# Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 25, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David B. Jellerson, P.E.
Environmental Superintendent
Cargill Fertilizer, Inc.
8813 US Highway 41 South
Riverview, Florida 34221

Re: DEP File No. 0570008-025-AC (PSD-FL-250)
3,200 Tons Per day Sulfuric Acid Plant

Dear Mr. Jellerson:

Enclosed is one copy of the Draft Air Construction Permit for the project at the existing Sulfuric Acid Plant No. 7 located at Cargill Fertilizer, US Highway 41 South, in Riverview, Hillsborough County. The Department's Intent to Issue Air Construction Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" must be published in the legal section of a newspaper of general circulation in Hillsborough County. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please note that *modeled* violations were predicted for sulfur dioxide ($SO_2$) with or without the production increase. According to Rule 62-212.400(5)(d), F.A.C., *"The owner ..... shall demonstrate ... that the increase in emissions .... will not cause or **contribute** to a violation of any ambient air quality standard ....."* The Department has interpreted "contribute" to mean "significantly contribute" with respect to the "Significant Impact Levels" for $SO_2$ and intends to issue the permit. This interpretation is consistent with EPA Guidance. [Draft NSR Workshop Manual, Page C.52, 1990] Because of the modeled violations, the Department must consider remedial action through the applicable provisions of the state implementation plan. We are reviewing the matter in the course of Title V permitting for large sources in the area and will assess the possible benefits from Title IV, Acid Rain requirements. We recommend that Cargill consider emission reductions at the existing sulfuric acid plants as one other project was already approved at the facility under similar circumstances.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please call Mr. Linero at 850/921-9523.

Sincerely,

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

CHF/aal

Enclosures

In the Matter of an
Application for Permit by:

Mr. David B. Jellerson, P.E.
Cargill Fertilizer, Inc.
8813 U.S. Highway 41 South
Riverview, Florida 33569

DEP File No. 0570008-025-AC
Draft PSD Permit No. PSD-FL-250
Sulfuric Acid Plant No. 7
Hillsborough County

_____/

## INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed project, as detailed in the application specified above and attached Technical Review and Preliminary determination, for the reasons stated below.

The applicant, Cargill Fertilizer, Inc. applied on May 1, 1998 to the Department for an air construction permit for a sulfuric acid plant at its phosphate fertilizer facility located at US Highway 41 South, Riverview, Hillsborough County. The application is to expand Sulfuric Acid Plant No. 7 to increase production from 2,200 to 3,200 tons per day of sulfuric acid.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit, including a review for the Prevention of Significant Deterioration and a determination of Best Available Control Technology for the control of nitrogen oxides, is required to conduct the work.

The Department intends to issue this air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed ""Public Notice of Intent to Issue Air Construction Permit." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue Air Construction Permit." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station # 35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

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

## CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, and DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 8-25-98 to the person(s) listed:

Mr. David B. Jellerson, Cargill*
Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. David Buff, P.E., Golder Assoc.
Mr. Bill Thomas, SWD
Mr. Ivan Choronenko, 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.

Kimberly Tober 8-25-98
(Clerk) (Date)

IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0570008-025-AC (PSD-FL-250)

Cargill Fertilizer Sulfuric Acid Plant No. 7
Hillsborough County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Cargill Fertilizer, Inc. to increase the capacity of the existing Sulfuric Acid Plant No. 7 located at on U.S. Highway 41 South in Riverview, Hillsborough County. The applicant's name and address are: Cargill Fertilizer, Inc., 8813 U.S. Highway 41 South, Riverview, Florida 33569.

The sulfuric acid plant produces the reagent used to acidulate phosphate rock to make fertilizers. Molten sulfur is the necessary raw material for sulfuric acid production. The project consists of: replacement of the drying tower and blower; installation of a new converter and boiler; increase in catalyst loading; and modifications to the existing sulfur burner, converter, interpass tower, final tower, boiler, superheaters, economizers, feedwater system, and steam system.

The project will increase the capacity of Plant No. 7 from 2,200 to 3,200 tons per day of sulfuric acid. The increase will reduce the need to purchase sulfuric acid from outside suppliers in order to operate the phosphoric acid plant at its maximum capacity. The Department has determined that PSD review and a BACT determination is not required for other emission units at the facility as a result of the modification of the sulfuric acid plant.

Control of $SO_2$ emissions is accomplished by the process itself which is based on the conversion of $SO_2$ to $SO_3$ and subsequent recovery as sulfuric acid product. The efficiency of the conversion and recovery is over 99.7 percent. The BACT emission limit for $SO_2$ was determined by the Department to be 3.5 pounds per ton of sulfuric acid produced on a 24-hour basis. Annual $SO_2$ emissions will be increased from 1,251 to 2,044 tons per year (TPY). The sulfuric acid mist BACT for this project was determined to be replacement of all mist eliminators with new ones and installation of additional ones to handle the increased production rate. This will meet a sulfuric acid mist emission limit of 0.12 pounds per ton of acid produced which is equal to 70 TPY. $NO_X$ emissions of 0.12 pounds per ton of acid produced and 70 TPY are inherently low and the increase is not significant with respect to PSD.

An air quality impact analysis was conducted. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted $SO_2$ PSD Class II increments consumed by all sources in the area, including this project, will be as follows:

| Averaging Time | Allowable Increment ($\mu g/m^3$) | Increment Consumed ($\mu g/m^3$) | Percent Consumed |
|---|---|---|---|
| 3-hour | 512 | 214 | 62 |
| 24-hour | 91 | 56 | 3 |
| Annual | 20 | 0.5 | 2.5 |

The project has no significant impact on the PSD Class I Chassahowitzka National Wilderness Area.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue Air Construction Permit." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station # 35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department. of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

Hillsborough County Environmental Protection Commission
1410 North 21 Street
Tampa, Florida 33605
Telephone: 813/272-5530
Fax: 813/272-5605

The complete project file includes the Draft Permit, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

# TECHNICAL EVALUATION

# AND

# PRELIMINARY DETERMINATION

## CARGILL FERTILIZER, INC.

Phosphate Fertilizer Facility

3200 Tons Per Day Sulfuric Acid Plant

Riverview, Hillsborough County

DEP File No. 0570008-025-AC
PSD-FL-250

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

August 25, 1998

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Cargill Fertilizer, Inc.
8813 US Highway South
Riverview, Florida 33569

Authorized Representative: Mr. David B. Jellerson, P.E., Environmental Superintendent

1.2 Reviewing and Process Schedule

| | |
|---|---|
| 05-01-98: | Date of Receipt of Application |
| 05-29-98: | DEP Completeness Request |
| 06-12-98: | Received Reply from Cargill |
| 07-10-98: | DEP Completeness Request |
| 07-20-98: | Received Reply from Cargill |
| 07-22-98: | Request From Cargill to Process Permit |
| 08-25-98: | Issue Intent |

## 2. FACILITY INFORMATION

2.1 Facility Location

The Cargill Fertilizer facility is located at U.S. Highway 41 South, Riverview, Hillsborough County. This site is approximately 85 kilometers from the Chassahowitzka National Wilderness Area, a Class I PSD Area. The UTM coordinates of this facility are Zone 17; 362.9 km E; 3082.5 km N.

2.2 Standard Industrial Classification Codes (SIC)

| | | |
|---|---|---|
| Major Group No. | 28 | Chemicals and Allied Products |
| Industry Group No. | 2874 | Phosphate Fertilizers |
| Industry Group No. | 2819 | Industrial Inorganic Chemicals (Sulfuric Acid) |

2.3 Facility Category

This phosphate fertilizer facility makes sulfuric acid, phosphoric acid and ammonium phosphates. Phosphoric acid is made by acidulation of phosphate rock with sulfuric acid. Waste gypsum is produced and stacked. The phosphoric acid is reacted with ammonia to make ammonium phosphates. The sulfuric acid is produced on-site by burning elemental sulfur, catalytically converting the resulting sulfur dioxide to sulfur trioxide, and absorbing it into a recirculating sulfuric acid solution.

The facility is classified as a major or Title V source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter ($PM/PM_{10}$), sulfur dioxide ($SO_2$), nitrogen oxides ($NO_X$), carbon monoxide (CO), or volatile organic compounds (VOC) exceed 100 TPY.

This industry is included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Per Table 62-212.400-2, modifications at the facility resulting in emissions increases greater than 40 TPY of $NO_X$ or $SO_2$, 25/15 TPY of $PM/PM_{10}$, or 7 TPY of sulfuric acid mist (SAM) require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.410, F.A.C. The facility includes sulfur storage and handling for which certain analyses are required per Rule 62-212.600, F.A.C.

## 3. PROCESS DESCRIPTION

The plant is a sulfur-burning double absorption sulfuric acid plant. This is the most common process and it continues to be improved and employed at both existing and new installations throughout the world.

The process is comprised of three distinct steps. These are sulfur combustion and gas preparation; catalytic conversion of sulfur dioxide to sulfur trioxide; and absorption of sulfur trioxide into sulfuric acid. The reactions are as follows:

- $S + O_2 \longrightarrow SO_2$ (sulfur burning)
- $2SO_2 + O_2 \longrightarrow 2SO_3$ (in presence of vanadium-containing catalyst)
- $SO_3 + H_2O \longrightarrow H_2SO_4$ (in concentrated sulfuric acid)

A great deal of heat is evolved throughout the process. Its management is an important consideration in optimizing the conversion and absorption steps as well as providing useful energy to the plant. Reaction kinetics and thermodynamics are also important factors. Following is a description of the process (refer to Figure 1):

Atmospheric air is drawn through a filter by the main compressor and then contacted with a recirculating stream of sulfuric acid in the drying tower which is packed with ceramic media. The dried air is blown into a refractory-lined burner where sprayed molten sulfur is combusted to produce sulfur dioxide ($SO_2$). The hot combustion gases are cooled to about 800°F in a waste heat boiler which recovers excess heat as saturated steam.

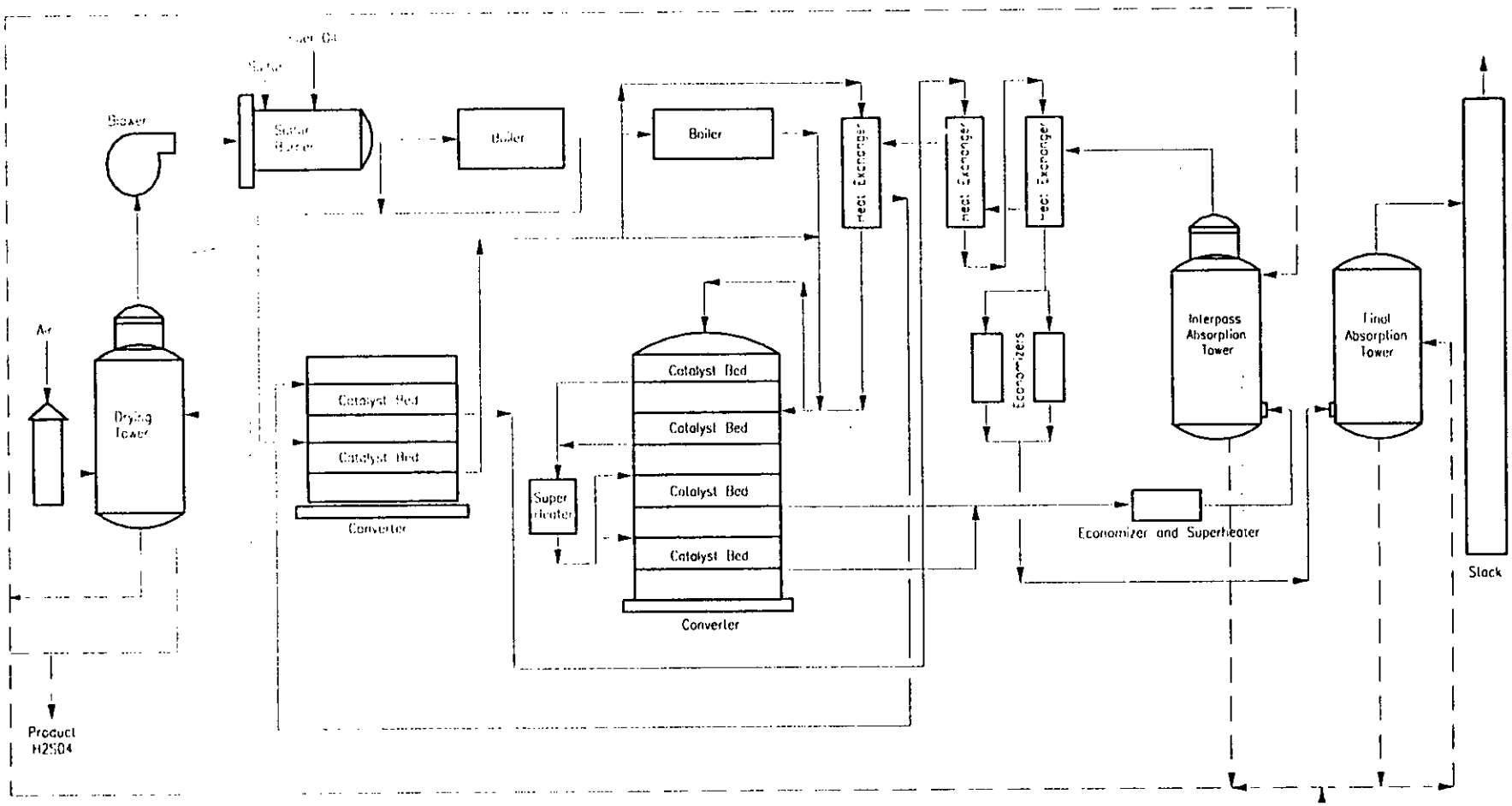
The stream, containing between 11 and 12 percent $SO_2$ and remaining air, is introduced into the first of four beds (passes) packed with vanadium-containing catalyst. In a series of steps, the $SO_2$ and excess oxygen from the air are progressively converted to $SO_3$. Between the third and fourth passes, the gases containing $SO_3$, some unconverted $SO_2$, oxygen, and atmospheric nitrogen are conveyed to an "interpass tower" where the $SO_3$ is absorbed into a stream of concentrated sulfuric acid and reacted with excess water to further strengthen the acid. By removing most $SO_3$ in the interpass absorber, the equilibrium favors further conversion of the remaining $SO_2$ to $SO_3$. This is accomplished in the fourth pass which is also filled with vanadium catalyst. The resulting stream is conveyed to the high-efficiency "final tower" where most of the remaining $SO_3$ reacts with water in a 98-99 percent sulfuric acid stream.

Throughout the conversion, the temperatures are moderated by a series of heat exchangers, a second waste heat boiler, a superheater and economizers so that the excess heat is removed and gases enter each bed at temperatures around 800°F. Each tower, including the drying tower, is equipped with mist eliminators to insure that sulfuric acid sprays and fine mists are contained, thereby protecting plant equipment and minimizing emissions to the atmosphere.

## 4. PROJECT DESCRIPTION

This permit addresses the following emissions unit:

| EMISSION UNIT NO. | SYSTEM | EMISSION UNIT DESCRIPTION |
|---|---|---|
| **004** | **Process** | **Sulfuric Acid Plant** |




Emission Unit – E.U. ID No. 004

Sulfuric Acid Plant – Flow Diagram

REVISION BY: KE
REVISION DATE: 06/08/98
FILENAME: FCAP.DRG

Figure 1

The project consists of: replacement of the drying tower and blower; installation of a new converter and boiler; increase in catalyst loading; and modifications to the existing sulfur burner, converter, interpass tower, final tower, boiler, superheaters, economizers, feedwater system, and steam system. The project will increase the production capacity to 3200 tons per day (TPD) of sulfuric acid.

The project will result in annual emissions of regulated pollutants in excess of levels during recent operation of the plant. There will be increases in $SO_2$ and sulfuric acid mist (SAM). There will also be minimal emissions increases in particulate matter, reduced sulfur compounds, volatile organic compounds and $SO_2$ from the molten sulfur system. Emission increases of $NO_X$, particulate matter, reduced sulfur compounds and volatile organic compounds are below their respective significant emission levels per Table 62-212.400-2, F.A.C. and do not require PSD or non-attainment new source review. However, PSD review is required for $SO_2$ and SAM since emissions will increase by more than 40 and 7 TPY for the two pollutants, respectively.

## 5. RULE APPLICABILITY

The project is subject to the federal new source performance standards (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H), incorporated by reference in Rule 62-204.800, F.A.C.

The proposed project is also subject to permitting, preconstruction review, emissions limits and compliance requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in Hillsborough County, an area designated as attainment for all criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is subject to review under Rule 62-212.400., F.A.C., Prevention of Significant Deterioration (PSD), because the potential emission increases for $SO_2$ and SAM exceed the significant emission rates given in Chapter 62-212, Table 62-212.400-2, F.A.C. PSD review requires an assessment of air quality impacts and a determination of Best Available Control Technology (BACT).

The Hillsborough County Environmental Protection Commission and the National Park Service provided opinions that a number of projects presently under review should be considered under a single permitting action. These include a mono-ammonium phosphate project as well as a rock dryer/grinder project.

Cargill has informed the Department that no modifications are planned at the phosphoric acid plant to take advantage of the increased production of sulfuric acid at the facility. Cargill provided information showing that it has imported more than 455,000 tons of sulfuric acid into the Riverview and Bartow fertilizer plants. Assuming a 100 percent capacity factor, the proposed increase at the No. 7 sulfuric acid plant of 1000 TPD will provide an additional 365,000 TPY. As a result, the proposed increase will not totally offset the company's requirement to purchase some acid.

The phosphoric acid plant will continue to operate as in the past, whether using purchased sulfuric acid or acid generated on-site. Furthermore, a PSD review and BACT determination was performed on the phosphoric acid plant in 1996. The Department has concluded that the project will not "debottleneck" the phosphoric acid plant, although annual production within permitted and design capacity may occur due to improved economics. This situation was already evaluated when the PSD review and BACT determination were conducted on the phosphoric acid plant in 1996. For reference, the BACT Determination served as the basis for EPA's proposal for Maximum Available Control Technology for new phosphoric acid plants.

Facility planning is often conducted in an incremental manner rather than as a single master plan. Separate, but related projects are often prioritized based on investment return. Some may be authorized while others deferred, canceled, re-activated, etc. With the long lead time required to get a permit and the expense of preliminary design, it is not unusual to submit related requests separately as the projects undergo internal scrutiny, prioritization, and preliminary design.

The Department does not believe that Cargill has separated the projects to avoid PSD and notes that all of them have been assessed for BACT. There appears to be no incentive to separate the projects for the purpose of avoiding PSD or BACT. There may be some incentive related to modeling requirements of projects resulting in ambient pollutant concentration increases greater than so-called "significant impact levels." However each of the applications under review includes impacts for $SO_2$ and $PM_{10}$ with respect to the respective ambient air quality standards and PSD increments.

Although the County has requested an opinion from EPA on these matters, the Department has concluded that the sulfuric acid project can be reviewed for PSD and undergo a BACT determination in accordance with Department rules. The Department will consider the EPA opinion when it is received.

The emission units affected by this permit modification shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

| | |
|---|---|
| Chapter 62-4 | Permits. |
| Rule 62-204.220 | Ambient Air Quality Protection |
| Rule 62-204.240 | Ambient Air Quality Standards |
| Rule 62-204.260 | Prevention of Significant Deterioration Increments |
| Rule 62-204.360 | Designation of Prevention of Significant Deterioration Areas |
| Rule 62-204.800 | Federal Regulations Adopted by Reference |
| Rule 62-210.300 | Permits Required |
| Rule 62-210.350 | Public Notice and Comments |
| Rule 62-210.370 | Reports |
| Rule 62-210.550 | Stack Height Policy |
| Rule 62-210.650 | Circumvention |
| Rule 62-210.700 | Excess Emissions |
| Rule 62-210.900 | Forms and Instructions |
| Rule 62-212.300 | General Preconstruction Review Requirements |
| Rule 62-212.400 | Prevention of Significant Deterioration |
| Rule 62-212.600 | Sulfur Storage and Handling Facilities |
| Rule 62-213 | Operation Permits for Major Sources of Air Pollution |
| Rule 62-296.320 | General Pollutant Emission Limiting Standards |
| Rule 62-297.310 | General Test Requirements |
| Rule 62-297.401 | Compliance Test Methods |
| Rule 62-297.520 | EPA Continuous Monitor Performance Specifications |

## 6. SOURCE IMPACT ANALYSIS

### 6.1 Emission Limitations

The proposed project will increase annual emissions of the following PSD pollutants (Table 212.400-2, F.A.C.): $SO_2$ and SAM. Per the application, the current emissions and requested allowable emissions for this modification are summarized in the following table.

6.2 Emission Summary

**Emissions From Sulfuric Acid Plant No. 7**

| Pollutant | Current Emissions (tons/yr) | Future Emissions (tons/yr) | Net Increase (tons/yr) | PSD Significant Level (tons/yr) |
|---|---|---|---|---|
| $SO_2$ | 1,251 | 2,044 | 793 | 40 |
| $NO_X$ | 40 | 70 | 30 | 40 |
| SAM | 13 | 88 | 75 | 7 |

6.3 Control Technology Review

The objective of the process and the pollution control requirements are compatible. This is to convert $SO_2$ to $SO_3$ and recover it as sulfuric acid. Prior to the 1970's most sulfuric acid was produced in a manner similar to the process previously described with the exception of the interpass tower and additional converter or pass. This was characterized by lower conversion efficiency and higher potential emissions.

Where required by environmental regulations, various control technologies were employed to further remove and recover $SO_2$ from single absorption plants. These typically were ammonia and caustic scrubbing processes. The addition of a second tower to the basic sulfuric acid manufacturing process obviated the need for and virtually eliminated the selection of add-on control processes. Since the onset of the dual absorption technology, further improvements in the process have resulted in the possibility of greater conversion efficiency and pollution reduction. Therefore add-on systems which do not result in additional sulfuric acid production remain uncompetitive except where a clear by-product market exists, such as for sodium sulfites by pulp and paper plants.

The fourth pass and final absorption tower are more or less beyond the economic requirements of the process and serve as the pollution control equipment. At some plants, converters (or passes) and absorbers following the interpass absorber are termed as "the abatement system." The impaction-based mist eliminators together with proper plant operation serve to control SAM emissions. $NO_X$ emissions are low (0.12 pounds per ton of acid produced) for this process based on estimates submitted by the applicant.

The overall conversion of $SO_2$ to $SO_3$ in the sulfuric acid process previously described in Section 3 above is over 99.7 percent. Approximately 90-95 % of acid recovery is effected in the interpass absorber with the remainder accomplished in the second absorber. The residual $SO_2$ concentration exiting the final tower is somewhere between 200 and 400 parts per million (ppm). This reflects short-term emissions of 2 to 4.0 pounds of $SO_2$ per ton of sulfuric acid produced. This is equal to 265 to 530 pounds per hour.

Similarly, some emissions of sulfuric acid mist occur. Depending on plant conditions and mist eliminator efficiency, emissions of sulfur acid mist are on the order of 0.02 to 0.15 pounds per ton of acid produced. This is equal to 3 to 20 pounds per hour.

The details of pollution control options are discussed in the draft Best Available Control Technology determination included with this evaluation.

6.4 Air Quality Analysis

6.4.1 Introduction

According to the application, the proposed project will increase emissions of two pollutants at levels in excess of PSD significant amounts: $SO_2$ and SAM. $SO_2$ is a criteria pollutant and has defined national and state ambient air quality standards (AAQS) and PSD increments. SAM is a non-criteria pollutant and has no AAQS or PSD increments defined for it; therefore, no air quality dispersion modeling was done for SAM. Instead, the BACT requirements will establish the SAM emission limit for this project. The PSD regulations require the following air quality analyses for this project:

- An analysis of existing air quality for $SO_2$;
- A significant impact analysis for $SO_2$;
- A PSD increment analysis for $SO_2$;
- An Ambient Air Quality Standards (AAQS) analysis for $SO_2$;
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The PSD increment and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A discussion of the required analyses follows.

6.4.2 Analysis of Existing Air Quality and Determination of Background Concentrations

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. This monitoring requirement may be satisfied by using previously existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined by air quality modeling, is less than a pollutant-specific de minimus concentration. In addition, if EPA has not established an acceptable monitoring method for the specific pollutant, monitoring may not be required.

If preconstruction ambient monitoring is exempted, determination of background concentrations for PSD significant pollutants with established AAQS may still be necessary for use in any required AAQS analysis. These concentrations may be established from the required preconstruction ambient air quality monitoring analysis or from previously existing representative monitoring data. These background ambient air quality concentrations are added to pollutant impacts predicted by modeling and represent the air quality impacts of sources not included in the modeling.

The table below shows that predicted $SO_2$ impacts are less than the de minimus level. Therefore, the project is exempted from the preconstruction monitoring requirement. However, $SO_2$ background concentrations of 25 and 14 ug/m$^3$ for the 3-hour and 24-hour averaging times, respectively, were established from previously existing air quality data for use in the AAQS analysis required for $SO_2$.

**Maximum Project Air Quality Impacts for Comparison to the De Minimus Ambient Levels.**

| Pollutant | Avg. Time | Max Predicted Impact (ug/m$^3$) | Impact Greater Than De Minimus? | De Minimus Level(ug/m$^3$) |
|---|---|---|---|---|
| $SO_2$ | 24-hour | 7 | NO | 13 |

6.4.3 Models and Meteorological Data Used in the Air Quality Impact Analysis

The applicant and the Department used the EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model to evaluate the pollutant emissions from the proposed project. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Tampa International Airport, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

Since five years of data were used in ISCST3, the highest-second-high (HSH) short-term predicted concentrations were compared with the appropriate AAQS or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards. For determining the project's significant impact area in the vicinity of the facility and if there are significant impacts from the project on any PSD Class I area, both the highest short-term predicted concentrations and the highest predicted yearly averages were compared to their respective significant impact levels.

6.4.4 Significant Impact Analysis

Initially, the applicant conducts modeling using only the proposed project's emissions. If this modeling shows significant impacts, additional modeling is required to determine the project's impacts on the AAQS or PSD increments. The modeling used a discrete receptor grid representing the property boundary and receptor locations corresponding to a polar grid up to the most distant property boundary. From the property boundary on out from the facility nine receptor rings with 10 degree intervals (10-360 degrees) were placed at distances ranging from 2 km to 11 km from the facility, which is located in a PSD Class II area. Thirteen discrete receptors were set in the Chassahowitzka National Wilderness Area (CNWA) which is a PSD Class 1 area located approximately 85 km to the northwest of the project at its closest point.

For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project are predicted in the vicinity of the facility or in the CNWA.

The tables below show the results of this modeling. Significant $SO_2$ impacts were predicted for the short term averaging times in both the Class II area in the vicinity of the project and the CNWA Class I area. Therefore, additional multiple source AAQS and PSD increment analyses were required for this project for the 3- and 24-hour averaging times.

**Maximum Project Air Quality Impacts for Comparison to the PSD Class II Significant Impact Levels in the Vicinity of the Facility.**

| Pollutant | Averaging Time | Maximum Predicted Impact ($ug/m^3$) | Significant Impact Level ($ug/m^3$) | Significant Impact? | Radius of Significant Impact (km) |
|---|---|---|---|---|---|
| $SO_2$ | Annual | 0.4 | 1 | NO | 0.0 |
| | 24-hour | 7 | 5 | YES | 7.0 |
| | 3-hour | 48 | 25 | YES | 7.0 |

**Maximum Project Air Quality Impacts in the CNWA for Comparison to the PSD Class I Significant Impact Levels**

| Pollutant | Averaging Time | Maximum Predicted Impact ($ug/m^3$) | Significant Impact Level ($ug/m^3$) | Significant Impact? |
|---|---|---|---|---|
| $SO_2$ | Annual | 0.007 | 0.1 | NO |
| | 24-hour | 0.28 | 0.2 | YES |
| | 3-hour | 2.33 | 1.0 | YES |

6.4.5 Receptor Networks For AAQS and PSD Increment Analyses

The receptor network submitted by the applicant included a discrete receptor grid placed along the property boundaries and a polar grid out to 7 km from the facility.

6.4.6 AAQS Analysis

For pollutants subject to an AAQS review, the total impact on ambient air quality is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes into account all sources of a particular pollutant that are not explicitly modeled. The AAQS analysis submitted with this proposed project shows that maximum predicted total $SO_2$ impacts in the area are predicted to exceed the AAQS at numerous receptors and times for the 24-hour and 3-hour averaging times. The maximum predicted total impacts are shown in the table below.. Cargill's proposed project may be permitted if it does not significantly contribute to any modeled violation. The applicant and the department did additional modeling to determine whether the project would significantly contribute to any

predicted violation of the AAQS. The results of the additional modeling show that the project does not significantly contribute to any predicted violation of the AAQS, and therefore can be permitted.

**$SO_2$ Ambient Air Quality Impacts**

| Averaging Time | Major Sources Impact ($ug/m^3$) | Background Conc. ($ug/m^3$) | Total Impact ($ug/m^3$) | Florida AAQS ($ug/m^3$) |
|---|---|---|---|---|
| 24-hour | 298 | 14 | 312[1] | 260 |
| 3-hour | 1468 | 25 | 1493[2] | 1300 |

1 The project has less than significant impacts for all predicted exceedances of $SO_2$ AAQS.

6.4.6 PSD Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant from a baseline concentration. The baseline $SO_2$ concentration was established in 1975 for existing major sources of $SO_2$.

PSD Class II Increment Analysis

The maximum predicted PSD Class II area $SO_2$ increments consumed by this project in conjunction with all other increment consuming sources in the vicinity of the facility are shown in the table below. The table shows that the maximum predicted $SO_2$ impacts are less than the allowable increments.

**$SO_2$ PSD Class II Increment Analysis**

| Averaging Time | Max Predicted Impact ($ug/m^3$) | Allowable Increment ($ug/m^3$) |
|---|---|---|
| 24-hour | 56 | 91 |
| 3-hour | 214 | 512 |

The nearest PSD Class I area is the Chassahowitzka National Wilderness Area (CNWA)located 85 km north of the facility at its closest point. The maximum predicted PSD Class I area $SO_2$ increments consumed by this project in conjunction with all other increment consuming sources in the vicinity of the Class I area are shown in the table below. The table shows that maximum predicted $SO_2$ impacts from all sources exceed the allowable increments:

**$SO_2$ PSD Class I Increment Analysis**

| Averaging Time | Max. Predicted Impact ($ug/m^3$) | Allowable Increment ($ug/m^3$) |
|---|---|---|
| 24-hour | 6.5[2] | 5 |
| 3-hour | 26.9[2] | 25 |

2 The project has less than significant impacts for all predicted exceedances of $SO_2$ increments

Additional modeling was done to determine the project's impacts whenenver there was a predicted exceedance of an increment. Results of the additional modeling show that the proposed project has no significant contribution to any predicted exceedances of the increments.

6.5 Additional Impacts Analysis

6.5.1 Impact Analysis Impacts On Soils, Vegetation, And Wildlife

The applicant did an air quality related values analysis (AQRV) for both the PSD Class II area near the facility and for the Chassahowitzka Class I area located 85 km to the north. The increased emissions from the project are not expected to impact the AQRVs of either area.

6.5.2 Impact On Visibility

A regional haze analysis was doneto assess the potential for a significant increase in regional haze in the Class I CNWA due to this source's projected increase in emissions. The results indicate that the impact of this project on visibility in the Class I area is insignificant.

6.5.3 Growth-Related Air Quality Impacts

The proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

## 7. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations, provided the Department's BACT determination is implemented. Although the project does not *significantly contribute* to *modeled* violations of the ambient air quality standards, the violations need to be addressed through the State Implementation Plan. In the meantime, the Department will review the Title V applications for large $SO_2$ sources in the area and recommends that Cargill review alternative measures to reduce $SO_2$ emissions from sulfuric acid plants in the Riverview facitlity.

A. A. Linero, P.E.
Cleve Holladay, Meteorologist

Insert A Cargill has informed the Department that no modifications are planned at the phosphoric acid plant to take advantage of the increased production of sulfuric acid at the Riverview facility. Cargill provided information showing that it has imported more than 455,000 tons of sulfuric acid into the Riverview and Bartow fertilizer plants over the last year. Assuming 100% capacity factor, the proposed increase at the No. 7 SAP of 1,000 TPD of sulfuric acid will provide an additional 365,000 TPY of sulfuric acid. As a result, the proposed increase will not totally offset the plants sulfuric acid requirements. Cargill will continue to purchase sulfuric acid. Therefore, the phosphoric acid plant will continue to operate as in the past, whether using purchased sulfuric acid or acid generated on-site. Further, a PSD review and BACT determination was conducted on the phosphoric acid plant in 1996. The Department has concluded that the project will not "debottleneck" the phosphoric acid plant, although annual production increases within permitted and design capacity may occur due to market conditions. This situation was already evaluated when the PSD review and BACT determination were conducted on the phosphoric acid plant in 1996.

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Insert B Although these actual test data from SAP No. 7 indicates SAM emissions lower than 0.15 lb/ton, information from Cargill shows that the air velocity at the mist eliminators will decrease slightly with the new system. Since efficiency decreases as velocity decreases with the impaction type mist eliminators, overall efficiency may decrease slightly. In addition, this will be a completely new system for which there is no actual operating experience. Given these uncertainties, an emission rate of 0.13 lb/ton of 100% sulfuric acid produced is considered to represent BACT for SAM. This limit would be the lowest SAM limit in the industry.

**PERMITTEE:**

Cargill Fertilizer, Inc.
8813 US Highway 41 South
Riverview, Florida 33569

| | |
|---|---|
| File No. | 0570008-025-AC |
| FID No. | 0570008 |
| SIC No. | 2819 |
| Permit No. | PSD-FL-250 |
| Expires: | December 31, 2001 |

*Authorized Representative:*
David B. Jellerson, P.E.
Environmental Superintendent

**PROJECT AND LOCATION:**

Permit to increase the capacity of Sulfuric Acid Plant No. 7 from 2,200 to 3,200 tons per day. The plant serves a fertilizer facility located at US Highway 41 South, Riverview, Hillsborough County. UTM coordinates are Zone 17; 362.9 km E ; 3082.5 km N.

**STATEMENT OF BASIS:**

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). 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).

**APPENDICES AND ATTACHMENTS MADE A PART OF THIS PERMIT:**

| | |
|---|---|
| Table 1 | Air Pollutant Standards and Terms |
| Appendix A | Best Operational Start-up Procedures for Sulfuric Acid Plants |
| Appendix BD | Best Available Control Technology Determination |
| Appendix CSC | Emission Unit(s) Common Specific Conditions |
| Appendix GC | Construction Permit General Conditions |



Howard L. Rhodes, Director
Division of Air Resources
Management

## SECTION I. FACILITY INFORMATION

### FACILITY DESCRIPTION

The existing complex consists of three sulfuric acid plants and associated molten sulfur storage and handling equipment, a phosphoric acid plant, mono and diammonium phosphate fertilizer plants, granular triple superphosphate plant, animal feed plant, phosphate rock grinding/drying facilities, sodium fluoride plant, a gypsum stack and process cooling ponds, and a material handling system. This permit is for a project to increase the capacity of an existing 2200 ton per day (TPY) sulfur-burning, double absorption sulfuric acid plant to 3200 TPY. The project consists of: replacement of the drying tower and blower; installation of a new converter and boiler; increase in catalyst loading; and modifications to the existing sulfur burner, converter, interpass tower, final tower, boiler, superheaters, economizers, feedwater system, and steam system.

Air pollution control equipment consists of the double absorption process, use of additional vanadium catalyst beyond the requirement for the production increase, and impaction-based mist eliminators on the final tower.

### EMISSION UNITS

This permit addresses the following emission units:

| EMISSIONS UNIT NO. | SYSTEM | EMISSIONS UNITS DESCRIPTION |
|---|---|---|
| 004 | Process | Sulfuric Acid Plant |

### REGULATORY CLASSIFICATION

The Cargill Fertilizer facility is classified as a "Major or Title V Source" per Rule 62-210.200, F.A.C., Definitions, because emissions of at least one regulated air pollutant exceed 100 tons per year (TPY).

Sulfuric acid 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 sulfur dioxide 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 for sulfuric acid mist and nitrogen oxides 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).

The molten sulfur storage and handling equipment is subject to **Rule 62-212.600, F.A.C.**. The sulfuric acid plant is also subject to 40 CFR Subpart H, New Source Performance Standards (NSPS) for Sulfuric Acid Plants, incorporated by reference in **Rule 62-204.800, F.A.C.**

## SECTION I. FACILITY INFORMATION

**PERMIT SCHEDULE:**

- 08/XX/98 Notice of Intent published in _____
- 08/25/98 Distributed Intent to Issue Permit
- 07/23/98 Received Cargill Request to Process Application Per Rule 62-4.055, F.A.C.
- 05/01/98 Received Application

**RELEVANT DOCUMENTS:**

The documents listed below are the basis of the permit. They are specifically related to this permitting action but do not supersede the conditions given in the permit. These documents are on file with the Department.

- Application received May 1, 1998.
- Department's letters dated May 29 and July 10.
- Comments from the National Park Service dated May 27, May 29, and July 28.
- Comments from the Environmental Protection Commission of Hillsborough County dated May 27 and July 10.
- EPA's letter dated September XX.
- Applicant's completeness responses received June 12 and July 20, Request to Process Application received July 23, and additional comments received August 6.
- Department's Intent to Issue dated August 25 and associated documents.
- Applicant's comments dated September XX on Department documents issued August 19.
- Department's Final Determination accompanying permit.

## SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

### GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Environmental Protection Commission of Hillsborough County, 1410 North 21 Street, Tampa, Florida 33605 (phone number: 813/272-5530). 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 Blairstone Road, 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 December 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.]**

# AIR CONSTRUCTION PERMIT 0570008-025-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

**SPECIFIC CONDITIONS - SULFURIC ACID PLANT NO. 7:**

The following Specific Conditions apply to the following emission units:

| EMISSIONS UNIT NO. | SYSTEM | EMISSIONS UNITS DESCRIPTION |
|---|---|---|
| 004 | Process | Sulfuric Acid Plant |

1. Emissions Unit 004 shall comply with all applicable provisions of the 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart H, Sulfuric Acid Plants. **[Rule 62-204.800(7)(b)10., F.A.C]**

2. Emissions Unit 004 shall also comply with all applicable requirements of 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart A, General Provisions. These include:

   - 40 CFR 60.7, Notification and record keeping
   - 40 CFR 60.8, Performance tests
   - 40 CFR 60.11, Compliance with standards and maintenance requirements
   - 40 CFR 60.12, Circumvention
   - 40 CFR 60.13, Monitoring requirements
   - 40 CFR 60.19, General notification and reporting requirements

3. Emissions of sulfur dioxide ($SO_2$), sulfuric acid mist (SAM), visible emissions (VE), and nitrogen oxides ($NO_X$) from the sulfuric acid plant shall not exceed the following limits: **[Rules 62-204.800(7)(b)10; 62-210.200; 62-212.400, F.A.C.]**

| Pollutant | Pounds per Hour | Tons per Year | Limit Basis |
|---|---|---|---|
| $SO_2$ | 467 [1] | 2044 | 3.5 lb/ton 100% $H_2SO_4$ produced (BACT) [1] |
| $SO_2$ | 533 | | 4 lb/ton 100% $H_2SO_4$ produced (NSPS) |
| SAM | 16 | 70 | 0.12 lb/ton 100% $H_2SO_4$ produced (BACT) |
| VE | 10% opacity | | NSPS |
| $NO_X$ | 16.0 [2] | 70 | 0.12 lb/ton 100% $H_2SO_4$ produced [2] |

1. 24-hour daily average based on CEMS data.
2. Applicant's estimate. Required for initial compliance test only to demonstrate that modification is minor with respect to PSD.

4. The production rate shall not exceed 3200 TPD as 100% sulfuric acid on a 24-hour basis. **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

5. This emission unit is allowed to operate continuously (8760 hours/year) **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

6. The permittee shall install approximately 586,000 liters of vanadium catalyst in the two converters. A change to another $SO_2$ control strategy shall not occur without the Department's review and approval and shall require submittal of a permit modification request to revise the Best Available Control Technology Determination. **[Rules 62-4.070 and 62-212.400, F.A.C.]**

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

7. The permittee shall install new impaction-based or Brownian diffusion-based mist eliminators to reduce emissions of sulfuric acid mist from the final tower. **[Rule 62-4.070 and 62-212.400, F.A.C.]**

8. The permittee shall comply with all applicable requirements of the Department's sulfur storage and handling rule. **[Rule 62-296.411, F.A.C.]**

9. 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.]**

10. Plant and emission control equipment operating parameters determined during compliance testing and/or inspection that will establish the proper operation of each emissions unit shall be included in the Title V permit. **[Rule 62-297.310, F.A.C. and 62-4.070(3), F.A.C.]**

11. A continuous emissions monitoring system (CEMS) shall be installed, calibrated, maintained, operated, and used to determine compliance with the 24-hour emissions limit for $SO_2$. The CEMS shall be installed and certified before the initial performance test and operated in compliance with 40 CFR 60, Appendix F, Quality Assurance Procedures (1997 version) or other Department-approved QA plan; 40 CFR 60, Appendix B, Performance Specification 2 (1997 version).

    The CEMS shall calculate and record emission rates in units of pounds of $SO_2$ per ton of 100 percent sulfuric acid produced. Each operating day, the average $SO_2$ emission rate for the previous 24 hours shall be calculated and recorded. Emissions shall be calculated in units of pounds of $SO_2$ per ton of 100 percent acid produced using one of the methods specified in 40 CFR 60.84. Averages are to be calculated as the arithmetic mean of each monitored operating hour from the previous 24 monitored operating hours. A monitored operating hour is each hour in which sulfur is burned in the unit and at least two emission measurements are recorded at least 15 minutes apart. Data taken during periods of startup, or when sulfur is not burned in the unit, or when the CEMS is out of control as defined in 40 CFR 60, Appendix F, Section 5.2 shall be excluded from the 24-hour average. Data recorded during periods of shutdown, malfunction, load change, and continuous operating periods shall be included in the daily calculation of the 24-hour average.

    To the extent the monitoring system is available to record emissions data, the CEMS shall be operated and shall record data at all operating hours when sulfur is burned in the unit, including periods of startup, shutdown, load change, continuous operation and malfunction. Monitor downtimes and excess emissions based on 3-hour averages, which include startup emissions, shall be reported on a quarterly basis using the SUMMARY REPORT in 40 CFR 60.7. A detailed report of the cause, duration, magnitude, and corrective action taken or preventative measures adopted for each excess emission occurrence, and a listing of monitor downtime occurrences shall accompany the SUMMARY REPORT when the total duration of excess emissions is 1% or greater or if the monitoring system downtime is 5% or greater of the total monitored operating hours.

The monitoring device shall meet the applicable requirements of Chapter 62-204, F.A.C., 40 CFR 60, Appendix F, and 40 CFR 60.13, including certification of each CEMS in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) Notification Requirements. Data on monitoring equipment specifications, manufacturer, type calibration and maintenance requirements, and the proposed location of each stack probe shall be provided to the Department for review at least 30 days prior to installation of a new CEMS. **[Rule 62-4.070 (3) F.A.C and Rule 62-204.800, F.A.C.]**

12. Compliance with the emission limits for $SO_2$ and SAM shall be determined using the following reference methods as described in 40 CFR 60, Appendix A (1996, version), adopted by reference in Chapter 62-204, F.A.C.

    **Method 8** Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources. (for demonstrating compliance with 40 CFR 60, Subpart H)

    **Method 9** Visual Determination of the **Opacity of Emissions from Stationary Sources.**

    These emissions units shall comply with all applicable requirements of Rule 62-297.310, F.A.C. General Test Requirements and 40 CFR 60.8 Performance Tests.

    Testing of emissions shall be conducted with the emissions units operating at permitted capacity, which is defined as 90-100% of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the unit may be tested at less than 90% of the maximum operating rate allowed by the permit; in this case, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C., and 40 CFR 60 Appendix A and 40 CFR 60.8, Subpart A].**

13. An initial stack test for $NO_X$ is required for informational purposes only. $NO_X$ emissions shall be determined using EPA Reference Method 7E. **[Rule 62-4.070, F.A.C]**

14. This facility shall maintain a central file containing all measurements, records, and other data that are required to be collected pursuant to this permit. Operators shall keep a daily operation and maintenance log to include, at a minimum, calibration logs for all instruments, maintenance/repair logs for any work performed on equipment or instruments, all measurements, records, and any other data required to be maintained by the permittee shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded. These data shall be made available to Department staff upon request. The Department shall be notified in writing at least 15 days prior to any emissions testing or auditing of any instrument required to be operated by these specific conditions in order to allow witnessing by authorized personnel. **[Rule 62-4.070(3), F.A.C.]**

15. This facility shall maintain adequate fencing, physical barriers, or equivalent around the facility property boundary to deter public access. **[40 CFR 50.1(e)]**

## Table 1 Air Pollutant Standards and Terms.

FACILITY ID NUMBER: 0570008

**Permittee:**
**Cargill Fertilizer, Inc.**

Permit No.: 0570008-025-AC
Sulfuric Acid Plant No. 7
Project to Increase Production to 3,200 tons per day

**Emission Unit 004**

| | | | | Allowable Emissions [2] | | Equivalent Emissions [3] | |
|---|---|---|---|---|---|---|---|
| E.U. ID# | Description | Pollutant ID | Fuel(s) [2] | Permit limits | lb/hr [1] | TPY | Basis |
| 4 | Sulfuric Acid Plant | $SO_2$ | molten sulfur | 4 lb/ton acid (3-hr) | 533 | | NSPS |
| 4 | Sulfuric Acid plant | $SO_2$ | molten sulfur | 3.5 lb/ton acid (24-hr) | 467 | 2,044 | BACT |
| 4 | Sulfuric Acid plant | SAM | molten sulfur | 0.12 lb/ton acid | 16 | 70 | BACT |
| 4 | Sulfuric Acid plant | NOX | molten sulfur | 0.12 lb/ton acid [4] | 16 | 70 | Application |
| 4 | Sulfuric Acid plant | VE | molten sulfur | 10 % opacity | | | NSPS |

### ALLOWABLE OPERATING RATES

| | |
|---|---|
| Hours of operation per year | 8760 |
| Sulfuric Acid Production | 3200 tons per day [5] |

**NOTES**

(1) At a maximum sulfuric acid production rate of 3,200 TPD as 100 percent sulfuric acid.
(2) Compliance Units. This emission unit facility shall demonstrate compliance based on these standards.
(3) "Equivalent Emissions" are based on annual emissions at 8760 hrs/yr. The "Equivalent Emissions" are also listed for informational purpose and for PSD and recordkeeping tracking purposes.
[4] Ton = 2000 pounds.
[5] NOX limit is to demonstrate accuracy of permit application emission estimate.

# APPENDIX A
# BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS

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1. Only one sulfuric acid plant at a facility should be started up and burning sulfur at a time. There are times when it will be acceptable for more than one sulfuric acid plant to be in the start-up mode at the same time, provided the following condition is met. It is not acceptable to initiate sulfur burning at one sulfuric acid plant when another plant at the same facility is emitting $SO_2$ at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEMs emission rates for the immediately preceding 20 minutes.

2. A plant start-up must be at the lowest practicable operating rate, not to exceed 70 percent of the designated operating rate, until the $SO_2$ monitor indicates compliance. Because production rate is difficult to measure during start-up, if a more appropriate indicator (such as blower pressure, furnace temperature, gas strength, blower speed, number of sulfur guns operating, etc.) can be documented, tested and validated, the Department will accept this in lieu of directly documenting of the suitable list of surrogate parameters to demonstrate and document the reduced operating rate on a plant-by-plant basis. Documentation that the plant is conducting start-up at the reduced rate is the responsibility of the owner or operator.

3. Sulfuric acid plants are authorized to emit excess emissions from start-up for a period of three consecutive hours provided best operational practices, in accordance with this agreement, to minimize emissions are followed. No plant shall be operated (with sulfur as fuel) out of compliance for more than three consecutive hours. Thereafter, the plant shall be shut down. the plant shall be shut down (cease burning sulfur) if, as indicated by the continuous emission monitoring system, the plant is not in compliance within three hours of startup. Restart may occur as soon as practicable following any needed repairs or adjustments, provided the corrective action is taken and properly documented.

4. Cold Start-Up Procedures.

   a. Converter.

      (1) The inlet and outlet temperature at the first two masses of catalyst shall be sufficiently high to provide immediate ignition when $SO_2$ enters the masses. In no event shall the inlet temperature to the first mass be less than 800°F or the outlet temperature to the first two masses be less than 700°F. These temperatures are the desired temperatures at the time the use of auxiliary fuel is terminated.

(2) The gas stream entering the converter shall contain $SO_2$ at a level less than normal, and sufficiently low to promote catalytic conversion to $SO_3$.

b. Absorbing Towers.

The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent $H_2SO_4$.

5. Warm Restart.

a. Converter

The inlet and outlet temperatures of the first two catalyst masses should be sufficiently high to ensure conversion. One of the following three conditions must be met:

(1) The first two catalyst masses inlet and outlet temperatures must be at a minimum of 700°F; or

(2) Two of the four inlet and outlet temperatures must be greater than or equal to 800°F; or

(3) The inlet temperature of the first catalyst must be greater than or equal to 600°F and the outlet temperature greater than or equal to 800°F. Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to 700°F.

Failure to meet one of the above conditions, requires use of cold start-up procedures.

To allow for technologies improvements or individual plant conditions, alternative conditions will be considered by the Department in appropriate cases.

b. Absorbing Towers.

The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent $H_2SO_4$.

# APPENDIX BD
# BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

**Sulfuric Acid Plant**
**Cargill Fertilizer, Inc.**
**PSD-FL-250 and 0570008-025-AC**
**Riverview, Hillsborough County**

## BACKGROUND

The applicant, Cargill Fertilizer, Inc., proposes to increase the capacity of its existing 2,200 tons per day (TPD) sulfuric acid plant (SAP No. 7) to 3,200 TPD. The plant is one of three SAPs at Cargill's fertilizer complex located at US Highway 41 South, Riverview, Hillsborough County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of sulfur dioxide ($SO_2$) and sulfuric acid mist (SAM). The project is therefore subject to review for Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rule 62-212.400, F.A.C.

Descriptions of the process, project, ambient air quality effects, and rule applicability are given in the separate Technical Evaluation and Preliminary Determination issued with the Department's Intent and Public Notice package.

## DATE OF RECEIPT OF A BACT APPLICATION:

The application received on May 1, 1998 included a proposed BACT determination prepared by the applicant's consultant, Golder Associates, Inc.

## REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

## BACT DETERMINATION REQUESTED BY THE APPLICANT:

| POLLUTANT | CONTROL TECHNOLOGY | PROPOSED BACT LIMIT |
|---|---|---|
| Sulfur Dioxide | Double Absorption Process<br>Increase Catalyst Mass Volume per Ton of Acid Capacity by 10 percent | 3.5 pounds per ton 100% $H_2SO_4$ (24-hr) |
| Sulfuric Acid Mist | Impaction-Based Mist Eliminators | 0.15 pounds per ton 100% $H_2SO_4$ |

The plant with the proposed controls and limits will emit approximately 2,044 tons per year (TPY) of $SO_2$, 88 TPY of SAM, and 70 TPY of $NO_X$. The applicant proposes to use the same process and control technology as used in the past to achieve the proposed limits. These limits will be met by converting over 99.7 percent of $SO_2$ produced into sulfur trioxide ($SO_3$), absorbing the $SO_3$ in circulating streams of sulfuric acid, and minimizing SAM formation and losses by process controls and impaction-based mist eliminators.

# APPENDIX BD
# BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

## BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, 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.

## STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is the New Source Performance Standard (NSPS) for sulfuric acid plants built since 1971. This NSPS, promulgated by EPA as 40 CFR 60, Subpart H, was adopted by the Department by reference in Rule 62-204.800, F.A.C. It was re-affirmed in 1985 by EPA. The emission limits required by Subpart H are 4 pounds $SO_2$ per ton acid (lb $SO_2$/ton) based on 3 hour averaging, 0.15 lb SAM/ton acid, and 10 percent visibility. No National Emission Standard for Hazardous Air Pollutants exists for sulfuric acid plants.

## EMISSION LIMITS AND BACT DETERMINATIONS BY EPA AND STATES:

Most sulfuric acid plant BACT determinations made to-date by EPA and the states, including the State of Florida, have been identical to the NSPS. Among the exceptions is General Chemical in Anacortes, Washington. In that case, Plant 3 undergoing a modification, was limited to the NSPS values for both $SO_2$ and SAM subject to subsequent testing. However, existing Plants 1 and 2 at the same facility and exhausting through the same stack, were limited to 1.159 lb $SO_2$/ton. An initial "BACT" limit was set for the combined stack emissions for the three units at 2.54 lb $SO_2$ /ton and 0.105 lb SAM/ton.

The General Chemical plants are double absorption plants like the Cargill plant. The feedstock at General Chemical is spent sulfuric acid and hydrogen sulfide whereas the feed at Cargill is elemental

sulfur. Following scrubbing, cleaning, and drying, the gas stream introduced to the first pass at the General Chemical plant is similar to that entering the first pass at the Cargill plant. The main distinction related to possible conversion and emissions control is that the gas strength of $SO_2$ going into the first pass at the General Chemical plants (8-12%) is more variable than the strength of $SO_2$ going into the first pass at Cargill. Also the General Chemical plants are much smaller than the Cargill plant. However no distinction was drawn or separate limits set in the preparation of the Subpart H standards which are equally applicable to both types of plants.

Recently, Mississippi Phosphates Corporation submitted an application to the State of Mississippi to increase production from 1650 TPD to 1786 TPD of acid at each of two plants. The increase will be attained by replacing pelletized vanadium (actually vanadium-containing) catalyst in the converters with low pressure drop, ring-shaped, vanadium catalyst. This will effectively debottleneck the plants with no other substantial changes. Mississippi Phosphates initially requested a limit of 3.25 lb $SO_2$/ton acid to avoid PSD review for $SO_2$. They proposed 0.15 lb SAM/ton acid and 10 percent opacity as BACT emission limits in satisfaction of PSD requirements. Ultimately, Mississippi issued a permit with short-term limits identical to those in the NSPS, but with future annual emissions capped at past actual annual emissions. These two plants use the same process as Cargill. One of them is the oldest double absorption process plant in the country.

In February 1998, the Department issued a permit to Piney Phosphates, Manatee County, to repair and restore to previous capacity a plant similar to the one under review. A BACT limit of 3.5 lb $SO_2$/ton acid on a 48-hour basis was specified for the project. In May, 1998 an Intent to Issue a permit for construction of a new 2,750 TPD sulfuric acid plant was issued to Farmland, Polk County. The BACT limit for $SO_2$ was determined to be 3.5 lb/ton acid on a 3-hour basis.

## OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the National Park Service dated May 27, May 29, and July 28, 1998.
- Comments from EPA Region IV dated September XX, 1998
- Comments from Hillsborough County dated May 29 and June 30.
- Papers written by Monsanto Enviro-Chem on sulfur dioxide emissions control
- Papers written by Monsanto Enviro-Chem on sulfuric acid processes
- Monsanto Enviro-Chem website information on technologies, catalysts, and pollution control
- Calgon Carbon/Monsanto Enviro-Chem joint press release on new $SO_2$ control technology
- Papers written by Haldor Topsoe on cesium catalysts and additional product information
- EPA background documents in support of NSPS and AP-42, Compilation of Emission Factors
- AWMA Air Pollution Control Manual

# APPENDIX BD
# BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

## DETERMINATION BY DEP:

| POLLUTANT | CONTROL TECHNOLOGY | EMISSION LIMIT |
|---|---|---|
| Sulfur Dioxide | Double Absorption Process Increase Catalyst Mass Volume per Ton of Acid Capacity by 10 percent | 3.5 lb/ton 100% $H_2SO_4$ (BACT, 24-hr) 4.0 lb/ton 100% H2SO4 (NSPS, 3-hr) |
| Sulfuric Acid Mist | Impaction or Brownian Diffusion-Based Mist Eliminators | 0.12 pounds per ton 100% $H_2SO_4$ (BACT) |

## DETERMINATION RATIONALE:

A "Top-Down" BACT determination rapidly converges to variations of the established double absorption technology wherein the production process and the BACT are identical, thus eliminating the need for add-on control equipment. The applicant's BACT proposal for $SO_2$ is equivalent to the Department's BACT determination. The Department's BACT determination requires compliance with a 24-hour limit of 3.5 lb $SO_2$/ton acid. The 24-hour average $SO_2$ removal efficiency is approximately 99.74 percent (%). The Department's BACT determination for SAM is more stringent than the applicant's proposal. The underpinnings for the Department's determination are:

1. The Department reviewed the application submitted by Mississippi Phosphates to the State of Mississippi. The scope of the project by Cargill is greater than the project by Mississippi Phosphates, which initially proposed an emissions limit of 3.25 lb $SO_2$/ton acid to avoid PSD and BACT. The final permitted limit for the Mississippi Phosphates project is 4.0 lb $SO_2$/ton acid. The annual emission cap (limiting future annual emissions after the production increase to past emissions) will necessitate that emissions at the plant be maintained between 3.0 and 4.0 lb $SO_2$/ton acid.
2. The determination for $SO_2$ is more stringent than the one for the Piney Point Phosphates project. The 3.5 lb $SO_2$/ton acid emission limit for Cargill is based on 24-hours, whereas the one for Piney Point Phosphates is based on 48-hours.
3. In the opinion of the Department, use of "cesium-promoted" vanadium catalyst in the fourth pass can reduce $SO_2$ emissions by 20 to 40 percent (to between 3.2 and 2.4 lb/ton acid or 99.76 to 99.82% conversion efficiency) in a cost-effective manner. This option provides a benchmark against which the applicant can weigh all the options available for $SO_2$ emissions reduction. The recently-issued permit for the Piney Point Phosphates project requires installation of cesium-promoted catalyst in the final pass at that project.
4. Without considering averaging time, the proposed $SO_2$ limit for the Cargill (and Farmland and Piney Point) project(s) reflects a 12.5 percent reduction from the NSPS limit in $SO_2$ emissions while still allowing a reasonable margin for compliance. The proposed limit of 3.5 lb $SO_2$/ton acid at Cargill can be achieved over an averaging time of 24 hours. This will allow the applicant to correct and compensate for 3-hour $SO_2$ emissions greater than 3.5 (but less than 4 lb/ton) by achieving emissions lower than 3.5 lb/ton during the rest of the 24-hour period.

5. Cargill plans to increase the amount of conventional vanadium used in order to achieve the higher production rate of 3200 TPD. Rather than switching to cesium-promoted catalyst, Cargill determined that a further 10 percent increase in the amount of conventional catalyst will also achieve the lower emission rate.

6. Conventional vanadium ringed catalyst costs $3.15 per liter (per Monsanto). Cargill will install an additional 48,000 liters of vanadium catalyst at a cost of over $150,000 in addition to the catalyst required to achieve 3,200 TPD at 3.5 lb $SO_2$/ton acid.

7. In the BACT determination for Piney Point, the Department estimated that the cost-effectiveness of $SO_2$ removal by use of cesium-promoted catalyst is less than $265 per ton of $SO_2$ removed. With the use of additional, but lower cost catalyst, together with the higher pressure drop, the cost-effectiveness will be about the same for the Cargill project as the Piney Point project.

8. Control options involving production of by-products or wastes are not necessary at Cargill. These needlessly require storage and handling of additional materials which unnecessarily complicate operations. Some of these processes were competitive prior to the development of the double absorption process. They have been phased out at many plants and are not seriously considered at any new or existing plants except where there is a market for the by-product (such as sodium sulfites used by pulp and paper mills).

9. There is no indication that add-on control methods are competitive with those which result in production of additional sulfuric acid when all costs are considered. The cost estimates available to the Department indicate they are generally more expensive than the cesium/vanadium catalyst alternative or simply adding more conventional catalyst and blower capacity. They remain available at the discretion of Cargill (particularly if there is a use for the by-products) as alternatives to achieve the Department's BACT $SO_2$ limits.

10. The Centaur process, which uses low temperature wet carbon catalysis/adsorption in place of the standard final pass and absorption tower, is viable and was (according to Monsanto and Calgon Carbon statements) demonstrated on a pilot scale at a sulfur burning plant. Commercial sales incorporating Centaur for 1000 TPD plants have been made to Philippines Phosphate Fertilizer Corporation and to a chemical company in Venezuela. It is licensed by Calgon Carbon and Monsanto Enviro-Chem. Emissions as low as 1 lb $SO_2$/ton acid are theoretically possible. However, the process has not yet been optimized and might result in a separate excess weak sulfuric acid stream (beyond plant water makeup needs) which might require treatment and disposal. Process optimization and building contingency treatment facilities would delay expansion of the plant.

11. The Department does not recommend the Centaur process at Cargill at this time. It remains an option that Cargill can choose if it prefers it over other alternatives. The process may actually gain appeal in future plants and modifications for economic reasons once the potential problems are determined and minimized.

12. Additional impaction-based Monsanto Enviro-Chem "CS" mist eliminators will be installed in the final tower. According to the applicant, there are safety and difficult construction considerations associated with installing the larger High Efficiency mist eliminator models (such as the HE and ES lines) in the existing tower. The space required to remove SAM by Brownian Diffusion is such that the upper portion of the existing tower would need to be flared or a new tower would need to be installed.

13. It would cost $2,000,000 to dismantle the existing tower and erect a new one. Together with the cost of the more expensive Brownian Diffusion mist eliminators, it is not cost-effective to require Cargill to replace the final tower in order to achieve a small reduction in SAM. The Brownian Diffusion option is considered BACT by the Department for new final towers and plants. The Department accepts Cargill's assertions regarding the safety and construction considerations regarding modifications of the existing final tower required to achieve a small reduction in SAM.

14. According to the application, SAM emissions ranged from a low of 0.010 to a high of 0.083 lb/ton at SAP No. 7. The Department also reviewed results of 11 tests (33 separate runs) conducted between 1989 and 1997 at the higher capacity SAPs Nos. 8 and 9. The averaged results of 3-run tests ranged from 0.01 to 0.05 lb/ton. The highest single run was approximately 0.08 lb/ton and is consistent with the results presented by the applicant for SAP No. 7.

15. According to the National Park Service, 0.10 lb SAM/ton acid is within the 95 percent confidence interval (after exclusion of "outliers") for SAM emission data collected by EPA.

16. Because Cargill will not install the Brownian Diffusion-based units (due to the special considerations cited), the Department will require that the impaction-based units be maintained such that they will achieve 0.12 lb/ton acid. This is lowest emission limit for SAM to-date at a sulfuric acid plant.

17. If Cargill installs a new tower or determines a safe way to physically modify the final tower, Brownian Diffusion mist eliminators will satisfy a "work practice" BACT in lieu of an emissions-based BACT.

18. The NSPS visibility limit of 10 percent opacity is consistent with the above discussion. There was no need to set a BACT opacity limit.

19. The increase in $NO_X$ is not significant with respect to PSD. The $NO_X$ limit of 0.12 lb/ton given in the application should insure that the increase will be small and not significant.

## COMPLIANCE METHODOLOGY:

Demonstration of compliance with the NSPS limits shall be as required by Subpart H. These are EPA Reference Method 8 for $SO_2$ and SAM. EPA Methods 1, 2, and 3 shall be used to determine stack and flue gas properties. An initial compliance test for $NO_X$ using EPA Method 7 or 7E is required to verify the low emission rate projected in the application.

$SO_2$ emissions must be continuously monitored as required by Subpart H. The monitoring shall also be used to demonstrate compliance with the Department BACT emission limit for $SO_2$ on a 24 hour block average.

**DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:**

A. A. Linero, P.E., Administrator, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

| Recommended By: | Approved By: |
|---|---|
| C. H. Fancy, P.E., Chief<br>Bureau of Air Regulation | Howard L. Rhodes, Director<br>Division of Air Resources Management |
| Date: | Date: |

# APPENDIX CSC

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

## SUBSECTION 1.0 CONSTRUCTION REQUIREMENTS

1.1 Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation **[Rule 62-204.800 F.A.C.]**. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. **[Rule 62-210.300, F.A.C.]**

## SUBSECTION 2.0 EMISSION LIMITING STANDARDS

2.1 General Particulate Emission Limiting Standards. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). **[Rule 62-296-320(4)(b)1, F.A.C.]**

2.2 Unconfined Emissions of Particulate Matter **[Rule 62-296.320(4)(c), F.A.C.]**

(a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.

(b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

(c) Reasonable precautions include the following:

- Paving and maintenance of roads, parking areas and yards.
- Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
- Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
- Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.

- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

*NOTE: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.*

2.3 General Pollutant Emission Limiting Standards: **[Rule 62-296.320, F.A.C.]**

(a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.

(b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

*NOTE: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.200(198)]*

## SUBSECTION 3.0 OPERATION AND MAINTENANCE

3.1 Changes/Modifications: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to, the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. *Routine maintenance of equipment will not constitute a modification of this permit.* **[Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]**

3.2 Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from

any liability for failure to comply with the conditions of this permit and the regulations. **[Rule 62-4.130, F.A.C.]**

3.3 Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. **[Rules 62-210.650, F.A.C.]**

3.4 Excess Emissions Requirements **[Rule 62-210.700, F.A.C.]**

(a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units 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 Permitting Authority office for longer duration. **[Rule 62-210.700(1), F.A.C.]**

(b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. **[Rule 62-210.700(4), F.A.C.]**

(c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. **[Rule 62-210.700(6), F.A.C.]**

3.5 Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. **[Rule 62-4.070(3), F.A.C.]**

## SUBSECTION 4.0 MONITORING OF OPERATIONS

4.1 Determination of Process Variables

(a) The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. **[Rule 62-297.310(5), F.A.C]**

## SUBSECTION 5.0 TEST REQUIREMENTS

5.1 Test Performance Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]**

5.2 Test Procedures shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. **[Rule 62-297.310, F.A.C.]**

5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least *(30) days* (initial) and *15 days* (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. **[Rule 62-297.310 and 40 CFR 60.8, F.A.C.]**

5.4 Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62 -212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. **[Rule 62-297.310(7)(b), F.A.C.]**

5.5 Stack Testing Facilities: The owner or operator shall install stack testing facilities in accordance with **Rule 62-297.310(6), F.A.C.**.

5.6 Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in **Rule 62-297.620, F.A.C.**

5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum

permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. **[Rule 62-297.310(2) and (3), F.A.C.]**

## SUBSECTION 6.0 REPORTS AND RECORDS

6.1 Duration: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. **[Rule 62-4.160(14)(b), F.A.C.]**

6.2 Emission Compliance Stack Test Reports:

(a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, but no later than 45 days after the last sampling run is completed. **[Rule 62-297.310(8), F.A.C.]**

b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in **Rule 62-297.310(8), F.A.C.**

6.3 Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. **[Rules 62-4.130 and 62-210.700(6), F.A.C.]**

6.4 Annual Operating Report for Air Pollutant Emitting Facility: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. **[Rule 62-210.370(3), F.A.C.]**

## SUBSECTION 7.0 OTHER REQUIREMENTS

7.1 Waste Disposal: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.

## 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; attached and incorporated into this permit;
(b) Determination of Prevention of Significant Deterioration; and
(c) Compliance with New Source Performance Standards.

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.

# Florida Department of Environmental Protection

## Memorandum

TO: Clair Fancy

FROM: A. A. Linero 8/24

DATE: August 24, 1998

SUBJECT: Cargill Fertilizer, Sulfuric Acid Plant No. 7
PSD-FL-250

Attached is the Intent for the modification of Cargill Fertilizer's existing sulfuric acid plant (SAP No. 7). The project will increase the plant capacity from 2,200 to 3,200 TPD. We have made a BACT determination of 3.5 lb $SO_2$/ton acid and 0.12 lb SAM/ton acid. The applicant has will achieve the $SO_2$ limit by installing additional conventional vanadium containing catalyst rather than replacing conventional catalyst with cesium-promoted catalyst. This is possible because there is sufficient space to enlarge existing vessels and rearrange the location of the catalyst masses within the two converters.

Installation of the larger Brownian Diffusion mist eliminators is not feasible within the existing final tower. Construction of a new one is estimated by Cargill to cost $2,000,000. However, review of historical SAM emission data by the Department and by the NPS indicates that lower emissions are routinely achieved even by conventional impaction-based units. The proposed Department's proposed limit is the lowest in the country to-date.

The applicant requested that the application be processed per Rule 62-4.055, F.A.C. Outstanding issues with respect to Hillsborough County include: odor control; treatment of SAM as particulate; application of a RACT opacity limit of 5 percent; consolidation of various simultaneous projects at Cargill; application of BACT to upstream and downstream units, and modeled $SO_2$ exceedances.

With regard to the modeled exceedances, they are not *"significant"* with respect to the *"significant impact levels"* used for modeling purposes. We have interpreted the term "will not cause or *contribute* to a violation of any ambient air quality standard" to mean "will not cause or *significantly contribute.*" [Rule 62-212.400(5)(d)] Consistent with this interpretation, however, the "agency must also take remedial action through the applicable provisions of the state implementation plan to address the predicted violation(s). [New Source Review Workshop Manual, Page C.52] Although Title IV will require reductions in $SO_2$, these are on a corporate-wide basis and a 30 day rolling average. Unless some reductions are required for short-term averaging periods, the modeled exceedances will continue to appear and we will not be able to continue approving projects in the immediate area.

AAL/aal

# Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

## P.E. Certification Statement

**Permittee:**

**DEP File No.** 0570008-025-AC (PSD-FL-250)

Cargill Fertilizer, Inc.
8813 US Highway 41 South
Riverview, Hillsborough County

**Project type:**

Project to increase the capacity of the 2200 ton per day sulfur burning Sulfuric Acid Plant No. 7 at the Cargill Fertilizer Riverview Complex to 3200 tons per day. Best Available Control Technology (BACT) is the double absorption process with a sulfur dioxide emission limit of 3.5 pounds per ton of acid produced. The applicant has chosen to meet this limit by increasing the ratio of vanadium-containing catalyst to plant capacity by 10 percent, rather than by using cesium-promoted vanadium catalyst in the final converter. BACT for sulfuric acid mist emissions is achievement of 0.12 pounds per ton of acid produced using impaction-based mist eliminators rather than installation of "Brownian Diffusion" mist eliminators in the final tower. Per the application, nitrogen oxides emissions are inherently low and no further control is feasible. The term *"contribute" in* "will not cause or *contribute* to a violation of any ambient air quality standard" found in Rule 62-212(5)(d), Ambient Impact Analysis, was interpreted to mean *"significantly contribute"* with respect to the "significant impact levels" used for modeling purposes. Will refer matter to Office of Policy Analysis and Program Management for consideration of State Implementation Plan revision.

***I HEREBY CERTIFY*** *that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

A. A. Linero, P.E. — Date
Registration Number: 26032

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (850) 921-9523
Fax (850) 922-6979

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. David B Jellerson, PE
Cargill Fertilizer
8813 US Hwy 41 South
Riverview, Fl 33521

4a. Article Number
P 265 659 409

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

7. Date of Delivery
8/31/98

5. Received By: *(Print Name)*
Roy Burnett

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

6. Signature: *(Addressee or Agent)*
X Roy Burnett

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.
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| | |
|---|---|
| Sent to [redacted] D. B. Jellerson | |
| Street & Number Cargill Fert. | |
| Post Office, State, & ZIP Code Riverview. 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 PSD-Fl-250 8-25-98 | |

PS Form **3800**, April 1995