/ton |
|---|---|---|---|---|---|---|---|
| Feb-94 | 56.4 | 0.700 | 0.0124 | 56.5 | 0.083 | 0.0015 | 0.0139 |
| Feb-94 | 56.4 | 0.645 | 0.0114 | 56.5 | 0.074 | 0.0013 | 0.0127 |
| Feb-94 | 56.4 | 0.537 | 0.0095 | 56.5 | 0.915 | 0.0162 | 0.0257 |
| Feb-95 | 56.5 | 0.710 | 0.0126 | 56.1 | 1.059 | 0.0189 | 0.0314 |
| Feb-95 | 56.5 | 0.787 | 0.0139 | 56.1 | 1.123 | 0.0200 | 0.0339 |
| Feb-95 | 56.5 | 0.753 | 0.0133 | 56.1 | 0.290 | 0.0052 | 0.0185 |
| May-96 | 58.5 | 0.616 | 0.0105 | 58.6 | 0.317 | 0.0054 | 0.0159 |
| May-96 | 58.5 | 0.781 | 0.0134 | 58.6 | 0.061 | 0.0010 | 0.0144 |
| May-96 | 58.5 | 0.655 | 0.0112 | 58.6 | 0.041 | 0.0007 | 0.0119 |
| Mar-97 | 62.2 | 0.474 | 0.0076 | 63.0 | 1.990 | 0.0316 | 0.0392 |
| Mar-97 | 62.2 | 0.378 | 0.0061 | 63.0 | 1.912 | 0.0303 | 0.0364 |
| Mar-97 | 62.2 | 0.346 | 0.0056 | 63.0 | 2.318 | 0.0368 | 0.0424 |
| | | Average = | 0.0106 | | | 0.0141 | 0.0247 |
| | | Standard Deviation = | 0.002863 | | | 0.013401 | 0.011430 |
| | | Average + 3 x Std. Dev. = | 0.0192 | | | 0.0543 | 0.0590 |

**MAP Production - PM Emissions**

| DATE | Rate TPH-P2O5 | Dryer PM-lb/hr | Dryer PM-lb/ton | Rate TPH-P2O5 | R/G PM-lb/hr | R/G PM-lb/ton | Combined PM-lb/ton |
|---|---|---|---|---|---|---|---|
| Feb-94 | 56.4 | 5.413 | 0.0960 | 56.5 | 0.940 | 0.0166 | 0.1126 |
| Feb-94 | 56.4 | 7.192 | 0.1275 | 56.5 | 0.857 | 0.0152 | 0.1427 |
| Feb-94 | 56.4 | 5.024 | 0.0891 | 56.5 | 1.570 | 0.0278 | 0.1169 |
| Feb-95 | 56.5 | 13.194 | 0.2335 | 56.1 | 2.266 | 0.0404 | 0.2739 |
| Feb-95 | 56.5 | 6.780 | 0.1200 | 56.1 | 2.610 | 0.0465 | 0.1665 |
| Feb-95 | 56.5 | 11.493 | 0.2034 | 56.1 | 1.846 | 0.0329 | 0.2363 |
| May-96 | 58.5 | 6.240 | 0.1067 | 58.6 | 2.588 | 0.0442 | 0.1508 |
| May-96 | 58.5 | 8.691 | 0.1486 | 58.6 | 3.292 | 0.0562 | 0.2047 |
| May-96 | 58.5 | 8.596 | 0.1469 | 58.6 | 2.121 | 0.0362 | 0.1831 |
| Mar-97 | 62.2 | 2.096 | 0.0337 | 63.0 | 1.490 | 0.0237 | 0.0573 |
| Mar-97 | 62.2 | 2.741 | 0.0441 | 63.0 | 1.489 | 0.0236 | 0.0677 |
| Mar-97 | 62.2 | 2.967 | 0.0477 | 63.0 | 1.538 | 0.0244 | 0.0721 |
| | | Average = | 0.1164 | | | 0.0323 | 0.1487 |
| | | Standard Deviation = | 0.061380 | | | 0.012669 | 0.068176 |
| | | Average + 3 x Std. Dev. = | 0.3006 | | | 0.0703 | 0.3533 |

While the preferred limits are indicated above, the limits based on a 99 percent confidence level can be estimated as follows:

F = 0.0247 + 2.58 x 0.01143

= 0.054 lb/ton P2O5 input

PM = 0.1487 + 2.58 x 0.068176

= 0.325 lb/ton P2O5 input

**DAP Production - Fluoride Emissions**

| DATE | Rate TPH-P2O5 | Dryer F- lb/hr | Dryer F - lb/ton | Rate TPH-P2O5 | R/G F- lb/hr | R/G F - lb/ton | Combined F - lb/ton |
|---|---|---|---|---|---|---|---|
| Feb-94 | 40.4 | 0.743 | 0.0184 | 37.6 | 0.107 | 0.0028 | 0.0213 |
| Feb-94 | 40.4 | 0.725 | 0.0180 | 37.6 | 0.152 | 0.0040 | 0.0220 |
| Feb-94 | 40.4 | 0.783 | 0.0194 | 37.6 | 0.123 | 0.0033 | 0.0227 |
| Feb-95 | 40.7 | 0.831 | 0.0204 | 40.9 | 0.877 | 0.0214 | 0.0418 |
| Feb-95 | 40.7 | 0.784 | 0.0193 | 40.9 | 0.432 | 0.0106 | 0.0298 |
| Feb-95 | 40.7 | 0.834 | 0.0205 | 40.9 | 0.249 | 0.0061 | 0.0266 |
| May-96 | 37.1 | 0.623 | 0.0168 | 38.9 | 0.178 | 0.0046 | 0.0214 |
| May-96 | 37.1 | 0.706 | 0.0190 | 38.9 | 0.127 | 0.0033 | 0.0223 |
| May-96 | 37.1 | 0.765 | 0.0206 | 38.9 | 0.071 | 0.0018 | 0.0224 |
| Mar-97 | 44.3 | 0.820 | 0.0185 | 43.6 | 0.320 | 0.0073 | 0.0259 |
| Mar-97 | 44.3 | 0.834 | 0.0188 | 43.6 | 0.186 | 0.0043 | 0.0231 |
| Mar-97 | 44.3 | 0.685 | 0.0155 | 43.6 | 0.218 | 0.0050 | 0.0205 |
| | | Average = | 0.0188 | | | 0.0062 | 0.0250 |
| | | Standard Deviation = | 0.001518 | | | 0.005331 | 0.005951 |
| | | Average + 3 x Std. Dev. = | 0.0233 | | | 0.0222 | 0.0428 |

**DAP Production - PM Emissions**

| DATE | Rate TPH-P2O5 | Dryer PM-lb/hr | Dryer PM-lb/ton | Rate TPH-P2O5 | R/G PM-lb/hr | R/G PM-lb/ton | Combined PM-lb/ton |
|---|---|---|---|---|---|---|---|
| Feb-94 | 40.4 | 1.148 | 0.0284 | 37.6 | 0.432 | 0.0115 | 0.0399 |
| Feb-94 | 40.4 | 0.950 | 0.0235 | 37.6 | 0.688 | 0.0183 | 0.0418 |
| Feb-94 | 40.4 | 1.447 | 0.0358 | 37.6 | 0.602 | 0.0160 | 0.0518 |
| Feb-95 | 40.7 | 2.420 | 0.0594 | 40.9 | 2.199 | 0.0538 | 0.1132 |
| Feb-95 | 40.7 | 3.431 | 0.0842 | 40.9 | 3.083 | 0.0754 | 0.1596 |
| Feb-95 | 40.7 | 2.857 | 0.0701 | 40.9 | 0.354 | 0.0087 | 0.0788 |
| May-96 | 37.1 | 2.677 | 0.0722 | 38.9 | 0.896 | 0.0230 | 0.0952 |
| May-96 | 37.1 | 2.635 | 0.0710 | 38.9 | 0.978 | 0.0251 | 0.0962 |
| May-96 | 37.1 | 1.768 | 0.0477 | 38.9 | 0.950 | 0.0244 | 0.0721 |
| Mar-97 | 44.3 | 11.415 | 0.2578 | 43.6 | 0.595 | 0.0136 | 0.2715 |
| Mar-97 | 44.3 | 5.674 | 0.1282 | 43.6 | 0.185 | 0.0042 | 0.1324 |
| Mar-97 | 44.3 | 3.031 | 0.0685 | 43.6 | 0.740 | 0.0170 | 0.0854 |
| | | Average = | 0.0789 | | | 0.0242 | 0.1032 |
| | | Standard Deviation = | 0.062946 | | | 0.020364 | 0.063854 |
| | | Average + 3 x Std. Dev. = | 0.2678 | | | 0.0853 | 0.2947 |

While the preferred limits are indicated above, the limits based on a 99 percent confidence level can be estimated as follows:

F = 0.025 + 2.58 x 0.005951

= 0.040 lb/ton P2O5 input

PM = 0.1032 + 2.58 x 0.063854

= 0.268 lb/ton P2O5 input

# ATTACHMENT 3

## MODELING INFORMATION

TABLE 5-1a

REVISED AIR QUALITY MODELING PARAMETERS
FOR PARTICULATE MATTER

FARMLAND HYDRO, L.P.
POLK COUNTY, FLORIDA

| Stack | | Emissions (g/s) | Ht (m) | Dia (m) | Vel (mps) | Temp (°K) |
|---|---|---|---|---|---|---|
| R/G (Current) | PM/PM10 | 0.83 | 39.3 | 1.68 | 10.64 | 354 |
| R/G (Proposed) | PM/PM10 | 1.00 | 39.3 | 1.68 | 13.90 | 372 |
| Dryer/Cooler (Current) | PM/PM10 | 2.00 | 39.3 | 2.29 | 13.11 | 315 |
| Dryer/Cooler (Proposed) | PM/PM10 | 2.85 | 39.3 | 2.29 | 19.55 | 316 |

TABLE 5-2a

REVISED SUMMARY OF SIGNIFICANT IMPACT ANALYSES
FOR PARTICULATE MATTER

FARMLAND HYDRO, L.P.
POLK COUNTY, FLORIDA

| MET YEAR | MAX. PREDICTED PM10 AMBIENT AIR IMPACTS (ug/m3) (1) | | | |
|---|---|---|---|---|
| | Class I Area | | Class II Area | |
| | 24-hr | Annual | 24-hr | Annual |
| 1987 | 0.02 | 0.001 | 4.44 | 0.11 |
| 1988 | 0.02 | 0.001 | 4.93 | 0.11 |
| 1989 | 0.02 | 0.001 | 3.57 | 0.09 |
| 1990 | 0.02 | 0.001 | 3.61 | 0.12 |
| 1991 | 0.02 | 0.001 | 4.14 | 0.11 |
| EPA SIG.(2) | 0.3 | 0.2 | 5 | 1 |
| NPS SIG.(3) | 0.27 | 0.08 | NA | NA |
| Is Impact Significant ? | NO | NO | NO | NO |

NOTES:

(1) The above predicted impacts represent the highest-high impacts.
(2) Significant impact levels proposed by EPA.
(3) Significant impact levels suggested by National Park Service.

THIS DISK CONTAINS PARTICULATE MATTER (PM) MODELING FILES FOR THE FARMLAND HYDRO, L.P. FACILITY IN GREEN BAY, FLORIDA. THE FOLLOWING ARE OUTPUT FILES ARE IN ASCII FORMAT.

THE FOLLOWING FILES CONTAIN ISCST3 MODELING OF:
SIA FOR CLASS I AREA CHASSAHOWITZKA NWR, AND CLASS 2 AREAS AND BUILDING DOWNWASH PROFILE INPUT PROGRAM (BPIP) FILES.

CLASS 1 MODELING OF SIGNIFICANT IMPACT ANALYSIS (SIA) FOR CHASSAHOWITZKA NWR CLASS 1 AREAS ARE PROVIDED IN THE FOLLOWING FILES:

| | | | | |
|---|---|---|---|---|
| FRM1PM87 | OUT | 51,002 | 02-04-98 | PM CLASS 1 SIA FOR 1987 |
| FRM1PM88 | OUT | 51,002 | 02-04-98 | PM CLASS 1 SIA FOR 1988 |
| FRM1PM89 | OUT | 51,002 | 02-04-98 | PM CLASS 1 SIA FOR 1989 |
| FRM1PM90 | OUT | 51,002 | 02-04-98 | PM CLASS 1 SIA FOR 1990 |
| FRM1PM91 | OUT | 51,002 | 02-04-98 | PM CLASS 1 SIA FOR 1991 |

SIGNIFICANT IMPACT ANALYSIS (SIA) FOR CLASS 2 AREAS ARE PROVIDED IN THE FOLLOWING FILES;

| | | | | |
|---|---|---|---|---|
| FRM2PM87 | OUT | 168,946 | 02-04-98 | PM CLASS 2 AND FAAQS SIA FOR 1987 |
| FRM2PM88 | OUT | 168,946 | 02-04-98 | PM CLASS 2 AND FAAQS SIA FOR 1988 |
| FRM2PM89 | OUT | 168,946 | 02-04-98 | PM CLASS 2 AND FAAQS SIA FOR 1989 |
| FRM2PM90 | OUT | 168,946 | 02-04-98 | PM CLASS 2 AND FAAQS SIA FOR 1990 |
| FRM2PM91 | OUT | 168,946 | 02-04-98 | PM CLASS 2 AND FAAQS SIA FOR 1991 |

BUILDING INPUT PROFILE PROGRAM (BPIP) FILES ARE PROVIDED IN BPIP-DW.EXE. BUILDING DOWNWASH CALCULATIONS ARE USED IN ALL MODELING. THE FOLLOWING BPIP FILES ARE PROVIDED;

| | | | | |
|---|---|---|---|---|
| FRM1 | INP | 2,124 | 10-28-97 | INPUT FOR PM SOURCES |
| FRM1 | OUT | 5,836 | 10-28-97 | OUTPUT FOR PM SOURCES |
| FRM1 | SUM | 91,659 | 10-28-97 | SUMMARY FOR PM SOURCES |

IF THERE ARE ANY QUESTIONS OR IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CALL.

FEBRUARY 4, 1998
KOOGLER AND ASSOCIATES
(352) 377-5822
KOOGLER@WORLDNET.ATT.NET

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345


IN REPLY REFER TO:

January 28, 1998


RECEIVED

FEB 04 1998

BUREAU OF
AIR REGULATION


Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

1050053-020-AC
PSD-FL-246

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application from Farmland Hydro, L.P., to increase the monoammonium phosphate and diammonium phosphate production rate at its phosphate fertilizer manufacturing facility in Polk County, Florida. The plant is located 110 km south of Chassahowitzka Wilderness, a Class I air quality area, administered by the Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

A Dale Hall

for Sam D. Hamilton
Regional Director

Enclosures

cc: J. Reynolds, BAR
C. Holladay, BAR

**Technical Review of Prevention of Significant Deterioration Permit Application for Farmland Hydro, L.P.'s Proposed Increase in Production of Monoammonium Phosphate and Diammonium Phosphate Polk County, Florida**

**by**

**Air Quality Branch, Fish and Wildlife Service – Denver**
**January 22, 1998**

Farmland Hydro, L.P., (Farmland) is proposing to increase the monoammonium phosphate (MAP) and diammonium phosphate (DAP) production rate at its phosphate fertilizer manufacturing facility in Polk County, Florida. The plant is located 110 km south of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The project will result in significant increases in emissions of fluorides (F) and particulate matter (PM).

| POLLUTANT | EMISSIONS INCREASE (TPY) |
|---|---|
| F | 23.4 |
| PM | 97 |

We find the permit application to be incomplete for the following reasons.

**Prevention of Significant Deterioration (PSD) Applicability**

In November 1997, Farmland submitted a Prevention of Significant Deterioration (PSD) permit application to expand its sulfuric acid plant (SAP) production capacity. The currently proposed MAP/DAP production increase would occur at the same manufacturing facility. Therefore, the two projects should be considered as one. According to the EPA *New Source Review Workshop Manual*,

> "Usually, at least two basic questions should be asked when evaluating the construction of multiple minor projects to determine if they should have been considered a single project. First, were the projects proposed over a relatively short period of time? Second, could the changes be considered as part of a single project?"

Because the projects would occur within two years of each other, and because the SAP ultimately feeds the MAP/DAP, they should be considered a single project. Both of the recent applications from Farmland should be combined and the effects of these projects on other emission sources at the facility should be evaluated with respect to PSD applicability and impacts.

In addition, the emissions calculations provided in Appendix A are not explained adequately. The equipment covered is not described and the origin of the "0.52" factor used in the input calculation is not explained.

**Best Available Control Technology (BACT) Analysis**

Farmland proposes that the existing wet scrubbing system, consisting of a two-stage wet scrubber followed by an ammonia vaporizer be considered BACT. However, because Farmland did not provide control efficiency estimates in this application, it is impossible to evaluate the effectiveness of the system. A similar system shown in the RACT/BACT/LAER Clearinghouse (RBLC) has a fluoride removal efficiency of 99.9%, but it is unclear whether Farmland's proposed technology would achieve this level of control.

Farmland rejected an alternate control technology, a packed bed scrubber using neutralized process water, on the basis of excessive cost. However, no documentation supporting the cost estimates was provided, and costs cannot be verified. Furthermore, the 10% interest rate used to calculate the capital recovery factor is incorrect. The latest version of the EPA Control Cost Manual recommends a 7% interest rate.

In addition, Farmland has proposed limits for fluoride emissions of 0.06 pounds per ton (lb/T) of feed material ($P_2O_5$) and for particulate matter of 0.3 lb/T of feed. The Florida Department of Environmental Protection (FDEP) has required similar plants to meet substantially lower limits for fluoride of 0.0417 lb/T and for particulate matter of 0.19 lb/T (see enclosed table).

***BACT Analysis Conclusions & Recommendations***

Both of the recent applications from Farmland should be combined and reviewed as one project, and the effects of these projects on other emission sources at the facility should be evaluated with respect to PSD applicability and impacts.

The application should be considered incomplete until the applicant provides more complete information on the nature of the processes to be modified, emission changes, effectiveness of the proposed control technology, and documentation to support the costs presented for competing control alternatives.

Emission limits should not exceed the 0.0417 lb fluoride/T and 0.19 lb particulate matter/T limits required by other similar permits issued by FDEP.

**Air Quality Related Values (AQRV) Analysis**

Farmland concluded that because the predicted air quality impacts were less than the significant impact levels for increment, no adverse impacts to Class I AQRVs would be expected. We agree that the potential for impacts to Class I AQRVs from this project is low, but our conclusion is based the distance of the project and the types and amounts of emissions. As we

have stated in the past, the AQRV analysis is independent of the Class I increment analysis. A source may have an adverse impact on AQRVs even though its predicted impacts are less than the significant impact levels for increment.

Farmland conducted a VISCREEN analysis to assess potential visible plume impacts to Chassahowitzka. The analysis predicted that this project would have a low potential to cause visible plumes in Chassahowitzka. However, we would like to clarify several points regarding this analysis.

First, because Farmland is greater than or equal to 50 km from a model receptor in the Class I area, Farmland should have consulted our office regarding the need for a regional haze analysis (see attached "Interim Visibility Modeling Guidance for Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida"). If the only significant emissions included 97 TPY PM and 23 TPY F, we would advise Farmland that a regional haze analysis was not required because of the low potential for impacts. However, if FDEP determines that the two Farmland applications should be combined and reviewed as one, Farmland should perform a regional haze analysis taking into consideration all emissions increases due to the SAP project and the MAP/DAP project. Farmland should compare their contribution to regional haze to the screening level of 0.5 deciview. If their predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, Farmland should conduct a cumulative modeling analysis including proposed emissions and all other increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

**Interim Visibility Modeling Guidance**
**For Sources Locating or Expanding Near**
**Chassahowitzka Wilderness, Florida**
**December 1997**

This Interim Visibility Modeling Guidance Document has been developed for use by PSD permit applicants seeking to locate or expand near Chassahowitzka Wilderness, a Class I area administered by the U.S. Fish and Wildlife Service (FWS). A more detailed, comprehensive guidance document will be available in early 1998.

Applicants should assume a background visual range of 65 km for Chassahowitzka Wilderness.

***Sources less than 50 km from a Class I area:***

Sources ***less than 50 km*** from a Class I area should perform an analysis to assess the potential for visible plumes from their emissions at the Class I area. The recommended models are VISCREEN (Levels 1 and 2) as the screening model and PLUVUE II as the more refined model. If the screening or refined modeling predicts an impact less than a delta E of 2.0 and a contrast of 0.05, no plume impact is expected and no further analysis is required. If the modeling predicts an impact equal to or greater than the 2.0 or 0.05 values, the potential for plume impacts is significant and the FLM will determine on a case-by-case basis whether or not those impacts would be adverse, considering predicted frequency, magnitude, duration, and other factors.

***Sources greater than or equal to 50 km from a Class I area:***

Sources ***greater than or equal to 50 km*** from a model receptor in a Class I area should perform an analysis to assess the potential for a significant increase in uniform (i.e., regional) haze in the Class I area due to the source's emissions. The source may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If the predicted impact is less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If the predicted impact is greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including the new source's proposed emissions and all other increment-consuming emissions. If the cumulative analysis predicts an impact less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If the cumulative impact is greater than 1.0 deciview, a significant increase in haze is possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the predicted frequency, magnitude, and duration of impacts.

Contact: Bud Rolofson, FWS Air Quality Branch (303) 969-2804

**Fertilizer Plant Permits from RBLC**

| Plant | Permit Issued | Product | Pollutant | Control Technology | Control Efficiency | Permit Emission Rate (Lb/T P205) | Average Emission Rate (Lb/T P205) |
|---|---|---|---|---|---|---|---|
| C. F. Industries | 5/25/92 | MAP | F | 2-stage scrubber w. cooler | 99.8% | 0.06 | |
| | | | | fresh water in last stage | | | |
| Farmland Hydro | 7/28/92 | DAP/MAP | F | multi-stage scrubbers | 99.9% | 0.06 | |
| IMC-Agrico | 4/13/94 | DAP | F | venturi scrubber | | 0.0417 | |
| IMC-Agrico | 4/18/94 | DAP | F | venturi scrubber | | 0.0417 | |
| | | | | | | | 0.05 |
| | | | | | | | |
| Cargill | 11/28/94 | DAP | PM | venturi/packed tower | | 0.19 | |
| Cargill | 10/13/92 | DAP | PM | venturi/packed tower | | 0.19 | |
| IMC-Agrico | 4/13/94 | DAP | PM | venturi scrubber | | 0.41 | |
| IMC-Agrico | 4/18/94 | DAP | PM | venturi scrubber | | 0.41 | |
| | | | | | | | 0.30 |
| | | | | | | | |
| Cargill | 10/13/92 | DAP | SO2 | 0.5% S oil | | 0.56 | 0.56 |

# Department of
# Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

January 23, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. C. M. Farris, Vice President, Operations
Farmland Hydro, L.P.
Post Office Box 960
Bartow, Florida 33831

Re: DEP File No. 1050053-020-AC (PSD-FL-246)
Green Bay Facility, MAP/DAP Production Increases

Dear Mr. Farris:

The Department has received the application on December 24, 1997 for an increase in the monoammonium and diammonium phosphate production rates of the existing facility at the Farmland's Green Bay Complex in Polk County. Based on our initial review of the proposed project, we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation:

1. Please provide the process flow diagram for this project indicating the scrubbers at each process step and any minor modifications required to facilitate the increase in production rates for MAP/DAP. Also, provide information on the scrubbers, what type, efficiencies, etc.
2. Please note that a previous BACT for IMC-Agrico DAP Plant (PSD-FL-204) was determined to be 0.0417 lb/ton $P_2O_5$ for fluoride emissions. This was based on the historical compliance test results for fluoride emissions at their DAP plant. Please provide similar data of compliance test results (last five years) for the MAP/DAP plants. Indicate by statistical analyses the most stringent BACT limit (lb/ton $P_2O_5$) that can be established based on the compliance test results. Provide the same analyses for particulate matter emissions.
3. Tables 3-1 and 3-2 of the application gives changes in emission rates and net emission changes for MAP production. Please provide the same information for DAP production.
4. The current air operating permit required emissions test from each stack (main stack and Reactor-Granulator stack) for ammonia during MAP/DAP production. Please provide the results for these tests, and indicate the percent loss of ammonia from the process.

5. The highest modeled concentration due to the proposed project is greater than the 24-hour $PM_{10}$ Class II significant impact level; therefore, a full impact analysis to determine impacts on the ambient air quality standard (AAQS) and PSD Class II increment is required for the 24-hour $PM_{10}$ averaging time.

We are including correspondence we have received from the U.S. Fish and Wildlife Service Please respond to their comments. We have not yet received comments from EPA. Their comments will be forwarded to you as soon as we receive them.

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call Cleve Holladay or John Reynolds (while Syed Arif is on leave) at (850)488-1344.

Sincerely,

1/23

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/sa

Enclosure

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Joe King, Polk County
John Koogler, P.E.

P 265 659 285

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# FACSIMILE COVER SHEET

*Date:* 1/20/98

*Telephone:* (303) 969-2617
*Fax:* (303) 969-2822

*To:* Cleve Holladay

*From:* Ellen Porter

*Subject:* Farmland Hydro

*Number of Pages:*
*(Including this cover sheet)* 5

*Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235*

**MEMORANDUM**

**To:** **Cleve Holladay**

**From:** **Ellen Porter**

**Subject:** **Farmland Hydro, L.P.**

**Date:** **January 20, 1998**

**General Comments**

The permit application is incomplete in several details, as discussed below. A process flow diagram and a description of the exact equipment affected by the proposed modification would be helpful. Also, the application implies that there will be no increase in emissions from the storage and shipping of MAP and DAP, despite their increased production. Farmland should explain this apparent contradiction. And, although the scrubber presumably controlling the dryer/screens/mills stack and R/G stack is proposed as Best Available Control Technology (BACT), no control efficiency is given. Emissions calculations provided in Appendix A are explained poorly or not at all; the equipment covered is not described and the origin of the "0.52" factor used in the input calculation is not explained.

**Prevention of Significant Deterioration (PSD) Applicability**

One overarching issue that must be addressed is the relationship of the proposed project to other existing emission units at this source. In late 1997, Farmland Hydro (FH) submitted a Prevention of Significant Deterioration (PSD) permit application to expand its sulfuric acid plant (SAP) production capacity. Any pollutant subject to PSD must be controlled through the use of BACT and the applicant must demonstrate that it will not adversely affect air quality. Although FH stated in that application that PSD applied only to sulfuric acid mist, nitrogen oxides, and sulfur dioxide from the new sulfuric acid plant, an increase in production at the sulfuric acid plant that would result in a corresponding increase in production and emissions at other fertilizer operations at this facility must also be counted towards triggering PSD. In addition to the pollutants noted above, emissions of hydrogen sulfide and volatile organic compounds from the other affected parts of the plant must be added to determine PSD applicability for those pollutants. In our comments to FDEP regarding the SAP, FWS advised that the applicant should quantify and add any increases in emissions of these pollutants from the existing facility to the quantities described above.

FH now proposes to expand the utilization of its monoammonium phosphate (MAP) and diammonium phosphate (DAP) plant by requesting that its permit limits be revised to reflect greater production. FH's application is based on the premise that it triggers PSD for only fluorides (F) and particulate matter (PM). Although FH has quantified the increases in emissions that occur at the existing MAP/DAP due to its increased

utilization, it should also include any increases in emissions that could occur at the phosphoric and sulfuric acid plants that also supply materials to the MAP/DAP plant. If the MAP/DAP plant requires the production of additional phosphoric acid to supply its input, the resulting increase in fluorides must be considered. Furthermore, because production of more phosphoric acid typically requires the use of more sulfuric acid and phosphate rock, the $SO_2$ and PM emissions that result from production and use of these substances at this source must be included.

Modification of the MAP/DAP and SAP within two years dictates that they be considered a single project. Rather than treating this application as a separate modification of an existing facility, it should instead be considered along with the SAP application and the air quality impacts of both projects should be reviewed. According to the EPA *New Source Review Workshop Manual*, "Usually, at least two basic questions should be asked when evaluating the construction of multiple minor projects to determine if they should have been considered a single project. First, were the projects proposed over a relatively short period of time? Second, could the changes be considered as part of a single project?" Because the projects occur within two years of each other, and because the SAP ultimately feeds the MAP/DAP, they must be considered a single project. In that case, potential emissions of all pollutants should be compared to their respective PSD thresholds. Those pollutants subject to PSD should be subjected to full PSD review, including Best Available Control Technology (BACT), increment, and impacts analyses.

**Best Available Control Technology (BACT)**

FH proposes that the existing wet scrubbing system, consisting of a two–stage wet scrubber followed by an ammonia vaporizer be considered BACT. Although this may be the same system that is shown in the RACT/BACT/LAER Clearinghouse (RBLC) as having a fluoride removal efficiency of 99.9%, in the absence of any control efficiency estimates in this application, it is impossible to evaluate its effectiveness.

FH rejected an alternate control technology, a packed bed scrubber using neutralized process water, on the basis of excessive cost. However, no documentation supporting any of the cost estimates was provided, and costs cannot be verified. Furthermore, the 10% interest rate used to calculate the capital recovery factor is incorrect—the latest version of the EPA Control Cost Manual now recommends a 7% interest rate.

A review of the RBLC (enclosed) found that FDEP has issued permits requiring that fluoride (F) emissions be limited to 0.0417 lb. per ton of phosphate (lb/T), and particulate (PM) be limited to 0.19 lb/T. These limits are substantially lower than the 0.06 lb F/T and 0.3 lb PM/T proposed by FH.

**Conclusions & Recommendations**

Both of the recent applications from FH should be combined and reviewed as one project, and the effects of these projects on other emission sources at the facility should be evaluated with respect to PSD applicability and impacts.

The application should be considered incomplete until the applicant provides more complete information on the nature of the processes to be modified, emission changes, effectiveness of the proposed control technology, and documentation to support the costs presented for competing control alternatives.

Emission limits should not exceed the 0.0417 lb F/T and 0.19 lb PM/T limits required by other permits issued by FDEP.

**Fertilizer Plant Permits from RBLC**

| Plant | Permit Issued | Product | Pollutant | Control Technology | Control Efficiency | Permit Emission Rate (Lb/T P205) | Average Emission Rate (Lb/T P205) |
|---|---|---|---|---|---|---|---|
| ? | | MAP | F | 2-stage scrubber w. cooler | 99.8% | 0.06 | |
| | | | | fresh water in last stage | | | |
| Farmland Hydro | 7/28/92 | DAP/MAP | F | multi-stage scrubbers | 99.9% | 0.06 | |
| IMC-Agrico | 4/13/94 | DAP | F | venturi scrubber | | 0.0417 | |
| IMC-Agrico | 4/18/94 | DAP | F | venturi scrubber | | 0.0417 | |
| | | | | | | | 0.05 |
| | | | | | | | |
| Cargill | 11/28/94 | DAP | PM | venturi/packed tower | | 0.19 | |
| Cargill | 10/13/92 | DAP | PM | venturi/packed tower | | 0.19 | |
| IMC-Agrico | 4/13/94 | DAP | PM | venturi scrubber | | 0.41 | |
| IMC-Agrico | 4/18/94 | DAP | PM | venturi scrubber | | 0.41 | |
| | | | | | | | 0.30 |
| | | | | | | | |
| Cargill | 10/13/92 | DAP | SO2 | 0.5% S oil | | 0.56 | 0.56 |