Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

February 5, 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Kathy Edgemon
Environmental Superintendent
Cargill Fertilizer, Inc.
8813 U.S. Highway 41 South
Riverview, Florida 33569

Re: DEP File No. 0570008-039-AC; PSD-FL-315A
Riverview Plant

Dear Ms. Edgemon:

The Department has reviewed your request of December 7, 2001, to provide greater operational flexibility at your No. 5 Di-ammonium Phosphate (DAP) plant. This request is acceptable to the Department. The plant will be re-designated as No. 5 Ammoniated Phosphate Plant. This change will allow Cargill to produce ammoniated phosphate fertilizers without restrictions to only producing DAP. The Department issued a revised BACT to include production of MAP at this plant.

Based on the above, the Department will modify PSD-FL-315, previously issued on November 21, 2001, as follows:

SUBSECTION A. COMMON CONDITIONS

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

EMISSION UNIT NO.	EMISSION UNIT DESCRIPTION
063-068, 074, 107	Molten Sulfur Handling System
005	No. 8 Sulfuric Acid Plant
006	No. 9 Sulfuric Acid Plant
073	Phosphoric Acid Plant
007	EPP Plant
078-081, 103	AFI Plants No. 1 and 2
055	No. 5 ~~DAP~~ Ammoniated Phosphate Plant

1. Unless otherwise indicated, the modification/construction and operation of the molten sulfur handling system, the Nos. 8 and Sulfuric Acid Plants, the Phosphoric Acid Plant, the EPP Plant, the AFI Plant Nos. 1 and 2, and the No. 5 ~~DAP~~ Ammoniated Phosphate Plant shall be in accordance with the capacities and specifications stated in the application. **[Rule 62-210.300, F.A.C.]**

SUBSECTION G. No. 5 ~~DAP~~ Ammoniated Phosphate Plant

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

EMISSION UNIT NO.	EMISSION UNIT DESCRIPTION
055	No. 5 ~~DAP~~ Ammoniated Phosphate Plant

1. The process input rate of the No. 5 ~~DAP~~ Ammoniated Phosphate Plant shall not exceed 1,764 tons per day of 100% phosphorus pentoxide (P_2O_5). **[Rule 62-210.200, F.A.C.]**

4. The No. 5 ~~DAP~~ Ammoniated Phosphate Plant may operate up to 8,760 hours per year. **[Rule 62-210.200, F.A.C.]**

5. Emissions from the No. 5 ~~DAP~~ Ammoniated Phosphate Plant shall not exceed the following **[Rule 62-212.400, F.A.C.]**

Pollutant	Maximum Allowable Emissions		
	lb/ton P_2O_5	lb/hr	TPY
PM/PM_{10}	0.174	12.8	56.1
Fluorides	0.04	2.9	12.9

6. Visible emissions from the No. 5 ~~DAP~~ Ammoniated Phosphate Plant shall not exceed 10% opacity. **[Permit No. 0570008-014-AV]**

10. The compliance test shall be conducted under each mode of operation, i.e., if the plant produced DAP and MAP, then compliance testing shall be done under both modes of operation. **[Applicant Request]**

11. 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)]**

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, 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 must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this permit modification was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 2/6/02 to the person(s) listed:

Ms. Kathy Edgemon, Cargill Fertilizer, Inc.*
Mr. B. Thomas, DEP-SWD
Mr. G. Worley, EPA
Mr. J. Bunyak, NPS
Ms. Alice Harman, P.E., EPCHC

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.

Victoria Gibson (Clerk) February 6, 2002 (Date)

FINAL DETERMINATION

Cargill Fertilizer, Incorporated
Riverview No. 5 DAP Plant
DEP File No. 0570008-039-AC, PSD-FL-315A

An Intent to Issue PSD Permit Modification for Cargill Fertilizer, Inc., Riverview plant, located at 8813 U.S. Highway 41 South, Riverview, Hillsborough County, Florida, was distributed on January 11, 2002. The Public Notice of Intent to Issue PSD Permit Modification was published in the Tampa Tribune on January 16, 2002. Copies of the draft construction permit were available for public inspection at the Department offices in Tampa and Tallahassee.

The Department received no comments from the public, the applicant, the EPA Region 4 office or the Fish and Wildlife Service.

The final action of the Department is to issue the PSD Permit Modification as proposed.

Revised BACT Determination
Riverview No. 5 DAP Plant (EU ID No. 055)
Cargill Fertilizer, Inc.
PSD-FL-315A/ 0570008-039-AC
Riverview, Hillsborough County

Cargill Fertilizer, Inc. was issued a BACT determination in November 2001, to modify several existing emission units at its phosphate fertilizer manufacturing facility located in Riverview, Florida. The proposed changes included increased molten sulfur through the molten sulfur handling system, additional digestion capacity associated with the Dorrco Reactor at the Phosphoric Acid plant (PAP), modification of the Granular Triple Super Phosphate (GTSP) plant, modification of the Animal Feed Ingredient (AFI) plant, construction of a second AFI granulation train, and modification of the No. 5 Diammonium Phosphate (DAP) plant.

Cargill submitted a request for a minor modification to the original construction permit on December 13, 2001. In order to meet marketing demands, Cargill needs to have greater operational flexibility at its No. 5 DAP Plant. The plant is to be re-designated as the No. 5 Ammoniated Phosphate Plant. This change will allow production of ammoniated phosphate fertilizers, DAP and Mono Ammonium Phosphate (MAP). The only physical modifications required to achieve this goal will be some minor piping changes. The revised BACT will include MAP production for this emission unit. The processes, emissions characteristics, and applicable control methods are similar for granulated MAP and DAP. The Department has determined that the same limits apply for the two granulated products when made at the same plant.

DATE OF RECEIPT OF COMPLETE MODIFIED BACT APPLICATION:

December 13, 2001.

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.

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*** (primarily HF). 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:

No. 5 Ammoniated Phosphate Plant

POLLUTANT	EMISSION LIMIT	LIMIT BASIS	CONTROL TECHNOLOGY
PM/PM_{10}	12.8 lb/hr	0.17 lb/ton P_2O_5 input	(3) Venturi scrubbers
F	2.9 lb/hr	0.04 lb/ton P_2O_5 input	(2) Tailgas scrubbers

BACT ANALYSIS

The No. 5 Ammoniated Phosphate plant is currently equipped with three venturi scrubbers and two tailgas scrubbers. The three primary venturi scrubbers are of different but similar design, as are the two tailgas scrubbers. One venturi scrubber controls PM emissions and recovers ammonia from the exhaust gases of the reactor and granulator, the second controls the cooler and equipment vents, and the third venturi scrubber controls PM emissions from the dryer. One tailgas scrubber controls fluoride emissions from the reactor, granulator, and cooler, while the second controls emissions from the dryer. Exhaust gases go to a common stack for the No. 5 Ammoniated Phosphate plant.

Currently, the scrubber systems are achieving lower emission rates for DAP production than required by permit No. 0570008-014-AV. As shown in recent stack tests, emissions from the common stack range from 1.3 to 2.9 lb/hr for PM and 0.47 to 3.02 lb/hr for F for DAP. These are equivalent to 0.018 to 0.042 lb of PM per ton of P_2O_5 input, and 0.008 to 0.042 lb of F per ton P_2O_5 input for DAP.

Cargill's proposed PM/PM_{10} emission rate for the No. 5 Ammoniated Phosphate plant of 12.8 lb/hr is equivalent to 0.174 lb/ton P_2O_5 input for either DAP or MAP production. This proposed limit is lower than the previous determinations, based on the actual emissions measured from the No. 5 Ammoniated Phosphate plant. The proposed limit is justified to provide certainty that the emission limit will be achievable on a continuous basis.

Cargill's proposed fluoride emission rate for the No. 5 Ammoniated Phosphate plant is 2.9 lb/hr, equivalent to 0.04 lb/ton P_2O_5 input for either DAP or MAP production. The proposed BACT limit is equal to the most stringent BACT issued to date for a MAP or DAP plant.

The sources of PM and VE, consisting primarily of DAP and MAP dust along with relatively small amounts of ammonium fluoride and other related compounds, are the reactor/granulator, cooler, screens and mills. These emissions are controlled by cyclones, which 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 were 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 maximum emissions from the cyclonic scrubbers be limited to 0.174 lb PM/ton and 0.04 lb F/ton of P_2O_5 input for either DAP or MAP production. Actual emissions from recent stack tests ranged from 0.018 to 0.042 lb PM/ton and 0.008 to 0.042 lb F/ton of DAP production. Test data indicate that the actual emissions from the cyclonic scrubbers are below the minimum previous BACT determinations of 0.18 lb PM/ton and 0.0417 lb F/ton of P_2O_5 input of MAP production. Based on the range of previous BACT determinations for PM and F, the proposed limits are lower than the previous determinations for F and PM.

The Department's recent BACT determinations for MAP plants are as follows:

Company Name	Permit Number	Permit Issue Date	F Emission Limit	PM Emission Limit
Cargill Bartow	PSD-FL-255	4-21-99	0.041 lb/ton P_2O_5	0.18 lb/ton P_2O_5
Farmland Hydro	PSD-FL-246	9-11-98	0.06 lb/ton P_2O_5	0.3 lb/ton P_2O_5

BACT DETERMINATION BY THE DEPARTMENT:

Based on the information provided by the applicant and other information available the Department agrees with the emission limit proposed by the applicant and establishes the following emission limits as BACT for this project:

No. 5 Ammoniated Phosphate Plant

POLLUTANT	EMISSION LIMIT	LIMIT BASIS	CONTROL TECHNOLOGY
PM/PM_{10}	12.8 lb/hr	0.17 lb/ton P_2O_5 input	(3) Venturi scrubbers
F	2.9 lb/hr	0.04 lb/ton P_2O_5 input	(2) Tailgas scrubbers

Visible emissions from the No. 5 Ammoniated Phosphate Plant shall not exceed 10% opacity.

COMPLIANCE

Compliance with the emission limits shall be in accordance with the following EPA Reference Methods as contained in 40 CFR 60, Appendix A or as otherwise approved by the Department:

EMISSION UNIT	POLLUTANT	EPA REFERENCE METHOD
No. 5 Ammoniated Phosphate Plant	PM/PM_{10}	5
	FL	13A or 13B
	VE	9

DETAILS OF THE REVISED ANALYSIS MAY BE OBTAINED BY CONTACTING:

Syed Arif, P.E. II Syed Arif 2/5/02
New Source Review Section
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

2/5/02
Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

2/5/02
Date:

Memorandum

Florida Department of
Environmental Protection

BAR

TO: Howard L. Rhodes

THRU: Clair Fancy
Al Linero

FROM Syed Arif

DATE: February 5, 2002

SUBJECT: Cargill Fertilizer, Inc. – Riverview Plant
DEP File No. 0570008-039-AC, PSD-FL-315A

Attached for approval and signature is a PSD permit modification to Cargill Fertilizer, Inc. for the Riverview Plant located in Hillsborough County. This permit modification re-designates the No. 5 Di-ammonium phosphate (DAP) plant to No. 5 Ammoniated Phosphate Plant. This change will allow production of ammoniated phosphate fertilizers, DAP and Mono Ammonium Phosphate (MAP). The only physical modifications required to achieve this goal will be some minor piping changes. The processes, emissions characteristics, and applicable control methods are similar for granulated MAP and DAP. The Department has determined that the same limits apply for the two granulated products when made at the same plant.

A revised BACT determination to include MAP production at this plant is also included.

The Public Notice was published on January 16, 2002 in the Tampa Tribune. No comments were received.

I recommend your approval and signature.

/sa
Attachments