STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by

Ms. Melody Russo
Environmental Superintendent
Cargill Fertilizer, Inc.
3200 Highway 60 west
Bartow, Florida 33830

DEP File No. 1050046-008-AC
PSD-FL-255

Enclosed is the FINAL Permit Number PSD-FL-255 to replace air pollution control equipment and make modifications necessary to increase production to 3,000 tons per day of MAP/DAP at the applicant's facility in Bartow, Polk County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accordance with Rule 62-212.400, F.A.C. - Prevention of Significant Deterioration (PSD) and Best Available Control Technology (BACT).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department of Environmental Protection in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000, 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 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 4-21-99 to the person(s) listed:

Melody Russo, Cargill*
Greg Worley, EPA
John Bunyak, NPS
David Buff, P.E., Golder Assoc.
Bill Thomas, DEP SWD
Joe King, Polk County

Clerk Stamp

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

Kini Faber 4-21-99
(Clerk) (Date)

FINAL DETERMINATION
CARGILL FERTILIZER, INC.
No. 3 Fertilizer (MAP/DAP) Plant
Permit No. 1050046-008-AC
PSD-FL-255

An Intent to Issue Air Construction Permit to Cargill Fertilizer, Inc. for the modification of the No. 3 Fertilizer Plant at the applicant's facility near Bartow, Polk County, Florida was distributed on February 11, 1999. The proposed permit provided for the replacement of air pollution control equipment and process modifications necessary to increase the production rate from 2,640 to 3,000 tons MAP/DAP per day (TPD).

The Public Notice of Intent to Issue Air Construction Permit was published in the Ledger (Lakeland) on February 19, 1999. Copies of the draft construction permit and related documents were available for public inspection at the Department's offices in Tallahassee and Tampa and at the Polk County Public Works Department in Bartow. Comments received from the applicant were addressed in correspondence issued concurrently with the Intent to Issue Air Construction Permit. Comments were submitted verbally by the applicant following publication of the Public Notice of Intent to Issue. Subsequently, the applicant and the Department reached agreement on the permit condition requiring the pressure drop of the scrubber system to be maintained at a minimum value.

The final action of the Department will be to issue the permit as discussed above.

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- 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.
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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:
Melody Russo, ES
Cargill Fert. Pizer
3208 Hwy 60 West
Bartow, FL 33830

4a. Article Number
Z 333 618 101

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

7. Date of Delivery
4-26-99

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*
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6. Signature: *(Addressee or Agent)*
X [signature]

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

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

Sent to: Melody Russo	
Street & Number: Cargill Fert.	
Post Office, State, & ZIP Code: Bartow FL	
Postage	$
Certified Fee	
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: 105046-008-AC 4-21-99 PSD-FL-255	

PS Form **3800**, April 1995

Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMITTEE:

Cargill Fertilizer, Inc.
3200 Highway 60 West
Bartow, Florida 33830

Authorized Representative:

Melody Russo
Environmental Superintendent

File No.	1050046-008-AC
Permit No.	PSD-FL-255
SIC No.	2874
Project:	No. 3 Fertilizer Plant
Expires:	March 31, 2002

PROJECT AND LOCATION:

Permit for the construction/modification of the No. 3 Fertilizer Plant that produces monoammonium and diammonium phosphate (MAP/DAP). The project involves the replacement of air pollution control equipment and process modifications necessary to increase the production rate from 2,640 to 3,000 tons MAP/DAP per day (TPD). The project is located at the Cargill Fertilizer facility, 3200 Highway 60 West, Bartow, Polk County. UTM coordinates are Zone 17; 409.8 km E; 3086.7 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

ATTACHED APPENDICES ARE MADE A PART OF THIS PERMIT:

Appendix BD	BACT Determination
Appendix GC	Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

SECTION II - ADMINISTRATIVE REQUIREMENTS

FACILITY DESCRIPTION

Cargill Fertilizer, Inc. operates a phosphate fertilizer manufacturing facility near Bartow, Polk County, Florida, producing sulfuric acid, wet-process phosphoric acid, and ammoniated phosphate fertilizers. The company has applied to increase the production rate from 2,640 TPD to 3,000 TPD at its No. 3 Fertilizer (MAP/DAP) Plant. The No. 3 Fertilizer Plant can produce DAP or MAP. The modifications will improve product quality in addition to increasing the maximum production rate. As a result of this production rate increase, increases in the actual particulate matter (PM), PM with an aerodynamic diameter of 10 microns or less (PM_{10}), sulfur dioxide (SO_2), fluoride (F) and other pollutant emissions including ammonia (NH_3) will occur.

REGULATORY CLASSIFICATION

The No. 3 Fertilizer Plant is classified as a "Major or Title V Source" per Rule 62-210.200, F.A.C., because it has the potential to emit at least 100 tons per year of particulate matter when potential fugitive emissions are included with potential controlled emissions.

Phosphate rock processing plants are listed as a Major Facility Category in Table 62-212.400-1, F.A.C., "Major Facility Categories." Therefore, stack and fugitive emissions of over 100 TPY of a regulated pollutant are sufficient to classify the installation as a "Major Facility" per the definitions in Rule 62-210.200, F.A.C., subject to the Significant Emission Rates given in Table 62-212.400-2, F.A.C. and the requirements of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) and Best Available Control Technology (BACT).

PERMIT SCHEDULE:

- 09-21-98: Original Application Received
- 10-30-98: Revised Application Received
- 02-11-99: Issued Intent to Issue Permit

RELEVANT DOCUMENTS:

The documents listed below are specifically related to this permitting action and form the basis of the permit. They are on file with the Department:

- Application received 09-21-98
- Department's incompleteness letter dated 10-15-98
- Applicant's submittal received 10-30-98
- National Park Service's letter received 10-28-98
- Technical Evaluation and Preliminary Determination dated 02-11-99
- Best Available Control Technology determination (issued concurrently with permit)

1. Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department's Southwest District Office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218. All applications for permits to construct or modify an emissions unit(s) *subject to the Prevention of Significant Deterioration or Nonattainment (NA) review requirements* should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), 2600 Blair Stone Road, MS 5505, Tallahassee, Florida 32399-2400 (phone number 850/488-0114).
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. Expiration: This air construction permit shall expire on March 31, 2001 [Rule 62-210.300(1), F.A.C.]. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the Department's Southwest District Office of any delays in completion of the project which would affect the startup day by more than 90 days. [Rule 62-4.090, F.A.C]
6. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the Department's Southwest District Office. [Chapter 62-213, F.A.C.]
7. Permit Approval: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)].
8. BACT Determination: In conjunction with extension of the 18 month periods to commence or continue construction, or extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of best available control technology for the source. [40 CFR 52.21(j)(4)]
9. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports using DEP Form 62-210.900(4) shall be sent to the DEP's Southwest District office by March 1st of each year.
10. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
11. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1997 version), shall be submitted to the DEP's Northwest District office.

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

The Specific Conditions listed in this section apply to the following emission units:

EMISSION UNIT NO.	EMISSION UNIT DESCRIPTION
001	No. 3 Fertilizer (MAP/DAP) Plant

1. Unless otherwise indicated, the modification and operation of the subject No. 3 Fertilizer Plant shall be in accordance with the capacities and specifications stated in the application or in updated submittals. **[Rule 62-210.300, F.A.C.]**
2. The subject emissions unit shall comply with all applicable provisions of the 40 CFR 60 New Source Performance Standards for Diammonium Phosphate Plants, Subpart V. **[Rule 62-204.800 F.A.C.]**
3. The No. 3 MAP/DAP Plant shall not produce more than ~~1,470~~ 3,000 tons per day of MAP or DAP product or process more than 61.25 tons of P_2O_5 input per hour for either product as determined using the procedure in Specific Condition No. 13. **[Rule 62-210.200, F.A.C.]**
4. The subject emission unit is allowed to operate continuously (8760 hours/year). **[Rule 62-210.200, F.A.C.]**
5. Total fluoride emissions shall not exceed 2.5 lb/hr and 10.95 TPY based on 0.041 lb F/ton of P_2O_5 input. **[Rule 62-212.400, F.A.C.]**
6. Particulate matter emissions shall not exceed 11.0 lb/hr and 48.2 TPY based on 0.18 lb/ton P_2O_5 input. **[Rule 62-212.400, F.A.C.]**
7. Visible emissions from the stack shall not exceed 15% opacity based on recent stack tests. **[Rule 62-212.400, F.A.C.]**
8. During periods of firing natural gas only, sulfur dioxide emissions from the stack shall be presumed as minimal and a sulfur dioxide compliance test shall be waived. No. 6 fuel oil with a maximum sulfur content of 1.5% sulfur by weight may be fired up to a maximum of 338,000 gallons per year. The firing rate of either fuel shall not exceed 40 million BTU per hour. The permittee shall maintain records of the fuel oil supplier's sulfur content analysis. **[Rule 62-210.200(227), F.A.C.]**
9. The total pressure drop across the combined primary and secondary scrubber control systems shall be maintained at all times during normal operation at a minimum pressure drop of 15 inches H_2O. Instances may occur at other times such as low operating rates during which the total pressure drop may be less than the normal rate minimum of 15 inches H_2O. The permittee shall install, calibrate, operate and maintain monitoring devices that continuously measure and record the total pressure drop across each scrubber. Accuracy of the monitoring devices shall be $\pm$ 5% over the operating range. **[Rules 62-297.310, 62-296.800; 40 CFR 60.223(c), F.A.C.]**
10. Before this construction permit expires, and annually, the subject emissions units shall be tested for compliance with the above emission limits. For the duration of all tests the emission units shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than permitted capacity (i.e., 90% of the maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. **[Rule 62-297.310, F.A.C.]**
11. The Department's Southwest District office in Tampa shall be notified in writing at least 15 days prior to the compliance tests. Written reports of the test results shall be submitted to that office within 45 days of test completion. **[Rule 62-297.310, F.A.C.]**

12. The compliance test procedures shall be in accordance with EPA Reference Methods 1, 2, 3, 4, 5, 7E, 9 and 13A or 13B, as appropriate, as published in 40 CFR 60, Appendix A. 60, Appendix A. **[Rules 62-204.800 and 62-297.310(7)(c), F.A.C.]**

13. All measurements, records, and other data required to be maintained by this facility shall be retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These data shall be made available to the Department upon request. **[Rule 62-4.070(3), F.A.C.]** The permittee shall install, calibrate, maintain, and operate a monitoring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The monitoring device shall have an accuracy of ±5 percent over its operating range. The permittee shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric tons/hour of phosphorus bearing feed using the flow monitoring device meeting the requirements of 40 CFR 60.223(a) and then by proceeding according to 40 CFR 60.224(b)(3). **[Rule 62-296.800, F.A.C.; 40 CFR 60.223(b)]**

14. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. **[Rule 62-296.320, F.A.C.]**

15. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. **[Rule 62-210.650, F.A.C.]**

16. The subject emissions units shall be subject to the following:

    - Excess emissions resulting from startup, shutdown or malfunction of any source shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. **[Rule 62-210.700, F.A.C.]**

    - Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited. **[Rule 62-210.700, F.A.C.]**

    - Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. **[Rule 62-210.700, F.A.C.]**

    - In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. **[Rule 62-210.700, F.A.C.]**

17. The permittee shall submit an Annual Operating Report using DEP Form 62-210.900(4) to the Department's Southwest District office by March 1 of the following year for the previous year's operation. **[Rule 62-210.370, F.A.C.]**

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Cargill Fertilizer, Inc.
No. 3 Fertilizer Plant (MAP/DAP) Plant Expansion
PSD-FL-255 / 1050046-008-AC
Bartow, Polk County

Cargill Fertilizer, Inc. has applied to increase the production rate from 2,640 tons per day (TPD) to 3,000 TPD at its No. 3 Fertilizer (MAP/DAP) Plant near Bartow in Polk County, Florida. The No. 3 Fertilizer Plant can produce Diammonium Phosphate (DAP) or Monoammonium Phosphate (MAP). The modifications will improve product quality in addition to increasing the maximum production rate. As a result of this production rate increase, increases in the actual particulate matter (PM), PM with an aerodynamic diameter of 10 microns or less (PM_{10}), sulfur dioxide (SO_2), fluoride (F) and other pollutant emissions including ammonia (NH_3) will occur. Typically, NH_3 emissions from this process are not significant enough to be regulated since an acid scrubbing step is used to recover the NH_3 and return it to the process. NH_3 emissions are of concern primarily when accidental leaks occur during its storage or transport. NH_3 is not a listed hazardous air pollutant.

The increases for PM/PM_{10} and F emissions will exceed the significant levels listed in Table 212.400-2 of Rule 62-212.400, Florida Administrative Code (F.A.C.). The project is therefore subject to Prevention of Significant Deterioration (PSD) review for PM/PM_{10} and F in accordance with Rule 62-212.400, F.A.C. A Best Available Control Technology (BACT) determination is part of the review required by Rules 62-212.400 and 62-296, F.A.C. Air pollution control equipment will consist of wet scrubbers for PM/PM_{10} and F emissions.

PROCESS EMISSIONS

The following table compares the current actual emissions to the applicant's proposed maximum emissions in tons/year:

	PM	PM_{10}	F	SO_2	VOC	NO_X	CO
Current Actual Emissions							
No. 3 Fertilizer plant	7.9 (a)	7.9 (a)	5.47 (a)	0.03 (b)	0.13 (b)	6.72 (b)	1.68 (b)
No. 4 Phosphoric Acid Plant (c)	-	-	1.47	-	-	-	-
No. 3 Filter (d)	-	-	1.26	-	-	-	-
No. 5 Phosphoric Acid Plant (e)	-	-	1.21	-	-	-	-
No. 3 Shipping Plant (f)	4.38	4.38	-	-	-	-	-
Total	12.38	12.38	9.41	0.03	0.13	6.72	1.68
Proposed Maximum Emissions							
No. 3 Fertilizer Plant	51.98 (g)	51.98 (g)	10.95 (g)	39.64 (h)	0.42 (h)	24.52 (h)	5.23 (h)
No. 4 Phosphoric Acid Plant (i)	-	-	10.01	-	-	-	-
No. 3 Shipping Plant (j)	12.0	12.0	-	-	-	-	-
Total	63.98	63.98	20.96	39.64	0.42	24.52	5.23
PSD Significant Emission Rate	25	15	3	40	40	40	100

Notes: F = fluoride.
MMscf = million standard cubic feet.

a) Based on average hours of operation during 1996 and 1997 of 7,981.5 hours and 7,454.2 hours, respectively, and annual stack test results (two tests in 1997) as follows:
1996: PM = 1.63 lb/hr; F = 1.74 lb/hr 1997: PM = 2.52 lb/hr; F = 1.07 lb/hr
Emission Rate (TPY) = [(1996 lb/hr * 1996 hrs.) + (1997 lb/hr *1997 hrs.)]/ 2* 2000 lb/ton)

b) Based on average No. 3 Fertilizer plant natural gas usage during 1996 and 1997 of 98.1 MMscf and 94.0 MMscf, respectively, and AP-42. Refer to Table 2-3b.
c) Based on average hours-of operation during 1996 and 1997 of 8015 hours and 8277 hours, respectively, and annual stack test results (two tests in 1997) as follows:
1996: F = 0.319 lb/hr 1997: F = 0.402 lb/hr
Emission Rate (TPY) = [(1996 lb/hr * 1996 hrs) + (1997 lb/hr *1997 hrs)] / 2* 2000 lb/ton)
d) Based on average hours of operation for the No. 4 Phosphoric Acid Plant during 1996 and 1997 of 8015 hours and 8277 hours, respectively, and annual stack test results (two tests in 1997) as follows:
1996: F =0.113 lb/hr 1997: F = 0.196 lb/hr
Emission Rate (TPY) = [(1996 lb/hr * 1996 hrs) + (1997 lb/hr *1997 hrs)] / 2 * 2000 lb/ton)
e) Based on average hours of operation during 1996 and 1997 of 8057 hours and 8313 hours, respectively, and annual stack test results (two tests in 1997) as follows:
1996: F = 0.337 lb/hr 1997: F = 0.254 lb/hr
Emission Rate (TPY) = [(1996 lb/hr * 1996 hrs.) + (1997 lb/hr *1997 hrs.)]/ 2 * 2000 lb/ton)
f) Based on average hours of operation during 1996 and 1997 of 2825.15 hours and 2942.5 hours, respectively, and annual stack test results as follows:
1996: PM = 3.1 lb/hr 1997: PM = compliance test waived due to the use of dust suppressant oil system
Emission Rate (TPY) = (1996 lb/hr * 1996 hrs.) / 2000 lb/ton)
g) Proposed emission rates are 11.6 lb/hr for PM; and 2.5 lb/hr for fluoride.
h) Based on a maximum heat input of 40 MMBtu/hr for 8760 hr/yr. Refer to Table 2-3.
i) Based on combined F emission limit for Nos. 4 and 5 Phosphoric Acid Plants of 2.29 lb/hr, from permit no. AC53-262532.
j) Based on PM/PM10 emission limit of 12 lb/hr, from permit no. AO53-185367.

DATE OF RECEIPT OF COMPLETE BACT APPLICATION:

The original application received on September 21, 1998 was complete on October 30, 1998.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212.400, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT 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.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit 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.

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as indicated below:

- ***Fluorides*** (HF and SiF_4). Controlled generally by scrubbing with pond water.
- ***Particulate Matter*** (PM, PM_{10}). Controlled generally by wet scrubbing or filtration.
- ***Combustion Products*** (SO_2, NO_X). NO_X controlled generally by good combustion of clean fuels. SO_2 controlled generally by scrubbing when quantities are substantial.
- ***Products of Incomplete Combustion*** (CO, VOC). Controlled generally by proper combustion.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the pollutant control equipment and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO_2, H_2SO_4, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT EMISSION LIMITS PROPOSED BY APPLICANT:

POLLUTANT	EMISSION LIMIT	LIMIT BASIS	CONTROL TECHNOLOGY
F	2.5 lb/hr	0.041 lb/ton P_2O_5 input	Packed scrubbers using pond water
PM	11.6 lb/hr	0.19 lb/ton	Venturi Scrubbers
VE	20% opacity	Permit AO53-169781	Same as PM

BACT ANALYSIS

GASEOUS FLUORIDES (F)

Fluoride-containing gases including hydrogen fluoride (HF) and silicon tetrafluoride (SiF_4) are evolved during the exothermic reaction between ammonia and phosphoric acid that occurs in the reactor and to a lesser extent in the granulator. Since the vent gases from the reactor and granulator contain ammonia in high concentrations, the first scrubbing stage uses a phosphoric acid stream as the scrubbing medium for recovery of ammonia so that it is recycled back to the process. A final stage of pond water scrubbing removes most of

the fluoride evolved from the process as well as that which is stripped out of the phosphoric acid in the first stage scrubber.

Additional fluoride and ammonia emissions are generated in the dryer and are controlled by a separate two-stage scrubbing system as for the reactor and granulator. Gaseous fluoride and ammonia emissions from the cooler are relatively low and therefore do not require special controls. The No. 3 Fertilizer Plant will be equipped with six scrubbers following the proposed modification. Four will be new scrubbers while two are existing. The scrubbers will be designed with the following operating parameters:

1. Reactor/Vents Acid Scrubber (new)

Outlet Temperature	185° F
Outlet Flow Rate	72,700 ACFM
Pressure Drop	15 in. H_2O
Recovery Solution Flow Rate	1,500 gpm

2. Granulator Acid Scrubber (new)

Outlet Temperature	178° F
Outlet Flow Rate	51,000 ACFM
Pressure Drop Recovery	16 in H_2O
Solution Flow Rate	800 gpm

3. Cooler Venturi-Cyclonic Scrubber (existing)

Outlet Temperature	86°F
Outlet Flow Rate	38,500 ACFM
Pressure Drop	15 in. H_2O
Water Flow Rate	660 gpm

4. R.G.C.V. Tailgas Scrubber (existing)

Outlet Temperature	1390° F
Outlet Flow Rate	152,900 ACFM
Pressure Drop	4 in. H_2O
Pond Water Flow Rate	4,600 gpm

5. Dryer Acid Scrubber (new)

Outlet Temperature	1700° F
Outlet Flow Rate	70,300 ACFM
Pressure Drop	16 in. H_2O
Recovery Solution Flow Rate	1,250 gpm

6. Dryer Tailgas Scrubber (new)

Outlet Temperature	1570° F
Outlet Flow Rate	70,000 ACFM
Pressure Drop	5 in. H2O
Pond Water Flow Rate	1,600 gpm

The top-down BACT determination for fluorides identified the control technologies listed below starting with the most stringent:

1. Packed scrubber using once-through fresh water.
2. Packed scrubber using neutralized water from a dedicated pond (fresh water makeup).
3. Packed scrubber using process cooling pond water.

Use of once-through fresh water would achieve the highest level of fluoride removal but this option is not practical for operations where water conservation is required and plant water balance problems would be created.

Option 2 is possible, the main considerations being the cost of installing the pond and equipment and the cost of operating a lime treatment unit. Lime treatment to a pH level of 3.5 to 4.0 causes fluorides to precipitate out of solution, primarily as calcium fluoride. At this point the water would contain as low as 30-60 ppm fluoride. With second-stage lime treatment to a pH of 6.0 or more, the calcium compounds (mainly dicalcium phosphate) precipitate out along with additional calcium fluoride. Upon settling at a pH in the range of 6.5 to 8.8, the fluoride content of the clear neutralized water may be as low as 15 ppm, depending on the quality of the neutralization facility and the mixing efficiency.

Costs for Option 2 are based on data submitted by the applicant and information from other sources. These include Phosphates and Phosphoric Acid, by Pierre Becker, 2nd ed., 1989, and Development Document for Interim Final Effluent Limitations Guidelines and Proposed New Source Performance Standards, USEPA, 1975:

Scrubber Pond with Liner (2 acres - spray cooling)	$ 75,000
Tanks, Pumps and Equipment	210,000
Other Costs	40,000
Total Installed Cost (T.I.C.)	$ 325,000
Raw Materials	$ 8,000
Solid Waste Disposal	10,000
Operation & Maintenance (@ 8.4% of T.I .C.)	27,000
Depreciation & Financial Charges (@ 16.9% of T.I.C.)	55,000
Annual Cost	$ 100,000

Assuming that treatment of the scrubber water will result in a decrease in fluoride concentration from 5,500 ppm to below 50 ppm, the driving force for absorption will increase by an additional 1.0 to 2.0 mass transfer units (NTU) which should result in an additional 1.5 lb/hr of fluoride removed. This results in the following cost effectiveness:

F Removed = (1.5)(8760)/2000 = 6.6 tons/yr
Cost Effectiveness = $100,000/6.6 = $15,150/ton

This figure is sufficiently high to rule out Option 2. However, it should be noted that the low magnitude of fluoride emissions relative to their potential environmental impact justifies the consideration of higher fluoride cost effectiveness figures relative to the high tonnage pollutants such as sulfur dioxide and nitrogen oxides. Option 3, therefore, is determined by the top-down approach as the basis for the fluoride BACT emission limit. The BACT limit will be the same as proposed by the applicant, 0.041 lb F/ton P_2O_5 input. This limit allows a margin for compliance above the highest September 11, 1997 test result of 0.037 lb F/ton P_2O_5. It should be noted that the test data summary submitted for the September 11, 1997 test incorrectly reported the F emissions on a total product basis instead of P_2O_5.

PARTICULATE MATTER (PM/PM_{10}) AND VISIBLE EMISSIONS (VE)

The sources of PM and VE, consisting primarily of DAP dust along with relatively small amounts of ammonium fluoride and other related compounds, are the granulator, dryer, cooler, screens and mills. These emissions are controlled by cyclones that remove most of the larger particles with the remainder controlled by wet scrubbers. The top-down approach for control of PM/PM_{10} and VE identified the following BACT options:

1. High-energy (>30 in. w.c.) venturi scrubber or ionizing wet scrubber.
2. Medium-energy (15-30 in.w.c.) venturi scrubber.

Characteristic of this process is that the first stage of scrubbing (acid scrubber) is primarily for ammonia recovery while the primary function of the second stage scrubber is fluoride removal, leaving PM/PM_{10} control with a secondary priority from a design standpoint. Since recovery of ammonia takes place by chemical reaction with the acid scrubbing medium, the required removal can be effected using a medium energy scrubber which also removes up to 85% of the product dust escaping the cyclones. The tail gas scrubber is a low pressure drop device that removes fluorides by absorption. For these reasons, employment of a high energy, high efficiency device for PM/PM_{10} removal has not been a design consideration for these plants.

If maximum PM/PM_{10} removal is considered to be a design parameter, the cost effectiveness of adding high energy scrubbing to the existing system (Option 1) would likely be in the range of $50,000 - $75,000 per incremental ton of PM/PM_{10} removed based on recent analyses for other projects. On a non-incremental basis, however, assuming replacement of the existing acid scrubbers with high energy ones, the cost effectiveness would drop to about $7,000 to $9,000 per ton for PM/PM_{10} removal in the 98+% efficiency range. Due to the high costs of installing new ducts, pumps, fans, and instrumentation for retrofitting an existing system, and the high energy costs, Option 1 is not feasible for this project.

Option 2 is the feasible choice, and the BACT requirement will be satisfied by specifying that the venturi scrubbers be designed for a minimum pressure drop of 15 in. H_2O and the operation of the combined scrubber systems be maintained at 15 in. H_2O during normal operation. Analysis of recent test data for these scrubbers confirms that there is an inordinate safety margin between actual and allowable PM emissions, average actuals being less than 20 percent of the allowables. Therefore, it is appropriate to reduce the allowables to a level consistent with typical margins for BACT limits. A margin of 100% above the average from the September 1997 stack test (0.09 x 2 = 0.18 lb/ton P_2O_5) appears reasonable for the reactor/granulators and dryers. The existing emission limit bases (gr/SCF) for the coolers are sufficient for this BACT determination.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACT DETERMINATION BY THE DEPARTMENT:

Based on the information provided by the applicant and other information available to the Department, the following emission limits are established employing the top-down BACT approach.

POLLUTANT	EMISSION LIMIT	LIMIT BASIS
F	2.5 lb/hr	0.041 lb/ton P_2O_5 input
PM/PM_{10}	11.0 lb/hr	0.18 lb/ton P_2O_5 input (1997 stack test)
VE	15% opacity	1997 stack tests

COMPLIANCE

Compliance with the fluoride limit shall be in accordance with the EPA Reference Method 13A or 13B as contained in 40 CFR 60, Appendix A.

Compliance with the PM/PM_{10} limit shall be in accordance with the EPA Reference Method 5 as contained in 40 CFR 60, Appendix A.

Compliance with the visible emission limit shall be in accordance with the EPA Reference Method 9 as contained in 40 CFR 60, Appendix A.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

John Reynolds, Permit Engineer
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road, MS 5505
Tallahassee, Florida 32399-2400

Recommended By:

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

4/20/99
Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

4/20/99
Date:

REFERENCES

Pierre Becker. 1989. Phosphates and Phosphoric Acid. Marcel Dekker, Inc. New York.

Robert E. Treybal. 1980. Mass Transfer Operations. McGraw-Hill, Inc. New York.

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U.S. Environmental Protection Agency. 1978. Diagnosing Vegetation Injury Caused by Air Pollution. Prepared by Applied Sciences Associates, Inc. EPA-450/3-78-005. Research Triangle Park, NC.

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U.S. Fish and Wildlife Service (USFWS). 1995. Air Quality Branch, Technical Review of Cargill Fertilizer PSD Application June 26, 1995.

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

G.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.

G.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 or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and 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 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.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment 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.

G.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.

G.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.

G.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 and 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.

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

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

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

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

G.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.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, 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.

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

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology *(X)*;
(b) Determination of Prevention of Significant Deterioration *(X)*; and
(c) Compliance with New Source Performance Standards *(X)*

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or 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:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses

G.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.

Memorandum

Florida Department of Environmental Protection

TO: Howard Rhodes

THRU: Clair Fancy

FROM: John Reynolds

DATE: April 19, 1999

SUBJECT: Cargill Fertilizer, No. 3 Fertilizer (MAP/DAP) Plant
DEP File No. 1050046-008-AC (PSD-FL-255)

Attached is the final permit and BACT determination for the modification of the above emissions unit at Cargill Fertilizer in Bartow. The project involves replacement of air pollution control equipment and process modifications necessary for increasing production from 2,640 to 3,000 tons MAP/DAP per day.

I recommend your approval of this permit and BACT determination.