



# Department of Environmental Protection

Lawton Chiles  
Governor

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

Virginia B. Wetherell  
Secretary

January 8, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President  
Operations and Administration  
Piney Point Phosphates, Inc.  
13300 US Highway 41 North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC (PSD-FL-242)  
2000 Ton Per day Sulfuric Acid Plant

Dear Mr. Stewart:

Enclosed is one copy of the Draft Air Construction Permit for the project at the existing sulfuric acid plant located at US Highway 41 at Piney Point in Palmetto, Manatee 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 within 30 (thirty) days of receipt of this letter. 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 modification.

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,

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

CHF/aal

Enclosures

# NOTICE TO BE PUBLISHED

## IN THE NEWSPAPER

### PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0810002-004-AC (PSD-FL-242)

Piney Point Phosphates Sulfuric Acid Plant and Sulfur Storage and Handling  
Manatee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Piney Point Phosphates, Inc. to repair and restore to previous capacity, the existing sulfuric acid plant located at on U.S. Highway 41 at Piney Point, near Palmetto, Manatee County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO<sub>2</sub>), sulfuric acid mist, and nitrogen oxides (NO<sub>x</sub>) pursuant to Rules 62-212.400 and 410, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's name and address are: Piney Point Phosphates, Inc., 13300 U.S. Highway 41, Palmetto, Florida 33476.

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 certain heat recovery and transfer equipment, boiler feedwater heater/deaerator, process towers and associated mist eliminators, gas ducts, certain foundations and structural steel, electrical components, insulation, instrumentation, certain tanks and pumps, and portions of conversion catalyst. The work also includes testing, repair, maintenance, or recommissioning of the sulfur burner, main compressor, reaction vessels, other heat recovery and transfer equipment, other tanks and pumps, the plant stack, sulfur pit, molten sulfur storage tank, and the SO<sub>2</sub> monitor.

The project will restore the plant to its previous capacity of 2000 tons per day of sulfuric acid. Control of SO<sub>2</sub> emissions is accomplished by the process itself which is based on the conversion of SO<sub>2</sub> to SO<sub>3</sub> 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<sub>2</sub> was determined by the Department to be 3.5 pounds per ton of sulfuric acid produced. Maximum annual SO<sub>2</sub> emissions will be 1279 tons per year (TPY). The sulfuric acid mist BACT for this project was determined to be replacement of all mist eliminators with new ones capable of providing optimum collection efficiency over a wide range of particle sizes. In particular the applicant will add 36 more high efficiency mist eliminators in the final tower than originally planned. This will meet the sulfuric acid mist emission limit of 0.15 pounds per ton of acid produced which is equal to 55 TPY. NO<sub>x</sub> emissions of 0.15 pounds per ton of acid produced and 44 TPY are inherently low and the increase is marginally significant. No cost effective methods are available to further reduce them.

The draft permit incorporates parts of the Agreement dated December 18, 1997 between Piney Point Phosphates and Manatee County which contains various conditions related to inspections, compliance assurance, reporting, safety, and technological requirements. It requires installation of 115,000 liters of cesium-vanadium catalyst in the final pass. This is the first specifically required use in this country of cesium-vanadium catalyst to reduce SO<sub>2</sub>. Plans to build a 2,700 TPD plant have been deferred. The Agreement and the terms of the draft permit require the existing plant to be permanently shut down if and when a new plant is built.

PSD increment consumption for ambient NO<sub>2</sub> is insignificant in both PSD Class I Chassahowitzka National Wilderness Area and the PSD Class II area near the plant. The project does not consume SO<sub>2</sub> increment in either the Class I or Class II areas because the source existed during the SO<sub>2</sub> major source baseline year of 1975 and had much higher emissions than expected following construction of the proposed project.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit 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 and requests for public meetings concerning the proposed DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of this Notice.

**NOTICE TO BE PUBLISHED  
IN THE NEWSPAPER**

Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

The Department will issue FINAL Permit with the conditions of the DRAFT Permit unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the Department's action or proposed action addressed in this notice of intent.

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 of intent. 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: 850/488-1344  
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

Manatee County Environmental  
Management Department  
202 Sixth Avenue East  
Bradenton, Florida 34208  
Telephone: 941/742-5980  
Fax: 941/742-5996

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 Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

In the Matter of an  
Application for Permit by:

Mr. Robert Stewart, Sr. Vice President, O&A  
Piney Point Phosphates, Inc.  
13300 US Highway 41 North  
Palmetto, Florida 34221

DEP File No. 00810002-004-AC  
Draft PSD Permit No. PSD-FL-242  
Sulfuric Acid Plant  
Manatee 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, Piney Point Phosphates, Inc., applied on October 31, 1997 to the Department for an air construction permit for a sulfuric acid plant at its phosphate fertilizer facility located at US Highway 41 at Piney Point, Palmetto, Manatee County. The application is to conduct "repair activities to start up the existing sulfuric acid plant and molten sulfur storage and handling system."

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 described in the application.

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 62-103.150, 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 within 30 (thirty) days 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: 850/488-1344; Fax 850/922-6979) 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 pursuant to Rule 62-103.150 (6), F.A.C.

The Department will issue the FINAL Permit, in accordance with the conditions of the enclosed DRAFT Permit 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 and requests for public meetings concerning the proposed DRAFT 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 [and requests for public meetings] should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT 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. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the action or proposed action addressed in this notice of intent.

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 of intent. 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.

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.



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 1-9-98 to the person(s) listed:

- Mr. Robert Stewart, PPP Inc. \*
- Mr. Ivan Nance, PPP Inc.
- Mr. Brian Beals, EPA
- Mr. John Bunyak, NPS
- Mr. John Koogler, P.E., K&A
- Mr. Bill Thomas, SWD
- Ms. Karen Collins, Manatee County

Clerk Stamp

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

Karen Collins                  1-9-98  
(Clerk)                                  (Date)

TECHNICAL EVALUATION  
AND  
PRELIMINARY DETERMINATION

PINEY POINT PHOSPHATES, INC.

Phosphate Fertilizer Facility  
2000 Tons Per Day Sulfuric Acid Plant and  
Molten Sulfur Storage & Handling  
Palmetto, Manatee County

DEP File No. 00810002-004-AC  
PSD-FL-242

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

January 8, 1997

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 1. APPLICATION INFORMATION

### 1.1 Applicant Name and Address

Piney Point Phosphates, Inc.  
13300 US Highway North  
Palmetto, Florida 34221

Authorized Representative: Mr. Robert Stewart, V.P., Operations and Administration

### 1.2 Reviewing and Process Schedule

10-31-97: Date of Receipt of Application  
11-07-97: Preliminary DEP Completeness Request  
11-26-97: DEP Completeness Request  
01-07-98: Application deemed complete  
01-09-98: Issue Intent

## 2. FACILITY INFORMATION

### 2.1 Facility Location

The Piney Point Phosphates fertilizer facility is located off U.S. Highway 41 North at Piney Point, near Palmetto, Manatee County. This site is approximately 120 kilometers from the Chassahowitzka National Wilderness Area, a Class I PSD Area. The UTM coordinates of this facility are Zone 17; 348.5 km E; 3057.3 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 diammonium phosphate. 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 diammonium phosphate. 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<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), 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<sub>x</sub> or SO<sub>2</sub>, 25/15 TPY of PM/PM<sub>10</sub>, or 3 TPY of fluorides (F) 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.



# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 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:

- $S + O_2 \rightarrow SO_2$  (sulfur burning)
- $2SO_2 + O_2 \rightarrow 2SO_3$  (in presence of vanadium-containing catalyst)
- $SO_3 + H_2O \rightarrow H_2SO_4$  (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 small saddle-shaped ceramic media. The dried air is blown by a steam-driven compressor 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 recover excess heat as saturated steam.

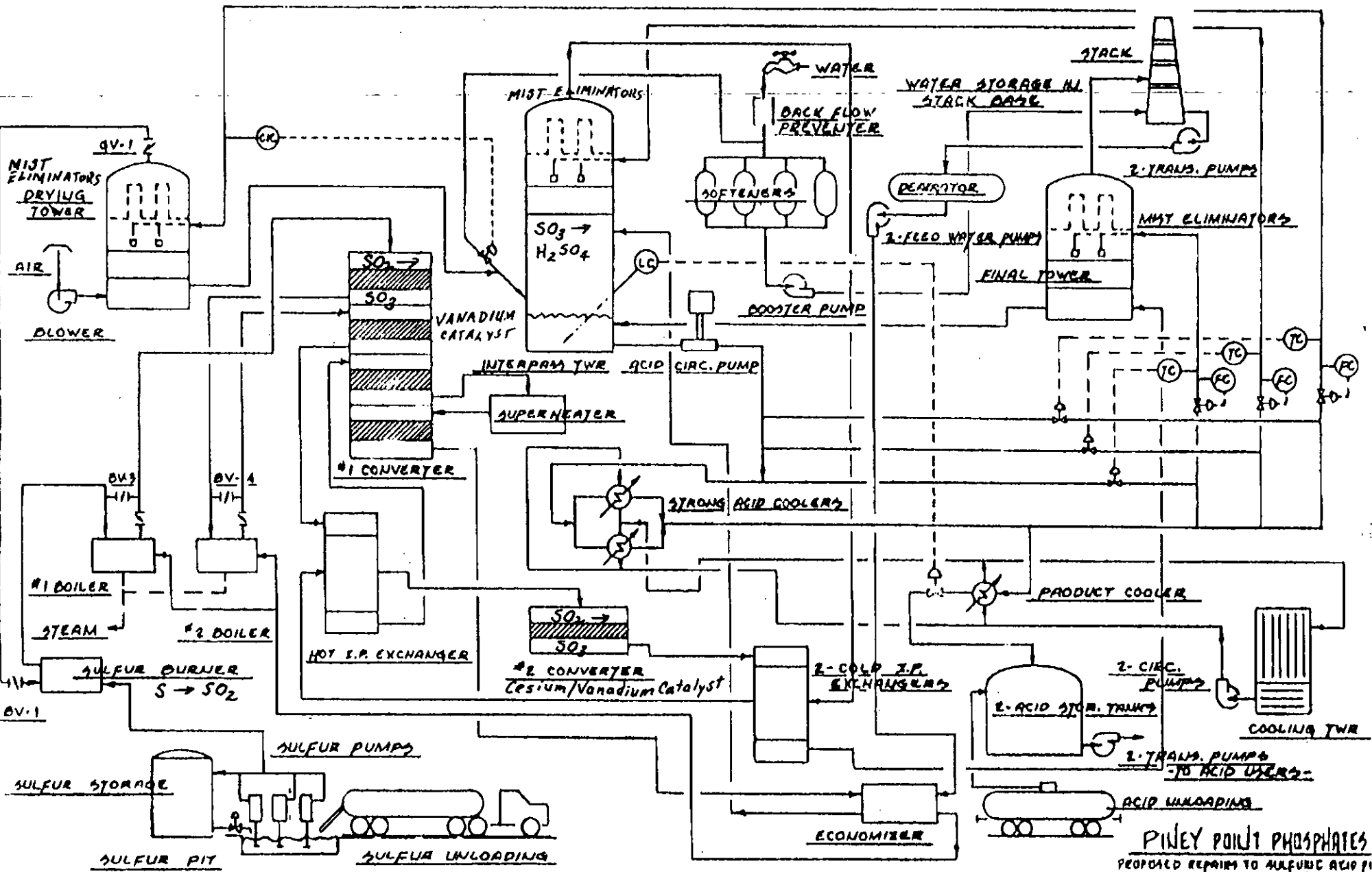
The stream, containing between 11 and 12 percent  $SO_2$  and remaining air, is introduced into a converter consisting of four beds (passes) packed with vanadium (actually vanadium-containing) catalyst. In a series of steps, the  $SO_2$  and excess oxygen from the air are progressively converted to  $SO_3$ . Between the fourth pass of the first converter and the second converter, 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 a single-pass converter 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 an intricate arrangement of heat exchangers, a second waste heat boiler, a superheater and an economizer so that the excess heat is removed and gases enter each bed at temperature 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 units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling



PINEY POINT PHOSPHATES  
 PROPOSED REPAIRS TO SULFURIC ACID PLANT  
 11/20/91

FIGURE 1 - SULFURIC ACID PROCESS  
 DOUBLE ABSORPTION - SULFUR BURNING

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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The applicant describes the project as “repair activities to start up the existing sulfuric acid plant and molten sulfur storage and handling system.” The project includes replacement of the heat recovery economizer, boiler feedwater heater/deaerator, the air drying tower, both absorption towers, mist eliminators, a cooling tower, portions of the conversion catalyst in Converter 1, all catalyst in Converter 2, instrumentation, various pumps, gas ducts, a condensate storage tank, an acid pump tank, as well as certain heat exchangers, structural steel, foundations, electrical components and insulation.

The project also includes repair, maintenance, or recommissioning of the sulfur burner, waste heat boilers, main compressor, both converters, heat recovery superheater, sulfuric acid storage tanks, plant stack, certain heat exchangers, the sulfur pit, a molten sulfur storage tank, and the SO<sub>2</sub> monitor.

The project will restore the plant to a capacity of 2000 tons per day (TPD) of sulfuric acid. The project will allow this rate to be achieved more easily particularly because of the replacement of degraded pelletized catalyst in Converter 1 with new low pressure ring-shaped catalyst. All pelletized catalyst in Converter 2 will be replaced with ringed catalyst. This results in a lower pressure drop across the plant. Production can, therefore, probably be sustained at the permitted rate for a longer period of time during the course of a “turnaround cycle” than during previous operation of the plant. By subsequent agreement between the applicant and Manatee County, the new ringed vanadium catalyst in the final converter will contain cesium. This catalyst is more effective than other ringed catalyst at lower temperatures, thus favoring more complete conversion of the reactants and possibly lower emissions of SO<sub>2</sub>.

As originally described by the applicant, the project will not result in annual emissions of regulated pollutants in excess of levels permitted during previous operation of the plant. The scope of the project will make the unit more reliable and the lower pressure drop will allow authorized production to be sustained at a higher level for a longer period of time between turnarounds. This will result in actual increases in SO<sub>2</sub>, sulfuric acid mist (SAM), and NO<sub>x</sub>. There will also be minimal emissions of particulate matter reduced sulfur compounds, volatile organic compounds and SO<sub>2</sub> from the molten sulfur system. Emission increases of 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<sub>2</sub>, SAM and NO<sub>x</sub> since emissions, per the application, will increase by more than 40 TPY.

## 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 Manatee 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<sub>2</sub>, SAM, and NO<sub>x</sub> 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). New or modified sulfur storage and handling facilities require review per Rule 62-212.600, F.A.C.

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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 62-212.410	Best Available control Technology
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<sub>2</sub>, SAM, NO<sub>x</sub>, and PM<sub>10</sub>. Emissions limits for individual fuels and averaging times are being revised for SO<sub>2</sub>, CO and mercury; however, annual emissions remain unchanged. Per the application, the current emissions and requested allowable emissions (as revised on December 18, 1997) for this modification are summarized in the following table. If the applicant were given any credit at all for past NO<sub>x</sub> emissions, then its increase would not be significant with respect to PSD.

### 6.2 Emission Summary

**Emissions Sulfuric Acid Plant and Sulfur Storage and Handling (total)**

Pollutant	Current Emissions (tons/yr)	Future Emissions (tons/yr)	Net Increase (tons/yr)	PSD Significant Level (tons/yr)
SO <sub>2</sub>	0	1279	1279	40
NO <sub>x</sub>	0	44	44	40
SAM	0	55	55	100

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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## 6.3 Control Technology Review

The objective of the process and the pollution control requirements are compatible. This is to convert SO<sub>2</sub> to SO<sub>3</sub> 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<sub>2</sub> 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 second converter 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 and absorbers following the interpass absorber are termed as "the abatement system." The high efficiency mist eliminators together with proper plant operation serve to minimize SAM emissions. NO<sub>x</sub> emissions are inherently low for this process and are marginally significant.

The overall conversion of SO<sub>2</sub> to SO<sub>3</sub> 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<sub>2</sub> 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<sub>2</sub> per ton of sulfuric acid produced. This is equal to 165 to 330 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 2 to 12 pounds per hour. The expected amount is less than 0.1 pounds per ton.

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 three pollutants at levels in excess of PSD significant amounts: SO<sub>2</sub>, NO<sub>x</sub> and SAM. SO<sub>2</sub> and NO<sub>x</sub> are criteria pollutants and have national and state ambient air quality standards (AAQS) and PSD increments defined for them. 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 NSPS 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<sub>2</sub> and NO<sub>x</sub>;
- A PSD increment analysis for SO<sub>2</sub> and NO<sub>x</sub>;
- An Ambient Air Quality Standards (AAQS) analysis for SO<sub>2</sub> and NO<sub>x</sub>;
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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 NO<sub>2</sub> impacts from the project are predicted to be less than the de minimus level; therefore, preconstruction ambient air quality monitoring is not required for this pollutant. However, an NO<sub>2</sub> background concentration of 9 ug/m<sup>3</sup> was established from previously existing air quality data for use in the NO<sub>2</sub> AAQS analysis. Predicted SO<sub>2</sub> impacts are greater than the de minimus level. Therefore, an SO<sub>2</sub> background concentration of 14 ug/m<sup>3</sup> for all averaging times was established from previously existing air quality data for use in the AAQS analysis required for SO<sub>2</sub>.

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

Pollutant	Avg. Time	Max Predicted Impact (ug/m <sup>3</sup> )	Impact Greater Than De Minimus?	De Minimus Level(ug/m <sup>3</sup> )
NO <sub>2</sub>	Annual	0.1	NO	14
SO <sub>2</sub>	24-hour	18	YES	13

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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### 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.

### 6.4.4 Receptor Networks For PSD Increment And AAQS Analyses

Both the applicant and the Department did an AAQS analysis. For the AAQS analysis, receptors were placed along the property boundaries and out to 20 km from the facility. This source does not consume SO<sub>2</sub> increment because the sulfuric acid plant, as it was configured in the increment baseline year of 1975 for existing major sources, was a single absorption plant and emitted far greater quantities of SO<sub>2</sub> than is being proposed for this project. The source consumes an insignificant amount of NO<sub>2</sub> increment, which is discussed in the following section.

### 6.4.5 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 which was established in 1977 (the baseline year was 1975 for existing major sources of SO<sub>2</sub>) for SO<sub>2</sub> and 1988 for NO<sub>x</sub>. As stated above no SO<sub>2</sub> increment is consumed by this project. The maximum predicted NO<sub>2</sub> impacts from this project are 0.13 ug/m<sup>3</sup> in the PSD Class II area in the vicinity of the source and 0.0011 ug/m<sup>3</sup>, annual average, in the PSD Class I Chassahowitzka National Wilderness Area (CNWA). These values are less than the respective significant impact levels of 1 ug/m<sup>3</sup>, annual average, in the PSD Class II area and 0.03 ug/m<sup>3</sup>, annual average, in the PSD Class I area. Therefore, no further NO<sub>2</sub> increment modeling was required for this project.

### 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 results of the AAQS analysis are summarized in the table below. These results are based upon the Department's

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

modeling since the Department had a more current source inventory. As shown in this table, emissions from the proposed facility are not expected to cause or significantly contribute to a violation of an AAQS.

**Ambient Air Quality Impacts**

Pollutant	Averaging Time	Major Sources Impact (ug/m <sup>3</sup> )	Background Conc. (ug/m <sup>3</sup> )	Total Impact (ug/m <sup>3</sup> )	Total Impact Greater Than AAQS?	Florida AAQS (ug/m <sup>3</sup> )
SO <sub>2</sub>	24-hour	193	14	207	NO	260
	Annual	32	14	46	NO	60
	3-hour	606	14	620	NO	1300
NO <sub>2</sub>	Annual	7	9	16	NO	100

## 6.5 Additional Impacts Analysis

### 6.5.1 Impact Analysis Impacts On Soils, Vegetation, And Wildlife

The maximum ground-level concentrations predicted to occur from SO<sub>2</sub> and NO<sub>x</sub> emissions as a result of the proposed project, including background concentrations and all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I area. No significant impacts on this area are expected.

### 6.5.2 Impact On Visibility

A regional haze analysis was used to assess the potential for a significant increase in regional haze in the Class I CNWA due to this source's projected increase in emissions. A regional haze analysis to determine visibility impacts in the Class I area was required by the National Park Service. 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.

### 6.5.4 Air Toxics Air Quality Impacts

The maximum predicted impacts of regulated and non-regulated toxic air pollutants that are proposed to be emitted by the project are all less than the Department's draft annual Ambient Reference Concentrations (ARC).



## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

### 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.

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

# DRAFT

## PERMITTEE:

Piney Point Phosphates, Inc.  
13300 US Highway 41 North  
Palmetto, Florida 34221

File No.	0810002-004-AC
FID No.	0810002
SIC No.	2819
Permit No.	PSD-FL-242
Expires:	March 31, 1999

### *Authorized Representative:*

Robert C. Stewart  
Vice-President, Operations and Administration

## PROJECT AND LOCATION:

Permit for the repair and restoration to previous capacity of a 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated sulfur storage and handling equipment serving a phosphoric acid and diammonium phosphate fertilizer facility located nine miles north of Palmetto on US Highway 41 North, Manatee County. UTM coordinates are Zone 17; 348.5 km E ; 3057.3 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 GC	Construction Permit General Conditions
Appendix CSC	Emission Unit(s) Common Specific Conditions

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Howard L. Rhodes, Director  
Division of Air Resources  
Management

AIR CONSTRUCTION PERMIT 0810002-004-AC

**SECTION I. FACILITY INFORMATION**

**SUBSECTION A. FACILITY DESCRIPTION**

The existing facility consists of a sulfuric acid plant and associated molten sulfur storage and handling equipment, a phosphoric acid plant, a diammonium phosphate fertilizer plant, a gypsum stack and process cooling ponds, rail and truck shipping and receiving facilities. This permit is for the repair and restoration to previous permitted capacity of the 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated molten sulfur handling equipment. The project includes replacement of process towers, converter catalyst, heat transfer and other process equipment as well as repair of the sulfur burner, air compressor, the converters, and other key process equipment. Air pollution control equipment consists of the double absorption process, use of cesium-vanadium catalyst in the final converter, and high efficiency mist eliminators on the final tower.

**EMISSION UNITS**

This permit addresses the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

**SUBSECTION B. REGULATORY CLASSIFICATION**

The Piney Point Phosphates Inc. (PPPI) 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 **Rules 62-212.400 and 410, 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.**

## AIR CONSTRUCTION PERMIT 0810002-004-AC

**SECTION I. FACILITY INFORMATION**

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**SUBSECTION C. PERMIT SCHEDULE:**

- 01/XX/98 Notice of Intent published January XX, 1998 in \_\_\_\_\_
- 1/08/98 Distributed Intent to Issue Permit
- 1/07//98 Application deemed complete
- 10/31/97 Received Application

**SUBSECTION D. RELEVANT DOCUMENTS:**

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

- Application received October 31, 1997
- Department's letters dated November 7, November 17, and November 26, 1997
- Comments from Manatee County's consultant, RTP Associates, dated November 21, 1997
- Comments from the National Park Service dated November 20 and December 15, 1997
- EPA's letter dated December 15, 1997
- Agreement between Manatee County and PPPI dated December 18, 1997
- Applicant's completeness responses dated December 26 and 30, 1997 and January 6, 1998
- Department's Technical Evaluation and Preliminary Determination dated January 8, 1997
- Department's Best Available Control Technology Determination dated February XX, 1998

## AIR CONSTRUCTION PERMIT 0810002-004-AC

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

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#### 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 Department of Environmental Protection, Southwest District Office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218 (phone number: 813/744-6100). 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 850/488-1344).
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. Emission Unit(s) Common Specific Conditions: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.
4. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
5. 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.]
6. Expiration: This air construction permit shall expire on December 31, 1999 [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.]
7. 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 0810002-004-AC

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

**SPECIFIC CONDITIONS - SULFURIC ACID PLANT AND MOLTEN SULFUR STORAGE AND HANDLING:**

The following Specific Conditions apply to the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

1. Emissions unit 001 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 001 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<sub>2</sub>), sulfuric acid mist (SAM), visible emissions (VE), and nitrogen oxides (NO<sub>x</sub>) from the sulfuric acid plant shall not exceed the following limits: [Rules 62-204.800(7)(b)10; 62-210.200; 62-212.410, F.A.C.]

Pollutant	Pounds per Hour	Tons per Year	Limit Basis
SO <sub>2</sub>	291.7 <sup>1</sup>	1,277.5	3.5 lb/ton 100% H <sub>2</sub> SO <sub>4</sub> produced (BACT) <sup>1</sup>
SO <sub>2</sub>	333.3 <sup>2,3</sup>		4.0 lb/ton 100% H <sub>2</sub> SO <sub>4</sub> produced (NSPS) <sup>2,3</sup>
SAM	12.5 <sup>3</sup>	54.8	0.15 lb/ton 100% H <sub>2</sub> SO <sub>4</sub> produced (NSPS) <sup>3</sup>
VE	10% opacity		BACT/NSPS
NO <sub>x</sub>	10.0 <sup>4</sup>	43.8	0.12 lb/ton 100% H <sub>2</sub> SO <sub>4</sub> produced <sup>4</sup>

1. 48-hour rolling average based on CEMS data.
2. 3-hour rolling average based on CEMS data.
3. Also, an annual EPA Method 8 test is required to demonstrate compliance with the 4.0 lb/ton SO<sub>2</sub> limit and the 0.15 lb/ton SAM limit.
4. Required for initial compliance test only.
4. Visible emissions (VE) shall not exceed 20% opacity from any source in the sulfur storage and handling system. [Rule 62-296.411, F.A.C.]
5. The design production capacity of the refurbished plant shall not exceed 2,000 tons per day of 100 percent (%) sulfuric acid. [December 18, 1977 Agreement]
6. The production rate shall not exceed 2000 tons per day (TPD) as 100% sulfuric acid on a 24-hour basis. [Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

## AIR CONSTRUCTION PERMIT 0810002-004-AC

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

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Monitor downtimes and excess emissions based on daily 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 device 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 monitor shall be provided to the Department for review at least 90 days prior to installation of a new CEMS. [Rule 62-4.070 (3) F.A.C. or Rule 62-204.800, F.A.C.]

32. Compliance with the emission limits for SO<sub>2</sub>, SAM, and NO<sub>x</sub> shall be determined using the following reference methods as described in 40 CFR 60, Appendix A (1995, version), adopted by reference in Chapter 62-204, F.A.C.

**Method 7E** Determination of Nitrogen Oxides from Stationary Sources.

**Method 8** Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources.

**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].

33. 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.]

## AIR CONSTRUCTION PERMIT 0810002-004-AC

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

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26. The permittee shall immediately notify Manatee County if there is an accident, malfunction or other event at the facility that poses a threat to human health or the environment in the areas located adjacent to the permittee's facility. Manatee County recognizes that, under such circumstances, the permittee may be required by law to provide notice to certain local, state, or federal agencies before the permittee provides notice to Manatee County. Minor exceedances authorized under Rule 62-210.700, F.A.C., are not subject to the notification requirements contained in this paragraph. **[December 18, 1997 Agreement]**
27. The permittee shall comply with all applicable requirements of the Department's sulfur storage and handling rule. **[Rule 62-296.411, F.A.C.]**
28. 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.]**
29. In order to minimize excess emissions during startup/shutdown/malfunction these emissions units shall adhere to best operational practices. The provisions of the Memorandum of Understanding issued by the Department on November 21, 1989, are hereby added to this permit as **Appendix A** and shall be added to the Title V permit. **[Rule 62-210.700, F.A.C., 40 CFR 60.7 and December 18, 1997 Agreement]**
30. 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.]**
31. A continuous emissions monitoring system (CEMS) shall be installed, calibrated, maintained, operated, and used to determine compliance with the emissions limit for SO<sub>2</sub>. 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 (1996 version) or other Department-approved QA plan; 40 CFR 60, Appendix 3, Performance Specification 1, 2, and 3 (1996 version).
- The CEMS shall calculate and record emission rates in units of pounds of SO<sub>2</sub> per hour. Sulfuric acid production rate and sulfur feed rate shall be recorded continually. Each operating day, the 3-hour and 48-hour average SO<sub>2</sub> emission rates for the previous 48 hours shall be calculated and recorded. Emissions shall be calculated in units of pounds per hour and pounds per ton of 100% acid produced. Averages are to be calculated as the arithmetic mean of each monitored operating hour. 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 not calibrated shall be excluded from the 48-hour average.
- For compliance with the emission limits, the 48-hour average shall not include data from periods of startup when no sulfuric acid is being produced. However, emissions during startup periods shall not exceed the pound per hour limits. Data recorded during periods of shutdown, malfunction, load change, and continuous operating periods shall be included in the daily 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.



## AIR CONSTRUCTION PERMIT 0810002-004-AC

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

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19. Manatee County shall provide the permittee with a list of qualified County representatives for the plant visits mentioned above. The list may be updated from time to time. Unless requested by the inspecting agency, no other persons are authorized by this Agreement to accompany the agencies during their inspections of the facility. **[December 18, 1997 Agreement]**
20. Whenever a Manatee County representative visits the facility, such representative shall comply with the permittee's safety regulations and shall follow all reasonable instructions provided by the permittee to ensure his or her safety. The permittee shall provide a copy of its safety regulations to the County so that the County's representatives may review the safety regulations before visiting the facility. **[December 18, 1997 Agreement]**
21. The permittee and Manatee County promptly shall provide each other with any report, test result or other information that is received from any agency concerning an inspection of the facility. **[December 18, 1997 Agreement]**
22. If Manatee County wishes to collect any samples at the facility, Manatee County shall split the samples with the permittee, if requested, and promptly shall provide the permittee with the results of any tests performed on the samples. **[December 18, 1997 Agreement]**
23. During inspections of the facility, Manatee County's representatives shall notify the permittee's escort before they take any photographs of the facility. In this fashion, the County's representative shall give the permittee's representative an opportunity to view the conditions or area at the facility that is the subject of the photograph. If Manatee County takes any photograph of the facility, Manatee County promptly shall provide a copy of the photograph to the permittee. However, Manatee County shall not take photographs or any equipment or processes reasonably designated by the permittee as proprietary and confidential. Photographs shall be taken only for authorized regulatory purposes. **[December 18, 1997 Agreement]**
24. The permittee and Manatee County shall work together in a cooperative manner to ensure and confirm that the permittee is complying with all local, state, and federal regulations. If requested, the permittee shall provide a tour of the facility once each year for the Manatee Board of County Commissioners or the Board's designees. **[December 18, 1997 Agreement]**
25. The permittee shall provide Manatee County with a copy of any report or document that the permittee is required to provide to any state or federal agency, (unless such documents are confidential under state or federal law), including but not limited to: (a) routine reports to agencies concerning the facility's stack tests, air emissions, surface water discharges, or other discharges; (b) reports concerning excess emissions, upset conditions or emergencies at the facility; (c) reports and other information required under the provisions of 40 CFR Part 68 or Paragraph 14, above; and (d) reports or other information that must be submitted to the Department pursuant to Paragraph 1, above. These reports and other materials shall be provided to Manatee County at the same time that they are provided to the state or federal agency. Should the permittee determine that a report or portion thereof is confidential, the permittee shall take steps to redact the confidential information, or if this is not possible, notify the County of the report and the permittee's reasons for not providing it to the County. These reports and other materials shall be submitted to the Director of the Manatee County Department of Environmental Management, P.O. Box 1000, Bradenton, Florida 34206-1000. **[December 18, 1997 Agreement]**

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

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7. The maximum molten sulfur throughput rate shall be 655 tons per day and 239,000 tons per year based on the maximum permitted sulfuric acid production rate of 2000 TPD of 100% sulfuric acid. [Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
8. These emissions units are allowed to operate continuously (8760 hours/year) [Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
9. The existing sulfuric acid plant shall cease operation and be permanently shut down when a new sulfuric acid plant commences commercial operations. [December 18, 1997 Agreement]
10. Prior to the initial plant startup, the permittee shall install approximately 115,000 liters of cesium-promoted catalyst in the final converter pass. The cesium catalyst shall be used for at least one plant turnaround cycle, or approximately two years, whichever is longer. [December 18, 1997 Agreement]
11. The permittee shall install high efficiency mist eliminators incorporating "Brownian Diffusion" to minimize emissions of fine sulfuric acid mist from the final tower. [Rule 62-212.10, F.A.C.]
12. The permittee shall prepare and submit to the Department's Southwest District and Manatee County each calendar quarter: (a) compliance calculation worksheets for SO<sub>2</sub> emissions; (b) the hourly CEMS data; and (c) supporting information necessary to demonstrate compliance with the emission limitations. [December 18, 1997 Agreement]
13. The permittee shall implement and carry out at all times the safety program referred to in the agreement between Manatee County and the permittee. [December 18, 1997 Agreement]
14. The permittee shall implement and carry out at all times a risk management program that complies with 40 CFR Part 68 for Program 3. The permittee shall modify its analyses, if necessary, when pending EPA litigation of certain issues is resolved. [December 18, 1997 Agreement]
15. Before resuming operation of the sulfuric acid plant, the permittee shall meet with representatives of Manatee County's Emergency Response and Emergency Services Department to review the plans for complying with Specific Condition No. 8 above. If Manatee County recommends installation of a public alarm system around the perimeter of the permittee's facility, the permittee will work diligently to comply with the County recommendation. Any such alarm shall be controlled exclusively by the permittee. [December 18, 1997 Agreement]
16. The permittee shall inspect, operate and maintain all process and support equipment in accordance with the best management practices required under all applicable federal, state and local regulations. Any major deficiencies shall be reported to the Manatee County Emergency Response and Emergency Services Department and corrected immediately to ensure the safe operations of the facility. [December 18, 1997 Agreement]
17. Manatee County's building inspectors and/or environmental compliance officials shall have access to the facility, following reasonable notice, to confirm that the permittee is in compliance with all applicable codes, ordinances, laws and regulations. [December 18, 1997 Agreement]
18. Manatee County shall be advised by the permittee as soon as the permittee has any knowledge of any scheduled or unscheduled visit by a representative of the Department, EPA, or the Occupational Health and Safety Administration, and the County shall be allowed to have one or two qualified observers accompany the agency inspectors during their visit to the facility. [December 18, 1997 Agreement]

**Table 1 Air Pollutant Standards and Terms.**

**DRAFT**

FACILITY ID NUMBER: 0810002

Permittee:  
Piney Point Phosphates, Inc.

Permit No.: 0810002-004-AC  
Sulfuric Acid Plant and Molten Sulfur Handling and Storage  
Repair and Restoration Project

Emission Units - Sulfuric Acid Plant, Molten Sulfur Handling/Storage

E.U. ID#	Description	Pollutant ID	Fuel(s) [2]	Allowable Emissions [2]		Equivalent Emissions [3]	
				Permit limits	lb/hr [1]	TPY	Basis
1	Sulfuric Acid Plant	SO <sub>2</sub>	molten sulfur	4 lb/ton acid (3-hr)	333		NSPS
1	Sulfuric Acid plant	SO <sub>2</sub>	molten sulfur	3.5 lb/ton acid (48-hr)	292	1278	BACT
1	Sulfuric Acid plant	SAM	molten sulfur	0.15 lb/ton acid	12.5	55	NSPS
1	Sulfuric Acid plant	NOX	molten sulfur	0.12 lb/ton acid	10	44	BACT
1	Sulfuric Acid plant	VE	molten sulfur	10 % opacity			NSPS
2	Molten Sulfur Handling	VE		20 % opacity			

**ALLOWABLE OPERATING RATES**

Hours of operation per year 8760  
Molten Sulfur Usage 655 tons per day  
Sulfuric Acid Production 2000 tons per day

**NOTES**

- (1) At a maximum sulfuric acid production rate of 2000 TPD as 100 percent sulfuric acid.
- (2) Compliance Method: This 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.

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

DRA

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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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> at a level less than normal, and sufficiently low to promote catalytic conversion to SO<sub>3</sub>.
    - 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<sub>2</sub>SO<sub>4</sub>.

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

**DRAFT**

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<sub>2</sub>SO<sub>4</sub>.

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Sulfuric Acid Plant
Piney Point Phosphates Inc.
PSD-FL-242 and 0810002-004-AC
Palmetto, Manatee County

DRAFT

BACKGROUND

The applicant, Piney Point Phosphates Inc., proposes to repair, restore, and restart its existing 2000 ton per day (TPD) sulfuric acid plant (SAP) at its fertilizer manufacturing facility on US Highway 41 North at Piney Point, Palmetto, Manatee 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 (SO2), sulfuric acid mist (SAM), and nitrogen oxides (NOx). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400 and 410, 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 October 31, 1997 included a proposed BACT determination prepared by the applicant's consultant, Koogler and Associates.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

Table with 3 columns: POLLUTANT, CONTROL TECHNOLOGY, PROPOSED BACT LIMIT. Rows include Sulfur Dioxide, Sulfuric Acid Mist, Visibility, and Nitrogen Oxides.

The plant with the originally proposed controls and limits will emit approximately 1460 tons per year (TPY) of SO2, 55 TPY of SAM, and 44 TPY of NOx. The applicant initially proposed 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 99.7 percent of SO2 produced into sulfur trioxide (SO3), absorbing the SO3 in circulating streams of sulfuric acid, and minimizing SAM formation and losses by process controls and high efficiency 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<sub>2</sub> per ton acid (lb SO<sub>2</sub>/ton), 0.15 lb SAM/ton acid, and 10 percent visibility. Therefore the BACT proposed by the applicant is consistent with the NSPS. No National Emission Standard for Hazardous Air Pollutants exist 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<sub>2</sub> 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<sub>2</sub>/ton. An initial "BACT" limit was set for the combined stack emissions for the three units at 2.54 lb SO<sub>2</sub>/ton and 0.105 lb SAM/ton.

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

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The General Chemical plants are double absorption plants like the Piney Point plant. The feedstock at General Chemical is spent sulfuric acid and hydrogen sulfide whereas the feed at Piney Point 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 Piney Point plant. The main distinction related to possible conversion and emissions control is that the gas strength of SO<sub>2</sub> going into the first pass at the General Chemical plants is more variable than the strength of SO<sub>2</sub> going into the first pass at Piney Point. Also the General Chemical plants are much smaller than the Piney Point 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 requested a limit of 3.25 lb SO<sub>2</sub>/ton acid to avoid PSD review for SO<sub>2</sub>. They proposed 0.15 lb SAM/ton acid and 10 percent opacity as BACT emission limits in satisfaction of PSD requirements. As of this date, the matter is under review by the State of Mississippi and EPA. These two plants use the same process as Piney Point. One of them is the oldest double absorption process plant in the country.

**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 received on November 24, and December 8, 1997
- Comments from EPA Region IV received on December 24, 1997
- Evaluation by RTP Associates on behalf of Manatee county received on November 24, 1997
- Further comments from RTP Associates received on November 26, 1997
- 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<sub>2</sub> control technology
- Papers written by Haldor Topsoe on cesium catalysts and additional product information
- BASF website information on catalysts
- EPA background documents in support of NSPS and AP-42, Compilation of Emission Factors
- AWWA Air Pollution Control Manual
- Site visits to plants by Department staff



## APPENDIX BD

### BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

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#### DETERMINATION BY DEP:

<u>POLLUTANT</u>	<u>CONTROL TECHNOLOGY</u>	<u>EMISSION LIMIT</u>
Sulfur Dioxide	Double Absorption	3.5 pounds per ton 100% H <sub>2</sub> SO <sub>4</sub> (48-hr)
Sulfuric Acid Mist	High Efficiency Mist Eliminators	0.15 pounds per ton 100% H <sub>2</sub> SO <sub>4</sub> (NSPS)
Visibility	As Above and Process Controls	10 percent
Nitrogen Oxides	None - Low Fuel Nitrogen, Combustion Temperature	0.12 pounds per ton 100% H <sub>2</sub> SO <sub>4</sub>

#### 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<sub>2</sub> is equivalent to the NSPS value and will apply as a 3-hour standard. In addition, the Department's BACT determination requires compliance with a 48-hour limit of 3.5 lb SO<sub>2</sub>/ton acid. The 48-hour average SO<sub>2</sub> removal efficiency required by the Department is approximately 99.74 percent (%) versus the applicant's proposed value of 99.70%. The underpinnings for the lower SO<sub>2</sub> values are:

- The extent of the repairs and restoration is at least as great as at Mississippi Phosphates, which has agreed to meet an emissions limit of 3.25 lb SO<sub>2</sub>/ton acid to avoid PSD and BACT.
- The Department believes that the applicant's plant will produce 2000 TPD of acid more comfortably than in the past simply by its plan to replace screened, pelletized, vanadium catalyst in Converter 1 and all catalyst in Converter 2 with low pressure drop, ring-shaped, vanadium catalyst. The more modern towers and heat transfer equipment also provide opportunities for lower pressure drop across the plant.
- The applicant expected the plant to emit 4 lb/ton SO<sub>2</sub> at 2000 TPD after the proposed project and considered all operational or add-on pollution control options to be unfeasible.
- In the opinion of the Department, use of "cesium-promoted" vanadium catalyst in the fifth and final pass (Converter 2) can reduce SO<sub>2</sub> 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. Attached are manufacturer summaries claiming even greater reductions under particular situations. This option provides a benchmark against which the applicant can weigh all the options available for SO<sub>2</sub> emissions reduction. The applicant and Manatee County recently agreed that cesium-vanadium catalyst will be installed in the final pass.
- The Department's proposed SO<sub>2</sub> limit reflects a 12.5 percent reduction in average SO<sub>2</sub> emissions while still allowing a reasonable margin for compliance. The emission limit of 3.5 lb SO<sub>2</sub>/ton acid can be achieved over an averaging time of 48 hours. This will allow the applicant to correct and compensate for 3-hour SO<sub>2</sub> 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 48-hour period.

## APPENDIX BD

## BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- Cesium-promoted vanadium ringed catalyst costs \$3.15 per liter (per Monsanto) more than standard vanadium ringed catalyst. Therefore 117,000 liters of cesium/vanadium catalyst will cost an additional \$370,000 over the cost of replacing the pelletized catalyst with non-cesium vanadium ringed catalyst as originally proposed by the applicant. The amortized cost over a period of 10 years is approximately \$50,000 per year.
- Replacement of 10 percent of the catalyst every other turn-around cycle (i.e. every 3 years) over an extended period of time, results in additional annual costs of roughly \$12,300. Thus total additional annual costs are approximately \$62,300.
- At 12.5 percent, SO<sub>2</sub> emissions reductions are about 180 TPY (0.125x1,460 TPY) for a Title V fee credit (@ \$25/ton SO<sub>2</sub>) of approximately \$4,500. This amount of SO<sub>2</sub> recovered is equivalent to about 280 TPY of acid produced for a credit (@ \$35/ton of acid) of approximately \$9,800. Therefore the marginal cost efficiency between 3.5 and 4 lb/ton acid is approximately \$265 per ton of SO<sub>2</sub> removed [(\$62,300 - 4,500 - 9,800)/300 tons]. At the expected emission reduction between 20 and 40 percent, the marginal costs will be even lower.
- In 1997 dollars, the above value is lower than the historical double absorption technology marginal cost effectiveness compared with single absorption technology, which was \$245 in 1985. It is lower than any add-on process analyzed by the applicant or reviewers. Therefore, it is not necessary to present a detailed cost-effectiveness analysis of add-on control options. The reader can refer to the application and comments by reviewers for those analyses.
- The above estimate is conservatively high because a converter full of catalyst remains after all of the screenings and replacements over the period of amortization. Cesium-promoted catalyst achieves equivalent conversions at lower temperatures than the standard type. The reduction in heating requirements after the interpass absorption tower results in an energy benefit that the Department has not quantified.
- Similar calculations can be performed using the most recent cesium/vanadium catalyst introduced by Haldor Topsoe in 1996. Though it is more expensive, it is more active than Topsoe's non-cesium line over the entire range of operating temperatures in the final pass. The Monsanto product, introduced in 1989, offers advantages over its own non-cesium line only at relatively low temperatures. The additional activity, daisy ring shape, and possibility of using less cesium catalyst indicate that the cost effectiveness of Haldor Topsoe's VK-69 catalyst would probably be at least as good as the comparable Monsanto product. BASF also makes a cesium/vanadium catalyst, but the Department has little information about it at this time.
- Cesium/vanadium catalyst (Haldor Topsoe VK-58) was used in the upper portion of the first passes at the three previously-mentioned General Chemical plants in Anacortes. While the purpose was to increase production, save startup time, and extend heat exchanger lifetime, the lower historical emissions encountered may have been partially due to the cesium/vanadium catalyst.
- Control options involving production of by-products or wastes are not advisable at Piney Point. These needlessly require storage and handling of additional materials which unnecessarily complicates operations at a site of concern to and under close scrutiny by the public. Some of these

## APPENDIX BD

## BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

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).

- 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. They remain available at the discretion of Piney Point (particularly if there is a use for the by-products) as alternatives to achieve the Department's BACT SO<sub>2</sub> limits.
- 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. A commercial sale incorporating Centaur for a 1000 TPD plant was made to Philippines Phosphate Fertilizer Corporation. It is licensed by Calgon Carbon and Monsanto Environmental-Chem. Emissions as low as 1 lb SO<sub>2</sub>/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 start up of the plant.
- The Department does not recommend the Centaur process at Piney Point at this time. It remains an option that Piney Point 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.
- Department records indicate that emissions less than 4 lb SO<sub>2</sub>/ton are commonly achieved throughout the entire turn-around cycle by several plants in Florida. In some cases, the lower levels may reflect existence of process bottlenecks, production permit limits, low production rates, or other considerations. Lower emissions may also be the result of progressive replacement of degraded pelletized vanadium catalyst with ringed vanadium catalyst without production increases over many turn-around cycles. For example, two plants at White Springs, Florida, typically emit 3.3 lb SO<sub>2</sub>/ton throughout their entire turn-around cycles even after increasing production at each plant from 2000 to 2500 TPD several years ago.
- The option of more frequent turn-arounds has a certain appeal. Nine month turn-arounds were the norm some years ago. However, plants are capable of running longer between turn-arounds and it is the conclusion of the Department that the operator is in the best position to judge the appropriateness of shutdowns. More frequent turn-arounds make a theoretical difference in SO<sub>2</sub> emissions at some plants but not at others. Additionally, real costs such as lost production during additional turn-arounds are important considerations despite assertions by some reviewers that they should not be included under certain cost evaluation methods. This and any other operational option is available at the discretion of the applicant in achieving the BACT limit.

### BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- All mist eliminators at the SAP will be replaced with the most appropriate devices (Monsanto Enviro-Chem CS-IP Co-Knit, ES, and CSII-P mist eliminators) based on the required duty. Per the original application, the Model CSII-P ("Cost Saver"), which relies only on impaction to remove SAM, was to be used in the final tower (see attached manufacturer description). The applicant has since agreed to include 36 of the high efficiency Model ES ("Energy Saver") mist eliminators in the final tower. This design incorporates "Brownian Diffusion" which enhances collection of smaller particles. This replacement constitutes BACT for this project, which is to return an existing plant to its previous capacity.
- According to the referenced EPA NSPS documents, SAM emissions ranged from a low of 0.004 to a high of 0.15 lb/ton at tested plants. The NSPS standard and Monsanto guarantee of 0.15 lb/ton together with replacement of the mist eliminators in the final tower with high efficiency models will likely result in SAM emissions less than 0.10 lb/ton.
- The visibility limit of 10 percent opacity is consistent with the above discussion.

#### COMPLIANCE METHODOLOGY:

Demonstration of compliance with the NSPS limits shall be as required by Subpart H. These are EPA Reference Method 8 for SO<sub>2</sub> and SAM. EPA Methods 1, 2, and 3 shall be used to determine stack and flue gas properties. An initial compliance test for NO<sub>x</sub> using EPA Method 7 or 7E is required to verify the low emission rate projected in the application.

SO<sub>2</sub> 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<sub>2</sub> on a 48 hour rolling 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:

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

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Howard L. Rhodes, Director  
Division of Air Resources Management

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Date:

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Date:

# Sulphuric Acid Catalyst VK69

## New Options for Double-Absorption Plants

Since the introduction of the first VK38 catalyst more than 50 years ago, the VK Series has represented Topsøe's heritage and commitment to quality and innovation.

The introduction of the first caesium-promoted vanadium catalyst, VK58, in the late 1980's meant a tremendous step forward in reducing tail-gas emissions from *single*-absorption sulphuric acid plants through operation at hitherto unseen low temperatures.

Other application areas of caesium-promoted catalysts include:

- Handling of strong, oxygen-rich SO<sub>2</sub> gases
- Significant reduction in SO<sub>2</sub> emissions during start-up
- Savings in start-up time and extended autothermal restart time limits
- Overcoming plant constraints

### VK69

In 1996 Topsøe introduced VK69, a newly developed caesium-promoted catalyst, optimized for operation in the last pass of *double*-absorption sulphuric acid plants. At these conditions VK69 shows a very significant activity advantage compared to regular catalysts.

### Features and Benefits

The improvement in activity has been brought about through physical as well as chemical changes compared to Topsøe's well-known VK58 caesium-promoted catalyst.

VK69, 9-mm mini-Daisy alongside 10-mm rings and 12-mm Daisy

### Support

VK69 is manufactured by a special extrusion process resulting in a highly porous catalyst.

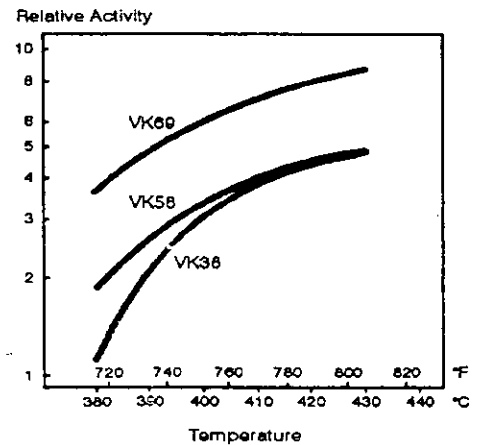
### Shape

In gases with low concentrations of sulphur dioxide the rate of oxidation of sulphur dioxide is impeded by intra-particle diffusion. The size and shape of the catalyst particles are hence important for the efficiency of the catalyst.

Topsøe's new 9-mm mini-Daisy shape proves 20 % more efficient compared with smooth 10-mm rings without compromising a low pressure drop.

### Chemical Composition

VK69 combines an increased vanadium content with a revised composition of the active phase. Caesium is used to stabilize the vanadium in its active state at low operating temperatures.



### Outstanding Activity

The revised support material, the optimum chemical composition, and the mini-Daisy shape together result in a 2-3 times higher activity for VK69 compared to other vanadium catalysts.

### Improved Performance

The very high activity of VK69 offers significant performance improvements in terms of:

- Emissions from existing plants can be cut in half without increasing the catalyst volume
- Increased production rate by using higher-strength SO<sub>2</sub> gas without increasing emissions or plant pressure drop





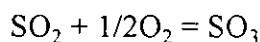
# Enviro-Chem Systems

## MONSANTO ENVIRO-CHEM SULFURIC ACID CATALYST

Monsanto has been manufacturing and marketing sulfuric acid catalyst since 1925. The catalyst is sold worldwide and Enviro-Chem provides high quality technical and commercial support before and after the sale. The vanadium-based catalyst is an extremely important "log" in the many sulfuric acid technologies provided by Monsanto Enviro-Chem.



The sulfuric acid catalyst is used in the oxidation of sulfur dioxide (SO<sub>2</sub>) as follows:



The sulfur trioxide (SO<sub>3</sub>) is then reacted with water to form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). The main components of the Enviro-Chem catalyst include: SiO<sub>2</sub> (silica: as a support), vanadium (V), potassium (K) and/or cesium (Cs), and various binders and additives. The reaction shown above actually occurs within a molten salt consisting of potassium/cesium sulfates and vanadium sulfates, coated on the solid silica support. This unique catalyst has proven to be very stable and long-lived in the sulfuric acid production industry. Because of the unique chemistry of this molten salt system, the vanadium is present as a complex sulfated salt mixture and NOT as vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>). Therefore, the catalyst is more correctly called a "vanadium-containing" catalyst rather than the commonly-used "vanadium pentoxide" catalyst.

Monsanto Enviro-Chem provides a wide variety of sulfuric acid catalyst products:

<b>Rings</b>	<b>LP-120</b>	<b>LP-110</b>	<b>LP-220</b>
Application	First/Second Beds	Third/Fourth Beds	First/Second Beds
Outside Diameter (mm)	12.7	9.5	9.5
Inside Diameter (mm)	5.0	4.0	4.0
Average Ring Length (mm)	14.0	13.0	13.0
<b>Pellets</b>	<b>T-210</b>	<b>T-11</b>	
Application	First/Second Beds	Third/Fourth Beds	
Diameter (mm)	5.5	5.5	
Crush Strength (kg)	12.0	12.0	
<b>Cesium-Promoted</b>	<b>Cs-120</b>	<b>Cs-110</b>	<b>Cs-210</b>
Shape	Ring	Ring	Pellet
Application	First/Second Beds	Lower Beds	All Beds
Outside Diameter (mm)	12.7	9.5	5.5
Inside Diameter (mm)	5.0	4.0	

\* The **cesium-promoted catalyst** was developed specifically for lower temperature operations which can lead to greater SO<sub>2</sub> conversion and hence lower emissions to the atmosphere. The cesium salt promoter reduces the required operating temperature for the sulfuric acid catalyst by as much as 40°C (70°F). Higher SO<sub>2</sub> conversion is possible at lower temperatures as long as the catalyst is "active"; the cesium-promoted catalysts are sufficiently active at these lower temperatures (390-410°C/735-770°F) to take advantage of this conversion "opportunity." The cesium/vanadium catalyst can be used in the first bed to reduce the bed inlet temperature (saving energy and start-up time). The Cs-110 or Cs-210 catalyst can be used in the final catalyst bed (at a low inlet temperature) to maximize the SO<sub>2</sub> conversion and reduce emissions. This unique catalyst was introduced in the late 1980's and has been applied in a variety of situations with significant SO<sub>2</sub> emissions reductions. Although the cesium catalyst is more costly than the standard potassium/vanadium catalysts, many customers have justified the added expense by increased production, higher steam production, and reduced emissions.

Technical service is also a major part of the overall sulfuric acid catalyst story. Enviro-Chem provides catalyst engineering studies to assist the customer in determining the catalyst needs in a specific plant, activity analysis and hardness determinations for used catalyst samples, and on-site converter-heat exchanger testing (called *PeGASvS*) to fully characterize the sulfuric acid plant operations which assist the customer in maintenance planning. Enviro-Chem has a variety of commercial and inventory locations throughout the world. Technical service functions are centered in St. Louis, MO (U.S.A.) and in Brussels, Belgium.



# Enviro-Chem Systems

Some of our landmark developments and contributions to the industry include:

1920s-

Introduction in the US of a sulfuric acid **catalyst** based on vanadium, a superior catalyst to platinum in the contact sulfuric acid process.

1930 -

Monsanto process and plant engineering packages made available to industry through **Leonard Construction Company**

1960s-

Development of fiber bed mist eliminator to reduce mist emissions from phosphoric and sulfuric acid plants.

1963 -

Introduced Type 11 catalyst tailored for higher activity in lower converter passes.

1970 -

First US interpass absorption plant designed by Enviro-Chem goes on stream.

1978 -

Designed first stainless steel converter for 12% gas and introduced Monsanto's stainless steel anodically protected acid coolers to replace cast iron.

1980s-

Introduction of modern energy efficient design concepts which increased steam production by 20-25%.

1980 -

Developed low pressure drop ring catalyst.

1984 -

Patented the Heat Recovery System which produces steam for process or power generation from heat previously lost in acid cooling systems which increases net heat recovery on sulfur burning plants up to 90%.

1986 -

Introduced Sandvik SX™ stainless steel material to the marketplace to replace steel and brick and cast iron in acid systems, leading to greater safety for operators and longer on-stream times.

1987 -

Introduced DynaWave® gas scrubbers to replace venturis and open humidifiers for improved gas cleaning efficiency.

1988 -

Obtained NO<sub>x</sub> and Nitric acid plant process technologies.

1989 -

\* Introduced Cesium catalyst for lower temperature operation in new and existing plants, allowing increased capacity and conversion in existing plants, and lower capital cost of new plants which require exit emissions down to 100 ppm SO<sub>2</sub>.

1990 -

Introduced the patented wet catalytic Monarch™ process further improving the energy recovery from acid plants

1992 -

Acquired technology for radial flow gas/gas heat exchanger which offers better layout and reduced pressure drop, and lower cost in many applications.





## Enviro-Chem Systems

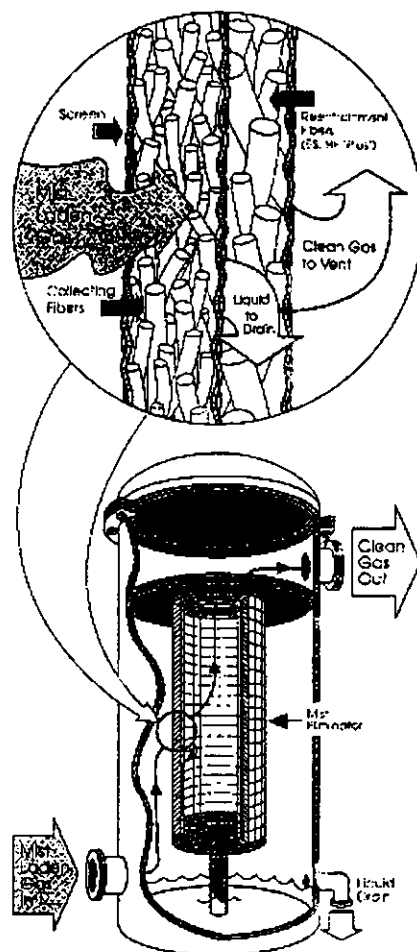
### For Superior Removal of Submicron Liquid & Soluble Solid Particles

Brink® Fiber Bed Mist Eliminators remove liquid or soluble solid mists from gas streams. They excel at collecting the very-difficult-to-remove, submicron-size mist particles that cause visible emissions (opacity).

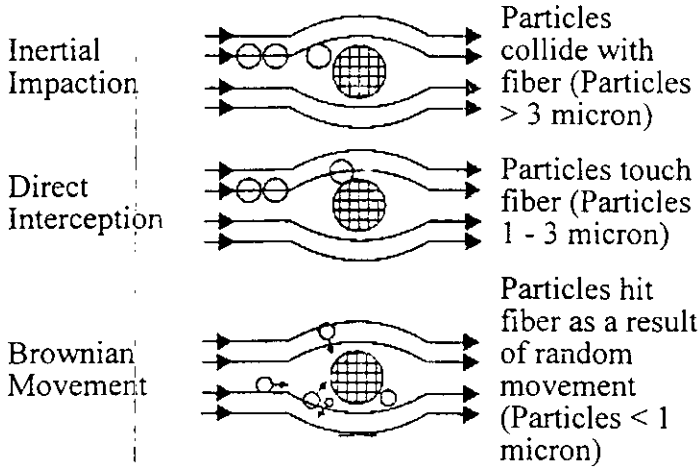
On plant stacks, Brink Mist Eliminators are used for pollution control. Within processes, they help protect equipment and prevent product contamination.

### Benefit from Brownian Diffusion

The key to high efficiency removal of submicron particles is the use of Brownian diffusion as a principal collecting mechanism. High efficiency models of Brink Mist Eliminators employ Brownian diffusion in this manner. Their small fibers, "deep" beds and low velocities provide the large number of targets and residence times necessary for collection by Brownian diffusion



**Collection Mechanism**



**Applications**

Typical Brink Mist Eliminator applications include:

- Sulfuric acid
- Phosphoric acid
- Nitric acid
- Chlorine
- Sulfonation
- Pulp and paper
- AN and urea fertilizer
- Chemical scrubbers
- Plastics
- Textiles
- Asphalt
- Lube oil vent
- Machine oil mist
- Metalworking fluid mist
  - Straight oil
  - Mineral oil
  - Water soluble oil
  - Synthetic coolant
  - Semi-synthetic coolants
- Food Processing
- Incineration
- Compressed gas

**How It Works**

All Mist Eliminators operate in a similar manner. Gases containing mist particles are directed horizontally through a bed of fibers. Particles collect on individual fibers of the bed by the mechanism of impaction, interception and Brownian diffusion, then coalesce to form liquid films which are moved through the bed by the gas flow. The collected liquid then drains off the downstream face of the bed by gravity. Brink Mist Eliminators are typically installed in a vessel from which the collected liquids are continuously drained.

## A Variety of Styles and Sizes

Brink Mist Eliminators come in a variety of styles and sizes. With Brownian diffusion types, collection efficiencies on submicron particles can be designed to exceed 99.5%:

High efficiency models using Brownian diffusion:

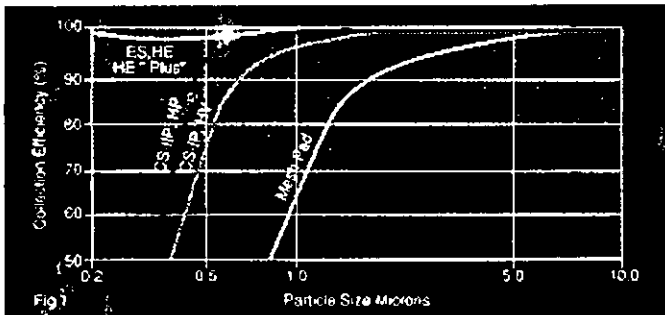
- the ES (Energy Saver)
- the HE (High Efficiency)
- the FP (Field Pack)

A recent innovation, the FP, features a special mat material in the form of a sleeve or tube that allows users to replace packing in the field without returning the element cage to the factory for fiber replacement.

Models which employ impaction only:

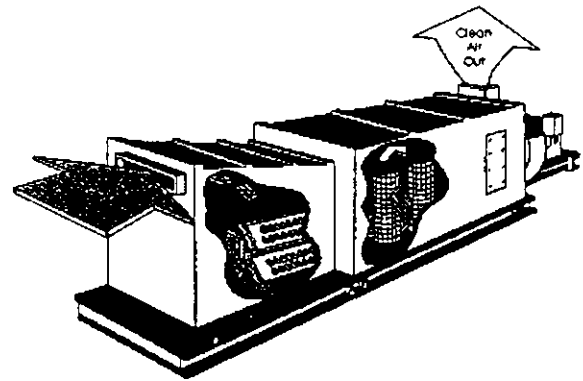
- the CS (Cost Saver)
- the HP (High Performance)
- the HV (High Velocity)

The ES, FP, HE "Plus" and CS models include a drainage layer that virtually eliminates reentrainment. Also, prefilters are available for applications where insoluble particles can cause pluggage, limiting the mist eliminator's useful life.



## Complete Package Systems

Enviro-Chem also offers complete package systems to control emissions from oleum and asphalt storage and loading operations; and from asphalt saturator, textile finishing and plasticizer coating operation. Package systems are available for collecting oil from turbine lube oil reservoir vents and metalworking fluid or oil/coolant from metalworking operations like machining, wet grinding mills, turning centers, lathes, screw machines, rolling, boring and drilling.



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

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- 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.

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

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 extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- (a) Determination of Best Available Control Technology (X);
  - (b) Determination of Prevention of Significant Deterioration (X); and
  - (c) Compliance with New Source Performance Standards (X)
- G.14 The permittee shall comply with the following:
- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - (c) Records of monitoring information shall include:
    - 1. The date, exact place, and time of sampling or measurements;
    - 2. The person responsible for performing the sampling or measurements;
    - 3. The dates analyses were performed;
    - 4. The person responsible for performing the analyses;
    - 5. The analytical techniques or methods used; and
    - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**APPENDIX CSC****EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS**

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**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 of 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.

## APPENDIX CSC

### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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- 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

## APPENDIX CSC

### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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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.]



## APPENDIX CSC

### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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#### 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

## APPENDIX CSC

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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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.

# Memorandum

# Florida Department of Environmental Protection

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TO: Clair Fancy

FROM: A. A. Linero 

DATE: January 8, 1997

SUBJECT: Piney Point Phosphates Sulfuric Acid Plant  
PSD-FL-242

Attached is the public notice package for modification of Piney Point Phosphates' existing sulfuric acid plant. The project consists of replacement of several key components including the drying tower, both absorption towers, the economizer and heat exchangers, as well as all catalyst in the final pass. It also includes replacement of various tanks, pumps, insulation, electrical components, certain foundations and structural support, etc. Repair, maintenance, and recommissioning work will be performed on other key equipment such as the main blower, other tanks, converters, etc.

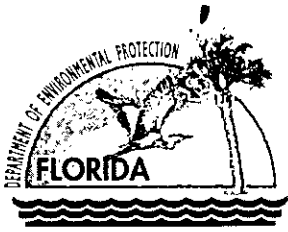
The project will restore the plant to its previous capacity of 2000 TPD. We have made a BACT determination of 3.5 lb SO<sub>2</sub>/ton acid. The applicant has agreed to achieve that limit by using cesium-vanadium catalyst in the final pass per a separate agreement with Manatee County. I expect the plant to perform better than required if properly operated (2.4 - 3.2 lb/ton).

BACT for sulfuric acid mist is the complete replacement of all mist eliminators. In particular, the ten new mist eliminators described in the application for the final tower, will be upgraded to 46 of the high efficiency mist eliminators. This will easily achieve the NSPS limit of 0.15 lb/ton acid.

I recommend your approval of this Intent to Issue.

Attachments

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.** 00810002-004-AC (PSD-FL-242)

Piney Point Phosphates Inc.  
Fertilizer Facility  
Palmetto, Manatee County

**Project type:**

Project to repair and restore to previously permitted capacity, the 2000 ton per day sulfur burning sulfuric acid plant. 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 use of cesium-promoted vanadium catalyst in the final converter. BACT for sulfuric acid mist emissions is the replacement of all mist eliminators and use of high efficiency mist eliminators in the final tower. Nitrogen oxides emissions are inherently low and no further control is feasible.

*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).*

 1/8/98

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) 488-1344  
Fax (850) 922-6979

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"Protect, Conserve and Manage Florida's Environment and Natural Resources"