

# CARGILL FERTILIZER, INC.

P.O. Box 9002 - Bartow, Florida 33830 - Telephone 813-534-9610 - FAX 813-534-9680

May 16, 1995

RECEIVED

MAY 24 1995

Bureau of  
Air Regulation

Mr. Clair Fancy  
Florida Department of Environmental Protection  
Bureau of Air Regulation  
2600 Blair Stone Rd.  
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

SUBJECT: Sulfuric Acid Plant Production Increase - Permit Application

Please find enclosed six (6) copies of a construction permit application for the increase in production of three existing sulfuric acid plants and associated sulfur handling operations located at our Bartow fertilizer facility. Included along with the application is a check in the amount of \$7,500 (check #577210019) for the permit processing fee.

Should you have any questions, or require additional information, please feel free to contact me at (813) 534-9613.

Sincerely,

David B. Jellerson, P.E.  
Environmental Superintendent

cc: Pinney, Morris, Polk, Fernandez  
P-10-02



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GOLDER ASSOCIATES GAINESVILLE  
3730 SHAMBLEE TUCKER ROAD  
ATLANTA, GA 30341

22074

Oct 20 1998

63-2/630  
00320

PAY  
TO THE  
ORDER OF

Florida Department of Environmental Protection \$ 50.00

Fifty Dollars & no/xx

DOLLARS

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FOR

*John R. Williams*

CLARKE AMERICAN BA

GUARDIAN & SAFETY

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MAY 24 1995

Bureau of  
Air Regulation

**PSD PERMIT  
APPLICATION**

**Nos. 4, 5, and 6 Sulfuric Acid Plants  
Expansion  
CARGILL FERTILIZER, INC.  
Bartow, Florida**

**Prepared For:**

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

**Prepared By:**

**KBN Engineering and Applied Sciences, Inc.  
6241 NW 23rd Street  
Gainesville, Florida 32653-1500**

**May 1995  
14442C**

**PART A**  
**AIR PERMIT APPLICATION**  
**LONG FORM**

# Department of Environmental Protection

## DIVISION OF AIR RESOURCES MANAGEMENT APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

### I. APPLICATION INFORMATION

This section of the Application for Air Permit form provides general information on the scope of this application, the purpose for which this application is being submitted, and the nature of any construction or modification activities proposed as a part of this application. This section also includes information on the owner of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department on diskette, this section of the Application for Air Permit must also be submitted in hard-copy form.

#### Identification of Facility Addressed in This Application

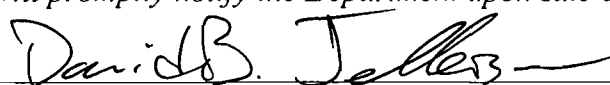
Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility name, if any; and a brief reference to the facility's physical location. If known, also enter the ARMS or AIRS facility identification number. This information is intended to give a quick reference, on the first page of the application form, to the facility addressed in this application. Elsewhere in the form, numbered data fields are provided for entry of the facility data in computer-input format.

Cargill Fertilizer, Inc. Bartow Facility; Polk County; 40TPA530046

#### Application Processing Information (DEP Use)

1. Date of Receipt of Application:	5-24-95
2. Permit Number:	AC53-271436
3. PSD Number (if applicable):	PSD-FL-229
4. Siting Number (if applicable):	

**Owner/Authorized Representative or Responsible Official**

1. Name and Title of Owner/Authorized Representative or Responsible Official: <b>David B. Jellerson, Environmental Superintendent</b>
2. Owner/Authorized Representative or Responsible Official Mailing Address:  Organization/Firm: <b>Cargill Fertilizer, Inc.</b> Street Address: <b>P.O. Box 9002</b> City: <b>Bartow</b> State: <b>FL</b> Zip Code: <b>33831</b>
3. Owner/Authorized Representative or Responsible Official Telephone Numbers:  Telephone: <b>(813)534-9613</b> Fax: <b>(813)534-9680</b>
4. Owner/Authorized Representative or Responsible Official Statement:  <i>I, the undersigned, am the owner or authorized representative* of the facility (non-Title V source) addressed in this Application for Air Permit or the responsible official, as defined in Chapter 62-213, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described in this application so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. If the purpose of this application is to obtain an air operation permit or operation permit revision for one or more emissions units which have undergone construction or modification, I certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted source.</i>   Signature _____ Date <u>5-16-95</u>

\* Attach letter of authorization if not currently on file.

### **Scope of Application**

This Application for Air Permit addresses the following emissions unit(s) at the facility (or Title V source). An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

#### **Emissions Unit ID / Description of Emissions Unit**

**12 No. 4 Sulfuric Acid Plant**  
**32 No. 6 Sulfuric Acid Plant**  
**33 No. 5 Sulfuric Acid Plant**  
**46 Molten Sulfur, Unloading, Storage and Handling System**

**Purpose of Application and Category**

Check one (except as otherwise indicated):

**Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.**

This Application for Air Permit is submitted to obtain:

- ☐ Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.
- ☐ Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: \_\_\_\_\_

- ☐ Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: \_\_\_\_\_

- ☐ Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: \_\_\_\_\_

Operation permit to be renewed: \_\_\_\_\_

- ☐ Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: \_\_\_\_\_

\_\_\_\_\_

- ☐ Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit. Give reason for the revision e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit to be revised: \_\_\_\_\_

Reason for revision: \_\_\_\_\_

\_\_\_\_\_

**Category II: All Air Construction Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.**

This Application for Air Permit is submitted to obtain:

- ☐ Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s): \_\_\_\_\_  
\_\_\_\_\_

- ☐ Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: \_\_\_\_\_

- ☐ Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit to be revised: \_\_\_\_\_

Reason for revision: \_\_\_\_\_  
\_\_\_\_\_

**Category III: All Air Construction Permit Applications for All Facilities and Emissions Units.**

This Application for Air Permit is submitted to obtain:

- ☒ Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: \_\_\_\_\_  
AO53-243295;AO53-188627A

- ☐ Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s): \_\_\_\_\_  
\_\_\_\_\_

- ☐ Air construction permit for one or more existing, but unpermitted, emissions units.

**Application Processing Fee**

Check one:

[ **x** ] Attached - Amount: \$ \$ 7,500.00

[   ] Not Applicable.

**Construction/Modification Information**

1. Description of Proposed Project or Alterations:

**Refer to Attachment A**

2. Projected or Actual Date of Commencement of Construction (DD-MON-YYYY):

**1 Aug 1995**

3. Projected Date of Completion of Construction (DD-MON-YYYY):

**1 Nov 1999**

**Professional Engineer Certification**

1. Professional Engineer Name: **David A. Buff**  
Registration Number: **19011**

2. Professional Engineer Mailing Address:  
Organization/Firm: **KBN Engineering and Applied Sciences, Inc.**  
Street Address: **6241 NW 23rd St., Suite 500**  
City: **Gainesville** State: **FL** Zip Code: **32653-1500**

3. Professional Engineer Telephone Numbers:  
Telephone: **(904)336-5600** Fax: **(904)336-6603**

4. Professional Engineer's Statement:

*I, the undersigned, hereby certify, except as particularly noted herein\*, that:*

*(1) To the best of my knowledge, there is reasonable assurance (a) that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; or (b) for any application for a Title V source air operation permit, that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application;*

*(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application; and*

*(3) For any application for an air construction permit for one or more proposed new or modified emissions units, the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.*

*David A. Buff*  
\_\_\_\_\_  
Signature

*5/12/95*  
\_\_\_\_\_  
Date

(seal)

Attach any exception to certification statement.

1. Name and Title of Application Contact: <b>David B. Jellerson, Environmental Superintendent</b>
2. Application Contact Mailing Address:  Organization/Firm: <b>Cargill Fertilizer, Inc.</b> Street Address: <b>P.O. Box 9002</b> City: <b>Bartow</b> State: <b>FL</b> Zip Code: <b>33831</b>
3. Application Contact Telephone Numbers:  Telephone: <b>(813)534-9613</b> Fax: <b>(813)534-9680</b>

Date	Description	Amount	Balance	Total

## II. FACILITY INFORMATION

### A. GENERAL FACILITY INFORMATION

#### Facility Name, Location, and Type

1. Facility Owner or Operator: <b>Cargill Fertilizer, inc.</b>			
2. Facility Name: <b>Bartow</b>			
3. Facility Identification Number: <b>40TPA530046</b> [ ] Unknown			
4. Facility Location Information: Facility Street Address: <b>3200 Highway 60 West</b> City: <b>Bartow</b> County: <b>Polk</b> Zip Code: <b>33830</b>			
5. Facility UTM Coordinates: Zone: <b>17</b> East (km): <b>409.8</b> North (km): <b>3087.0</b>			
6. Facility Latitude/Longitude: Latitude (DD/MM/SS): <b>27/54/22</b> Longitude: (DD/MM/SS): <b>81/54/59</b>			
7. Governmental Facility Code: <b>O</b>	8. Facility Status Code: <b>A</b>	9. Relocatable Facility? [ ] Yes [x] No	10. Facility Major Group SIC Code: <b>28</b>
11. Facility Comment:			

#### Facility Contact

1. Name and Title of Facility Contact: <b>David B. Jellerson, Environmental Superintendent</b>			
2. Facility Contact Mailing Address: Organization/Firm: <b>Cargill Fertilizer, Inc.</b> Street Address: <b>P.O. Box 9002</b> City: <b>Bartow</b> State: <b>FL</b> Zip Code: <b>33831</b>			
3. Facility Contact Telephone Numbers: Telephone: <b>(813)534-9613</b> Fax: <b>(813)534-9680</b>			

### Facility Regulatory Classifications

1. Small Business Stationary Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
2. Title V Source? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Synthetic Non-Title V Source? <input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Synthetic Minor Source of Pollutants Other than HAPs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6. Major Source of HAPs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible
7. Synthetic Minor Source of HAPs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8. One or More Emissions Units Subject to NSPS? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9. One or More Emissions Units Subject to NESHAP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10. Title V Source by EPA Designation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11. Facility Regulatory Classifications Comment:

## **B. FACILITY REGULATIONS**

Depending on the application category, this subsection of the Application for Air Permit form provides either a brief analysis or detailed listing of federal, state, and local regulations applicable to the facility as a whole. (Regulations applicable to individual emissions units within the facility are addressed in Subsection III-B of the form.)

**Rule Applicability Analysis** (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

**List of Applicable Regulations** (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

**62-212.400 - Prevention of Significant Deterioration**

### C. FACILITY POLLUTANT INFORMATION

This subsection of the Application for Air Permit form allows for the reporting of potential and estimated emissions of selected pollutants on a facility-wide basis. It must be completed for each pollutant for which the applicant proposes to establish a facility-wide emissions cap and for each pollutant for which emissions are not reported at the emissions-unit level.

**Facility Pollutant Information:** Pollutant \_\_\_\_\_ of \_\_\_\_\_

1. Pollutant Emitted:		
2. Estimated Emissions:		(tons/yr)
3. Requested Emissions Cap:	(lb/hr)	(tons/yr)
4. Basis for Emissions Cap Code:		
5. Facility Pollutant Comment:		

**Facility Pollutant Information** Pollutant \_\_\_\_\_ of \_\_\_\_\_

1. Pollutant Emitted:		
2. Estimated Emissions:		(tons/yr)
3. Requested Emissions Cap:	(lb/hr)	(tons/yr)
4. Basis for Emissions Cap Code:		
5. Facility Pollutant Comment:		

**Facility Pollutant Information:** Pollutant \_\_\_\_\_ of \_\_\_\_\_

1. Pollutant Emitted:		
2. Estimated Emissions:		(tons/yr)
3. Requested Emissions Cap:	(lb/hr)	(tons/yr)
4. Basis for Emissions Cap Code:		
5. Facility Pollutant Comment:		

**Facility Pollutant Information:** Pollutant \_\_\_\_\_ of \_\_\_\_\_

1. Pollutant Emitted:		
2. Estimated Emissions:		(tons/yr)
3. Requested Emissions Cap:	(lb/hr)	(tons/yr)
4. Basis for Emissions Cap Code:		
5. Facility Pollutant Comment:		

## D. FACILITY SUPPLEMENTAL INFORMATION

This subsection of the Application for Air Permit form provides supplemental information related to the facility as a whole. (Supplemental information related to individual emissions units within the facility is provided in Subsection III-I of the form.) Supplemental information must be submitted as an attachment to each copy of the form, in hard-copy or computer-readable form.

### Supplemental Requirements for All Applications

1. Area Map Showing Facility Location: <input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Facility Plot Plan: <input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Process Flow Diagram(s): <input checked="" type="checkbox"/> Attached, Document ID(s): <u>PSD Report</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
5. Fugitive Emissions Identification: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
6. Supplemental Information for Construction Permit Application: <input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u> <input type="checkbox"/> Not Applicable

### Additional Supplemental Requirements for Category I Applications Only

7. List of Insignificant Activities: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
8. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Equipment/Activities Onsite but Not Required to be Individually Listed <input type="checkbox"/> Not Applicable

<p>9. Alternative Methods of Operation:</p> <p><input type="checkbox"/> Attached, Document ID: _____</p> <p><input type="checkbox"/> Not Applicable</p>
<p>10. Alternative Modes of Operation (Emissions Trading):</p> <p><input type="checkbox"/> Attached, Document ID: _____</p> <p><input type="checkbox"/> Not Applicable</p>
<p>11. Enhanced Monitoring Plan:</p> <p><input type="checkbox"/> Attached, Document ID: _____</p> <p><input type="checkbox"/> Not Applicable</p>
<p>12. Risk Management Plan Verification:</p> <p><input type="checkbox"/> Plan Submitted to Implementing Agency - Verification Attached Attached, Document ID: _____</p> <p><input type="checkbox"/> Plan to be Submitted to Implementing Agency by Required Date</p> <p><input type="checkbox"/> Not Applicable</p>
<p>13. Compliance Report and Plan</p> <p><input type="checkbox"/> Attached, Document ID: _____</p> <p><input type="checkbox"/> Not Applicable</p>
<p>14. Compliance Statement (Hard-copy Required)</p> <p><input type="checkbox"/> Attached, Document ID: _____</p> <p><input type="checkbox"/> Not Applicable</p>

Emissions Unit Information Section 1 of 4

### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

#### A. GENERAL EMISSIONS UNIT INFORMATION

This subsection of the Application for Air Permit form provides general information on the emissions unit addressed in this Emissions Unit Information Section, including information on the type, control equipment, operating capacity, and operating schedule of the emissions unit..

##### Type of Emissions Unit Addressed in This Section

Check one:

- ☒ [ X ] This Emissions Unit information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.



Emissions Unit Control Equipment Information

A.

1. Description:

**Double Contact Process**

2. Control Device or Method Code: **044**

B.

1. Description:

**Mist Eliminator - High Velocity**

2. Control Device or Method Code: **014**

C.

1. Description:

2. Control Device or Method Code:

**Emissions Unit Operating Capacity**

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr                      tons/day
3. Maximum Process or Throughput Rate:	
4. Maximum Production Rate:	2,600      TPD as 100% H <sub>2</sub> SO <sub>4</sub>
5. Operating Capacity Comment:	

**Emissions Unit Operating Schedule**

1. Requested Maximum Operating Schedule:
24 hours/day,                      7 days/week,
52 weeks/yr                      8760 hours/yr

**B. EMISSIONS UNIT REGULATIONS**

Depending on the application category, this subsection of the Application for Air Permit form provides either a brief analysis or detailed listing of all federal, state, and local regulations applicable to the emissions unit addressed in this Emissions Unit Information Section.

**Rule Applicability Analysis** (Required for Category II Applications and Category III applications involving non Title-V sources. See Instructions.)

**List of Applicable Regulations** (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

40 CFR 60.7  
40 CFR 60.8  
40 CFR 60.82(a)  
40 CFR 60.83(a)  
40 CFR 60.84(a)  
40 CFR 60.84(b)  
40 CFR 60.84(c)  
40 CFR 60.84(e)  
40 CFR 60.85  
62-210.700  
62-212.400  
62-296.320(2) - objectionable odors  
62-296.402(2)  
62-296.402(3)  
62-296.402(4)  
62-296.402(5)  
62-296.800  
62-297.310  
62-297.340  
62-297.570

**C. EMISSION POINT (STACK/VENT) INFORMATION**

This subsection of the application for Air Permit form provides information about the emission point associated with the emissions unit addressed in this Emissions Unit Information Section. An emission point is typically a stack or vent but can be any identifiable location at which air pollutants, including fugitive emissions, are discharged into the atmosphere.

**Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram:  4SAP								
2. Emission Point Type Code:  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4								
3. Descriptions of Emissions Points Comprising this Emissions Unit:          								
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:          								
5. Discharge Type Code:  <table><tr><td><input type="checkbox"/> D</td><td><input type="checkbox"/> F</td><td><input type="checkbox"/> H</td><td><input type="checkbox"/> P</td></tr><tr><td><input type="checkbox"/> R</td><td><input checked="" type="checkbox"/> V</td><td><input type="checkbox"/> W</td><td></td></tr></table>	<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P	<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W	
<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P					
<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W						

6. Stack Height:	200	ft
7. Exit Diameter:	6.75	ft
8. Exit Temperature:	158	°F
9. Actual Volumetric Flow Rate:	130,000	acfm
10. Percent Water Vapor:	0	%
11. Maximum Dry Standard Flow Rate:		dscfm
12. Nonstack Emission Point Height:		ft
13. Emission Point UTM Coordinates:		
Zone:	East (km):	North (km):
14. Emission Point Comment:		

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of segment data (Fields 1-10) must be completed for each segment required to be reported and for each alternative operating method or mode (emissions trading scenario) under Chapter 62-213, F.A.C., for which the maximum hourly or annual segment-related rate would vary. A segment is a material handling, process, fuel burning, volatile organic liquid storage, production, or other such operation to which emissions of the unit are directly related. See instructions for further details on this subsection of the Application for Air Permit.

**Segment Description and Rate Information:** Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode): <b>Sulfuric Acid - Contact Process</b>	
2. Source Classification Code (SCC): <b>3-01-023-01</b>	
3. SCC Units: <b>tons 100% H2SO4</b>	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: <b>949,000</b>
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment: <b>2,600 TPD 100% H2SO4</b>	

Segment Description and Rate Information: Segment \_\_\_\_\_ of \_\_\_\_\_

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode):	
2. Source Classification Code (SCC):	
3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment:	

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 1 of 3

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		
2. Total Percent Efficiency of Control:		<b>99.9 %</b>
3. Primary Control Device Code: <b>044</b>		
4. Secondary Control Device Code:		
5. Potential Emissions:		<b>433.3 lbs/hr</b> <b>1,898 tons/yr</b>
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3      _____ to _____ tons/yr		
8. Emission Factor:		<b>4 lb/ton</b> <b>100% H<sub>2</sub>SO<sub>4</sub></b>
Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH 100% H<sub>2</sub>SO<sub>4</sub> x 4.0 lb/ton = 433.3 lb/hr; 433.3 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 1,898.0 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
<b>4</b>	<b>lb/ton</b>	<b>100% H2SO4 produced</b>
4. Equivalent Allowable Emissions:	<b>433.33</b> lbs/hr	<b>1,898</b> tons/yr
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 2 of 3

1. Pollutant Emitted: <b>SAM</b>		
2. Total Percent Efficiency of Control:		<b>99.9 %</b>
3. Primary Control Device Code: <b>014</b>		
4. Secondary Control Device Code:		
5. Potential Emissions:		<b>16.25 lbs/hr                      71.2 tons/yr</b>
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3        _____ to _____ tons/yr		
8. Emission Factor:		<b>0.15 lb/ton                      100% H2SO4</b>
Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 1 of 4  
**Allowable Emissions (Pollutant identification on front page)**

**A.**

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>0.15 lb/ton product as 100% H2SO4</b>		
4. Equivalent Allowable Emissions:	<b>16.25 lbs/hr</b>	<b>71.2 tons/yr</b>
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

**B.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 3 of 3

1. Pollutant Emitted: <b>NO<sub>x</sub></b>		
2. Total Percent Efficiency of Control:		%
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>16.25</b> lbs/hr	<b>71.2</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor:	<b>0.15</b> lb/ton	<b>100% H<sub>2</sub>SO<sub>4</sub></b>
Reference: <b>Stack Testing</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 1 of 4  
Allowable Emissions (Pollutant identification on front page)

**A.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**B.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**F. VISIBLE EMISSIONS INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are subject to a visible emissions limitation. The intent of this subsection of the form is to identify each activity associated with the emissions unit addressed in this section for which a separate opacity limitation would be applicable. Visible emission subtype codes for each such activity are listed in the instructions for Field 1. Most emissions units will be subject to a "subtype VE" limit only.

**Visible Emissions Limitations:** Visible Emissions Limitation 1 of 1

1.	Visible Emissions Subtype:	VE
2.	Basis for Allowable Opacity:	<input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:	10 %      Exceptional Conditions:      %  Maximum Period of Excess Opacity Allowed:      min/hour
4.	Method of Compliance:	Annual Visible Emission Test DEP Meth. 9
5.	Visible Emissions Comment:	62-296.800 FAC and 40 CFR 60.83(a)(2)

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:           %           Exceptional Conditions:           %  Maximum Period of Excess Opacity Allowed:           min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:           %           Exceptional Conditions:           %  Maximum Period of Excess Opacity Allowed:           min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**G. CONTINUOUS MONITOR INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are required by rule or permit to install and operate one or more continuous emission, opacity, flow, or other type monitors. A separate set of continuous monitor information (fields 1-6) must be completed for each monitoring system required.

**Continuous Monitoring System** Continuous Monitor 1 of 1

1. Parameter Code:	SO2		
2. CMS Requirement:	<input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other		
3. Monitor Information:			
Monitor Manufacturer:	DuPont		
Model Number:	460	Serial Number:	4028
4. Installation Date (DD-MON-YYYY):	1 Dec 1975		
5. Performance Specification Test Date (DD-MON-YYYY):			
6. Continuous Monitor Comment:	62-296.800 and 62-296.400 FAC; 40 CFR 60.84		

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**H. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT  
TRACKING INFORMATION**

This subsection of the Application for Air Permit form must be completed for all applications, not just those undergoing prevention-of-significant-deterioration (PSD) review pursuant to Rule 62-212.400, F.A.C. The intent of this subsection is to make a preliminary determination as to whether the emissions unit addressed in this Emissions Unit Information Section consumes PSD increment. PSD increment is consumed (or expanded) as a result of emission increases (decreases) occurring after pollutant-specific baseline dates. Pollutants for which baseline dates have been established are sulfur dioxide, particulate matter, and nitrogen dioxide.

**PSD Increment Consumption Determination****1. Increment Consuming for Particulate Matter or Sulfur Dioxide?**

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

- ☒ [x] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.
- [ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.
- [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

## 2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

- ☒ The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
SO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
NO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
4. Baseline Emissions:			
PM	lbs/hr		tons/yr
SO <sub>2</sub>	lbs/hr	3111	tons/yr
NO <sub>2</sub>		24	tons/yr
5. PSD Comment:			

**I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION**

This subsection of the Application for Air Permit form provides supplemental information related to the emissions unit addressed in this Emissions Unit Information Section. Supplemental information must be submitted as an attachment to each copy of the form, in hard-copy or computer-readable form.

**Supplemental Requirements for All Applications**

1.	Process Flow Diagram	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
2.	Fuel Analysis or Specification	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
3.	Detailed Description of Control Equipment	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
4.	Description of Stack Sampling Facilities	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
5.	Compliance Test Report	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
		<input type="checkbox"/> Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
7.	Operation and Maintenance Plan	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
8.	Supplemental Information for Construction Permit Application	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable
9.	Other Information Required by Rule or Statute	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable

**Additional Supplemental Requirements for Category I Applications Only**

10. Alternative Methods of Operation  <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading)  <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Enhanced Monitoring Plan  <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements  <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
14. Acid Rain Permit Application  <input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____  <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____  <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____  <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____  <input checked="" type="checkbox"/> Not Applicable

Emissions Unit Information Section 2 of 4

### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

#### A. GENERAL EMISSIONS UNIT INFORMATION

This subsection of the Application for Air Permit form provides general information on the emissions unit addressed in this Emissions Unit Information Section, including information on the type, control equipment, operating capacity, and operating schedule of the emissions unit.

##### Type of Emissions Unit Addressed in This Section

Check one:

- ☒ [ X ] This Emissions Unit information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- [ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.
- [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.



Emissions Unit Control Equipment Information

**A.**

1. Description:

**Double Contact Process**

2. Control Device or Method Code: **044**

**B.**

1. Description:

**Mist Eliminator - High Velocity**

2. Control Device or Method Code: **014**

**C.**

1. Description:

2. Control Device or Method Code:

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr                      tons/day
3. Maximum Process or Throughput Rate:	
4. Maximum Production Rate:	2,600      TPD as 100% H <sub>2</sub> SO <sub>4</sub>
5. Operating Capacity Comment:	

Emissions Unit Operating Schedule

1. Requested Maximum Operating Schedule:
24 hours/day,                      7 days/week,
52 weeks/yr                      8760 hours/yr

**B. EMISSIONS UNIT REGULATIONS**

Depending on the application category, this subsection of the Application for Air Permit form provides either a brief analysis or detailed listing of all federal, state, and local regulations applicable to the emissions unit addressed in this Emissions Unit Information Section.

**Rule Applicability Analysis** (Required for Category II Applications and Category III applications involving non Title-V sources. See Instructions.)

**List of Applicable Regulations** (Required for Category I applications and Category III applications involving Title-V sources. See Instructions:)

40 CFR 60.7  
40 CFR 60.8  
40 CFR 60.82(a)  
40 CFR 60.83(a)  
40 CFR 60.84(a)  
40 CFR 60.84(b)  
40 CFR 60.84(c)  
40 CFR 60.84(e)  
40 CFR 60.85  
62-210.700  
62-212.400  
62-296.320(2) - objectionable odors  
62-296.402(2)  
62-296.402(3)  
62-296.402(4)  
62-296.402(5)  
62-296.800  
62-297.310  
62-297.340  
62-297.570

**C. EMISSION POINT (STACK/VENT) INFORMATION**

This subsection of the application for Air Permit form provides information about the emission point associated with the emissions unit addressed in this Emissions Unit Information Section. An emission point is typically a stack or vent but can be any identifiable location at which air pollutants, including fugitive emissions, are discharged into the atmosphere.

**Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram:  5SAP								
2. Emission Point Type Code:  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4								
3. Descriptions of Emissions Points Comprising this Emissions Unit:          								
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:          								
5. Discharge Type Code:  <table><tr><td><input type="checkbox"/> D</td><td><input type="checkbox"/> F</td><td><input type="checkbox"/> H</td><td><input type="checkbox"/> P</td></tr><tr><td><input type="checkbox"/> R</td><td><input checked="" type="checkbox"/> V</td><td><input type="checkbox"/> W</td><td></td></tr></table>	<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P	<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W	
<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P					
<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W						

6. Stack Height:	200	ft
7. Exit Diameter:	6.75	ft
8. Exit Temperature:	158	°F
9. Actual Volumetric Flow Rate:	130,000	acfm
10. Percent Water Vapor:	0	%
11. Maximum Dry Standard Flow Rate:		dscfm
12. Nonstack Emission Point Height:		ft
13. Emission Point UTM Coordinates:		
Zone:	East (km):	North (km):
14. Emission Point Comment:		

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of segment data (Fields 1-10) must be completed for each segment required to be reported and for each alternative operating method or mode (emissions trading scenario) under Chapter 62-213, F.A.C., for which the maximum hourly or annual segment-related rate would vary. A segment is a material handling, process, fuel burning, volatile organic liquid storage, production, or other such operation to which emissions of the unit are directly related. See instructions for further details on this subsection of the Application for Air Permit.

**Segment Description and Rate Information:** Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode): <b>Sulfuric Acid - Contact Process</b>	
2. Source Classification Code (SCC): <b>3-01-023-01</b>	
3. SCC Units: <b>tons 100% H2SO4</b>	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: <b>949,000</b>
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment: <b>2,600 TPD 100% H2SO4</b>	

**Segment Description and Rate Information:** Segment \_\_\_\_\_ of \_\_\_\_\_

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode):	
2. Source Classification Code (SCC):	
3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment:	

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 1 of 3

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		
2. Total Percent Efficiency of Control: <b>99.9 %</b>		
3. Primary Control Device Code: <b>044</b>		
4. Secondary Control Device Code:		
5. Potential Emissions: <b>433.3 lbs/hr</b> <b>1,898 tons/yr</b>		
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor: <b>4 lb/ton</b> <b>100% H<sub>2</sub>SO<sub>4</sub></b> Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one): <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions: <b>108.3 TPH 100% H<sub>2</sub>SO<sub>4</sub> x 4.0 lb/ton = 433.3 lb/hr; 433.3 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 1,898.0 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
<b>4</b>	<b>lb/ton</b>	<b>100% H2SO4 produced</b>
4. Equivalent Allowable Emissions:	<b>433.33</b> lbs/hr	<b>1,898</b> tons/yr
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 2 of 3

1. Pollutant Emitted: <b>SAM</b>		
2. Total Percent Efficiency of Control:		<b>99.9 %</b>
3. Primary Control Device Code: <b>014</b>		
4. Secondary Control Device Code:		
5. Potential Emissions:		<b>16.25 lbs/hr</b> <b>71.2 tons/yr</b>
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3      _____ to _____ tons/yr		
8. Emission Factor:		<b>0.15 lb/ton</b> <b>100% H2SO4</b>
Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 3 of 3

1. Pollutant Emitted: <b>NO<sub>x</sub></b>		
2. Total Percent Efficiency of Control:		%
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>16.25</b> lbs/hr	<b>71.2</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3    _____ to _____ tons/yr		
8. Emission Factor:	<b>0.15</b> lb/ton	<b>100% H<sub>2</sub>SO<sub>4</sub></b>
Reference: <b>Stack Testing</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 2 of 4  
Allowable Emissions (Pollutant identification on front page)

No. 5 Sulfuric Acid  
 Sulfuric Acid Mist

A.

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>0.15 lb/ton product as 100% H2SO4</b>		
4. Equivalent Allowable Emissions:	<b>16.25 lbs/hr</b>	<b>71.2 tons/yr</b>
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

Emissions Unit Information Section 2 of 4  
**Allowable Emissions (Pollutant identification on front page)**

**A.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**B.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**F. VISIBLE EMISSIONS INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are subject to a visible emissions limitation. The intent of this subsection of the form is to identify each activity associated with the emissions unit addressed in this section for which a separate opacity limitation would be applicable. Visible emission subtype codes for each such activity are listed in the instructions for Field 1. Most emissions units will be subject to a "subtype VE" limit only.

**Visible Emissions Limitations:** Visible Emissions Limitation 1 of 1

1.	Visible Emissions Subtype:	<b>VE</b>
2.	Basis for Allowable Opacity:	<input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:	<b>10</b> %      Exceptional Conditions:      %  Maximum Period of Excess Opacity Allowed:      min/hour
4.	Method of Compliance:	<b>Annual Visible Emission Test DEP Meth. 9</b>
5.	Visible Emissions Comment:	<b>62-296.800 FAC and 40 CFR 60.83(a)(2)</b>

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**G. CONTINUOUS MONITOR INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are required by rule or permit to install and operate one or more continuous emission, opacity, flow, or other type monitors. A separate set of continuous monitor information (fields 1-6) must be completed for each monitoring system required.

**Continuous Monitoring System** Continuous Monitor 1 of 1

1. Parameter Code:	<b>SO2</b>
2. CMS Requirement:	<input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information:	Monitor Manufacturer: <b>Ametek</b> Model Number: <b>46000002000</b> Serial Number: <b>7686</b>
4. Installation Date (DD-MON-YYYY):	<b>1 Dec 1993</b>
5. Performance Specification Test Date (DD-MON-YYYY):	
6. Continuous Monitor Comment:	<b>62-296.800 and 62-296.400 FAC; 40 CFR 60.84</b>

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information:  Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information:  Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

## H. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

This subsection of the Application for Air Permit form must be completed for all applications, not just those undergoing prevention-of-significant-deterioration (PSD) review pursuant to Rule 62-212.400, F.A.C. The intent of this subsection is to make a preliminary determination as to whether the emissions unit addressed in this Emissions Unit Information Section consumes PSD increment. PSD increment is consumed (or expanded) as a result of emission increases (decreases) occurring after pollutant-specific baseline dates. Pollutants for which baseline dates have been established are sulfur dioxide, particulate matter, and nitrogen dioxide.

### PSD Increment Consumption Determination

#### 1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

- ☒ [x] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- ☐ [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ [ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- ☐ [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

## 2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

- ☒ The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
SO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
NO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
4. Baseline Emissions:			
PM	lbs/hr		tons/yr
SO <sub>2</sub>	lbs/hr	3111	tons/yr
NO <sub>2</sub>		24	tons/yr
5. PSD Comment:			

**I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION**

This subsection of the Application for Air Permit form provides supplemental information related to the emissions unit addressed in this Emissions Unit Information Section. Supplemental information must be submitted as an attachment to each copy of the form, in hard-copy or computer-readable form.

**Supplemental Requirements for All Applications**

1.	Process Flow Diagram	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
2.	Fuel Analysis or Specification	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
3.	Detailed Description of Control Equipment	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
4.	Description of Stack Sampling Facilities	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
5.	Compliance Test Report	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
		<input type="checkbox"/> Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
7.	Operation and Maintenance Plan	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
8.	Supplemental Information for Construction Permit Application	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable
9.	Other Information Required by Rule or Statute	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable

**Additional Supplemental Requirements for Category I Applications Only**

10. Alternative Methods of Operation
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading)
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Enhanced Monitoring Plan
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
14. Acid Rain Permit Application
<input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____
<input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____
<input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____
<input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____
<input checked="" type="checkbox"/> Not Applicable

Emissions Unit Information Section 3 of 4**III. EMISSIONS UNIT INFORMATION**

A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

**A. GENERAL EMISSIONS UNIT INFORMATION**

This subsection of the Application for Air Permit form provides general information on the emissions unit addressed in this Emissions Unit Information Section, including information on the type, control equipment, operating capacity, and operating schedule of the emissions unit..

**Type of Emissions Unit Addressed in This Section**

Check one:

- ☒ [ **x** ] This Emissions Unit information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- ☐ [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.



Emissions Unit Control Equipment Information

**A.**

1. Description:

**Double Contact Process**

2. Control Device or Method Code: **044**

**B.**

1. Description:

**Mist Eliminator - High Velocity**

2. Control Device or Method Code: **014**

**C.**

1. Description:

2. Control Device or Method Code:

**Emissions Unit Operating Capacity**

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr                      tons/day
3. Maximum Process or Throughput Rate:	
4. Maximum Production Rate:	2,600      TPD as 100% H <sub>2</sub> SO <sub>4</sub>
5. Operating Capacity Comment:	

**Emissions Unit Operating Schedule**

1. Requested Maximum Operating Schedule:
24 hours/day,                      7 days/week,
52 weeks/yr                      8760 hours/yr

**B. EMISSIONS UNIT REGULATIONS**

Depending on the application category, this subsection of the Application for Air Permit form provides either a brief analysis or detailed listing of all federal, state, and local regulations applicable to the emissions unit addressed in this Emissions Unit Information Section.

**Rule Applicability Analysis** (Required for Category II Applications and Category III applications involving non Title-V sources. See Instructions.)

**List of Applicable Regulations** (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

40 CFR 60.7  
40 CFR 60.8  
40 CFR 60.82(a)  
40 CFR 60.83(a)  
40 CFR 60.84(a)  
40 CFR 60.84(b)  
40 CFR 60.84(c)  
40 CFR 60.84(e)  
40 CFR 60.85  
62-210.700  
62-212.400  
62-296.320(2) - objectionable odors  
62-296.402(2)  
62-296.402(3)  
62-296.402(4)  
62-296.402(5)  
62-296.800  
62-297.310  
62-297.340  
62-297.570

**C. EMISSION POINT (STACK/VENT) INFORMATION**

This subsection of the application for Air Permit form provides information about the emission point associated with the emissions unit addressed in this Emissions Unit Information Section. An emission point is typically a stack or vent but can be any identifiable location at which air pollutants, including fugitive emissions, are discharged into the atmosphere.

**Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram:  6SAP								
2. Emission Point Type Code:  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4								
3. Descriptions of Emissions Points Comprising this Emissions Unit:          								
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:          								
5. Discharge Type Code:  <table><tr><td><input type="checkbox"/> D</td><td><input type="checkbox"/> F</td><td><input type="checkbox"/> H</td><td><input type="checkbox"/> P</td></tr><tr><td><input type="checkbox"/> R</td><td><input checked="" type="checkbox"/> V</td><td><input type="checkbox"/> W</td><td></td></tr></table>	<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P	<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W	
<input type="checkbox"/> D	<input type="checkbox"/> F	<input type="checkbox"/> H	<input type="checkbox"/> P					
<input type="checkbox"/> R	<input checked="" type="checkbox"/> V	<input type="checkbox"/> W						

6. Stack Height:	200	ft
7. Exit Diameter:	6.75	ft
8. Exit Temperature:	158	°F
9. Actual Volumetric Flow Rate:	130,000	acfm
10. Percent Water Vapor:	0	%
11. Maximum Dry Standard Flow Rate:		dscfm
12. Nonstack Emission Point Height:		ft
13. Emission Point UTM Coordinates:		
Zone:	East (km):	North (km):
14. Emission Point Comment:		

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of segment data (Fields 1-10) must be completed for each segment required to be reported and for each alternative operating method or mode (emissions trading scenario) under Chapter 62-213, F.A.C., for which the maximum hourly or annual segment-related rate would vary. A segment is a material handling, process, fuel burning, volatile organic liquid storage, production, or other such operation to which emissions of the unit are directly related. See instructions for further details on this subsection of the Application for Air Permit.

**Segment Description and Rate Information:** Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode): <b>Sulfuric Acid - Contact Process</b>	
2. Source Classification Code (SCC): <b>3-01-023-01</b>	
3. SCC Units: <b>tons 100% H2SO4</b>	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: <b>949,000</b>
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment: <b>2,600 TPD 100% H2SO4</b>	

**Segment Description and Rate Information:** Segment \_\_\_\_\_ of \_\_\_\_\_

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode):	
2. Source Classification Code (SCC):	
3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment:	

Emissions Unit Information Section 3 of 4

### E. POLLUTANT INFORMATION

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 1 of 3

1. Pollutant Emitted: <b>SO2</b>		
2. Total Percent Efficiency of Control:		<b>99.9 %</b>
3. Primary Control Device Code: <b>044</b>		
4. Secondary Control Device Code:		
5. Potential Emissions:		<b>433.3 lbs/hr                      1,898 tons/yr</b>
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:		
<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3        _____ to _____ tons/yr		
8. Emission Factor:		<b>4 lb/ton                      100% H2SO4</b>
Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one):		
<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:		
<b>108.3 TPH 100% H2SO4 x 4.0 lb/ton = 433.3 lb/hr; 433.3 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 1,898.0 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 3 of 4  
Allowable Emissions (Pollutant identification on front page)

No. 6 Sulfuric Acid  
Sulfur Dioxide

A.

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
<b>4</b>	<b>lb/ton</b>	<b>100% H2SO4 produced</b>
4. Equivalent Allowable Emissions:	<b>433.33</b> lbs/hr	<b>1,898</b> tons/yr
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 2 of 3

1. Pollutant Emitted: <b>SAM</b>		
2. Total Percent Efficiency of Control:		<b>99.9 %</b>
3. Primary Control Device Code: <b>014</b>		
4. Secondary Control Device Code:		
5. Potential Emissions:		<b>16.25 lbs/hr                      71.2 tons/yr</b>
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3        _____ to _____ tons/yr		
8. Emission Factor:		<b>0.15 lb/ton                      100% H2SO4</b>
Reference: <b>NSPS Limit</b>		
9. Emissions Method Code (check one):  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions:  <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 3 of 4  
Allowable Emissions (Pollutant identification on front page)

No. 6 Sulfuric Acid  
Sulfuric Acid Mist

A.

1. Basis for Allowable Emissions Code: <b>Rule</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>0.15 lb/ton product as 100% H2SO4</b>		
4. Equivalent Allowable Emissions:	<b>16.25 lbs/hr</b>	<b>71.2 tons/yr</b>
5. Method of Compliance: <b>Annual stack test using EPA Method 8</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode): <b>Rule 62-296.800; 40 CFR 60, Subpart H</b>		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 3 of 3

1. Pollutant Emitted: <b>NO<sub>x</sub></b>		
2. Total Percent Efficiency of Control:		%
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>16.25</b> lbs/hr	<b>71.2</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor:	<b>0.15</b> lb/ton	<b>100% H<sub>2</sub>SO<sub>4</sub></b>
Reference: <b>Stack Testing</b>		
9. Emissions Method Code (check one): <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5		
10. Calculation of Emissions: <b>108.3 TPH x 0.15 lb/ton = 16.25 lb/hr; 16.25 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 71.2 TPY</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 3 of 4  
**Allowable Emissions (Pollutant identification on front page)**

No. 6 Sulfuric Acid  
Nitrogen Oxide

**A.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**B.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**F. VISIBLE EMISSIONS INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are subject to a visible emissions limitation. The intent of this subsection of the form is to identify each activity associated with the emissions unit addressed in this section for which a separate opacity limitation would be applicable. Visible emission subtype codes for each such activity are listed in the instructions for Field 1. Most emissions units will be subject to a "subtype VE" limit only.

**Visible Emissions Limitations:** Visible Emissions Limitation 1 of 1

1.	Visible Emissions Subtype: <b>VE</b>
2.	Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions: <b>10</b> %      Exceptional Conditions:      %  Maximum Period of Excess Opacity Allowed:      min/hour
4.	Method of Compliance: <b>Annual Visible Emission Test DEP Meth. 9</b>
5.	Visible Emissions Comment: <b>62-296.800 FAC and 40 CFR 60.83(a)(2)</b>

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**G. CONTINUOUS MONITOR INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are required by rule or permit to install and operate one or more continuous emission, opacity, flow, or other type monitors. A separate set of continuous monitor information (fields 1-6) must be completed for each monitoring system required.

**Continuous Monitoring System** Continuous Monitor 1 of 1

1. Parameter Code:	<b>SO2</b>
2. CMS Requirement:	<input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information:	Monitor Manufacturer: <b>DuPont</b> Model Number: <b>460</b> Serial Number: <b>4029</b>
4. Installation Date (DD-MON-YYYY):	<b>1 Dec 1975</b>
5. Performance Specification Test Date (DD-MON-YYYY):	
6. Continuous Monitor Comment:	<b>62-296.800 and 62-296.400 FAC; 40 CFR 60.84</b>

**Continuous Monitoring System** Continuous Monitor        of       

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**Continuous Monitoring System** Continuous Monitor        of       

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**H. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION**

This subsection of the Application for Air Permit form must be completed for all applications, not just those undergoing prevention-of-significant-deterioration (PSD) review pursuant to Rule 62-212.400, F.A.C. The intent of this subsection is to make a preliminary determination as to whether the emissions unit addressed in this Emissions Unit Information Section consumes PSD increment. PSD increment is consumed (or expanded) as a result of emission increases (decreases) occurring after pollutant-specific baseline dates. Pollutants for which baseline dates have been established are sulfur dioxide, particulate matter, and nitrogen dioxide.

**PSD Increment Consumption Determination****1. Increment Consuming for Particulate Matter or Sulfur Dioxide?**

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

- ☒ [x] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- ☐ [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ [ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- ☐ [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

## 2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

- ☒ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- ☐ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ ] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
SO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
NO <sub>2</sub>	<input checked="" type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
4. Baseline Emissions:			
PM	lbs/hr		tons/yr
SO <sub>2</sub>	lbs/hr	3111	tons/yr
NO <sub>2</sub>		24	tons/yr
5. PSD Comment:			

**I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION**

This subsection of the Application for Air Permit form provides supplemental information related to the emissions unit addressed in this Emissions Unit Information Section. Supplemental information must be submitted as an attachment to each copy of the form, in hard-copy or computer-readable form.

**Supplemental Requirements for All Applications**

1.	Process Flow Diagram	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
2.	Fuel Analysis or Specification	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
3.	Detailed Description of Control Equipment	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
4.	Description of Stack Sampling Facilities	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
5.	Compliance Test Report	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
		<input type="checkbox"/> Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
7.	Operation and Maintenance Plan	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
8.	Supplemental Information for Construction Permit Application	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable
9.	Other Information Required by Rule or Statute	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable

**Additional Supplemental Requirements for Category I Applications Only**

10. Alternative Methods of Operation
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading)
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Enhanced Monitoring Plan
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
14. Acid Rain Permit Application
<input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____
<input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____
<input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____
<input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____
<input checked="" type="checkbox"/> Not Applicable

Emissions Unit Information Section 4 of 4**III. EMISSIONS UNIT INFORMATION**

A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

**A. GENERAL EMISSIONS UNIT INFORMATION**

This subsection of the Application for Air Permit form provides general information on the emissions unit addressed in this Emissions Unit Information Section, including information on the type, control equipment, operating capacity, and operating schedule of the emissions unit.

**Type of Emissions Unit Addressed in This Section**

Check one:

- ☐ ] This Emissions Unit information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- ☐ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.
- ☒ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- ☐ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section:  <b>Molten Sulfur unloading, storage, and handling system</b>		
2. ARMS Identification Number: [ ] No Corresponding ID [ ] Unknown <b>45,46,47,48,49,50</b>		
3. Emissions Unit Status Code: <b>A</b>	4. Acid Rain Unit? [ ] Yes [ <b>x</b> ] No	5. Emissions Unit Major Group SIC Code: <b>28</b>
6. Initial Startup Date (DD-MON-YYYY):		
7. Long-term Reserve Shutdown Date (DD-MON-YYYY):		
8. Package Unit: Manufacturer: Model Number:		
9. Generator Nameplate Rating: MW		
10. Incinerator Information:  Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F		
11. Emissions Unit Comment:  <b>Pt. 45-Stack serving A Sulfur Pit; Pt. 46-Vent serving 7,500 ton tank; Pt. 47-Vent serving 3,000 ton tank; Pt. 48-Vents (2) on 3,000 ton tank; Pt. 49-Vents (2) on 3,000 ton tank; Pt. 50-Stack serving B Sulfur Pit</b>		

### Emissions Unit Control Equipment Information

A.

1. Description:
2. Control Device or Method Code:

**B.**

1. Description:
2. Control Device or Method Code:

C.

1. Description:
2. Control Device or Method Code:

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr                      tons/day
3. Maximum Process or Throughput Rate:	960,000      TPY
4. Maximum Production Rate:	
5. Operating Capacity Comment: Maximum daily throughput rate of 14,400 tons/day.	

Emissions Unit Operating Schedule

1. Requested Maximum Operating Schedule:	
24 hours/day,	7 days/week,
52 weeks/yr	8760 hours/yr

**B. EMISSIONS UNIT REGULATIONS**

Depending on the application category, this subsection of the Application for Air Permit form provides either a brief analysis or detailed listing of all federal, state, and local regulations applicable to the emissions unit addressed in this Emissions Unit Information Section.

**Rule Applicability Analysis** (Required for Category II Applications and Category III applications involving non Title-V sources. See Instructions.)

**List of Applicable Regulations** (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

62-04.070(3)  
62-04.090(1)  
62-210.370(3)  
62-296.310(3)(c)  
62-296.320(2)  
62-296.411(1)(a)  
62-296.411(1)(b)  
62-296.411(1)(d)  
62-296.411(1)(e)  
62-296.411(1)(f)  
62-296.411(1)(g)  
62-296.411(1)(h)  
62-296.411(1)(j)  
62-297.330  
62-297.340(1)(c)  
62-297.340(1)(i)  
62-297.420  
62-297.570

**C. EMISSION POINT (STACK/VENT) INFORMATION**

This subsection of the application for Air Permit form provides information about the emission point associated with the emissions unit addressed in this Emissions Unit Information Section. An emission point is typically a stack or vent but can be any identifiable location at which air pollutants, including fugitive emissions, are discharged into the atmosphere.

**Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram:  <b>Pit A, Pit B, 7,500 ton tank, 4806A (3,000 ton tank)</b>
2. Emission Point Type Code:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4
3. Descriptions of Emissions Points Comprising this Emissions Unit:  <b>See Stack Parameters (Attachment EU4-1)</b>
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:          
5. Discharge Type Code:  <input type="checkbox"/> D <input type="checkbox"/> F <input type="checkbox"/> H <input checked="" type="checkbox"/> P <input type="checkbox"/> R <input type="checkbox"/> V <input type="checkbox"/> W

Attachment EU4-1. Stack Parameters

Pt. ID	Source	Height (ft)	Diameter (ft)	Temperature (°F)	Flow Rate (acfm)
PITA	Pit A - 200 tons	40	1.0	200	2,700
PITB	Pit B - 300 tons	40	1.0	200	2,700
4806 A	3,000 ton tank	31	2.0	200	18
7,500	7,500 ton tank	40	2.0	200	18

Note: 1,000 ton tank has two vents with parameters as shown.

6. Stack Height:	40	ft
7. Exit Diameter:	1	ft
8. Exit Temperature:	200	°F
9. Actual Volumetric Flow Rate:	2,700	acfm
10. Percent Water Vapor:		%
11. Maximum Dry Standard Flow Rate:		dscfm
12. Nonstack Emission Point Height:		ft
13. Emission Point UTM Coordinates:		
Zone:	East (km):	North (km):
14. Emission Point Comment:		

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of segment data (Fields 1-10) must be completed for each segment required to be reported and for each alternative operating method or mode (emissions trading scenario) under Chapter 62-213, F.A.C., for which the maximum hourly or annual segment-related rate would vary. A segment is a material handling, process, fuel burning, volatile organic liquid storage, production, or other such operation to which emissions of the unit are directly related. See instructions for further details on this subsection of the Application for Air Permit.

**Segment Description and Rate Information:** Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode): <b>Sulfuric Acid - Contact Process Other Not Classified</b>	
2. Source Classification Code (SCC): <b>3-01-023-99</b>	
3. SCC Units: <b>tons product</b>	
4. Maximum Hourly Rate: <b>600</b>	5. Maximum Annual Rate: <b>960,000</b>
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment: <b>7,800 TPD H2SO4 x 365 days/yr x 32/98 ÷ 0.97 = 960,000 TPY sulfur (Conversion efficiency is 97%)</b>	

**Segment Description and Rate Information:** Segment \_\_\_\_ of \_\_\_\_

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode):	
2. Source Classification Code (SCC):	
3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment:	

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 1 of 4

1. Pollutant Emitted: <b>PM-Sulfur</b>		
2. Total Percent Efficiency of Control: _____ %		
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>1.28</b> lbs/hr	<b>5.35</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor: <b>0.2</b> grains/cf for tanks <b>0.02</b> grains/cf for pits Reference: <b>Construction Permit AC53-174175 Application</b>		
9. Emissions Method Code (check one):  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5		
10. Calculation of Emissions:  <b>See Table 2-3 of PSD Report</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 4 of 4  
Allowable Emissions (Pollutant identification on front page)

Molten Sulfur System  
Particulate Matter - Sulfur

A.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 2 of 4

1. Pollutant Emitted: <b>TRS</b>		
2. Total Percent Efficiency of Control:		%
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>1.56</b> lbs/hr	<b>6.56</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor:	<b>0.000035</b> lb/cf <b>0.0000035</b> lb/cf	for tanks for pits
Reference: <b>Construction Permit AC53-174175 application</b>		
9. Emissions Method Code (check one):  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5		
10. Calculation of Emissions:  <b>Refer to Table 2-3 of PSD Report</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 4 of 4  
Allowable Emissions (Pollutant identification on front page)

Molten Sulfur System  
Total Reduced Sulfur

A.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**E. POLLUTANT INFORMATION**

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 3 of 4

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		
2. Total Percent Efficiency of Control: _____ %		
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>3.26</b> lbs/hr	<b>13.68</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3       _____ to _____ tons/yr		
8. Emission Factor: <b>0.000073</b> lb/cf <b>for tanks</b> <b>0.000073</b> lb/cf <b>for pits</b> Reference: <b>Construction Permit AC53-174175 Application</b>		
9. Emissions Method Code (check one):  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5		
10. Calculation of Emissions:  <b>Refer to Table 2-3 of PSD report</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 4 of 4  
**Allowable Emissions (Pollutant identification on front page)**

Molten Sulfur System  
Sulfur Dioxide

**A.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**B.**

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

## E. POLLUTANT INFORMATION

For the emissions unit addressed in this Emissions Unit Information Section, a separate set of pollutant information must be completed for each pollutant required to be reported. See instructions for further details on this subsection of the Application for Air Permit.

**Pollutant Potential/Estimated Emissions:** Pollutant 4 of 4

1. Pollutant Emitted: <b>VOC</b>		
2. Total Percent Efficiency of Control:		%
3. Primary Control Device Code:		
4. Secondary Control Device Code:		
5. Potential Emissions:	<b>2.32</b> lbs/hr	<b>9.75</b> tons/yr
6. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
7. Range of Estimated Fugitive/Other Emissions:  <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/yr		
8. Emission Factor: <b>0.000052</b> lb/cf <b>for tanks</b> <b>0.0000052</b> lb/cf <b>for pits</b> Reference: <b>Construction Permit AC53-174175 application</b>		
9. Emissions Method Code (check one):  <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5		
10. Calculation of Emissions:  <b>Refer to Table 2-3 of PSD report</b>		
11. Pollutant Potential/Estimated Emissions Comment:		

Emissions Unit Information Section 4 of 4  
Allowable Emissions (Pollutant identification on front page)

Molten Sulfur System  
Volatile Organic Compounds

A.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lbs/hr	tons/yr
5. Method of Compliance:		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode):		

**F. VISIBLE EMISSIONS INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are subject to a visible emissions limitation. The intent of this subsection of the form is to identify each activity associated with the emissions unit addressed in this section for which a separate opacity limitation would be applicable. Visible emission subtype codes for each such activity are listed in the instructions for Field 1. Most emissions units will be subject to a "subtype VE" limit only.

**Visible Emissions Limitations:** Visible Emissions Limitation 1 of 1

1.	Visible Emissions Subtype: <b>VE</b>
2.	Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions: <b>20</b> %      Exceptional Conditions:      %  Maximum Period of Excess Opacity Allowed:      min/hour
4.	Method of Compliance: <b>VE Test; EPA Method 9 at permit renewal</b>
5.	Visible Emissions Comment: <b>62-296.411(1)(g)</b>

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**Visible Emissions Limitations:** Visible Emissions Limitation \_\_\_\_\_ of \_\_\_\_\_

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3.	Requested Allowable Opacity Normal Conditions:            %            Exceptional Conditions:            %  Maximum Period of Excess Opacity Allowed:            min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment:

**G. CONTINUOUS MONITOR INFORMATION**

This subsection of the Application for Air Permit form must be completed for only those emissions units which are required by rule or permit to install and operate one or more continuous emission, opacity, flow, or other type monitors. A separate set of continuous monitor information (fields 1-6) must be completed for each monitoring system required.

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

**Continuous Monitoring System** Continuous Monitor \_\_\_\_\_ of \_\_\_\_\_

1. Parameter Code:
2. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other
3. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:
4. Installation Date (DD-MON-YYYY):
5. Performance Specification Test Date (DD-MON-YYYY):
6. Continuous Monitor Comment:

## H. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

This subsection of the Application for Air Permit form must be completed for all applications, not just those undergoing prevention-of-significant-deterioration (PSD) review pursuant to Rule 62-212.400, F.A.C. The intent of this subsection is to make a preliminary determination as to whether the emissions unit addressed in this Emissions Unit Information Section consumes PSD increment. PSD increment is consumed (or expanded) as a result of emission increases (decreases) occurring after pollutant-specific baseline dates. Pollutants for which baseline dates have been established are sulfur dioxide, particulate matter, and nitrogen dioxide.

### PSD Increment Consumption Determination

#### 1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

- ☐ The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- ☐ None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

## 2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

- ☐ The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.
- ☐ For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.
- ☐ None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
SO <sub>2</sub>	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
NO <sub>2</sub>	<input type="checkbox"/> C	<input type="checkbox"/> E	<input type="checkbox"/> Unknown
4. Baseline Emissions:			
PM	lbs/hr	tons/yr	
SO <sub>2</sub>	lbs/hr	tons/yr	
NO <sub>2</sub>		tons/yr	
5. PSD Comment:			

**I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION**

This subsection of the Application for Air Permit form provides supplemental information related to the emissions unit addressed in this Emissions Unit Information Section. Supplemental information must be submitted as an attachment to each copy of the form, in hard-copy or computer-readable form.

**Supplemental Requirements for All Applications**

1.	Process Flow Diagram	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Waiver Requested
		<input type="checkbox"/> Not Applicable	
2.	Fuel Analysis or Specification	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
3.	Detailed Description of Control Equipment	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
4.	Description of Stack Sampling Facilities	<input type="checkbox"/> Attached, Document ID: _____	<input type="checkbox"/> Waiver Requested
		<input checked="" type="checkbox"/> Not Applicable	
5.	Compliance Test Report	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
		<input type="checkbox"/> Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
7.	Operation and Maintenance Plan	<input type="checkbox"/> Attached, Document ID: _____	<input checked="" type="checkbox"/> Not Applicable
8.	Supplemental Information for Construction Permit Application	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable
9.	Other Information Required by Rule or Statute	<input checked="" type="checkbox"/> Attached, Document ID: <u>PSD Report</u>	<input type="checkbox"/> Not Applicable

**Additional Supplemental Requirements for Category I Applications Only**

10. Alternative Methods of Operation
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading)
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Enhanced Monitoring Plan
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements
<input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
14. Acid Rain Permit Application
<input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____
<input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____
<input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____
<input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____
<input checked="" type="checkbox"/> Not Applicable

**PART B**  
**PSD REPORT**

**TABLE OF CONTENTS**  
(Page 1 of 4)

LIST OF TABLES	vi
LIST OF FIGURES	viii
1.0 INTRODUCTION	1-1
2.0 PROJECT DESCRIPTION	2-1
2.1 <u>GENERAL</u>	2-1
2.2 <u>PRODUCTION RATES AND EMISSIONS</u>	2-1
2.2.1 SULFURIC ACID PLANTS	2-1
2.2.2 MOLTEN-SULFUR HANDLING FACILITY	2-7
2.3 <u>PHYSICAL CHANGES TO SULFURIC ACID PLANTS</u>	2-11
2.4 <u>EFFECTS ON OTHER PROCESS EQUIPMENT</u>	2-11
3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY	3-1
3.1 <u>NATIONAL AND STATE AAQS</u>	3-1
3.2 <u>PSD REQUIREMENTS</u>	3-1
3.2.1 GENERAL REQUIREMENTS	3-1
3.2.2 INCREMENTS/CLASSIFICATIONS	3-3
3.2.3 CONTROL TECHNOLOGY REVIEW	3-6
3.2.4 AIR QUALITY MONITORING REQUIREMENTS	3-8
3.2.5 SOURCE IMPACT ANALYSIS	3-9
3.2.6 ADDITIONAL IMPACT ANALYSES	3-9
3.2.7 GOOD ENGINEERING PRACTICE STACK HEIGHT	3-10
3.3 <u>NON-ATTAINMENT RULES</u>	3-11

## TABLE OF CONTENTS

(Page 2 of 4)

3.4	<u>SOURCE APPLICABILITY</u>	3-11
3.4.1	PSD REVIEW	3-11
3.4.1.1	<u>Pollutant Applicability</u>	3-11
3.4.1.2	<u>Ambient Monitoring</u>	3-12
3.4.1.3	<u>GEP Stack Height Analysis</u>	3-14
3.4.1.4	<u>PSD Increment Consumption</u>	3-14
3.4.2	NON-ATTAINMENT REVIEW	3-14
3.4.3	NEW SOURCE PERFORMANCE STANDARDS	3-14
4.0	AMBIENT MONITORING ANALYSIS	4-1
4.1	<u>MONITORING REQUIREMENTS</u>	4-1
4.2	<u>BACKGROUND SO<sub>2</sub> CONCENTRATIONS</u>	4-1
5.0	BEST AVAILABLE CONTROL TECHNOLOGY	5-1
5.1	<u>SULFUR DIOXIDE</u>	5-1
5.1.1	PROPOSED SO <sub>2</sub> BACT	5-1
5.1.2	ALTERNATIVE SO <sub>2</sub> CONTROL TECHNOLOGIES	5-3
5.1.3	BACT ANALYSIS FOR SO <sub>2</sub>	5-9
5.1.3.1	<u>Environmental Effects</u>	5-9
5.1.3.2	<u>Energy Impacts</u>	5-11
5.1.3.3	<u>Economic Analysis</u>	5-11
5.1.4	SUMMARY	5-16
5.2	<u>H<sub>2</sub>SO<sub>4</sub> MIST</u>	5-16
5.2.1	PROPOSED H <sub>2</sub> SO <sub>4</sub> MIST BACT	5-16
5.2.2	ALTERNATIVE H <sub>2</sub> SO <sub>4</sub> MIST CONTROL TECHNOLOGIES	5-17

**TABLE OF CONTENTS**  
(Page 3 of 4)

5.3	<u>BACT FOR NO<sub>x</sub> EMISSIONS</u>	5-19
6.0	AIR QUALITY MODELING APPROACH	6-1
6.1	<u>GENERAL MODELING APPROACH</u>	6-1
6.1.1	SIGNIFICANT IMPACT ANALYSIS	6-1
6.1.2	AAQS/PSD MODELING ANALYSIS	6-1
6.1.3	MODEL SELECTION	6-2
6.1.4	METEOROLOGICAL DATA	6-6
6.2	<u>EMISSION INVENTORY</u>	6-6
6.2.1	CARGILL FACILITY	6-6
6.2.2	AAQS AND PSD CLASS II EMISSION INVENTORIES	6-9
6.2.3	PSD CLASS I EMISSION INVENTORY	6-14
6.3	<u>RECEPTOR LOCATIONS</u>	6-15
6.3.1	SIGNIFICANT IMPACT ANALYSIS	6-15
6.3.2	AAQS AND PSD CLASS II IMPACT ASSESSMENT	6-15
6.3.3	CLASS I IMPACT ASSESSMENT	6-15
6.4	<u>BACKGROUND CONCENTRATIONS</u>	6-15
6.5	<u>BUILDING DOWNWASH EFFECTS</u>	6-19
6.6	<u>MODEL RESULTS</u>	6-22
6.6.1	SIGNIFICANT IMPACT ANALYSIS	6-22
6.6.2	AAQS ANALYSIS	6-22
6.6.3	PSD CLASS II ANALYSIS	6-28

# **TABLE OF CONTENTS** (Page 4 of 4)

6.6.4	PSD CLASS I ANALYSIS	6-28
6.6.5	H <sub>2</sub> SO <sub>4</sub> MIST ANALYSIS	6-33
7.0	ADDITIONAL AIR QUALITY IMPACT ANALYSIS	7-1
7.1	<u>VICINITY OF BARTOW PLANT</u>	7-1
7.1.1	SOILS	7-1
7.1.2	VEGETATION AND WILDLIFE	7-1
7.1.3	VISIBILITY IMPACTS	7-5
7.1.4	ADDITIONAL GROWTH	7-8
7.2	<u>AIR QUALITY RELATED VALUES ANALYSIS</u>	7-8
7.2.1	INTRODUCTION	7-8
7.2.2	SULFUR DIOXIDE	7-10
7.2.3	H <sub>2</sub> SO <sub>4</sub> MIST	7-15
7.2.4	NITROGEN DIOXIDE	7-16
7.2.5	COMBINED EFFECTS OF SULFUR DIOXIDE AND NITROGEN DIOXIDE	7-16
REFERENCES		REF-1
APPENDICES		
APPENDIX A	SO <sub>2</sub> EMISSION RATE CALCULATIONS FOR FUEL BURNING SOURCES AT CARGILL BARTOW FACILITY	
APPENDIX B	CONTINUOUS SO <sub>2</sub> EMISSION FROM SULFURIC ACID PLANTS	
APPENDIX C	SO <sub>2</sub> EMISSION INVENTORIES FOR AAQS, PSD CLASS II, AND PSD CLASS I	
APPENDIX D	SOURCE CONTRIBUTIONS TO MAXIMUM PREDICTED 24- AND 3-HOUR AAQS CONCENTRATIONS FOR PSD CLASS II INCREMENT CONSUMPTION VALUES	
APPENDIX E	24- AND 3-HOUR PSD CLASS I ANALYSIS SIGNIFICANT IMPACT ANALYSIS AND SOURCE CONTRIBUTIONS ISCST 2 OUTPUT DETAIL AND EVENT 2 OUTPUT DETAIL	

## LIST OF TABLES

(Page 1 of 2)

2-1	Current and Proposed Permit Limitations for Nos. 4, 5, and 6 Sulfuric Acid Plants, Cargill Fertilizer, Bartow Plant	2-5
2-2	Stack Parameters for Existing and Expanded Bartow H <sub>2</sub> SO <sub>4</sub> Plants	2-6
2-3	Estimated Emissions for Molten Sulfur Handling: Cargill Fertilizer, Bartow, FL	2-10
3-1	National and State AAQS, Allowable PSD Increments, and Significance Levels (µg/m <sup>3</sup> )	3-2
3-2	PSD Significant Emission Rates and <i>De Minimis</i> Monitoring Concentrations	3-4
3-3	PSD Source Applicability Analysis, Cargill Bartow Nos. 4, 5, and 6 Sulfuric Acid Plant Expansion	3-13
3-4	PSD Increment Consumption Baseline and Future SO <sub>2</sub> and NO <sub>x</sub> Emissions, Cargill Fertilizer, Inc.	3-15
4-1	Ambient SO <sub>2</sub> Concentrations for Air Monitoring Stations Located Within Polk County--1990 to 1993	4-2
5-1	Summary of Recent SO <sub>2</sub> Emission Test Results, Cargill Bartow	5-2
5-2	Previous BACT Determinations for H <sub>2</sub> SO <sub>4</sub> Plants	5-4
5-3	Economic Analysis for Alternative SO <sub>2</sub> Control Systems, H <sub>2</sub> SO <sub>4</sub> Plants, Cargill Fertilizer, Bartow	5-12
5-4	Actual SO <sub>2</sub> Emissions for Cargill Bartow 1992-1994	5-14
5-5	Summary of Recent H <sub>2</sub> SO <sub>4</sub> Emission Test Results, Cargill Bartow	5-18
5-6	Summary of Recent NO <sub>x</sub> Emission Test Results, Cargill Fertilizer; Bartow, FL	5-20
6-1	Major Features of the ISCST2 Model	6-4
6-2	Summary of Cargill Bartow SO <sub>2</sub> Sources Used for the Modeling Analysis	6-6
6-3	SO <sub>2</sub> Screening Analysis for the AAQS and PSD Class II Inventories for the proposed Cargill Bartow H <sub>2</sub> SO <sub>4</sub> Plant Modification	6-8
6-4	Cargill Property Boundary Receptors Used in the Modeling Analysis	6-13

## LIST OF TABLES

(Page 2 of 2)

6-5	Chassahowitzka Wilderness Area Receptors Used in the Modeling Analysis	6-14
6-6	Dimensions for Buildings Used in the Modeling Analysis for Cargill Bartow Plant	6-16
6-7	Maximum Predicted SO <sub>2</sub> Concentrations for the Proposed Project Only - Screening Analysis	6-18
6-8	Maximum Predicted NO <sub>x</sub> Concentrations for the Proposed Project Only - Screening Analysis	6-19
6-9	Maximum Predicted SO <sub>2</sub> Concentrations for the AAQS Screening Analysis	6-20
6-10	Maximum Predicted SO <sub>2</sub> Concentrations as Compared With AAQS - Refined Analysis	6-21
6-11	Maximum Predicted SO <sub>2</sub> PSD Class II Increment Consumption - Screening Analysis	6-23
6-12	Maximum Predicted SO <sub>2</sub> Concentrations as Compared with PSD Class II Increments - Refined Analysis	6-24
6-13	Maximum Predicted SO <sub>2</sub> Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area	6-25
6-14	Maximum Predicted NO <sub>2</sub> Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area	6-26
6-15	Maximum Predicted SO <sub>2</sub> PSD Class I Increment Consumption at the Chassahowitzka Wilderness Area	6-28
6-16	Predicted 24-Hour and 3-Hour SO <sub>2</sub> PSD Class I Increments Violations	6-29
7-1	SO <sub>2</sub> Effects Levels for Various Plant Species	7-3
7-2	Sensitivity Groupings of Vegetation Based on Visible Injury at Different SO <sub>2</sub> Exposures	7-4
7-3	NO <sub>2</sub> Doses Reported to Affect Plant Species Similar to Vegetation in the Region of Cargill Bartow Facility	7-6
7-4	Examples of Lowest Observed Effect Levels of Air Pollutants	7-7
7-5	Summary of Continuous SO <sub>2</sub> Monitoring Data Collected Near the Chassahowitzka NWA	7-12
7-6	Incremental and Cumulative SO <sub>2</sub> Impacts at the Class I Area	7-13

## LIST OF FIGURES

2-1	Location of Cargill Fertilizer's Bartow Plant	2-2
2-2	Site Map of Cargill Fertilizer, Inc., Bartow, FL	2-3
2-3	Cargill Fertilizer, Bartow--Sulfuric Acid Plant - Process Flow	2-4
2-4	Cargill Fertilizer, Inc. - Bartow, FL Molten Sulfur Unloading - Process Flow	2-9
6-1	Isopleth of Maximum 24-Hour H <sub>2</sub> SO <sub>4</sub> Mist Impacts	6-31
6-2	Isopleth of Actual H <sub>2</sub> SO <sub>4</sub> Mist Impacts	6-32
7-1	Level - 1 Visibility Screening Analysis for Cargill No 4, 5, and 6 H <sub>2</sub> SO <sub>4</sub> Plants	7-9

## 1.0 INTRODUCTION

Cargill Fertilizer, Inc., is proposing to modify the existing Nos. 4, 5, and 6 Sulfuric Acid ( $\text{H}_2\text{SO}_4$ ) plants at its phosphate fertilizer manufacturing facility located in Bartow, Florida. The modifications will allow each  $\text{H}_2\text{SO}_4$  plant to increase its maximum  $\text{H}_2\text{SO}_4$  production rate from 2,280 tons per day (TPD) to 2,600 TPD of 100 percent  $\text{H}_2\text{SO}_4$ . As a result of this production rate increase, an increase in the allowable sulfur dioxide ( $\text{SO}_2$ ) and  $\text{H}_2\text{SO}_4$  mist emissions for each plant is being requested. The throughput rate of the associated molten sulfur storage facility will also increase accordingly.

Based on the requested maximum emissions for the affected sources, the proposed modification will constitute a major modification at a major stationary source under current federal and state air quality regulations. This report addresses the requirements of the prevention of significant deterioration (PSD) review procedures pursuant to rules and regulations implementing the Clean Air Act (CAA) Amendments of 1977. The Florida Department of Environmental Protection (FDEP) has PSD review and approval authority in Florida. Based on the PSD source applicability analysis, a PSD review is required for  $\text{SO}_2$  and  $\text{H}_2\text{SO}_4$  mist.

This application contains six additional sections. A complete description of the project, including air emission rates, is presented in Section 2.0. The air quality review requirements and new source review applicability of the project are discussed in Section 3.0.

Ambient monitoring requirements under PSD are addressed in Section 4.0. The best available control technology (BACT) analysis is presented in Section 5.0. The air quality impact analysis and impacts on soils, vegetation and visibility required as part of the PSD new source review process are addressed in Sections 6.0 and 7.0, respectively.

## 2.0 PROJECT DESCRIPTION

### 2.1 GENERAL

Cargill is proposing to expand the maximum production capacity of the existing Nos. 4, 5, and 6  $\text{H}_2\text{SO}_4$  plants at its phosphate fertilizer manufacturing plant located in Bartow, Florida. The plant is located approximately 4 miles west of Bartow. The location of the Bartow facility is shown in Figure 2-1; the three existing  $\text{H}_2\text{SO}_4$  plants at Cargill are shown in Figure 2-2.

Phosphate fertilizers are manufactured at the Cargill facility. A raw material utilized in the manufacture of phosphate fertilizers is sulfuric acid. Sulfuric acid is reacted with phosphate rock to produce phosphoric acid. In order to produce sulfuric acid, molten sulfur is burned in a sulfuric acid plant.  $\text{SO}_2$  and  $\text{H}_2\text{SO}_4$  mist emissions are a byproduct of the chemical reaction. All of the  $\text{H}_2\text{SO}_4$  plants at Cargill use double adsorption technology to increase the efficiency of sulfuric acid recovery and to minimize emissions. A flow diagram of the process is presented in Figure 2-3.

### 2.2 PRODUCTION RATES AND EMISSIONS

#### 2.2.1 SULFURIC ACID PLANTS

The current permitted capacity of the Nos. 4, 5, and 6  $\text{H}_2\text{SO}_4$  plants is 2,280 TPD each expressed as 100 percent  $\text{H}_2\text{SO}_4$ . The maximum capacity after modification will be 2,600 TPD each plant. The total  $\text{H}_2\text{SO}_4$  production rate of the Cargill facility after expansion will be 7,800 TPD.

The Nos. 4, 5, and 6  $\text{H}_2\text{SO}_4$  plants at Cargill are currently subject to emission limits of 4.0 pounds per ton (lb/ton) for  $\text{SO}_2$  and 0.15 lb/ton for  $\text{H}_2\text{SO}_4$  mist emissions. These limits are equivalent to the federal new source performance standards (NSPS) for new sulfuric acid plants. Both the current and proposed permit limitations for each sulfuric acid plant at Cargill are summarized in Table 2-1. It is proposed to retain the current NSPS limits of 4.0 lb/ton for  $\text{SO}_2$  and 0.15 lb/ton for  $\text{H}_2\text{SO}_4$  mist. The basis for these limits as BACT is presented in Section 5.0.

Stack parameters for the both the current and expanded  $\text{H}_2\text{SO}_4$  plants are presented in Table 2-2. The existing stacks at Cargill serving the  $\text{H}_2\text{SO}_4$  plants will be utilized for the expanded plant. The stack parameters shown in Table 2-2 will be used in the modeling analysis to determine the

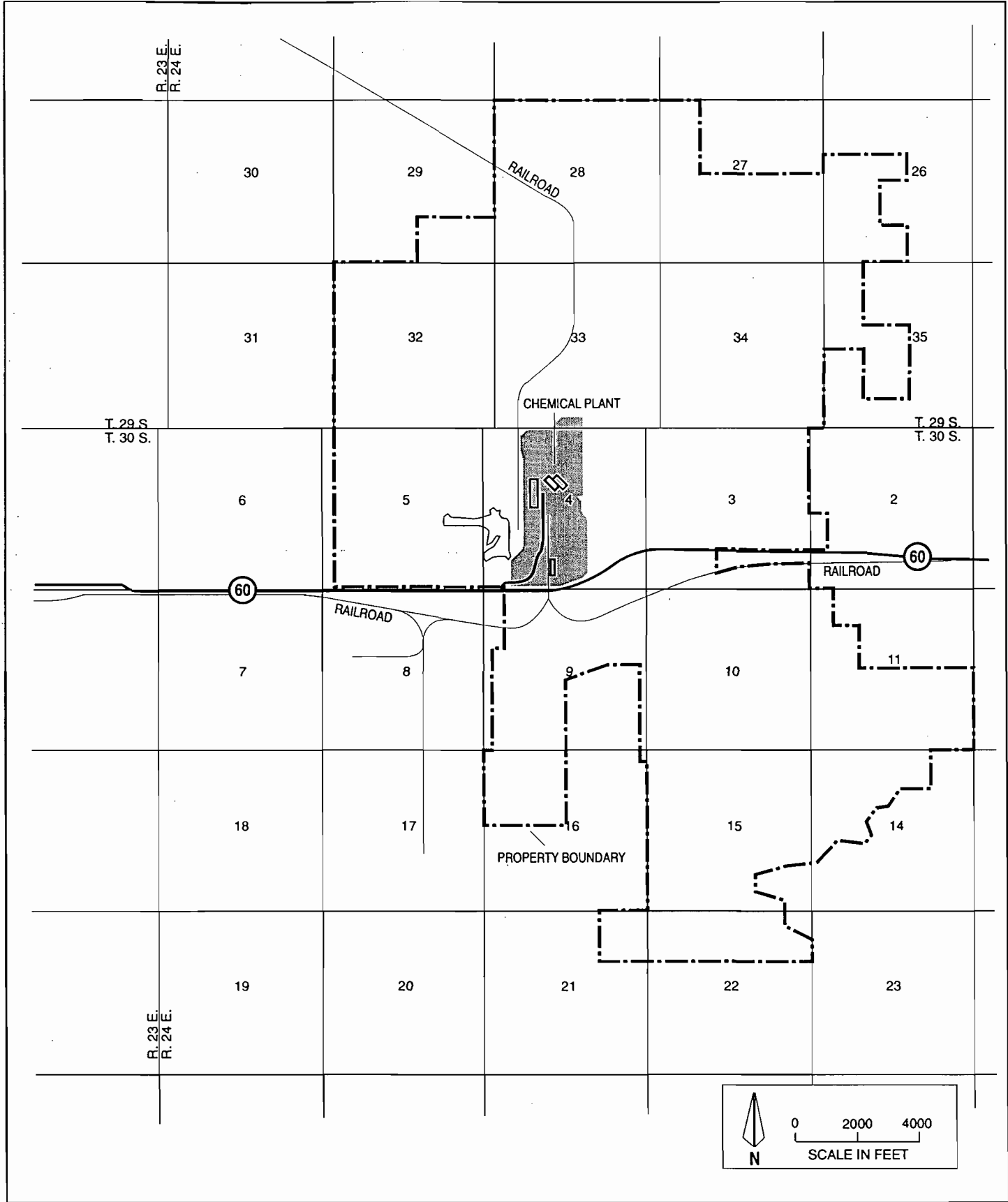


Figure 2-1  
Location of Cargill Fertilizer's Bartow Plant



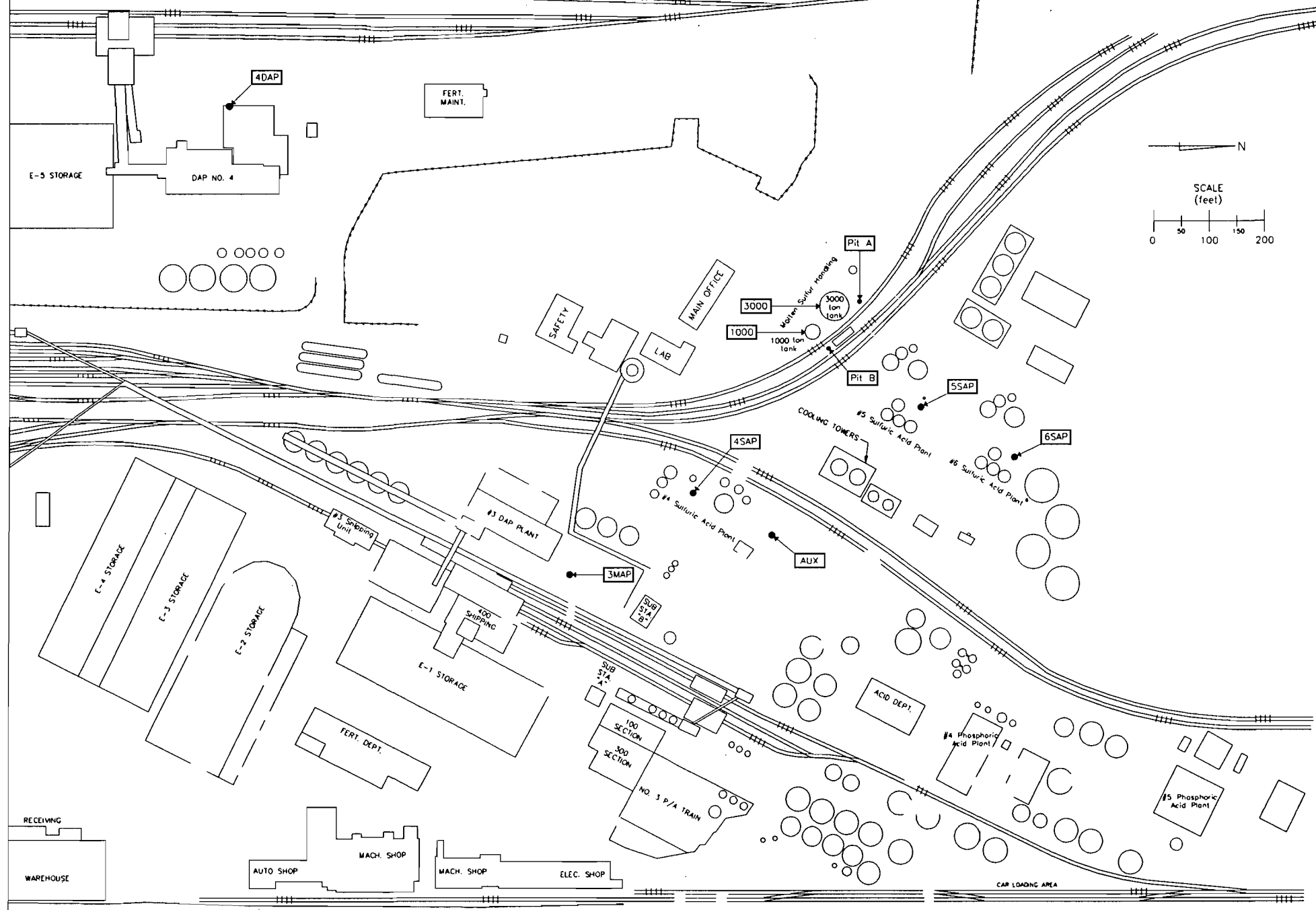


Figure 2-2 Site map of Cargill Fertilizer, Inc., Bartow, FL

Best Available Copy

sulfur input -- 36.5 tons/hr  
acid produced (as 100% H<sub>2</sub>SO<sub>4</sub>)--  
108.3 tons/hr

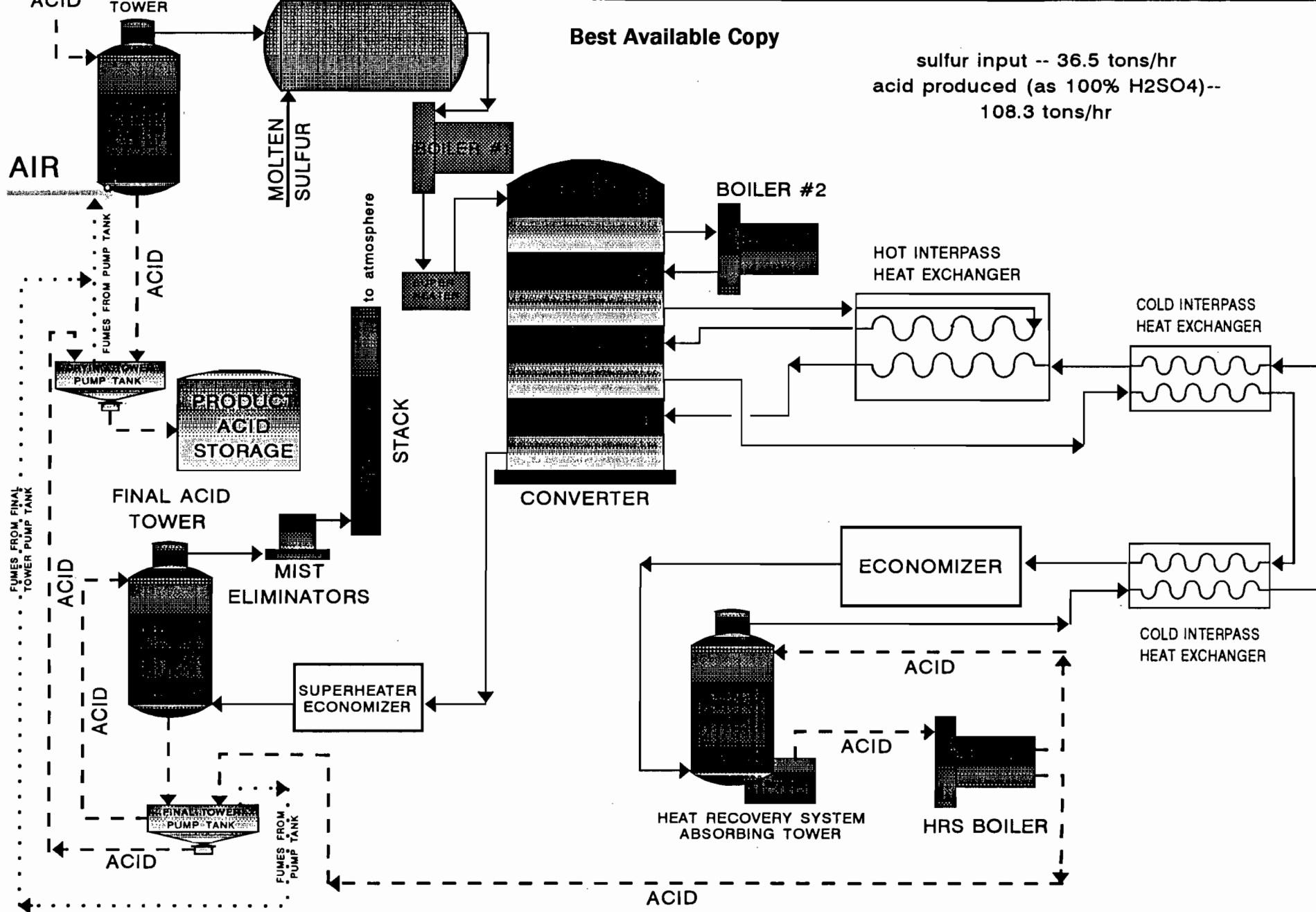


FIGURE 2-3: Cargill Fertilizer, Bartow -- Sulfuric Acid Plant - Process Flow

---> ACID FLOW

—> GAS STREAM FLOW

Table 2-1. Current and Proposed Permit Limitations for Nos. 4, 5, and 6 Sulfuric Acid Plants, Cargill Fertilizer, Bartow Plant

Emission Scenario	Emission Limit <sup>a</sup>	Emission Rate			
		Each Plant		Total All Three Plants	
		lb/hr	TPY	lb/hr	TPY
<u>Current Limitations @ 2,280 TPD</u>					
SO <sub>2</sub>	4.0 lb/ton	380.0	1,664.4	1,140.0	4,993.2
H <sub>2</sub> SO <sub>4</sub> Mist	0.15 lb/ton	14.25	62.4	42.8	187.2
<u>Proposed Limitations @ 2,600 TPD</u>					
SO <sub>2</sub>	4.0 lb/ton	433.3 <sup>b</sup>	1,898.0	1,300.0 <sup>b</sup>	5,694.0
H <sub>2</sub> SO <sub>4</sub> Mist	0.15 lb/ton	16.25 <sup>b</sup>	71.2	48.8 <sup>b</sup>	213.5
<u>Increase in Allowable Emissions</u>					
SO <sub>2</sub>	—	53.3	233.6	160.0	700.8
H <sub>2</sub> SO <sub>4</sub> Mist	—	2.0	8.8	6.0	26.3

Note: lb/day = pounds per day.  
 lb/hr = pounds per hour.  
 lb/ton = pounds per ton.  
 H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
 % = percent.  
 SO<sub>2</sub> = sulfur dioxide.  
 TPD = tons per day.  
 TPY = tons per year.

<sup>a</sup> lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>b</sup> 3-hour average.

Table 2-2. Stack Parameters for Existing and Expanded Bartow H<sub>2</sub>SO<sub>4</sub> Plants

Plant	H <sub>2</sub> SO <sub>4</sub> Production Rate <sup>a</sup> (TPD)	Stack (ft)	Stack Diameter (ft)	Gas Flow Rate (acfm)	Gas Velocity (fps)	Gas Temperature (°F)
<u>Existing Conditions</u>						
Nos. 4, 5, and 6 H <sub>2</sub> SO <sub>4</sub> (each)	2,280	200	6.75	114,000	53.1	158
<u>Future Conditions</u>						
Nos. 4, 5, and 6 H <sub>2</sub> SO <sub>4</sub> (each)	2,600	200	6.75	130,000	60.5	158

Note:     acfm = actual cubic feet per minute.  
              °F = degrees fahrenheit.  
              fps = feet per second.  
              ft = feet.  
              H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
              TPD = tons per day.

<sup>a</sup> As 100% H<sub>2</sub>SO<sub>4</sub>.

net increase in impacts due to the proposed expansion, as well as the total ambient impacts due to the expanded facility.

NO<sub>x</sub> emissions are currently regulated under the existing operating permit for the sulfuric acid plants (AO53-243295). An emission factor for NO<sub>x</sub> of 0.15 lb/ton 100 percent H<sub>2</sub>SO<sub>4</sub> has been developed for sulfuric acid plants based on limited source testing. Based on this factor, the total NO<sub>x</sub> emissions associated with 7,800 TPD H<sub>2</sub>SO<sub>4</sub> production are 48.75 lb/hr and 213.5 TPY. The increase in NO<sub>x</sub> emissions due to the proposed expansion would be 110.9 TPY (refer also to Section 3.0, Table 3-3). Therefore, PSD review is triggered for NO<sub>x</sub> emissions.

### **2.2.2 MOLTEN-SULFUR HANDLING FACILITY**

The molten-sulfur handling and storage system at Bartow consists of rail and truck unloading systems, one unloading pit, one unloading/transfer pit, and two molten sulfur storage tanks. Sulfur is delivered either by railcar or by truck. Steam is used to heat the railcars and trucks in order to melt the sulfur prior to transfer. The molten sulfur is then unloaded into the 200 ton sulfur unloading pit (Pit A) from railcars or trucks, or into the 300-ton sulfur unloading pit (Pit B) from railcars. Molten sulfur from Pit A can be pumped directly to the H<sub>2</sub>SO<sub>4</sub> plants or to either the 1,000-ton or 3,000-ton storage tank. Molten sulfur from the Pit B is pumped only to the storage tanks.

Sulfur is transferred from the sulfur pit to the 1,000-ton surge tank at a maximum rate of 108 TPH. Sulfur is transferred from the sulfur pit to the 3,000-ton surge tank at a maximum rate of 157 TPH. Sulfur flows by gravity from the surge tanks back to the sulfur pit to maintain the liquid level in the pit. Sulfur is transferred from the pit to the molten sulfur burners in the sulfuric acid plants at a maximum rate of 109.4 TPH when all three plants are operating.

Sulfur Pit A has a capacity of 200 tons and, during normal operations, the pit always contains molten sulfur. Automatic level controllers regulate the gravity flow from the surge tanks back to the sulfur pit and maintain a fairly constant level in the sulfur pit. Sulfur is pumped from the pit to the surge tanks and from the pit directly to the sulfur burners in the sulfuric acid plants.

The storage pits are each evacuated at an airflow rate of approximately 2,700 acfm and exhausted to separate 40 ft tall stacks. A flow diagram of the molten-sulfur handling system is presented in Figure 2-4.

The molten-sulfur handling and storage facilities will also be physically modified as part of this project in order to better accommodate the increase in actual daily and annual throughput rates. The maximum daily and annual throughput rates will be increased. The daily permitted throughput rate is increasing since the maximum daily throughput rate must be higher than the annual average daily throughput rate to accommodate the unloading of unit trains. The requested maximum throughput rates are as follows:

Maximum annual molten-sulfur rate

$$\text{H}_2\text{SO}_4 \text{ production rate (max)} = 7,800 \text{ TPD} \times 365 \text{ days/yr} = 2,847,000 \text{ TPY}$$

$$\text{Molecular weight H}_2\text{SO}_4 = 98$$

$$\text{Molecular weight sulfur} = 32$$

$$\text{Theoretical sulfur requirements} = 2,847,000 \text{ TPY} \times 32/98 = 929,637 \text{ TPY}$$

$$\text{Conversion efficiency in H}_2\text{SO}_4 \text{ plants} = 97 \text{ percent}$$

$$929,637 \text{ TPY} \div 0.97 = 958,384 \text{ TPY sulfur}$$

To be conservative, round up to 960,000 TPY sulfur.

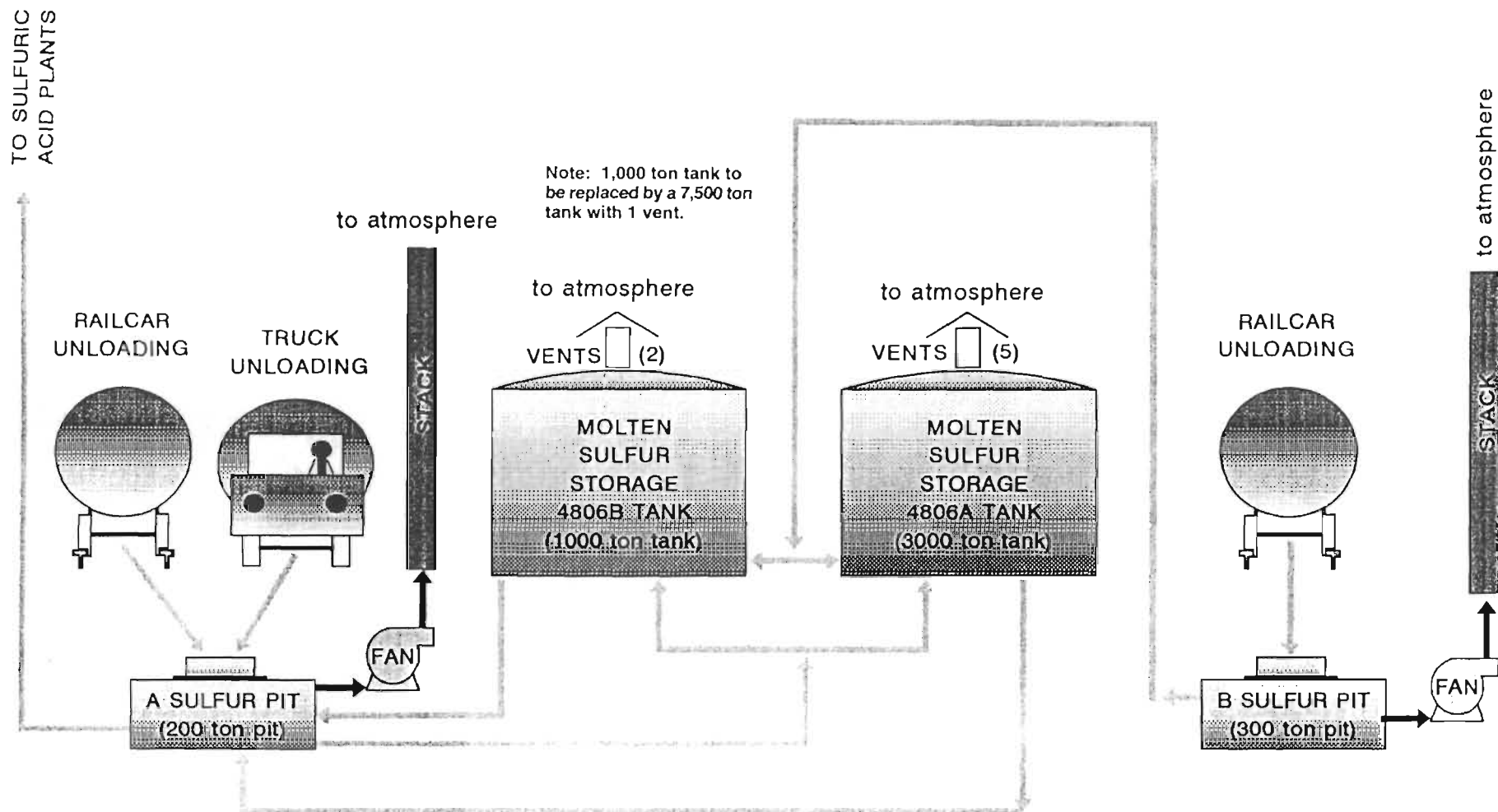
Maximum daily molten-sulfur rate

Maximum sulfur unloading rate is three 100-ton railcars per hour into Pit B, and one 100-ton railcar and eight 25-ton trucks into Pit A, for a total maximum of 600 TPH. The maximum daily unloading rate, therefore, is:

$$600 \text{ TPH} \times 24 \text{ hr/day} = 14,400 \text{ TPD.}$$

In order to better accommodate the increased sulfur throughput, Cargill proposes to replace the existing 1,000-ton storage tank with a 7,500-ton tank.

Emissions of sulfur particulates, total reduced sulfur (TRS),  $\text{SO}_2$ , and volatile organic compounds (VOC) were developed for the molten handling system. The emission estimates are provided in Table 2-3. The emission factors for tanks and pits, the sulfur transfer rates, and the ventilation rates were all based upon the same assumptions used in the original permit application for the system. The maximum sulfur throughput rates have been revised to reflect the proposed



Molten Sulfur Received -- 2,625 TPD  
 Molten Sulfur to Plants -- 2,625 TPD

→ GAS FLOW

→ SULFUR FLOW

Figure 2-4  
 Cargill Fertilizer, Inc. - Bartow, FL  
 Molten Sulfur Unloading - Process Flow



Table 2-3. Estimated Emissions from Molten Sulfur Handling; Cargill Fertilizer, Bartow, FL

		3,000 ton tank					7,500 ton tank**					Pit A	Pit B	
Parameters	Units	Loading 3000 ton tank from Pit A	Unloading 3000 ton tank into Pit A	Idle 3000 ton tank	Total Emissions 3000 ton tank (tons/yr)	Max Emissions 3000 ton tank (lb/hr)	Loading 7500 ton tank from Pit B	Unloading 7500 ton tank into Pit A	Idle 7500 ton tank	Total Emissions 7500 ton tank (tons/yr)	Max Emissions 7500 ton tank (lb/hr)	to Pit A	to Pit B	
SULFUR FLOW RATES														
Maximum loading rate	tpH	157	110	0			108	110	0			200	300	
Annual loading rate	TPY	720,000	720,000	---			240,000	240,000	---			1,680,000	240,000	
VENTILATION RATES														
Loading/Unloading	cfm	47	-33	---			32	-33	---			---	---	
Natural Ventilation through vents	cfm	90	90	90			36	36	36			---	---	
Total Ventilation	cfm	137	57	90			68	3	36			2,700	2,700	
TRANSFER TIMES														
Loading/Unloading time	hr/yr	4,586	6,545	---			2,222	2,182	---			---	---	
Idle time	hr/yr	---	---	2,215 *			---	---	4,356			---	---	
Operating time	hr/yr	---	---	---			---	---	---			8,760	8,760	
					Total Emissions 3000 ton tank (tons/yr)	Max Emissions 3000 ton tank (lb/hr)						Total Emissions 7500 ton tank (tons/yr)	Max Emissions 7500 ton tank (lb/hr)	
EMISSIONS														
Sulfur particle emissions from														
Loading tank or Pit / Idle tank / Pit	lb/hr	0.234	0.098	0.154	---	0.23	0.117	0.006	0.062	---	0.12	0.463	0.463	
Loading tank or Pit / Idle tank / Pit	tpy	0.537	0.321	0.171	1.03	---	0.130	0.006	0.134	0.27	---	2.027	2.027	
TRS (as H2S) emissions from														
Loading tank or Pit / Idle tank / Pit	lb/hr	0.287	0.120	0.189	---	0.29	0.143	0.007	0.076	---	0.14	0.567	0.567	
Loading tank or Pit / Idle tank / Pit	TPY	0.658	0.394	0.209	1.26	---	0.159	0.007	0.165	0.33	---	2.483	2.483	
SO2 emissions from														
Loading tank or Pit / Idle tank / Pit	lb/hr	0.599	0.251	0.394	---	0.60	0.298	0.014	0.158	---	0.30	1.183	1.183	
Loading tank or Pit / Idle tank / Pit	TPY	1.373	0.821	0.436	2.63	---	0.332	0.016	0.343	0.69	---	5.180	5.180	
VOC emissions from														
Loading tank or Pit / Idle tank / Pit	lb/hr	0.427	0.179	0.281	---	0.43	0.213	0.010	0.112	---	0.21	0.842	0.842	
Loading tank or Pit / Idle tank / Pit	TPY	0.978	0.585	0.311	1.87	---	0.236	0.011	0.245	0.49	---	3.690	3.690	

Total Emissions from Molten Sulfur Handling	Total Emissions (tons/yr)	Max Emissions (lb/hr)
Sulfur particle emissions	5.35	1.28
TRS (as H <sub>2</sub> S) emissions	6.56	1.56
SO <sub>2</sub> emissions	13.68	3.26
VOC emissions	9.75	2.32

Emission Factors for tanks:

sulfur particle	0.2 grains/ cu. ft.
TRS (as H <sub>2</sub> S)	0.000035 lb/cu. ft.
SO <sub>2</sub>	0.000073 lb/cu. ft.
VOC	0.000052 lb/cu. ft.
Density of Sulfur at 280 F	112 lb/cu. ft.

Emission Factors for Pits:

sulfur particle	0.02 grains/ cu. ft.
TRS (as H <sub>2</sub> S)	3.5E-06 lb/cu. ft.
SO <sub>2</sub>	7.3E-06 lb/cu. ft.
VOC	5.2E-06 lb/cu. ft.
Density of Sulfur at 280 F	112 lb/cu. ft.

\* Idle time for 3000 ton tank is 8760 hours per year minus unloading time only.

\*\* This tank is replacing existing 1,000 ton tank.

expansion. In addition, in order to simplify the estimates while remaining conservative, it was assumed that 75 percent of the sulfur throughput passes through Pit A and 25 percent passes through Pit B, and all of the molten sulfur goes from the pits to the storage tanks before being pumped to the H<sub>2</sub>SO<sub>4</sub> plants. Thus, Pit A actually sees 1,680,000 TPY throughput (720,000 TPY unloaded to Pit A plus 960,000 TPY unloaded from the tanks to the H<sub>2</sub>SO<sub>4</sub> plants).

### **2.3 PHYSICAL CHANGES TO SULFURIC ACID PLANTS**

The modifications required to achieve increased production rates from the H<sub>2</sub>SO<sub>4</sub> plants will be implemented in a gradual manner, most likely coinciding with scheduled major maintenance overhauls of the plants. The following is a list of the items presently being considered by Cargill for the Nos. 4, 5, and 6 H<sub>2</sub>SO<sub>4</sub> plants. Cargill may implement any one of these items, or a combination of these may be implemented. The actual modifications selected will depend on cost, benefits, efficiency of recovery, energy, etc.

1. New blower wheel and drive;
2. New lower pressure drop #1 boiler;
3. Install cold air bypass (5 to 10 percent) around burner and boiler;
4. Replace superheater and economizers with low pressure drop, larger units;
5. Parallel gas flow to #1 and #2 boilers. New superheater in the exit of first mass;
6. New or parallel gas to gas heat exchanger;
7. New parallel converter masses;
8. Run inlet acid to dry tower at cooler temperatures;
9. Reverse plant flow to forced draft type; and

### **2.4 EFFECTS ON OTHER PROCESS EQUIPMENT**

Sulfuric acid produced in the Bartow sulfuric acid plants is used in the Bartow Nos. 4 and 5 phosphoric acid plants to produce phosphoric acid. This phosphoric acid is then used to produce monoammonium phosphate (MAP) and diammonium phosphate (DAP) in the Nos. 3 and 4 MAP/DAP plants. An application has recently been submitted to FDEP requesting an increase in production capacity for the Nos. 4 and 5 phosphoric acid plants. In addition, the No. 3 MAP/DAP plant is already operating at near capacity. The additional phosphoric acid will therefore be used in the No. 4 DAP plant. In fact, Cargill is currently purchasing phosphoric

acid in order to meet production requirements for the No. 4 DAP plant. These purchases will decrease once the proposed expansion is operational.

There will be no effect upon the No. 4 DAP plant since a construction permit for increased capacity has recently being issued by FDEP (AC53-246403). In addition, an increase in production rate for the No. 4 DAP shipping unit has recently been obtained. The permits associated with these plants are adequate to accommodate the increase in phosphoric acid production.

### **3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY**

The following discussion pertains to federal and state new source review requirements and their applicability to Cargill's proposed Bartow sulfuric acid plant expansion. These requirements must be satisfied before construction can begin on the proposed project.

#### **3.1 NATIONAL AND STATE AAQS**

The existing applicable national and Florida ambient air quality standards (AAQS) are presented in Table 3-1. National primary AAQS were promulgated to protect the public health, and national secondary AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as non-attainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

#### **3.2 PSD REQUIREMENTS**

##### **3.2.1 GENERAL REQUIREMENTS**

Federal PSD requirements are contained in the Code of Federal Regulations (CFR), Title 40, Part 52.21, prevention of significant deterioration of air quality. The State of Florida has adopted PSD regulations [Rule 62-212.400, Florida Administrative Code (F.A.C.)] that essentially are identical to the federal regulations. PSD regulations require that all new major stationary facilities or major modifications to existing major facilities which emit air pollutants regulated under CAA be reviewed and a construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by the U.S. Environmental Protection Agency (EPA) and PSD approval authority in Florida has been granted to FDEP.

A "major facility" is defined under Florida PSD regulations as any one of 28 named source categories that has the potential to emit 100 tons per year (TPY) or more of any pollutant regulated under the CAA, or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. An "emission unit" is defined as any part or activity of a facility that has the potential to emit any air pollutant. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant, considering the application of control equipment and any other federally enforceable limitations on the emission units' capacity. A "major modification" is defined under PSD regulations as a change at an existing major stationary

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significance Levels ( $\mu\text{g}/\text{m}^3$ )

Pollutant	Averaging Time	AAQS			PSD Increments		Significant Impact Levels
		National		State of Florida			
		Primary Standard	Secondary Standard		Class I	Class II	
Particulate Matter (PM10)	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum	150 <sup>b</sup>	150 <sup>b</sup>	150 <sup>a</sup>	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum	365 <sup>b</sup>	NA	260 <sup>a</sup>	5	91	5
	3-Hour Maximum	NA	1,300 <sup>b</sup>	1,300 <sup>a</sup>	25	512	25
Carbon Monoxide	8-Hour Maximum	10,000 <sup>b</sup>	10,000 <sup>b</sup>	10,000 <sup>a</sup>	NA	NA	500
	1-Hour Maximum	40,000 <sup>b</sup>	40,000 <sup>b</sup>	40,000 <sup>a</sup>	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone	1-Hour Maximum <sup>c</sup>	235	235	235	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	15	NA	NA	NA

Note:

AAQS = Ambient Air Quality Standards.

NA = Not applicable, i.e., no standard exists.

Particulate matter (PM<sub>10</sub>) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

PSD = prevention of significant deterioration.

 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter.<sup>a</sup>Maximum concentration not to be exceeded more than once per year.<sup>b</sup>Achieved when the expected number of exceedances per year is less than 1.<sup>c</sup>Achieved when the expected number of days per year with concentrations above the standard is less than 1.

Sources: 40 CFR 50.

40 CFR 52.21.

Rule 62-272, F.A.C.

facility that increases emissions by greater than significant amounts. PSD significant emission rates are shown in Table 3-2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Major new facilities and major modifications are required to undergo the following analyses related to PSD for each pollutant emitted in significant amounts:

1. Source information,
2. Control technology review,
3. Source impact analysis,
4. Preconstruction air quality monitoring analysis, and
5. Additional impact analyses.

In addition to these analyses, a new source also must be reviewed with respect to good engineering practices (GEP) stack height regulations. If the proposed new source or modification is located in a non-attainment area for any pollutant, the source may be subject to non-attainment new source review requirements.

Discussions concerning each of these requirements are presented in the following sections.

### **3.2.2 INCREMENTS/CLASSIFICATIONS**

The 1977 CAA amendments address the prevention of significant deterioration of air quality. The law specifies that certain increases in air quality concentrations above the baseline concentration level of SO<sub>2</sub> and total suspended particulate matter [PM(TSP)] would constitute significant deterioration. The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or will have an impact. Congress also directed EPA to evaluate PSD increments for other criteria pollutants and, if appropriate, promulgate PSD increments for such pollutants.

Three classifications were designated, based on criteria established in the CAA amendments. Certain types of areas (international parks, national wilderness areas, memorial parks larger than 5,000 acres, and national parks larger than 6,000 acres) were designated as Class I areas. All other areas of the country were designated as Class II. PSD increments for Class III areas were

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	<i>De Minimis</i> Monitoring Concentration ( $\mu\text{g}/\text{m}^3$ )
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter (TSP)	NSPS	25	10, 24-hour
Particulate Matter (PM10)	NAAQS	15	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY <sup>a</sup>
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	—
Reduced Sulfur Compounds	NSPS	10	—
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Asbestos	NESHAP	0.007	NM
Beryllium	NESHAP	0.0004	0.001, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.

NESHAP = National Emission Standards for Hazardous Air Pollutants.

NM = No ambient measurement method.

NSPS = New Source Performance Standards.

PM10 = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

PSD = prevention of significant deterioration.

TPY = tons per year.

TSP = total suspended particulate matter.

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter.

<sup>a</sup> No *de minimis* concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.

defined, but no areas were designated as Class III. However, Congress made provisions in the law to allow the redesignation of Class II areas to Class III areas.

In 1978, EPA promulgated PSD regulations related to the requirements for classifications, increments, and area designations as set forth by Congress. PSD increments were initially set for only SO<sub>2</sub> and PM(TSP). However, in 1988, EPA promulgated final PSD regulations for NO<sub>x</sub> and established PSD increments for nitrogen dioxide (NO<sub>2</sub>). On June 3, 1993, EPA promulgated PSD increments for particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM<sub>10</sub>). The PM<sub>10</sub> increments replaced the PM(TSP) increments.

The current federal PSD increments are shown in Table 3-1. As shown, Class I increments are the most stringent, allowing the smallest amount of air quality deterioration, while the Class III increments allow the greatest amount of deterioration. FDEP has adopted the EPA class designations and allowable PSD increments for PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>2</sub>.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. In reference to the baseline concentration, the baseline date actually includes three different dates:

1. The major source baseline date, which is January 6, 1975, in the cases of SO<sub>2</sub> and PM<sub>10</sub>, and February 8, 1988, in the case of NO<sub>2</sub>;
2. The minor source baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application; and
3. The trigger date, which is August 7, 1977, for SO<sub>2</sub> and PM<sub>10</sub>, and February 8, 1988, for NO<sub>2</sub>.

By definition in the PSD regulations, baseline concentration means the ambient concentration level that exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable minor source baseline date, and

2. The allowable emissions of major stationary facilities that began construction before January 6, 1975, for SO<sub>2</sub> and PM<sub>10</sub> sources, or February 8, 1988, for NO<sub>x</sub> sources, but which were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and, therefore, affect PSD increment consumption:

1. Actual emissions representative of a major stationary facility on which construction began after January 6, 1975, for SO<sub>2</sub> and PM<sub>10</sub> sources, and after February 8, 1988, for NO<sub>x</sub> sources; and
2. Actual emission increases and decreases at any stationary facility occurring after the major source baseline date that result from a physical change or change in the method of operation of the facility.

The minor source baseline date for SO<sub>2</sub> and PM<sub>10</sub> has been set as December 27, 1977, for the entire State of Florida [Rule 62-212.400, F.A.C.]. The minor source baseline date for NO<sub>2</sub> has been set as March 28, 1988, for all of Florida.

### **3.2.3 CONTROL TECHNOLOGY REVIEW**

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the facility or modification [Rule 62-212.400(5)(c), F.A.C.]. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in Rule 62-212.200, F.A.C. as:

An emissions limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the 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 (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall,

to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice, or operation.

The requirements for BACT were promulgated within the framework of PSD in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's Guidelines for Determining Best Available Control Technology (BACT) (EPA, 1978) and in the PSD Workshop Manual (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980),

BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis.

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with New Source Performance Standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and PSD Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected.

EPA issued a draft guidance document in 1990 on the top-down approach entitled Top-Down Best Available Control Technology Guidance Document (EPA, 1990a). The "draft" guidance requires starting with the most stringent (or top) technology and emissions limits that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified.

It is noted that the American Paper Institute (API) initiated legal action in 1989 against the EPA over the implementation of the top-down approach. EPA and API reached a settlement agreement (July 9, 1991) which requires EPA to initiate formal rulemaking for BACT procedures. A proposed rule was required by January, 1992, but has not yet been published. However, until new rules are issued, EPA is requiring that the top-down approach still be used to determine BACT.

#### **3.2.4 AIR QUALITY MONITORING REQUIREMENTS**

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C, any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, 1987a).

Under the exemption rule, FDEP may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2 [Rule 62-212.400, F.A.C.].

### **3.2.5 SOURCE IMPACT ANALYSIS**

A source impact analysis must be performed for a proposed major facility or major modification subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rates shown in Table 3-2 [Rule 62-212.400(5)(d) F.A.C.]. The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval.

Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (EPA, 1987b). The source impact analysis for criteria pollutants can be limited to the new or modified source if the net increase in impacts as a result of the new or modified source is below significance levels, as presented in Table 3-1.

Various lengths of record for meteorological data can be used for impact analyses. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards.

### **3.2.6 ADDITIONAL IMPACT ANALYSES**

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analysis of the impairment to visibility and the impacts on soils and vegetation that would occur as

a result of the proposed source [40 CFR 52.21; Rule 62-212.400(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts from general commercial, residential, industrial, and other growth associated with the facility or modification also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

### **3.2.7 GOOD ENGINEERING PRACTICE STACK HEIGHT**

The 1977 CAA amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985). Identical regulations have been adopted by FDEP [Rule 62-210.550, F.A.C.]. GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

$$H_g = H + 1.5L$$

where:  $H_g$  = GEP stack height,

$H$  = Height of the structure or nearby structure, and

$L$  = Lesser dimension (height or projected width) of nearby structure(s); or

3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature but not greater than 0.8 kilometer (km). Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Cargill facility is generally flat, plume impaction was not considered in determining the GEP stack height.

### **3.3 NON-ATTAINMENT RULES**

Based on the current non-attainment provisions (Rule 62-212.500, F.A.C.), all major new facilities and modifications to existing major facilities located in a non-attainment area must undergo non-attainment review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the non-attainment pollutant, or if the modification results in a significant net emission increase of the non-attainment pollutant.

For major facilities or major modifications that locate in an attainment or unclassifiable area, the non-attainment review procedures apply if the source or modification is located within the area of influence of a non-attainment area. The area of influence is defined as an area that is outside the boundary of a non-attainment area but within the locus of all points that are 50 km outside the boundary of the non-attainment area. Based on Rule 62-212.500(2)(a), F.A.C., all VOC facilities or emission units that are located within an area of influence are exempt from the provisions of new source review for non-attainment areas. Facilities or emissions units that emit other non-attainment pollutants and are located within the area of influence are subject to non-attainment review unless the maximum allowable emissions do not have a significant impact within the non-attainment area.

### **3.4 SOURCE APPLICABILITY**

#### **3.4.1 PSD REVIEW**

##### **3.4.1.1 Pollutant Applicability**

The Cargill facility is located in Polk County, which has been designated by EPA and FDEP as an attainment area for SO<sub>2</sub>. Polk County and surrounding counties are designated as PSD Class II areas for SO<sub>2</sub>. The site is located about 105 km from a PSD Class I area (Chassahowitzka National Wilderness Area).

The Cargill facility is considered to be an existing major stationary facility because potential emissions of certain regulated pollutants exceed 100 TPY (for example, potential SO<sub>2</sub> emissions currently exceed 100 TPY). As a result, PSD review is required for the proposed modification for each pollutant for which the net increase in emissions exceeds the PSD significant emission rates presented in Table 3-2 (i.e., a major modification).

The net increase in actual and allowable emissions due to the proposed expansion is summarized in Table 3-3 (reference Table 2-1). As shown, the net increase in SO<sub>2</sub> emissions is 2,578.5 TPY (increase of 700.8 TPY in allowable emissions), and the increase in H<sub>2</sub>SO<sub>4</sub> mist emissions is 158.1 TPY (increase of 26.3 TPY in allowable emissions). The increase in NO<sub>x</sub> emissions is 110.9 TPY, which is greater than the PSD significant emission rate of 40 TPY. The increase in SO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> mist, and NO<sub>x</sub> emissions will all exceed the PSD significant emission rates. Therefore, the proposed project is subject to PSD review for these pollutants.

There have been no contemporaneous SO<sub>2</sub> emission increases occurring at the Cargill Bartow facility since 1993, when a PSD permit was issued for a sulfuric acid plant expansion. The phosphoric acid plants at Cargill will utilize the increased H<sub>2</sub>SO<sub>4</sub> produced by the H<sub>2</sub>SO<sub>4</sub> plants. An application to increase production capacity of the phosphoric acid plants was recently submitted to FDEP. The increased H<sub>2</sub>SO<sub>4</sub> capacity will allow the expanded phosphoric acid plants to meet their permitted capacities, while reducing requirements for purchase of phosphoric acid from outside producers.

#### **3.4.1.2 Ambient Monitoring**

Based upon the increase in emissions from Cargill's proposed project, a PSD preconstruction ambient monitoring analysis is required for SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> mist. However, if the increase in impacts of a pollutant is less than the *de minimis* monitoring concentration, then an exemption from the preconstruction ambient monitoring requirement may be granted for that pollutant. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

For SO<sub>2</sub>, the maximum 24-hour impact due to the proposed expansion (see Section 6-0, Table 6-7) is 7.2 µg/m<sup>3</sup>, which is below the *de minimis* monitoring concentration of 13 µg/m<sup>3</sup>. For NO<sub>x</sub>, the *de minimis* monitoring concentration is 14 µg/m<sup>3</sup>, annual average, and the maximum increase in annual average NO<sub>x</sub> impacts due to the proposed expansion is 0.15 µg/m<sup>3</sup>. In addition, there is no approved ambient monitoring method for H<sub>2</sub>SO<sub>4</sub> mist. As a result, the proposed modification can be exempted from the preconstruction monitoring requirements for both these pollutants.

Table 3-3. PSD Source Applicability Analysis, Cargill Bartow Nos. 4, 5, and 6 Sulfuric Acid Plant Expansion

Emission Scenario	Emission Rate (TPY)		
	SO <sub>2</sub>	H <sub>2</sub> SO <sub>4</sub> Mist	NO <sub>x</sub>
Current Actual Emissions (1993 - 1994 Average) <sup>a</sup>	3,115.5	55.4	102.6
Current Allowable Emissions @ 6,840 TPD Total <sup>b</sup>	4,993.2	187.2	149.8
Proposed Maximum Emissions @ 7,800 TPD Total <sup>b</sup>	5,694.0	213.5	213.5
Total Net Increase: Current Actuals versus Proposed Maximums	2,578.5	158.1	110.9
Total Net Increase: Current Allowables versus Proposed Maximums	700.8	26.3	63.7
PSD Significant Emission Rate	40	7	40

Note: H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
 NO<sub>x</sub> = nitrogen oxides.  
 PSD = prevention of significant deterioration.  
 SO<sub>2</sub> = sulfur dioxide.  
 TPD = tons per day.  
 TPY = tons per year.

<sup>a</sup> From 1993 and 1994 Annual Operating Reports submitted to FDEP.

<sup>b</sup> Based upon 4.0 lb/ton for SO<sub>2</sub>, 0.15 lb/ton for H<sub>2</sub>SO<sub>4</sub> mist, and 0.15 lb/ton for NO<sub>x</sub>.

#### **3.4.1.3 GEP Stack Height Analysis**

The GEP stack height regulations allow any stack to be at least 65 m [213 feet (ft)] high. The Nos. 4, 5, and 6 H<sub>2</sub>SO<sub>4</sub> plants at Cargill are existing sources with stack heights less than 65 m. These stacks will not be modified. As a result, the *de minimis* GEP stack height is not exceeded by the sulfuric acid plant sources.

#### **3.4.1.4 PSD Increment Consumption**

The PSD regulations provide that any emission increases or decreases occurring after January 6, 1975, due to construction at major stationary sources affects PSD increment consumption. A review of past modeling studies and SO<sub>2</sub> emission inventories shows that at the time of the baseline date, the Nos. 1, 2, and 3 H<sub>2</sub>SO<sub>4</sub> plants were operating at Cargill (W.R. Grace at that time). As a result, these plants are included in the baseline for the purposes of determining PSD increment consumption. The H<sub>2</sub>SO<sub>4</sub> plants Nos. 1, 2, and 3 were shut down after the PSD major facility baseline date. The baseline emissions for these units, based on the previous modeling analysis, are shown in Table 3-4. The total baseline SO<sub>2</sub> emissions are 9,334 TPY. Total future SO<sub>2</sub> emissions after expansion are 5,694 TPY. Thus, there has been a net decrease of 3,640 TPY of SO<sub>2</sub>. This represents an expansion of the available PSD increments.

For NO<sub>x</sub>, the PSD baseline date is 1988. The PSD baseline NO<sub>x</sub> emissions are based upon actual plant H<sub>2</sub>SO<sub>4</sub> production in 1988 and an emission factor of 0.10 lb/ton. The baseline emissions are shown in Table 3-4.

### **3.4.2 NON-ATTAINMENT REVIEW**

The Bartow facility is located in Polk County, which has been designated as an attainment area for all pollutants. As a result, non-attainment review does not apply to the proposed project.

### **3.4.3 NEW SOURCE PERFORMANCE STANDARDS**

Federal NSPS have been promulgated for new and modified sulfuric acid plants (40 CFR 60, Subpart H). The NSPS currently apply to the Nos. 4, 5, and 6 H<sub>2</sub>SO<sub>4</sub> plants, and will continue to apply in the future. The NSPS limits are 4.0 lb/ton for SO<sub>2</sub>, and 0.15 lb/ton for H<sub>2</sub>SO<sub>4</sub> mist emissions.

Table 3-4. PSD Increment Consumption Baseline and Future SO<sub>2</sub> and NO<sub>x</sub> Emissions, Cargill Fertilizer, Inc.

Emission Scenario	Emissions (TPY)		Basis
	SO <sub>2</sub>	NO <sub>x</sub>	
<u>Baseline Emissions</u>			
Nos. 1, 2, and 3			
H <sub>2</sub> SO <sub>4</sub> Plants	9,334	—	Previous modeling analysis 1988 production (1,437,174 tons H <sub>2</sub> SO <sub>4</sub> ); 0.10 lb/ton
	—	71.9	
<u>Future Emissions</u>			
Nos. 4, 5, and 6			
H <sub>2</sub> SO <sub>4</sub> Plants	5,694	—	7,800 TPD; 4 lb/ton
	—	213.5	7,800 TPD; 0.15 lb/ton
<u>Net Change</u>	-3,640	141.6	

Note: H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
 lb/ton = pounds per ton.  
 PSD = prevention of significant deterioration.  
 SO<sub>2</sub> = sulfur dioxide.  
 TPD = tons per day.  
 TPY = tons per year.

## **4.0 AMBIENT MONITORING ANALYSIS**

### **4.1 MONITORING REQUIREMENTS**

The CAA Amendments of 1977 require that the owner or operator of any proposed major new source or major modification conduct ambient air monitoring for applicable pollutants. As discussed in the source applicability section, Section 3.4, SO<sub>2</sub>, NO<sub>x</sub>, and H<sub>2</sub>SO<sub>4</sub> mist may all be exempted from PSD preconstruction monitoring requirements.

### **4.2 BACKGROUND SO<sub>2</sub> CONCENTRATIONS**

A background SO<sub>2</sub> concentration must be estimated to account for SO<sub>2</sub> sources which are not explicitly included in the atmospheric dispersion modeling analysis. In order to estimate reasonable background SO<sub>2</sub> concentrations, FDEP-recommended background levels were utilized. FDEP has indicated in other PSD permits issued in Polk County that an SO<sub>2</sub> background level of 10 µg/m<sup>3</sup> is appropriate. Therefore, this value was used for all averaging times.

In order to provide additional supportive data for this PSD permit application, a review of recent, available SO<sub>2</sub> monitoring data in the area of Cargill Bartow's plant was performed. A summary of ambient SO<sub>2</sub> data available from 1990 to 1993 for all monitors located within Polk County is presented in Table 4-1. One SO<sub>2</sub> monitoring station, Mulberry, is located within 10 km of Cargill, which has a continuous SO<sub>2</sub> monitor. The monitor is operated by FDEP. Data recoveries have exceeded 94 percent the last 2 years.

Annual average, 24-hour maximums, and 3-hour maximums for SO<sub>2</sub> from the monitoring station are shown in Table 4-1. Since all these monitors are located in an area of multisource emissions (refer to Section 6.0), these concentrations are expected to include substantial contributions from sources in the area, including the existing Cargill Bartow facility. These potential major contributing sources are explicitly included in the modeling analysis, as are almost all emissions from sources located within 50 km of the Cargill Bartow facility (refer to Section 6.2.2). As a result, these concentrations are not representative of actual background concentrations which would be expected to occur in conjunction with the worst-case meteorology.

Table 4-1. Ambient SO<sub>2</sub> Concentrations for Air Monitoring Stations Located Within Polk County--1990 to 1993

Location		Site Number	UTM Coordinates (km)		Period		Number of Observations	Concentration (µg/m <sup>3</sup> )				
City	County		East	North	Year	Months		3-Hour		24-Hour		Annual
Mulberry	Polk	2860-006-F02	405.5	3086.0	1993	January-December	8,234	201	199	55	47	9
					1992	January-December	8,655	256	151	39	38	10
					1991	February-December	7,118	203	176	42	40	12
Nichols	Polk	3680-010-F02	399.5	3081.3	1993	January-December	8,492	266	221	61	55	11
					1992	January-December	8,205	213	183	50	48	11
					1991	January-December	8,542	179	167	67	58	10
					1990	January-December	8,612	341	252	66	62	9
Lakeland	Polk	2160-004-F02	412.75	3108.5	1991	January-January	252	31	16	7	5	3
					1990	January-December	8,683	122	122	42	27	5
Homeland <sup>a</sup>	Polk	3680-037-J02	418.7	3076.35	1992	January-October	6,040	170	161	42	42	7
					1991	October-December	1,657	72	49	31	29	6
Nichols <sup>b</sup>	Polk	3680-036-J01	400.1	3066.2	1992	January-March	1,920	199	—	42	—	10
					1991	April-December	5,694	202	136	42	40	8

<sup>a</sup> Monitoring station from Florida Power Corporation's Polk County site.<sup>b</sup> Monitoring station from Tampa Electric Company's Polk Power Station site.

Sources: FDEP, 1990, 1991, 1992, 1993. KBN, 1995.

## **5.0 BEST AVAILABLE CONTROL TECHNOLOGY**

The source applicability analysis for the proposed Cargill Bartow H<sub>2</sub>SO<sub>4</sub> plant expansion, presented in Section 3.0, identified SO<sub>2</sub>, NO<sub>x</sub> and H<sub>2</sub>SO<sub>4</sub> mist as air pollutants requiring a BACT review under federal and state PSD regulations. This section describes the proposed BACT and emission limits for each pollutant subject to BACT. An analysis of alternative control technologies is also presented.

### **5.1 SULFUR DIOXIDE**

#### **5.1.1 PROPOSED SO<sub>2</sub> BACT**

The H<sub>2</sub>SO<sub>4</sub> plants at Cargill Bartow are double-absorption plants. The double absorption plant is considered to be state-of-the-art in reducing SO<sub>2</sub> emissions from H<sub>2</sub>SO<sub>4</sub> plants and is already in operation at the Bartow H<sub>2</sub>SO<sub>4</sub> plant. Therefore, this control technology is proposed as BACT for SO<sub>2</sub>. The proposed BACT SO<sub>2</sub> emission limit for the plant is the current allowable level of 4 lb/ton of H<sub>2</sub>SO<sub>4</sub> produced, and is equivalent to the BACT emission rate determined by FDEP in the 1994 PSD construction permit for the No. 8 and No. 9 H<sub>2</sub>SO<sub>4</sub> expansion at Cargill's Riverview plants. It is also equivalent to all previous BACT determinations for H<sub>2</sub>SO<sub>4</sub> plants.

SO<sub>2</sub> compliance test data for the Bartow H<sub>2</sub>SO<sub>4</sub> plants for the last 2 years are presented in Table 5-1. These plants received a PSD construction permit for a capacity expansion in January 1993. The test data since that date are presented. The current permitted production rate for each plant is 2,280 TPD (95.0 TPH). As shown, the most recent tests on the plants were conducted at production rates ranging from 81.6 TPH to 92.5 TPH. SO<sub>2</sub> emissions (compliance test averages) ranged from 2.56 to 3.97 lb/ton, with a maximum individual test of 4.05 lb/ton. These levels are up to the 4.0 lb/ton limit, and higher operating rates, process variables, and catalyst aging could cause higher average emissions. In 1995, an individual test reflected an emission rate of 4.05 lb/ton. This demonstrates that the H<sub>2</sub>SO<sub>4</sub> plants can emit and have emitted at actual levels up to the 4.0 lb/ton limit.

Table 5-1. Summary of Recent SO<sub>2</sub> Emission Test Results, Cargill Bartow

Date	Average Production Rate <sup>a</sup> (tons/hr)	SO <sub>2</sub> (lb/hr)		SO <sub>2</sub> (lb/ton)	
		Average	Maximum	Average	Maximum
<u>No. 4 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
01/21/93	89.6	304.5	324.1	3.40	3.62
10/07/93	86.9	263.5	285.5	3.03	3.29
10/11/93	86.9	277.9	313.1	3.20	3.60
10/13/93	86.9	265.5	267.3	3.08	3.05
10/15/93	86.9	222.7	244.4	2.56	2.81
10/27/94	92.5	316.4	327.5	3.42	3.54
02/08/95	90.7	316.0	317.5	3.50	3.50
<u>No. 5 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
10/14/93	81.7	270.1	277.3	3.30	3.39
10/16/93	81.6	301.7	316.7	3.70	3.88
08/11/94	92.0	241.4	243.1	2.62	2.64
02/15/95	90.8	255.6	263.7	2.80	2.90
<u>No. 6 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
10/28/93	84.4	251.2	265.7	2.98	3.15
08/25/94	91.0	323.5	326.1	3.55	3.58
03/02/95	86.2	342.5	349.0	3.97	4.05
<u>Allowable Rate</u>		380		4.0	

Note: H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
 lb/hr = pounds per hour.  
 lb/ton = pounds per ton.  
 SO<sub>2</sub> = sulfur dioxide.  
 tons/hr = tons per hour.

<sup>a</sup> As 100 percent sulfuric acid.

Source: KBN, 1995.

A summary of continuous SO<sub>2</sub> emission data from each of the H<sub>2</sub>SO<sub>4</sub> plants is presented in Appendix B. Presented are daily average SO<sub>2</sub> emissions in lb/hr and lb/ton of 100 percent H<sub>2</sub>SO<sub>4</sub> produced for the time period May 24, 1994 through December 19, 1994. Days on which plant downtime occurred were not included, since the daily average SO<sub>2</sub> emission rate is not valid on these days. From the reported data, the following summary is presented:

Plant	Days	Daily SO <sub>2</sub> Emissions (lb/ton)	
		Average	Maximum
No. 4 SAP	169	2.55	3.67
No. 5 SAP	203	2.91	3.83
No. 6 SAP	192	3.13	3.78

The maximum SO<sub>2</sub> emissions from each plant have approached the 4.0 lb/ton level.

Based on the test data, BACT for the Bartow H<sub>2</sub>SO<sub>4</sub> plants is proposed as 4.0 lb/ton. A lower SO<sub>2</sub> emission level may not be achievable on a continuous basis, particularly in light of the potential effects of higher production, catalyst aging, and day-to-day variation in other process variables.

### 5.1.2 ALTERNATIVE SO<sub>2</sub> CONTROL TECHNOLOGIES

EPA's latest review of NSPS for H<sub>2</sub>SO<sub>4</sub> plants (MITRE Corp., 1979) presents a comprehensive assessment of alternative control technologies for removing SO<sub>2</sub> from H<sub>2</sub>SO<sub>4</sub> plant tail gases. Alternative technologies identified included the double-absorption contact H<sub>2</sub>SO<sub>4</sub> plant, sodium sulfite-bisulfite scrubbing, ammonia scrubbing, and molecular sieves. The study concluded that the best demonstrated control technology to reduce SO<sub>2</sub> emissions is the double-absorption H<sub>2</sub>SO<sub>4</sub> plant. Nearly all the H<sub>2</sub>SO<sub>4</sub> plants built in the United States since 1971 have used the double-absorption process, wherein two absorber stages are used. The SO<sub>2</sub> conversion efficiency for the double-absorption plant is 96 percent or greater.

A review of H<sub>2</sub>SO<sub>4</sub> plant BACT determinations was conducted to determine control technologies and emission rates associated with plants constructed or modified since the EPA study was conducted in 1979. The results of the review are summarized in Table 5-2. This information

Table 5-2. Previous BACT Determinations for H<sub>2</sub>SO<sub>4</sub> Plants

Date Permit Issued	Company Name	Plant Capacity (TPD)	Sulfur Dioxide		H <sub>2</sub> SO <sub>4</sub> Mist	
			Allowable Emissions (lb/ton)	Basis	Allowable Emissions (lb/ton)	Basis
02/23/95	Cargill Fertilizer-Riverview (PSD-FL-209)	2,900/3,200	4.0	NSPS	0.15	NSPS, Mist Eliminator
01/05/93	Cargill Fertilizer-Bartow (formerly Seminole Fertilizer) (PSD-FL-191)	6,840	4.0	NSPS, Double Absorption	0.15	NSPS, Mist Eliminator
03/10/92*	Agrico Chemical (PSD-FL-179)	2,700	4.0	NSPS, Double Absorption	0.15	NSPS, Mist Eliminator
05/22/91*	IMC Fertilizer, Inc. (PSD-FL-170)	14,500	4.0	NSPS, Double Absorption	0.15	NSPS, Mist Eliminator
02/29/88	Coal Gasification, Inc.	700	4.0	NSPS	0.15	NSPS
07/21/87	Cargill Fertilizer-Riverview (formerly Gardinier, Inc.) (No. 8 H <sub>2</sub> SO <sub>4</sub> plant)	2,500	4.0	NSPS	0.15	NSPS
06/13/84	Chevron Co., USA	1,900	4.0	NSPS	0.15	NSPS
10/02/81	Conserv	2,000	4.0	NSPS, Double Absorption	0.15	NSPS, Acid Mist Eliminator
06/01/81	New Wales Chemical	2,750	4.0	NSPS, Double Absorption	0.15	NSPS
04/01/81	U.S.S. Agri-Chemicals	1,850	4.0	NSPS	-	-
07/11/80	Cargill Fertilizer-Riverview (formerly Gardinier, Inc.) (No. 7 H <sub>2</sub> SO <sub>4</sub> Plant)	1,750	4.0	NSPS, Double Absorption	0.15	NSPS

Note: BACT = best available control technology.  
H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
TPD = tons per day.  
lb/ton = pounds per ton.  
NSPS = New Source Performance Standards.

\* FDEP Technical Evaluation and Preliminary Determination.

was obtained from the EPA's BACT/LAER Clearinghouse. As indicated in the table, all BACT determinations since 1979 have resulted in allowable SO<sub>2</sub> levels equivalent to the NSPS of 4.0 lb/ton. These plants have ranged in capacity from 700 TPD to 2,750 TPD. All have utilized the double-absorption technology. FDEP determined BACT for SO<sub>2</sub> emissions from the No. 8 and No. 9 H<sub>2</sub>SO<sub>4</sub> plants at Cargill Riverview to be 4.0 lb/ton in the recent (1995) PSD permit issued for the No. 8 and No. 9 H<sub>2</sub>SO<sub>4</sub> plant expansion.

### **Catalyst Replacement**

The EPA (1978), in their review of the new source performance standards (NSPS), identified more frequent catalyst replacement as a potential SO<sub>2</sub> control technology for H<sub>2</sub>SO<sub>4</sub> plants. They analyzed replacing the catalyst on a frequency three times the normal, i.e., once a year for the first catalyst bed, once every 2 years on the second, and once every 3 years on the third bed. Although no estimate of improved conversion efficiency was presented, EPA concluded from this analysis that the economic impact would be adverse to the industry. The price of H<sub>2</sub>SO<sub>4</sub> was stated to be \$55/Mg. The more frequent catalyst replacement was estimated to result in a cost impact of approximately \$0.50/Mg. Although this represented only about a 1 percent impact on the price of H<sub>2</sub>SO<sub>4</sub>, it also represented a 20 percent decrease in pre-tax profits. This impact was concluded to be adverse to the industry.

In addition to the adverse cost impacts of more frequent catalyst replacement, it must be considered that Cargill does not routinely replace the catalyst in its H<sub>2</sub>SO<sub>4</sub> plants. Given the type of gas stream to which the catalyst in Cargill's H<sub>2</sub>SO<sub>4</sub> plants is normally exposed, essentially no deterioration of the conversion efficiency of the catalyst takes place.

In Cargill's type of operation, where normally no catalyst poisons are encountered in the gas streams, catalyst screening is performed purely as a maintenance function. Catalyst screening is determined by dirt build-up, which results in a higher resistance to air flow and reduced production capacity. Typically, screening of the first mass and occasionally the tops of the second and fourth masses is performed when plant maintenance shutdown takes place. Catalyst replacement is limited to that required to make up for the mechanical attrition taking place during the removal and screening operation. The replacement cost of a full charge of catalyst at Cargill

would be in excess of \$1 million, depending on the size of unit and catalyst market prices. However, due to Cargill's maintenance procedures, such replacement would not be expected to reduce SO<sub>2</sub> emissions.

In summary, for Cargill's type of gas stream, no gain in efficiency would be obtained from more frequent catalyst replacement, and its costs would be substantial. Therefore, this control technology was not considered further for Cargill's Bartow H<sub>2</sub>SO<sub>4</sub> plants.

### **Molecular Sieves**

The EPA, in their review of the new source performance standards (NSPS), also identified molecular sieves as a potential SO<sub>2</sub> control technology for H<sub>2</sub>SO<sub>4</sub> plants. Molecular sieves consist of a system in which SO<sub>2</sub> is absorbed on synthetic zeolites. The adsorbed material is desorbed by purified hot tail gas from the operating system and sent back to the acid plant.

According to EPA (1979), molecular sieve systems have only been tried on one H<sub>2</sub>SO<sub>4</sub> plant. However, extensive operational difficulties with this system have caused this plant to be retrofitted with a dual absorption system (same as Cargill's present system). Therefore, based on the lack of commercial demonstration for this technology, it is not considered further for Cargill's H<sub>2</sub>SO<sub>4</sub> plants.

### **Flue Gas Desulfurization (FGD) Systems**

There are several types of SO<sub>2</sub> FGD systems which could theoretically be employed on H<sub>2</sub>SO<sub>4</sub> plants. The EPA (1979) identified sodium sulfite-bisulfite scrubbing and ammonia scrubbing as two potential technologies. Other common technologies such as wet limestone FGD, wet sodium hydroxide scrubbing, and lime spray drying FGD could also theoretically be applied. Each of these FGD systems are discussed further in the following sections.

#### **Sodium Sulfite-Bisulfite Scrubbing**

This process, developed by Wellman-Power gas, is based upon absorption of SO<sub>2</sub> in a sodium sulfite solution in a three-stage absorber. The resulting solution is sodium bisulfate. The solution is heated to form sodium sulfite crystals, and SO<sub>2</sub> gas and water vapor is released. The crystals are then separated from the mother liquid and dissolved in the recovered condensate for recycle to the absorber. The recovered SO<sub>2</sub> is sent back to the H<sub>2</sub>SO<sub>4</sub> plant.

Although this technology has potential for  $\text{H}_2\text{SO}_4$  plants, it is not known to have been applied to any  $\text{H}_2\text{SO}_4$  plant in practice. Therefore, based on the lack of commercial demonstration for this technology, it is not considered further for Cargill's  $\text{H}_2\text{SO}_4$  plants.

### **Ammonia Scrubbing**

Ammonia scrubbing involves the use of aqueous ammonia and water in a two-stage scrubbing system. A mist eliminator follows in order to remove fine ammonium salts generated in the scrubbing process. These fine ammonium salts can result in a highly visible plume if not controlled. Expected  $\text{SO}_2$  removal efficiency of an ammonia scrubbing system based upon vendor estimates, is approximately 85 percent.

The resulting ammonium sulfate-bisulfate solution is converted by reaction with  $\text{H}_2\text{SO}_4$  in a stripper to evolve  $\text{SO}_2$  gas and produce an ammonium sulfate byproduct solution. The  $\text{SO}_2$  is returned to the acid plant while the solution is treated for the production of fertilizer grade ammonium sulfate. The process is dependent upon a suitable market for ammonium sulfate.

There are many different types of plants employing ammonia scrubbing, two of which are  $\text{H}_2\text{SO}_4$  plants in the phosphate industry: one in Texas and one in Idaho. Both of these employ a single absorption  $\text{H}_2\text{SO}_4$  plant, as opposed to the standard dual absorption plant. The single absorption plant would result in much higher uncontrolled  $\text{SO}_2$  emissions, making add-on  $\text{SO}_2$  control more cost effective, particularly if the byproduct market existed.

### **Wet Limestone Scrubbing**

Wet scrubbing is a gaseous and liquid phase reaction process in which the  $\text{SO}_2$  gas is transferred to the scrubbing liquid under saturated conditions. The wet scrubbing process creates a liquid waste stream. Therefore, a wastewater treatment and disposal system is generally required for a wet scrubbing system.

The most frequently utilized wet FGD technology is the wet limestone system. The preferred version of the technology is the spray tower. In this system, a slurry of atomized limestone is sprayed into a tall vertical absorber tower through a series of nozzles. The flue gas enters usually at the bottom of the tower, passes vertically up through the spray droplets, and exits the vessel at the top.

The slurry is recirculated through the absorber system. This recirculation increases the scrubbing utilization of the carbonate reagent. A bleedstream is taken off from the recycled slurry stream to avoid build-up inside the spray tower. The scrubbing reaction produces calcium sulfite as the byproduct. Many systems further oxidize the sulfite into calcium sulfate, which is easier to dewater. Byproducts and unreacted reagent in the bleedstream is dewatered using a variety of equipment including thickeners, centrifuges, and vacuum filters. Dewatering systems reduce the water content in the filtered waste solid to between 10 to 50 percent by weight, depending on the system.

Technically, wet limestone scrubbing processes are capable of reducing SO<sub>2</sub> emissions with a removal efficiency between 70 to 93 percent. Based on vendor estimates, the estimated SO<sub>2</sub> removal efficiency for the wet limestone scrubbing process is 90 percent.

### **Lime Spray Drying**

In the dry scrubbing process, the flue gas entering the scrubber contacts an atomized slurry of either wet lime or wet sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>) sorbent. The SO<sub>2</sub> gas reacts with lime or sodium sorbent to form initially either calcium sulfite (CaSO<sub>3</sub>•½H<sub>2</sub>O) or sodium sulfite (Na<sub>2</sub>SO<sub>3</sub>). Further oxidation or SO<sub>2</sub> absorption is enhanced by the drying process, and the sulfite salts transform into calcium sulfate (CaSO<sub>4</sub>•2H<sub>2</sub>O) or sodium sulfate solids.

A typical spray dryer will use lime as the reagent because it is more readily available than sodium carbonate. Lime slurry is injected into the spray dryer chamber through either a rotary atomizer or pressurized fluid nozzles. The moisture in the lime slurry evaporates and cools the flue gas, and the wet lime absorbs SO<sub>2</sub> in the flue gas and reacts to form pseudo liquid-solid phase salts that are then dried into insoluble crystals by the heat content of the flue gases.

The particulate exiting the spray dryer scrubber contains dried calcium salts and dried unreacted lime. Moisture content of the dried calcium salt leaving the absorber is about 2 to 3 percent, eventually decreasing to about 1 percent downstream. The simultaneous evaporation and reaction in the spray drying process increases the moisture and particulate content of the flue gas and reduces the flue gas temperature.

In the spray dryer scrubber, the amount of water used is optimized to produce an exit stream with "dry" particulates and gases with no liquid discharge from the scrubber. The "dry" reaction products must be removed from the flue gas by a particulate collection device downstream. This differs from the wet scrubber system, wherein the slurry leaving that system must be dewatered at great cost and the gas is cooled to adiabatic saturation temperature.

The dry scrubber usually is located upstream of the particulate control device, which is either an electrostatic precipitator (ESP) or a fabric filter (baghouse) system. A baghouse can provide slightly greater SO<sub>2</sub> removal compared to an ESP system. When a baghouse is used, a layer of porous filter cake forms on the filter bag surfaces. This filter cake contains unspent reagent which provides a site for additional SO<sub>2</sub> removal since the flue gases pass through the filter cake.

Spray dryer scrubbers can reduce SO<sub>2</sub> emissions by up to 92 percent. This is similar to other wet scrubbers such as wet limestone and sodium hydroxide. However, since the dry scrubbing option would require an additional particulate control device, such as a baghouse, this option would be much more expensive than the wet scrubbing options. As a result, this option was not considered further for the Cargill H<sub>2</sub>SO<sub>4</sub> plants.

### **5.1.3 BACT ANALYSIS FOR SO<sub>2</sub>**

This section discusses the overall technical, environmental, energy, and economic impacts of the alternative control technologies, including the proposed technology of the double absorption H<sub>2</sub>SO<sub>4</sub> plant. The wet scrubbing techniques of wet limestone, ammonia, and sodium hydroxide can reduce SO<sub>2</sub> emissions by 90 to 95 percent, and are considered technically feasible for the Cargill H<sub>2</sub>SO<sub>4</sub> plants.

#### **5.1.3.1 Environmental Effects**

The primary environmental concern of using the wet scrubbing systems is the process wastewater or waste sludge which is generated. These waste streams require proper treatment and disposal.

##### **Wet Limestone Scrubbing**

Typically, waste sludge is landfilled onsite, potentially impacting local groundwater. The wet limestone system applied to the Bartow H<sub>2</sub>SO<sub>4</sub> plants would generate approximately 20,000 tons of solid sludge each year, which would require approximately 5 acre-ft of landfill space each

year. The calcium sulfate sludge could be disposed of by further processing to make gypsum that may be used by a wallboard manufacturing facility. However, this option is not viable for the proposed project since there is no known market for the gypsum in the area. The additional capital cost for the gypsum processing equipment would also be a concern.

A wet limestone scrubber also has the disadvantage of high water consumption. Wet limestone scrubbers for the project will require approximately 200 million gallons of water per year. Such large water demand will have an undesirable environmental effect in the Polk County area, which is already experiencing declining water supply levels due to increasing demands on water consumption and lower than average rainfall.

#### **Ammonia Scrubbing**

The major environmental issues concerning the use of the ammonia scrubbing process is wastewater treatment and water consumption. An ammonium sulfate-bisulfate aqueous waste stream is created by the process that requires further treatment or disposal. For every ton of  $\text{SO}_2$  removed, there will be approximately 600 gallons of aqueous waste generated. Conversion of this waste stream to ammonium sulfate is not practical since there is no known market in the area for ammonium sulfate.

The estimated maximum water requirement for the ammonia scrubbing system at Cargill is approximately 2.3 million gallons per year. As discussed above, this is a negative environmental impact in an area of declining water levels and declining water availability.

#### **Sodium Hydroxide Scrubbing**

As with the ammonia scrubbing process, the major environmental issues concerning the use of the sodium hydroxide scrubbing process is wastewater treatment and water consumption. An aqueous waste stream is created by the process that requires further treatment or disposal. For every ton of  $\text{SO}_2$  removed, there will be approximately 400 gallons of aqueous waste generated.

The estimated maximum water requirement for the sodium scrubbing system at Cargill is approximately 1.6 million gallons per year. As discussed above, this is a negative environmental impact in an area of declining water levels and declining water availability.

### **5.1.3.2 Energy Impacts**

All three scrubber alternatives require electricity to drive various mechanical equipment, including fans and pumps. The estimated energy requirement is approximately 8,000 megawatt-hours per year (MW-hr/yr) for the wet limestone scrubber, approximately 9,000 MW-hr/yr for the ammonia scrubbing system, and approximately 2,800 MW-hr/yr for the sodium hydroxide scrubber.

### **5.1.3.3 Economic Analysis**

This section presents the total capital investment (TCI) and the annualized cost (AC) of the three wet scrubber options for the Cargill Bartow H<sub>2</sub>SO<sub>4</sub> plants. Capital costs were developed from basic equipment costs provided by vendor quotes for each process, and with standard cost factors for estimating the direct and indirect costs of the emission control systems (EPA, 1990b). Annual operating costs were developed considering the annualized capital recovery cost and other direct and indirect operating costs. These costs are presented in Table 5-3.

Uncontrolled SO<sub>2</sub> emissions for the purpose of determining cost effectiveness of the various control alternatives are based on the proposed allowable SO<sub>2</sub> emissions of 5,694 TPY from the Nos. 4, 5 and 6 H<sub>2</sub>SO<sub>4</sub> plants combined, and an operating factor of 70 percent. This operating factor is based on historical data from the plants over the last 3 years (see Table 5-4). These data indicate that SO<sub>2</sub> emissions from the plants over the last 3 years have averaged approximately 63 percent of the allowable SO<sub>2</sub> emissions. However, to be conservative in the analysis, an operating factor of 70 percent was used to represent future maximum conditions. The uncontrolled SO<sub>2</sub> emissions used as the basis of the BACT analysis was therefore 3,986 TPY.

Controlled SO<sub>2</sub> emissions were based on 90 percent removal efficiency for the wet limestone system and the ammonia scrubbing system, and a 95 percent removal efficiency for the sodium hydroxide scrubbing system.

The total cost effectiveness of each scrubber option is obtained by dividing the SO<sub>2</sub> emission reduction (in TPY) by the total annualized cost of the scrubber option (see Table 5-3). The cost effectiveness for the wet limestone scrubber option is \$1,900/ton of SO<sub>2</sub> removed; \$4,000/ton for the ammonia scrubbing system; and \$1,900/ton of SO<sub>2</sub> removed for the sodium hydroxide scrubber system. These cost effectiveness values are near to or higher than the levels that FDEP

Table 5-3. Economic Analysis for Alternative SO2 Control Systems, H2SO4 Plants, Cargill Fertilizer, Bartow

Cost Items	Cost Factors	Caustic Scrubber (\$)	Limestone Wet Scrubber (\$)	Ammonia Scrubber (\$)
<b>DIRECT CAPITAL COSTS (DCC):</b>				
(1) Purchased Equipment				
(a) Basic Equipment (a)	Vendor Quote	2,690,000	3,770,000	6,720,000
(b) Auxiliary Equipment	25% / 50% / 50%	672,500	1,885,000	3,360,000
(c) Structure Support	10% x (1a)	269,000	377,000	672,000
(d) Instrumentation & Controls	included	included	included	included
(e) Freight (b)	5% x (1a .. 1d)	181,575	301,600	537,600
(f) Sales Tax (Florida)	6% x (1a .. 1d)	217,890	361,920	645,120
(g) Subtotal	(1a .. 1f)	4,030,965	6,695,520	11,934,720
(2) Direct Installation (b)	80% x (1a .. 1f)	3,224,772	5,356,416	9,547,776
Total DCC:	(1) + (2)	7,255,737	12,051,936	21,482,496
<b>INDIRECT CAPITAL COSTS (ICC):</b>				
(3) Indirect Installation				
(a) Engineering & Supervision (b)	10% x (DCC)	725,574	1,205,194	2,148,250
(b) Construction & Field Expenses (b)	10% x (DCC)	725,574	1,205,194	2,148,250
(c) Contruction Contractor Fee (b)	10% x (DCC)	725,574	1,205,194	2,148,250
(d) Contingencies (b)	20% x (DCC)	1,451,147	2,410,387	4,296,499
(4) Other Indirect Costs				
(a) Startup & Testing (b)	3% x (DCC)	217,672	361,558	644,475
(b) Working Capital (c)	30-day DOC	365,793	206,715	549,723
Total ICC:	(3) + (4)	4,211,333	6,594,241	11,935,446
TOTAL CAPITAL INVESTMENT (TCI):	DCC + ICC	11,467,070	18,646,177	33,417,942

Table 5-3. Economic Analysis for Alternative SO<sub>2</sub> Control Systems, H<sub>2</sub>SO<sub>4</sub> Plants, Cargill Fertilizer, Bartow

Cost Items	Cost Factors	Caustic Scrubber (\$)	Limestone Wet Scrubber (\$)	Ammonia Scrubber (\$)
<b>DIRECT OPERATING COSTS (DOC):</b>				
(1) Labor				
(a) Operator (d)	22 \$/hr, 8,760 hr/yr	192,720	192,720	192,720
(b) Supervisor (b)	15% of operator cost	28,908	28,908	28,908
(2) Maintenance (d)	5% of direct capital cost	362,787	602,597	1,074,125
(3) Replacement Parts	3% of direct capital cost	217,672	361,558	644,475
(4) Utilities				
(a) Electricity	85 \$per MW-hr; 1,110 / 3,240 / 3,600	94,350	275,400	306,000
(b) Water	0.27 \$/1,000 gal 16,000 gal/ton limestone	N/A	54,000	N/A
(5) Raw Chemicals				
(a) Caustic NaOH (50% purity)	207 \$ / ton delivered for 14,500 TPY	3,001,500	--	--
(b) Limestone (97% purity)	32 \$ / ton delivered for 12,500 TPY	--	400,000	--
(c) Ammonia (29.4% purity)	260 \$ / ton delivered for 14,800 TPY	--	--	3,848,000
(6) Solids Waste Disposal (e)	27 \$/ton for 18,200/20,200/18,600 TPY	491,400	545,400	502,200
(7) Liquid Waste Treatment	0.10 \$ / 1000 gal for treatment	174	20,000	248
Total DOC		4,389,511	2,480,583	6,596,676
<b>INDIRECT OPERATING COSTS (IOC): (b)</b>				
(7) Overhead	80% of operating labor & maintenance	467,532	659,380	1,036,602
(8) Property Taxes	1% of total capital investment	114,671	186,462	334,179
(9) Insurance	1% of total capital investment	114,671	186,462	334,179
(10) Administration	2% of total capital investment	229,341	372,924	668,359
Total IOC		926,215	1,405,227	2,373,320
<b>CAPITAL RECOVERY COSTS (CRC)</b>				
	CRF of 0.1628	1,866,839	3,035,598	5,440,441
<b>ANNUALIZED COSTS (AC):</b>				
	DOC + IOC + CRC	7,182,564	6,921,407	14,410,437
Uncontrolled SO <sub>2</sub> Emissions (TPY) (70% of capacity)		3,986	3,986	3,986
SO <sub>2</sub> Control Efficiency (%)		95	90	90
TOTAL SO <sub>2</sub> REMOVED		3,787	3,587	3,587
COST \$/TON SO <sub>2</sub> REMOVED		1,897	1,929	4,017

## Notes:

- (a) The basic equipment costs for each scrubber system are based on pricing from Monsanto Enviro-Chem.
- (b) Based on catalytic incinerators, from OAQPS Control Cost Manual, Fourth Edition.
- (c) 30 days of direct operating costs, calculated from the annualized cost Table 2 (i.e., total DOC/12 months).
- (d) Based on Capital Cost Factors for ESP, from OAQPS Control Cost Manual, Fourth Edition (1990).
- (e) Scrubber effluent for disposal based on amount of sulfur dioxide removed and ratio of molecular weights for reagent / SO<sub>2</sub>

Table 5-4. Actual SO<sub>2</sub> Emissions for Cargill Bartow 1992-1994

Year	SO <sub>2</sub> Emissions <sup>a</sup> (TPY)					Percent of Allowable Emissions
	SAP No. 4	SAP No. 5	SAP No. 6	Total	Allowable	
1994	1,129	895	1,270	3,294	4,992	66
1993	854	1,133	750	2,937	4,992	59
1992	1,054	1,169	907	3,130	4,992	63
Average	1,012	1,066	976	3,120	4,992	63

<sup>a</sup> Based on Annual Operating Reports.

and EPA have considered as reasonable for controlling SO<sub>2</sub> emissions from new sources (i.e., \$2,000 per ton of SO<sub>2</sub> removed).

In addition to this high cost effectiveness for add-on SO<sub>2</sub> controls, any of these alternatives would have a severe economic impact upon Cargill's business. The Florida phosphate market has been severely depressed for many years. Some large plants have been sold recently due to economic losses. The phosphate plants operate under a very small profit margin. Companies have had to reduce operating costs and improve efficiencies just to remain in business. Cargill is a progressive company which has implemented many process improvements over the years, including air pollution control equipment, in order to increase production rates with existing process equipment.

Market prices for granular phosphate products vary from year to year, but have generally been low. MAP, DAP, and GTSP are the main products produced with the use of H<sub>2</sub>SO<sub>4</sub>. The current market price for these products is approximately \$170/ton, but was at a much lower price of \$115/ton in 1993. In 1994, the Cargill Bartow plant produced approximately 1.9 million tons of MAP and DAP products. As shown in Table 5-3 any of the three control alternatives would cost at least \$7 million annually. Therefore, in order to maintain an already low profit margin, the impact on the price of DAP for Cargill would be approximately \$3.70/ton produced. Although this is only a 2 percent increase in the price of the product, it represents a decrease of about a 40 percent in pretax profits for these products. As noted by EPA in 1979, an impact of 20 percent or more upon pretax profits was found to be adverse to the industry. Therefore, requiring Cargill to impose add-on SO<sub>2</sub> control equipment at considerable annual cost would be unreasonable.

Moreover, no H<sub>2</sub>SO<sub>4</sub> plant in Florida is known to have been required to use add-on control equipment to control SO<sub>2</sub> emissions. All plants employ the double adsorption technology for SO<sub>2</sub> control. All previous BACT determinations for SO<sub>2</sub> for H<sub>2</sub>SO<sub>4</sub> plants in Florida have specified double adsorption as the control technology.

Cargill is proposing to increase allowable SO<sub>2</sub> emissions by only 700 TPY. This is a relatively small increase compared to recent increases approved for three other phosphate manufacturers. To require Cargill to implement add-on SO<sub>2</sub> controls when no other plant has been required to do

so would not be consistent with other BACT determinations, and would impact Cargill severely, as described above. This would place Cargill at a severe economic disadvantage.

For the reasons described above, the three wet scrubber options are considered economically infeasible for the proposed Cargill project. The double adsorption technology currently employed by the Cargill Bartow  $\text{H}_2\text{SO}_4$  plants represents BACT for  $\text{SO}_2$ .

#### **5.1.4 SUMMARY**

In summary, the current double absorption  $\text{H}_2\text{SO}_4$  plants with allowable emissions of 4.0 lb/ton for  $\text{SO}_2$  is considered to be BACT for the following reasons:

1. The adverse and unreasonable economic impact of alternative  $\text{SO}_2$  control technologies;
2. The variability in day-to-day emissions due to process variables and performance; and
3. Emission levels already close to the allowable levels, and the potential for higher emissions at the increased operating rates.

## **5.2 $\text{H}_2\text{SO}_4$ MIST**

### **5.2.1 PROPOSED $\text{H}_2\text{SO}_4$ MIST BACT**

The Cargill Bartow  $\text{H}_2\text{SO}_4$  plants are currently equipped with high efficiency mist eliminators to control  $\text{H}_2\text{SO}_4$  mist emissions. Current emission limits are 0.15 lb/ton for  $\text{H}_2\text{SO}_4$  mist based upon the NSPS. The proposed BACT emission level for  $\text{H}_2\text{SO}_4$  mist is the current allowable for the units of 0.15 lb/ton.

All  $\text{H}_2\text{SO}_4$  plants operating in the United States in 1979 that were required to meet the NSPS level for  $\text{H}_2\text{SO}_4$  mist of 0.15 lb/ton used high efficiency mist eliminators, primarily of the vertical pad type (MITRE Corp., 1979). Acid mist emissions are primarily related to moisture levels in the sulfur feedstock and in the air fed to the furnace, and the efficiency of the mist eliminator. Since the Cargill  $\text{H}_2\text{SO}_4$  plants currently use high efficiency mist eliminators, and this technology is considered to be the state-of-the-art control, it is proposed as BACT for  $\text{H}_2\text{SO}_4$  mist emissions. The EPA NSPS review study (MITRE Corp., 1979) identified these types of mist eliminators as the best demonstrated control technology for  $\text{H}_2\text{SO}_4$  emissions. In addition, FDEP previously determined this technology as BACT for previous  $\text{H}_2\text{SO}_4$  expansions permitted in Florida.

H<sub>2</sub>SO<sub>4</sub> mist source test data from the Bartow plants operating near their current permitted rates are presented in Table 5-5. Review of the source test data presented in Table 5-5 shows that past H<sub>2</sub>SO<sub>4</sub> mist compliance test values have ranged from 0.016 lb/ton to 0.098 lb/ton. Individual tests have been as high as 0.217 lb/ton, above the 0.15 lb/ton limit. These data indicate that emissions can fluctuate significantly, due to the factors discussed previously for SO<sub>2</sub>, and can range up to the 0.15 lb/ton current allowable limit. Based on the compliance test data, no reduction in the current allowable level is justified for the No. 9 H<sub>2</sub>SO<sub>4</sub> plant.

### **5.2.2 ALTERNATIVE H<sub>2</sub>SO<sub>4</sub> MIST CONTROL TECHNOLOGIES**

EPA's review of the H<sub>2</sub>SO<sub>4</sub> plant NSPS (MITRE Corp., 1979) identified three types of fiber mist eliminators and an electrostatic precipitator (ESP) as control techniques for controlling H<sub>2</sub>SO<sub>4</sub> mist emissions from H<sub>2</sub>SO<sub>4</sub> plants. EPA chose the fiber mist eliminator as the best demonstrated technology for the following reasons:

1. No evidence exists that any new H<sub>2</sub>SO<sub>4</sub> plants have installed ESPs to control mist emissions.
2. ESPs require a relatively large space for erection.
3. ESPs would have high capital and installation costs, as well as high operating costs as a result of high maintenance due to the acid environment in which the ESP would operate.

The three types of fiber mist eliminators identified as applicable to H<sub>2</sub>SO<sub>4</sub> plants are the vertical tube, the vertical panel, and the horizontal pad filters. Source test data in the EPA review indicated that all types can meet the NSPS level of 0.15 lb/ton, and no one type is superior to the others. Since these types of filters are currently in use on the Bartow H<sub>2</sub>SO<sub>4</sub> plant, it is concluded that the alternative mist eliminators cannot achieve a degree of H<sub>2</sub>SO<sub>4</sub> mist reduction that is significantly better than is now being achieved.

Previous BACT determinations for H<sub>2</sub>SO<sub>4</sub> plants throughout the U.S. are summarized in Table 5-2. This information was obtained from the EPA's BACT/LAER Clearinghouse. The data show that all BACT determinations for H<sub>2</sub>SO<sub>4</sub> plants constructed or modified since 1980 have resulted in allowable H<sub>2</sub>SO<sub>4</sub> mist emission rates equivalent to the NSPS of 0.15 lb/ton. Based upon these considerations, the selected BACT for control of H<sub>2</sub>SO<sub>4</sub> mist emissions is the currently operating, high efficiency mist eliminators to control mist emissions to 0.15 lb/ton.

Table 5-5. Summary of Recent H<sub>2</sub>SO<sub>4</sub> Emission Test Results, Cargill Bartow

Date	Average Production Rate <sup>a</sup> (tons/hr)	(lb/hr)		(lb/ton)	
		Average	Maximum	Average	Maximum
<u>No. 4 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
01/21/93	89.6	6.01	7.17	0.070	0.080
10/15/93	86.9	8.53	18.87	0.098	0.217
10/27/94	92.5	3.82	4.94	0.041	0.053
02/08/95	90.7	3.20	3.24	0.035	0.035
<u>No. 5 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
10/16/93	81.6	7.00	15.24	0.086	0.187
08/11/94	92.0	3.87	4.37	0.042	0.048
02/15/95	90.8	2.10	2.42	0.023	0.026
<u>No. 6 H<sub>2</sub>SO<sub>4</sub> Plant</u>					
10/28/93	84.4	8.04	9.40	0.095	0.111
08/25/94	91.0	1.47	1.87	0.016	0.020
03/02/95	86.2	2.75	3.42	0.031	0.040
Allowable Rate		14.3		0.15	

Note: H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
 lb/hr = pounds per hour.  
 lb/ton = pounds per ton.  
 SO<sub>2</sub> = sulfur dioxide.  
 tons/hr = tons per hour.

<sup>a</sup> As 100 percent sulfuric acid.

Source: KBN, 1995.

The proposed Cargill H<sub>2</sub>SO<sub>4</sub> expansion will increase allowable H<sub>2</sub>SO<sub>4</sub> mist emissions by 6.0 lb/hr. This will result in only a 14 percent increase over the current allowable H<sub>2</sub>SO<sub>4</sub> emissions of 42.8 lb/hr. A lower BACT emission limit would not result in significant benefits to the environment.

### **5.3 BACT FOR NO<sub>x</sub> EMISSIONS**

H<sub>2</sub>SO<sub>4</sub> plants are known to emit small amounts of NO<sub>x</sub>. Source tests have been conducted on a few operating plants in Florida. There are several source tests which have been conducted on the H<sub>2</sub>SO<sub>4</sub> plants at Bartow. These are summarized in Table 5-6. As shown, the NO<sub>x</sub> emissions are very low, averaging about 0.10 lb/ton 100 percent H<sub>2</sub>SO<sub>4</sub> produced and about 10 lb/hr for each plant. The current emission limits for NO<sub>x</sub> are 11.4 lb/hr per plant, and 0.12 lb/ton. This limit has been met, but with little or no margin.

It is believed that the present application represents the first BACT analysis performed for NO<sub>x</sub> emissions from a H<sub>2</sub>SO<sub>4</sub> plant. No BACT determinations for NO<sub>x</sub> were found in the BACT Clearinghouse information.

The low NO<sub>x</sub> emissions from Cargill Bartow's sulfuric acid plants are the result of the low combustion temperatures in the sulfur burning system. The low NO<sub>x</sub> emissions demonstrate that the sulfuric acid plants are not significant sources of NO<sub>x</sub>. Due to the already low NO<sub>x</sub> emissions, it would not be economically feasible for add-on retrofit NO<sub>x</sub> control technologies. A selective non-catalytic reduction (SNCR) system would have a capital cost of approximately \$2.5 million and an annual operating cost of \$1 million per year for each plant. If this system controlled all of the NO<sub>x</sub> emissions (71.2 TPY @ 0.15 lb/ton), the cost effectiveness of this system would be over \$14,000/ton of NO<sub>x</sub> removed. A flue gas recirculation system would have an annual operating cost of roughly \$300,000 per year per plant and a cost effectiveness of over \$20,000/ton, assuming 20 percent NO<sub>x</sub> reduction.

Based on the above considerations, the proposed BACT for the Cargill Bartow plant is the low-NO<sub>x</sub>-emitting combustion system inherent in the Bartow H<sub>2</sub>SO<sub>4</sub> plants.

Table 5-6. Summary of Recent NO<sub>x</sub> Emission Test Results, Cargill Fertilizer, Bartow, FL

Date	Average	NO <sub>x</sub> (lb/hr)		NO <sub>x</sub> (lb/ton) <sup>a</sup>	
	Production Rate <sup>a</sup> (tons/hr)	Average	Maximum	Average	Maximum
#4 H <sub>2</sub> SO <sub>4</sub> Plant					
10/07/93	86.9	9.4	9.5	0.11	0.11
10/27/94	92.5	11.03	11.44	0.119	0.124
02/08/95	90.7	5.3	5.89	0.06	0.06
#5 H <sub>2</sub> SO <sub>4</sub> Plant					
10/14/93	81.6	8.1	8.2	0.10	0.10
08/11/94	92.0	9.05	9.32	0.10	0.10
02/15/95	90.8	9.1	11.01	0.10	0.12
#6 H <sub>2</sub> SO <sub>4</sub> Plant					
10/28/93	84.4	8.3	8.4	0.09	0.10
08/25/94	91.0	9.78	9.82	0.11	0.11
03/02/95	86.2	9.03	9.19	0.10	0.11
Allowable Rates		11.4		0.12	

Note: H<sub>2</sub>SO<sub>4</sub> = Sulfuric Acid  
 lb/hr = pounds per hour  
 lb/ton = pounds per ton  
 NO<sub>x</sub> = nitrogen oxides  
 tons/hr = tons per hour

<sup>a</sup> As 100% sulfuric acid

<sup>b</sup> Calculated as [Average + (1.96 x Std. dev.)]

Source: KBN, 1995.

Since no control equipment or special operating practices are required to achieve the low NO<sub>x</sub> levels, setting a NO<sub>x</sub> emission limit for these plants is not considered necessary. As a result, it is requested that a NO<sub>x</sub> emission limit not be established for the plants.

## **6.0 AIR QUALITY MODELING APPROACH**

### **6.1 GENERAL MODELING APPROACH**

#### **6.1.1 SIGNIFICANT IMPACT ANALYSIS**

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For all criteria pollutants that are emitted in excess of the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the emission increase(s) alone will result in predicted impacts in excess of the EPA/FDEP significant impact levels. If the project's impacts are above the significant impact levels, then a more detailed modeling analysis is performed. Current FDEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. If screening analysis indicates that maximum predicted concentrations are within 75 percent of the significant impact levels, modeling refinements are performed.

#### **6.1.2 AAQS/PSD MODELING ANALYSIS**

For all pollutants that have a significant impact, a full impact analysis is required. In general, when 5 years of meteorological data are used, the highest annual and the highest, second-highest (HSH) short-term concentrations are to be compared to the applicable AAQS and allowable PSD increments. The HSH is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with air quality standards and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two phases is the density of the receptor grid spacing employed when predicting concentrations. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record.

If the original screening analysis indicates that the highest concentrations are occurring in a selected area(s) of the grid and the area's total coverage is too vast to directly apply a refined receptor grid, then an additional screening grid(s) will be used over that area. The additional screening grid(s) will employ a greater receptor density than the original screening grid, so refinements can be performed if necessary.

Refinements of the maximum predicted concentrations are typically performed for the receptors of the screening receptor grid at which the highest and/or HSH concentrations occurred over the 5-year period. Generally, if the maximum concentration from other years in the screening analysis are within 10 percent of the overall maximum concentration, those other concentrations are refined as well. Typically, if the highest and HSH concentrations are in different locations, concentrations in both areas are refined.

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor to be refined. The angular spacing between radials is generally 2 degrees and the radial distance interval between receptors is 100 m. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2-degree angular interval and centered on the screening receptor. The angular spacing for refinements can change depending upon the distance being modeled. For far distances, a 1-degree spacing could be used. For very close distances, a 10-degree spacing may be adequate. The domain of the refinement grid typically extends to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to ensure that a valid HSH concentration is obtained. A more detailed description of the model used, along with the emission inventory, meteorological data, and screening receptor grids used in the analysis, are presented in the following sections.

### **6.1.3 MODEL SELECTION**

The selection of an appropriate air dispersion model was based on the model's ability to simulate impacts in areas surrounding the Cargill site. Within 50 km of the site, the terrain can be described as simple, i.e., flat to gently rolling. As defined in EPA modeling guidelines, simple terrain is considered to be an area where the terrain features are all lower in elevation than the top

of the stack(s) under evaluation. Therefore, a simple terrain model was selected to predict maximum ground-level concentrations.

The Industrial Source Complex Short-term (ISCST2, Version 3109) dispersion model (EPA, 1992b) was used to evaluate the pollutant emissions from the proposed facility and other existing major facilities. This model is available from EPA's Technical Transfer Network (TTN) Bulletin Board Service (BBS). The ISCST2 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. The ISCST2 model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The hourly concentrations are processed into non-overlapping, short-term and annual averaging periods. For example, a 24-hour average concentration is based on 24 1-hour averages calculated from midnight to midnight of each day. For each short-term averaging period selected, the highest and second-highest average concentrations are calculated for each receptor. As an option, a table of the 50 highest concentrations over the entire field of receptors can be produced.

Major features of the ISCST2 model are presented in Table 6-1. The ISCST2 model has both rural and urban mode options which affect the wind speed profile exponent law, dispersion rates, and mixing-height formulations used in calculating ground level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the source's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3-km radius circle centered on the site location, the urban option should be selected. Otherwise, the rural option is more appropriate.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The regulatory default options include:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural or urban option,
5. Default vertical potential temperature gradients,
6. Calm wind processing, and

Table 6-1. Major Features of the ISCST2 Model

ISCST2 Model Features
<ul style="list-style-type: none"> <li>• Polar or Cartesian coordinate systems for receptor locations</li> <li>• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations</li> <li>• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1973, and 1975)</li> <li>• Procedures suggested by Huber and Snyder (1976) and Huber (1977) for evaluating building wake effects</li> <li>• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash</li> <li>• Separation of multiple point sources</li> <li>• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations</li> <li>• Capability of simulating point, line, volume and area sources</li> <li>• Capability to calculate dry deposition</li> <li>• Variation of wind speed with height (wind speed-profile exponent law)</li> <li>• Concentration estimates for 1-hour to annual average times</li> <li>• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm</li> <li>• Consideration of time-dependent exponential decay of pollutants</li> <li>• The method of Pasquill (1976) to account for buoyancy-induced dispersion</li> <li>• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)</li> <li>• Procedure for calm-wind processing</li> <li>• Wind speeds less than 1 m/s are set to 1 m/s.</li> </ul>

Note: ISCST2 = Industrial Source Complex Short-Term.

Source: EPA, 1992b.

7. Reducing calculated  $\text{SO}_2$  concentrations in urban areas by using a decay half-life of 4 hours.

#### **6.1.4 METEOROLOGICAL DATA**

Meteorological data used in the ISCST2 model to determine air quality impacts 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 and Ruskin, respectively. The 5-year period of meteorological data was from 1982 through 1986. The NWS station at Tampa International Airport, located approximately 61 km west of the Cargill plant site, was selected for use in the study because it is the closest primary weather station to the study area which is representative of the plant site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

The wind speed, cloud cover, and cloud ceiling values were used in the ISCST2 meteorological preprocessor program, RAMMET, to determine atmospheric stability using the Turner stability scheme. Based on the temperature measurements at morning and afternoon, mixing heights were calculated with the radiosonde data using the Holzworth approach (1972). Hourly mixing heights were derived from the morning and afternoon mixing heights using the interpolation method developed by EPA (Holzworth, 1972). The hourly surface data and mixing heights were used to develop a sequential series of hourly meteorological data (i.e., wind direction, wind speed, temperature, stability, and mixing heights). Because the observed hourly wind directions were classified into one of 36 10-degree sectors, the wind directions were randomized within each sector to account for the expected variability in air flow.

## **6.2 EMISSION INVENTORY**

### **6.2.1 CARGILL FACILITY**

The Cargill  $\text{SO}_2$  emission inventory is presented in Table 6-2. Stack data for the Cargill sources were obtained from current operating permits and stack test data.  $\text{SO}_2$  emissions for all Cargill sources were developed using data from current permits and AP-42 emission factors (refer to Appendix A). Operating data for the  $\text{H}_2\text{SO}_4$  plants was derived by taking the average of the last 2 years of stack test data and prorating it based on the proposed production rate increase. The pollutants that are to undergo PSD review are  $\text{SO}_2$ ,  $\text{NO}_x$ , and  $\text{H}_2\text{SO}_4$  mist.

Table 6-2. Summary of Cargill Bartow SO<sub>2</sub> Sources Used for the Modeling Analysis

Sources	SO <sub>2</sub> Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	<u>Stack Location<sup>a</sup></u>	
						X (m)	Y (m)
<u>Proposed Sources</u>							
DAP 4	12.66	42.7	3.33	16.27	328.7	0	0
DAP 3	6.56	30.5	2.29	12.30	341.5	308	147
AUXBLR	21.03	9.4	1.07	12.67	505.4	298	315
H <sub>2</sub> SO <sub>4</sub> 4	54.60	61.0	2.06	18.45	343.2	252	224
H <sub>2</sub> SO <sub>4</sub> 5	54.60	61.0	2.06	18.45	343.2	182	358
H <sub>2</sub> SO <sub>4</sub> 6	54.60	61.0	2.06	18.45	343.2	217	477
<u>Baseline Sources</u>							
Rock Dryer	-39.41	15.24	2.04	17.32	327	274	-914
H <sub>2</sub> SO <sub>4</sub> 1 and 2	-216.0	45.72	1.37	16.50	352	322	329
H <sub>2</sub> SO <sub>4</sub> 3	-52.50	45.72	1.52	16.70	311	322	329

Note: g/s = grams per second.  
H<sub>2</sub>SO<sub>4</sub> = sulfuric acid.  
K = Kelvin.  
m = meter.  
m/s = meters per second.  
SO<sub>2</sub> = sulfur dioxide.

<sup>a</sup> Relative to grid center located at the DAP No. 4 stack location.

Source: KBN, 1995.

In order to determine the SO<sub>2</sub> and NO<sub>x</sub> significant impact areas, the current and future operating conditions of the H<sub>2</sub>SO<sub>4</sub> plants were modeled to determine the net air quality change due to the proposed expansion. The modeled SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions rates are shown in Table 2-1, and stack parameters are shown in Table 2-2. The modeled emissions for NO<sub>x</sub> are presented in Table 3-3.

Modeling of the existing and future H<sub>2</sub>SO<sub>4</sub> plants for SO<sub>2</sub> demonstrated that the proposed expansion would have a significant impact at a distance out to 15.0 km from the Cargill facility based on the annual emissions increase for SO<sub>2</sub>. Therefore, the significant impact area is established as 15.0 km.

Modeling of the existing and future H<sub>2</sub>SO<sub>4</sub> plants for NO<sub>x</sub> demonstrated the proposed expansion will be below the significant impact levels in both Class I and Class II areas. Therefore, further modeling analysis for NO<sub>x</sub> is not required.

No significance levels have been established for H<sub>2</sub>SO<sub>4</sub> mist. The maximum H<sub>2</sub>SO<sub>4</sub> mist impacts due to the H<sub>2</sub>SO<sub>4</sub> plants in the vicinity of the plant will be compared with the FDEP Ambient Reference Concentrations (ARC) for H<sub>2</sub>SO<sub>4</sub> mist.

#### **6.2.2 AAQS AND PSD CLASS II EMISSION INVENTORIES**

All major SO<sub>2</sub> sources located within 70 km of Cargill were identified and are presented in Table 6-3. The inventory data were based on information developed for the PSD permit application for Seminole Electric Cooperative, Inc. (SECI) Hardee Unit 3 plant, data obtained from the Florida Air Pollutant Information System (APIS) and the Hillsborough County Environmental Protection Commission, and the previous air quality impact assessment prepared for the Cargill Riverview plant (KBN, 1993).

The FDEP has recommended a technique for eliminating sources in the modeling analyses if the source's emissions do not meet an emission criteria. The technique is the "Screening Threshold" method, developed by the North Carolina Department of Natural Resources and Community Development, and approved by the EPA. The method is designed to objectively eliminate from the emission inventory those sources which are not likely to have a significant interaction with the source undergoing evaluation. In general, sources that should be considered in the modeling

Table 6–3. SO<sub>2</sub> Screening Analysis for the AAQS and PSD Class II Inventories for the proposed Cargill Bartow H<sub>2</sub>SO<sub>4</sub> Plant Modification

Facility Name	Relative Coordinates to Cargil Bartow (km)		Distance to Facility (km)	Direction (degrees)	Screening Emission Threshold (TPY) <sup>a</sup>	Maximum Allowable Emissions (TPY)	Included in AAQS and/or PSD Class II Modeling Analysis?	
	X	Y						
40TPA530046	Cargill/Seminole Fertilizer Bartow <sup>b</sup>	0.0	0.0	0.0	360	SIA	5177	YES
40TPA530048	Mulberry Phosphates(Royster) <sup>b</sup>	-2.8	-1.6	3.2	240	SIA	2013	YES
40TPA530146	Pavex Corporation	3.5	-0.6	3.6	100	SIA	75	YES
40TPA530050	US Agri-Chem Bartow	3.7	-0.5	3.7	98	SIA	-1579	YES
40TPA530052	CF Industries Bartow, Bonnie Mine Rd. <sup>b</sup>	-1.1	-4.4	4.5	194	SIA	464	YES
40TPA530053	Farmland Industries Green Bay <sup>b</sup>	0.0	-7.3	7.3	180	SIA	4087	YES
NA	Mulberry Cogeneration <sup>b</sup>	4.1	-6.2	7.4	147	SIA	464	YES
40TPA530182	Geologic Recovery	-7.7	-1.0	7.8	263	SIA	98	YES
40TPA530027	IMC-Agrico Company (Noralyn Mine)	5.2	-6.5	8.3	141	SIA	505	YES
40TPA530060	Mobile Electrophosphate	-3.9	-7.4	8.4	208	SIA	-1441	YES
NA	IMC - Agrico Pierce	-5.4	-7.8	9.5	215	SIA	-1645	YES
40TPA530045	Orange Co.	9.2	-3.2	9.7	109	SIA	26	YES
40TPA530047	Mobil Mining - Nichols <sup>b</sup>	-11.1	-1.5	11.2	262	SIA	2304	YES
40TPA530057	IMC Agrico/Conserve <sup>b</sup>	-11.1	-2.6	11.4	257	SIA	1593	YES
40TPA530100	Schering Berlin Polymers, Inc.	1.2	12.1	12.2	6	SIA	50	YES
NA	Estech/Swift Polk	2.0	-12.6	12.8	171	SIA	-4853	YES
NA	FPC Polk County <sup>b</sup>	4.8	-12.9	13.8	160	SIA	859	YES
40TPA530059	IMC Agrico Chem - New Wales <sup>b</sup>	-12.9	-7.9	15.1	239	3	13921	YES
40TPA530055	IMC-Agrico Chem - S. Pierce <sup>b</sup>	-2.0	-15.5	15.6	187	13	4377	YES
40TPA530003	Lakeland City Power Larsen <sup>b</sup>	-0.3	15.9	16.0	359	19	5024	YES
40TPA530009	Florida Tile Industries	-4.1	15.6	16.1	345	23	2	YES
40TPA530095	Lakeland Regional Medical Center	-3.1	17.5	17.8	350	55	160	YES
40TPA530080	Imperial Phosphate (Brewer)	-4.7	-17.3	17.9	195	-41	-669	YES
NA	Panda Kathleen <sup>b</sup>	-10.8	14.6	18.2	324	63	25	YES
40TPA530015	Florida Juice Partners, Ltd.	-10.5	15.0	18.3	325	66	2	YES
40TPA530051	US Agri-Chemicals Corporation <sup>b</sup>	6.5	-17.8	18.9	160	79	3229	YES
40TPA530004	Lakeland City Power McIntosh <sup>b</sup>	-1.0	19.0	19.0	357	81	30567	YES
40TPA530082	Macasphalt Winter Haven	13.6	14.7	20.0	43	101	48	YES
40TPA530233	Teco Polk Power <sup>b</sup>	-7.0	-19.45	20.5	199	111	2010	YES
40TPA530023	Coca Cola	12.1	16.9	20.8	36	116	709	YES
40TPA530007	Owens - Brockway	13.9	16.0	21.2	41	24	120	YES
40TPA530037	SFE Processing	12.2	17.4	21.3	35	25	188	YES
40HIL290102	Mobil Mining - Big Four Mine <sup>b</sup>	-14.7	-19.1	24.1	218	82	589	YES
40HIL290249	Alumax Extrusions	-23.9	10.2	26.0	293	120	30	NO
NA	SECI Hardee (50 % I) <sup>b</sup>	-4.6	-29.4	29.8	189	195	219	YES
40TPA250015	TECO Hardee <sup>b</sup>	-4.6	-29.7	30.1	189	201	219	YES
40TPA530002	Citrus World, Inc.	31.6	0.5	31.6	89	232	280	YES
40HIL290005	CF Industries, Inc. Zephyrhills <sup>b</sup>	-21.5	29.2	36.3	324	325	9036	YES
40TPA250009	City of Wauchula	8.9	-39.8	40.8	167	416	180	NO
40HIL290076	Delta Asphalt	-37.4	18.6	41.8	296	435	51	NO
40TPA530001	Alcoma Packing	42.1	-1.3	42.1	92	442	327	NO
40TPA530061	Holly Hill Fruit Product	31.5	28.6	42.5	48	451	69	NO
40TPA530019	Cargill Citro - America	38.4	-18.5	42.6	116	452	223	NO
40TPA530014	Standard Sand & Silica	32.0	31.4	44.8	46	497	288	NO
40HIL290057	Gulf Coast Lead	-45.5	6.7	46.0	278	520	1498	YES
40HIL290008	Cargill Riverview <sup>b</sup>	-46.1	-4.4	46.3	265	526	5767	YES
40HIL290070	Weyhaeuser CO	-46.7	11.5	48.1	284	562	21	NO
40HIL290012	Couch Construction Company	-47.4	9.9	48.4	282	568	59	NO

Table 6–3. SO<sub>2</sub> Screening Analysis for the AAQS and PSD Class II Inventories for the proposed Cargill Bartow H<sub>2</sub>SO<sub>4</sub> Plant Modification

Facility Name		Relative Coordinates to Cargil Bartow (km)		Distance to Facility (km)	Direction (degrees)	Screening Emission Threshold (TPY) <sup>a</sup>	Maximum Allowable Emissions (TPY)	Included in AAQS and/or PSD Class II Modeling Analysis?
		X	Y					
40HIL290039	TECO – Big Bend <sup>b</sup>	-47.6	-11.8	49.0	256	581	237854	YES
40HIL290040	TECO – Gannon	-49.5	0.7	49.5	271	590	93265	YES
40HIL290127	Tampa City McKay Bay Refuse – To – Energy <sup>b</sup>	-49.5	5.1	49.8	276	595	745	YES
40HIL290082	Sulpher Terminals Co. Inc.	-51.5	3.2	51.6	274	632	103	NO
40HIL290038	TECO – Hookers Point	-51.5	4.2	51.7	275	633	13524	YES
40HIL290018	Lafarge Corp.	-51.8	3.8	51.9	274	639	20293	YES
40HIL290083	Amoco Oil	-51.7	5.2	52.0	276	639	46	NO
40MAN410010	FPL Manatee	-42.3	-32.7	53.5	232	669	83351	YES
30ORL490014	FPC Osceola <sup>b</sup>	36.8	39.2	53.8	43	675	16945	YES
52FTM280012	Macasphalt Avon Park	41.6	-36.8	55.5	131	711	100	NO
40TPA510002	Lykes Pasco Co.	-26.0	52.4	58.5	334	770	2042	YES
40HIL290099	Sulfuric Acid Trading Company	-60.5	-5.3	60.7	265	815	156	NO
30ORL490032	Southern Soil Services, Inc.	46.0	40.3	61.2	49	823	44	NO
30ORL480109	Reedy Creek Energy Services, Inc. EPCOT <sup>b</sup>	32.5	52.2	61.5	32	830	28	NO
40HIL290028	Gold Bond Building Products	-62.2	-4.1	62.3	266	847	308	NO
52FTM280004	Tampa Electric Company Sebring	47.3	-44.3	64.8	133	896	100	NO
30ORL490001	Kissimmee Utility Authority <sup>b</sup>	50.6	42.5	66.1	50	922	1482	YES
40PNL520011	FPC Bartow	-67.1	-4.2	67.2	266	945	62618	YES

## Notes:

All facilities with a total maximum allowable SO<sub>2</sub> emissions of more than 2 TPY within the SIA distance and more than 20 TPY from 20 to 70 km of the facility are included in the screening analysis.

<sup>a</sup> Screening emissions threshold is 20 x (Distance to facility – 20), based on North Carolina Screening Method.

A significant impact distance of 20 km was assumed in order to include additional facilities into the inventory.

<sup>b</sup> indicates PSD sources at this facility

analyses are those with emissions greater than Q (in TPY) which is calculated by the following criteria:

$$Q = 20 \times D$$

where D is:

1. the distance (km) from Cargill to the source undergoing evaluation for short-term analysis, or
2. the distance (km) from the edge of Cargill's significant impact area (15 km) to the source undergoing evaluation for long-term analysis.

For this analysis the long-term criteria was used since less sources would be eliminated than with the short-term criteria and would thus result in a more conservative approach.

A listing of the sources in the inventory, along with associated maximum allowable emissions, distance from Cargill, and associated Q, are presented in Table 6-3. Those sources with maximum allowable SO<sub>2</sub> emissions which are below the calculated "screening threshold" emissions were eliminated from further consideration in the modeling analysis.

Sources located more than 65 km from Cargill were not considered in the screening analysis. However, the Kissimmee Utility Authority and Florida Power Corporation (FPC) Bartow facilities were included in the screening analysis since they are substantial SO<sub>2</sub> emitters and are located at distances of 66.1 and 67.2 km, respectively, from Cargill. The total SO<sub>2</sub> source emissions considered for this modeling analysis is as follows.

	<u>TPY</u>
All Sources Within 65 km	684,445
Kissimmee Utility Authority and FPC Bartow	<u>50,239</u>
Total All Sources	734,684
Source Emissions Included	732,502
Percent of Total Emissions Included in Modeling Analysis	99.70

Sources with similar stack heights and stack parameters were combined and treated as one stack to reduce computation time. The individual emissions, stack, and operating parameters for the background sources considered in the screening and refined analysis are presented in Appendix C, Table C-1.

One background source, whose data were obtained from APIS, was further analyzed because preliminary air modeling indicated that the source by itself exceeded the AAQS. The source was Mulberry Phosphate's auxiliary steam boiler, APIS ID number 40TPA53004809. Generally, the auxiliary boilers are used only for startup and do not run when the other boilers or  $\text{H}_2\text{SO}_4$  plants are running. A review of the APIS Master Detail sheets for this source indicated that it has a similar heat input rate to the Cargill Bartow plant's own auxiliary steam boiler. The flow rate was then recalculated as 24,000 acfm, producing an exit velocity of 11.34 m/s. The exit gas temperature was assumed to be similar to Cargill auxiliary boiler's exit gas temperature of 505.4 K.

A summary of  $\text{SO}_2$  sources used in the PSD Class II modeling analysis is presented in Appendix C, Table C-2. The inventory includes all PSD increment consuming/expanding sources within 65 km of the Cargill Bartow site. The SECI Hardee Unit 3 PSD Class I source data were the initial basis of the current inventory. Updates to that inventory include source changes from the Cargill - Riverview sulfuric acid plant modification, the recent proposed modification to the original SECI Hardee Unit 3 PSD application, a new PSD source at Panda Kathleen, and updated source information for the Cargill Bartow plant.

### **6.2.3 PSD CLASS I EMISSION INVENTORY**

A summary of  $\text{SO}_2$  sources used in the PSD Class I modeling analysis for the Chassahowitzka NWA is presented in Appendix C, Table C-3. The SECI Hardee Unit 3 PSD Class I inventory was the initial basis of the current inventory. Updates to that inventory include source changes from the Cargill - Riverview sulfuric acid plant modification, the recent proposed modification to the original SECI Hardee Unit 3 PSD application, new PSD sources at Panda Kathleen and GRU, and updated source information for the Cargill Bartow plant.

### **6.3 RECEPTOR LOCATIONS**

#### **6.3.1 SIGNIFICANT IMPACT ANALYSIS**

To determine the SO<sub>2</sub> significant impact area, concentrations were predicted for 216 receptors located in a radial grid centered on H<sub>2</sub>SO<sub>4</sub> No. 4 stack. Receptors were located in "rings" with 36 receptors per ring, spaced at 10° intervals and at distances of 5, 7, 10, 15, 20, and 25 km from the H<sub>2</sub>SO<sub>4</sub> No. 4 stack location. The proposed expansion was determined to be significant out to 15 km from the Cargill site, based on the annual averaging time.

#### **6.3.2 AAQS AND PSD CLASS II IMPACT ASSESSMENT**

A polar receptor grid was used to cover the spatial extent of the proposed project's significant impact area (15 km). The screening grid included 180 regular grid and 146 discrete receptors. The regular grid receptors were located as rings at distances of 5.0, 7.0, 9.0, 12.0, and 15.0 km. Discrete receptors included 36 receptors located on the plant property boundary at 10° intervals, plus 110 additional off-property receptors at distances of 1.5, 2.0, 2.5, 3.0, and 4.0 km from the DAP No. 4 stack to cover the area between the property boundary and the closest regular receptor grid distance (i.e., 5.0 km). The 36 property boundary receptors used for the screening analysis are presented in Table 6-4. All receptor locations are relative to the DAP No. 4 stack location, which is the origin for the AAQS and PSD increment analysis.

#### **6.3.3 CLASS I IMPACT ASSESSMENT**

Maximum SO<sub>2</sub> impacts for the Chassahowitzka NWA were predicted at 13 discrete receptors located along the border of the Class I area. SO<sub>2</sub> and NO<sub>x</sub> impacts for the proposed modification only were also compared to the Class I significance levels recommended by the National Park Service (NPS). A listing of Class I receptors is provided in Table 6-5.

### **6.4 BACKGROUND CONCENTRATIONS**

To estimate total air quality concentrations, a background concentration must be added to the modeling results. The background concentration is considered to be the air quality concentration contributed by sources not included in the modeling evaluation.

The estimation of appropriate background levels for this project was based on existing ambient air quality data. Some of the ambient monitors under consideration are influenced by local SO<sub>2</sub> sources. Since all the major SO<sub>2</sub> sources near the Bartow facility are included in the emission

Table 6-4. Cargill Property Boundary Receptors Used in the Modeling Analysis

Direction (deg)	Distance (m)	Direction (deg)	Distance (m)
10	3760.	190	1158.
20	3941.	200	1212.
30	3344.	210	1313.
40	3780.	220	1481.
50	4789.	230	1761.
60	3789.	240	2256.
70	3065.	250	2092.
80	2925.	260	1996.
90	2758.	270	1966.
100	2629.	280	1996.
110	2100.	290	2092.
120	1460.	300	2270.
130	1265.	310	2566.
140	1179.	320	2706.
150	1137.	330	2393.
160	1131.	340	2627.
170	1160.	350	2507.
180	1142.	360	3703.

Note: Distances are relative to the DAP No. 4 stack location.  
deg = degree.  
m = meter.

Table 6-5. Chassahowitzka Wilderness Area Receptors Used in the Modeling Analysis

UTM Coordinates	
East (km)	North (km)
340.3	3,165.7
340.3	3,167.7
340.3	3,169.8
340.7	3,171.9
342.0	3,174.0
343.0	3,176.2
343.7	3,178.3
342.4	3,180.6
341.1	3,183.4
339.0	3,183.4
336.5	3,183.4
334.0	3,183.4
331.5	3,183.4

inventory, some local source emissions could potentially be accounted for twice in the AAQS analysis. Based on the air quality data analysis, a more appropriate  $\text{SO}_2$  background concentration of  $10 \mu\text{g}/\text{m}^3$  was assumed for the annual, 24-hour, and 3-hour averaging times. This concentration represents the potential contribution to total  $\text{SO}_2$  ambient concentration levels due to sources not included in the modeling analysis. The background concentrations are to be added to maximum predicted annual, HSH 24-hour, and HSH 3-hour concentrations for comparison to the AAQS.

## **6.5 BUILDING DOWNWASH EFFECTS**

The procedures used for addressing the effects of building downwash are those recommended in the ISC Dispersion Model User's Guide. The building height, length, and width are input to the model, which uses these parameters to modify the dispersion parameters. For short stacks (i.e., physical stack height is less than  $H_b + 0.5 L_b$ , where  $H_b$  is the building height and  $L_b$  is the lesser of the building height or projected width), the Schulman and Scire (1980) method is used. The features of the Schulman and Scire method are as follows:

1. Reduced plume rise as a result of initial plume dilution,
2. Enhanced plume spread as a linear function of the effective plume height, and
3. Specification of building dimensions as a function of wind direction.

For cases where the physical stack is greater than  $H_b + 0.5 L_b$  but less than GEP, the Huber-Snyder (1976) method is used. For both downwash algorithms, the ISCST model uses direction-specific building dimensions for  $H_b$  and  $L_b$  for 36 radial directions, with each direction representing a 10-degree sector.

To determine the potential for downwash to occur at the Cargill Bartow facility, the following buildings were analyzed using a plot plan of the site: the No. 3 Fertilizer plant, the No. 4 Fertilizer plant, the auxiliary boiler building, the DAP E-5 storage building, and the shipping building. A summary of these buildings' dimensions is provided in Table 6-6.

The potential for downwash was determined for each 10-degree wind direction sector using a resolution of 1 degree. For each direction, a building structure was determined to be within the zone of influence of a stack if the stack is within  $5L_b$  downwind of the building,  $2L_b$  upwind of the building, or  $0.5L_b$  crosswind of the building. Based on this analysis, direction-specific

**Table 6-6. Dimensions for Buildings Used in the Modeling Analysis for Cargill Bartow Plant**

Building	Building Height (ft)	Building Length (ft)	Building Width (ft)
No. 3 Fertilizer Plant	75	173	150
Auxiliary Boiler Building	20	58	23
E-5 Storage	88	800	207
No. 4 Fertilizer Plant	185	167	140
Shipping Building	143	63	115

Source: KBN, 1995.

building heights and widths for each 10-degree wind direction sector were developed using the EPA's Building Profile Input Program (BPIP, Version 95086) for all affected site sources.

The stacks for sulfuric acid plants (SAP) number 4, 5, and 6 are 200 feet tall. SAP 4 and 5 stacks were determined to be beyond the zone of influence of any building structures at the site. The stack for SAP 6 was determined to be more than 2.5 times the height of the tallest influencing building (i.e., the No. 3 Fertilizer plant). Therefore, SAP 4, 5, and 6 stacks are not affected by building downwash.

## **6.6 MODEL RESULTS**

### **6.6.1 SIGNIFICANT IMPACT ANALYSIS**

#### **SO<sub>2</sub>**

A summary of the maximum SO<sub>2</sub> concentrations predicted for the proposed modification only in the screening analysis is presented in Table 6-7. These results indicate the proposed increase in SO<sub>2</sub> emissions from the H<sub>2</sub>SO<sub>4</sub> plants will result in low ambient impacts. The maximum annual and 24-hour concentrations of 3.39 and 9.5 µg/m<sup>3</sup>, respectively, are above the significance levels of 1 and 5 µg/m<sup>3</sup>, respectively. The 3-hour maximum concentration is 28.9 µg/m<sup>3</sup>, which is above the significance level of 25 µg/m<sup>3</sup>. It was further determined that the significant impact area for the proposed modification extends out approximately 15.0 km from the Cargill facility, based on annual average impacts.

#### **NO<sub>x</sub>**

A summary of the maximum NO<sub>x</sub> concentrations predicted for the proposed modification only in the screening analysis is presented in Table 6-8. The maximum predicted impact of 0.15 µg/m<sup>3</sup> is well below the significant impact level of 1.0 µg/m<sup>3</sup>. Therefore, additional modeling analyses for NO<sub>x</sub> is not required.

### **6.6.2 AAQS ANALYSIS**

Summaries of the maximum predicted annual average, 24-hour, and 3-hour SO<sub>2</sub> concentrations predicted for all sources for the screening analysis are presented in Table 6-9. Based on the screening results, refinements were performed. A summary of the refined modeling analysis is presented in Table 6-10. The maximum predicted annual, 24-hour, and 3-hour SO<sub>2</sub> concentrations are 55, 182, and 537 µg/m<sup>3</sup>. These concentrations are all below the AAQS of

Table 6-7. Maximum Predicted SO<sub>2</sub> Concentrations for the Proposed Project Only - Screening Analysis

Averaging Time	Concentration (µg/m <sup>3</sup> )	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual	3.39	250.	2092.	82123124
	2.61	250.	2092.	83123124
	3.15	240.	2256.	84123124
	2.66	250.	2092.	85123124
	2.59	90.	2758.	86123124
24-Hour High	6.7	240.	2256.	82050324
	6.1	170.	1160.	83052724
	5.9	320.	2706.	84022624
	9.5	120.	5000.	85010424
	5.7	90.	2758.	86081524
24-Hour HSH	4.5	220.	1481.	82080424
	5.8	250.	2092.	83102024
	5.1	280.	2500.	84061624
	4.7	280.	1996.	85082824
	4.6	90.	2758.	86060724
8-Hour High	12.2	240.	2256.	82050316
	15.1	240.	2256.	83101616
	13.6	310.	2566.	84102816
	17.3	120.	5000.	85010416
	13.4	290.	2092.	86111116
8-Hour HSH	11.7	220.	1481.	82080416
	12.9	250.	2092.	83110216
	11.9	250.	2092.	84100716
	12.5	280.	1996.	85082816
	12.9	260.	1996.	86091716
3-Hour High	22.3	260.	1996.	82062409
	24.8	100.	2629.	83110515
	25.9	160.	2000.	84053009
	28.9	80.	2925.	85052409
	25.6	110.	3000.	86081615
3-Hour HSH	20.2	220.	1481.	82011712
	23.5	170.	1160.	83041612
	21.7	280.	1996.	84091815
	20.0	140.	1500.	85092615
	19.8	130.	1265.	86090318

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

<sup>a</sup> All receptor coordinates are reported with respect the DAP #4 stack location.

Table 6-8. Maximum Predicted NO<sub>x</sub> Concentrations for the Proposed Project Only - Screening Analysis

Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ )	Receptor Location*		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual	0.15	250.	2092.	82123124
	0.12	250.	2092.	83123124
	0.14	240.	2256.	84123124
	0.12	250.	2092.	85123124
	0.11	90.	2758.	86123124

Note: YY=Year, MM=Month, DD=Day, HH=Hour.

\* All receptor coordinates are reported with respect the DAP #4 stack location.

Table 6-9. Maximum Predicted SO<sub>2</sub> Concentrations for the AAQS Screening Analysis

Averaging Time	Concentration (µg/m <sup>3</sup> )	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual	44	240.	4000.	82123124
	41	240.	4000.	83123124
	45	240.	4000.	84123124
	44	240.	2500.	85123124
	44	230.	2500.	86123124
HSH 24-Hour	166	240.	4000.	82120824
	147	240.	4000.	83102124
	171	230.	2500.	84062524
	162	80.	2925.	85042824
	151	70.	3065.	86040824
HSH 3-Hour	402	180.	4000.	82061312
	408	190.	4000.	83082312
	413	230.	12000.	84092818
	513	160.	1131.	85011206
	500	160.	1131.	86011512

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

<sup>a</sup> All receptor coordinates are reported with respect the DAP #4 stack location.

Table 6-10. Maximum Predicted SO<sub>2</sub> Concentrations as Compared With AAQS - Refined Analysis

Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ )			Receptor Locations <sup>a</sup>		Period Ending (YYMMDDHH)	Florida AAQS ( $\mu\text{g}/\text{m}^3$ )
	Total	Modeled	Background	Direction (degrees)	Distance (m)		
Annual	55	45	10	241	4,000	82123124	60
	55	45	10	240	4,000	84123124	
	55	45	10	238	2,700	85123124	
24-Hour <sup>b</sup>	179	169	10	240	4,100	82120824	260
	182	172	10	232	2,600	84062524	
	172	162	10	80	2,925	85042824	
3-Hour <sup>b</sup>	537	527	10	162	1,134	85011206	1,300
	510	500	10	160	1,131	86011512	

Note: YY=Year, MM=Month, DD=Day, HH=Hour

<sup>a</sup> Receptors locations are relative to the DAP No. 4 location.

<sup>b</sup> All short-term concentrations are highest, second-highest concentrations.

60, 260, and 1,300  $\mu\text{g}/\text{m}^3$ , respectively. Source contributions to the maximum 24-hour and 3-hour HSH concentrations are provided in Appendix D.

### 6.6.3 PSD CLASS II ANALYSIS

The results of the screening analysis for PSD Class II increment consumption are presented in Table 6-11. Based on the screening modeling results, refinements were performed. A summary of the refined modeling analyses is shown in Table 6-12.

The maximum PSD increment consumption is located in an area approximately 14.5 km southwest of the Cargill plant site. The maximum predicted  $\text{SO}_2$  PSD increment consumption was calculated as -2.1, 37.5, and 237  $\mu\text{g}/\text{m}^3$ , respectively, for the annual, 24-hour, and 3-hour averaging times. These values are well below the allowable Class II PSD increments of 20, 91, and 512  $\mu\text{g}/\text{m}^3$ , respectively, for the annual, 24-hour and 3-hour averaging times. Source contributions to the maximum 24-hour and 3-hour PSD increment consumption are provided in Appendix D.

### 6.6.4 PSD CLASS I ANALYSIS

#### $\text{SO}_2$

Maximum  $\text{SO}_2$  concentrations predicted at the PSD Class I area of the Chassahowitzka NWA for comparison to the NPS recommended Class I significance values are presented in Table 6-13. These concentrations are predicted for the proposed sulfuric acid plant modification only. The maximum predicted impacts are 0.067, 0.36, and 1.53  $\mu\text{g}/\text{m}^3$  for the annual, 24-hour, and 3-hour averaging periods, respectively. These impacts exceed the NPS significance levels for all averaging time periods. Therefore, a more extensive  $\text{SO}_2$  PSD Class I modeling analysis was performed.

#### $\text{NO}_2$

Maximum  $\text{NO}_2$  concentrations due to the proposed  $\text{H}_2\text{SO}_4$  plant modification are presented in Table 6-14. The maximum impact of 0.0029  $\mu\text{g}/\text{m}^3$  is below the NPS recommended significant impact level of 0.025  $\mu\text{g}/\text{m}^3$ . Therefore, a more extensive PSD Class I analysis is not required for this pollutant.

Table 6-11. Maximum Predicted SO<sub>2</sub> PSD Class II Increment Consumption - Screening Analysis

Averaging Time	Concentration (µg/m <sup>3</sup> )	Receptor Location*		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual	-3.2	10.	15000.	82123124
	-4.2	10.	15000.	83123124
	-2.1	340.	15000.	84123124
	-4.6	40.	15000.	85123124
	-5.8	20.	15000.	86123124
24-Hour HSH	21	340.	15000.	82091424
	20	240.	12000.	83110824
	25	230.	15000.	84092924
	25	220.	15000.	85122924
	20	230.	15000.	86011324
3-Hour HSH	100	230.	15000.	82091218
	100	250.	15000.	83030415
	99	250.	15000.	84111109
	112	230.	15000.	85101012
	109	230.	15000.	86101615

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

\* All receptor coordinates are reported with respect to the DAP #4 stack location.

Table 6-12. Maximum Predicted SO<sub>2</sub> Concentrations as Compared with PSD Class II Increments - Refined Analysis

Averaging Time	Concentration (µg/m <sup>3</sup> )	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)	Allowable Increment (µg/m <sup>3</sup> )
		Direction (degrees)	Distance (m)		
Annual	-2.1	340	15000	84123124	20
24-Hour <sup>b</sup>	37.5	236.	14,500	84081324	91
	35.3	232.	14,200	85032324	
3-Hour <sup>b</sup>	217	241.	14,300	85110215	512
	237	237.	14,600	86080112	

Note: YY=Year, MM=Month, DD=Day, HH=Hour

<sup>a</sup> All receptor coordinates are with respect to the DAP #4 stack location.

<sup>b</sup> All short-term concentrations are highest, second-highest concentrations.

Table 6-13. Maximum Predicted SO<sub>2</sub> Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area

Averaging	Concentration	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)	NPS Recommended Significance Levels (µg/m <sup>3</sup> )
		UTM-E	UTM-N		
Annual	0.067	342000.	3174000.	82123124	0.03
	0.051	342000.	3174000.	83123124	
	0.043	340300.	3165700.	84123124	
	0.044	340700.	3171900.	85123124	
	0.063	340300.	3165700.	86123124	
24-Hour High	0.36	342000.	3174000.	82072924	0.07
	0.22	342000.	3174000.	83110724	
	0.19	340700.	3171900.	84041924	
	0.22	340300.	3165700.	85102924	
	0.28	343000.	3176200.	86121024	
3-Hour High	1.53	342000.	3174000.	82062524	0.48
	1.30	342000.	3174000.	83120224	
	1.05	340300.	3165700.	84111909	
	0.97	340300.	3165700.	85052003	
	1.22	343700.	3178300.	86010312	

Note: YY=Year, MM=Month, DD=Day, HH=Hour.

<sup>a</sup> All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

Table 6-14. Maximum Predicted NO<sub>2</sub> Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area

Averaging	Concentration	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)	NPS Recommended Significance Levels (µg/m <sup>3</sup> )
		UTM-E	UTM-N		
Annual	0.0029	342000.	3174000.	82123124	0.025
	0.0022	342000.	3174000.	83123124	
	0.0019	340300.	3165700.	84123124	
	0.0019	340700.	3171900.	85123124	
	0.0027	340300.	3165700.	86123124	

Note: YY=Year, MM=Month, DD=Day, HH=Hour.

<sup>a</sup> All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

### SO<sub>2</sub> Refined Analysis

Maximum increment consumption values predicted at the Class I area are presented in Table 6-15. These impacts are predicted using the inventory presented in Table C-3. The maximum predicted annual, 24-hour, and 3-hour concentrations are -0.28, 6.4, and 26.1  $\mu\text{g}/\text{m}^3$ , respectively. The 24-hour and 3-hour impacts exceed the PSD Class I increment values of 5 and 25  $\mu\text{g}/\text{m}^3$ , respectively. In order to assess the proposed modification's contribution to any predicted PSD Class I violations, an analysis was performed to determine all time periods and receptors at which a violation occurred. Initially, the 24-hour and 3-hour exceedances of the PSD Class I allowable increments of 5 and 25  $\mu\text{g}/\text{m}^3$ , respectively, were determined for each year. Days for which PSD increment violations were predicted were determined. A summary of 24-hour and 3-hour periods for which PSD Class I increment violations were predicted is shown in Table 6-16. The ISCST2 model was run for the proposed project on only those days in which a 24-hour or 3-hour violation occurred. If the proposed project exceeded the NPS significant impact levels on a day for which a violation was predicted, then the receptor location of the violation was compared to the receptor location of the project's NPS exceedance.

Based on the PSD Class I analysis, it was determined that SO<sub>2</sub> impacts from the proposed H<sub>2</sub>SO<sub>4</sub> plant expansion will not contribute significantly to any predicted violation of the allowable PSD Class I increments at the Chassahowitzka Wilderness Area.

ISCST2 printout (i.e., maxfiles) of all 24-hour and 3-hour PSD Class I allowable increment exceedances due to all sources and NPS significant impact level exceedances due to the proposed project are included in Appendix E. The source contributions for the maximum HSH 24-hour and 3-hour PSD Class I increment consumption values are also provided in Appendix D.

#### **6.6.5 H<sub>2</sub>SO<sub>4</sub> MIST ANALYSIS**

FDEP has developed ambient reference concentrations (ARCs) for sulfuric acid mist: 10  $\mu\text{g}/\text{m}^3$ , 8-hour average and 2.4  $\mu\text{g}/\text{m}^3$ , 24-hour average. Based on the allowable H<sub>2</sub>SO<sub>4</sub> emissions from the H<sub>2</sub>SO<sub>4</sub> plants (213.5 TPY), the maximum sulfuric acid mist concentration due to all H<sub>2</sub>SO<sub>4</sub> plants after the expansion is 6.39  $\mu\text{g}/\text{m}^3$ , 8-hour average and 4.02  $\mu\text{g}/\text{m}^3$ , 24-hour average. The 24-hour ARC is exceeded, while the 8-hour ARC is not.

Table 6-15. Maximum Predicted SO<sub>2</sub> PSD Class I Increment Consumption at the Chassahowitzka Wilderness Area

Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ )	Receptor Location <sup>a</sup>		Period Ending (YYMMDDHH)
		UTM-E (m)	UTM-N (m)	
Annual	-0.35	341100.	3183400.	82123124
	-0.56	341100.	3183400.	83123124
	0.26	343700.	3178300.	84123124
	-0.38	340300.	3165700.	85123124
	-0.28	342000.	3174000.	86123124
24-Hour HSH	5.7	340700.	3171900.	82071524
	5.4	340300.	3165700.	83103024
	5.4	342000.	3174000.	84061724
	5.5	340300.	3169800.	85112724
	6.4	343000.	3176200.	86053124
3-Hour HSH	22.0	340300.	3169800.	82011724
	21.5	340300.	3167700.	83081006
	18.4	340300.	3169800.	84071703
	21.1	339000.	3183400.	85110806
	26.1	341100.	3183400.	86111706

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

<sup>a</sup> All receptor coordinates are Universal Transverse Mercator (UTM) Coordinates.

Table 6-16. Predicted 24-Hour and 3-Hour SO<sub>2</sub> PSD Class I Increments Violations

Date Ending		Receptor UTM Location (km)		Predicted Total Impact ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>
Year	Date (MM/DD)	(E)	(N)	
<u>24-Hour</u>				
1982	06/10	340300	3167700	5.02
1982	06/10	340300	3169800	5.38
1982	07/15	340700	3171900	5.66
1982	09/09	340700	3171900	5.27
1983	07/30	340300	3165700	5.12
1983	07/30	340300	3167700	5.06
1983	10/30	340300	3165700	5.39
1984	03/23	340300	3167700	5.19
1984	03/23	340300	3169800	5.08
1984	06/17	342000	3174000	5.40
1985	11/12	340300	3167700	5.48
1985	11/12	340700	3171900	5.14
1985	11/16	340300	3165700	5.54
1985	11/27	340300	3169800	5.55
1986	02/01	340300	3165700	5.72
1986	02/01	340300	3169800	5.45
1986	03/08	343000	3176200	5.11
1986	05/31	343000	3176200	6.36
1986	06/01	340700	3171900	5.32
1986	06/01	342000	3174000	6.15
1986	06/01	343000	3176200	5.56
1986	06/14	340300	3167700	5.08
1986	06/24	340700	3171900	5.16
1986	07/05	342000	3174000	5.43
1986	07/12	339000	3183400	5.07
1986	09/27	340300	3169800	5.37
1986	09/27	340700	3171900	5.24
1986	11/05	340700	3171900	5.55
1986	11/05	342000	3174000	5.17
1986	11/07	340300	3165700	5.25
1986	11/11	343700	3178300	5.13
1986	12/19	342000	3174000	5.20
1986	12/19	343000	3176200	5.68
<u>3-Hour</u>				
1986	11/17 (PD 2)	341100	3183400	26.09

Note: The 24-hour and 3-hour PSD Class I increments are 5 and 25  $\mu\text{g}/\text{m}^3$ , respectively.

<sup>a</sup> Violations predicted by the ISCST2 model were for the 24-hour and 3-hour averaging times only. No annual violations were predicted.

The spatial extent of 24-hour concentrations exceeding the ARC is portrayed graphically in Figure 6-1. As shown, the area exceeding  $2.4 \mu\text{g}/\text{m}^3$  is limited almost entirely to Cargill property. The only significant area of exceedance lying outside of Cargill property is to the southwest of Cargill. In addition, based on the actual  $\text{H}_2\text{SO}_4$  emissions for the last 2 years (55.4 TPY; see Table 3-3), exceedances of the 24-hour ARC are predicted in only a very small area (see Figure 6-2). As a result, no adverse impacts due to  $\text{H}_2\text{SO}_4$  mist emissions from Cargill are expected.



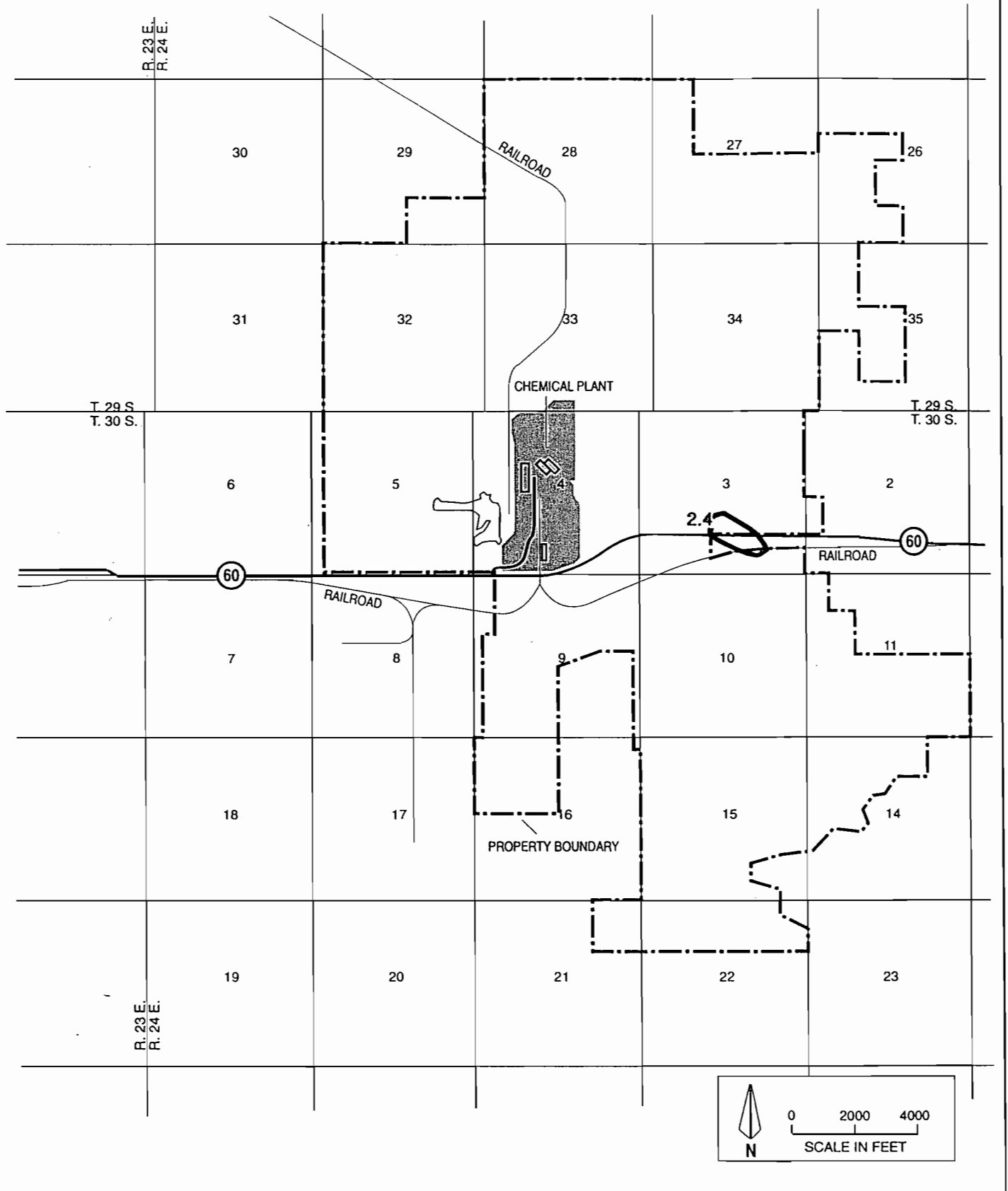


Figure 6-2  
Isopleth of Actual  $\text{H}_2\text{SO}_4$  Mist Impacts

Note: FDEP ARC =  $2.4 \mu\text{g}/\text{m}^3$



## **7.0 ADDITIONAL AIR QUALITY IMPACT ANALYSIS**

### **7.1 VICINITY OF BARTOW PLANT**

SO<sub>2</sub>, NO<sub>x</sub>, and H<sub>2</sub>SO<sub>4</sub> mist are the only compounds of significant consequence which will be emitted from Cargill Bartow H<sub>2</sub>SO<sub>4</sub> facilities. This section addresses the potential impacts of these emissions upon soils, vegetation, and visibility in the vicinity of the Cargill plant, as well as within the Chassahowitzka Class I area.

#### **7.1.1 SOILS**

Many of the soils in the region and most of the soils at the site have been disturbed and altered by phosphate mining and facility development. They are currently mapped as arents-hydraquents-neihurst (U.S. Department of Agriculture, 1990).

These soils will not be affected by SO<sub>2</sub> concentrations resulting from facility emissions, because the underlying substrate is neutral to alkaline and would neutralize any acidifying effects of SO<sub>2</sub> deposition.

The poorly drained sands are already strongly acidic. Normal liming practices currently used on soils in the vicinity of Cargill by agricultural interests will effectively mitigate the small effects of any increased SO<sub>2</sub> deposition resulting from the increased SO<sub>2</sub> emissions from the proposed expansion.

#### **7.1.2 VEGETATION AND WILDLIFE**

The response of vegetation and wildlife to atmospheric pollutants is influenced by the concentration of the pollutant, duration of exposure, and frequency of exposures. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure. The impact of the Cargill H<sub>2</sub>SO<sub>4</sub> facilities on regional vegetation and wildlife was assessed by comparing pollutant doses that are predicted from modeling with threshold doses reported from the scientific literature which could adversely affect plant or animal species typical of those present in the region.

### Sulfur Dioxide

Air pollutants occurring at elevated levels have long been known to potentially cause injury to plants. For SO<sub>2</sub>, acute injury usually develops within a few hours or days of exposure. Symptoms include marginal, flecked, and/or intercostal necrotic areas which appear water-soaked and dullish green initially. This injury generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth and possible tissue necrosis (EPA, 1982a). Background levels of sulfur dioxide range from 2.5 to 25 µg/m<sup>3</sup>. Phytotoxic symptoms demonstrated by plants can occur as low as 88 µg/m<sup>3</sup> (U.S. Department of Health, Education, and Welfare, 1971). However, this occurs with the more primitive plants (i.e., mosses, ferns, lichens).

Many studies have been conducted to determine the effects of high concentration, short-term SO<sub>2</sub> exposure on agronomic and natural community plants. Observed effect levels for several plant species are summarized in Table 7-1. Plants can be grouped into sensitivity levels (Table 7-2). Sensitive plants include ragweed, legumes, blackberry, southern pine, red and black oak, white ash, and sumac. These species can be injured by exposure to 3-hour SO<sub>2</sub> concentrations ranging from 790 to 1,570 µg/m<sup>3</sup>. Intermediate sensitivity plants include maples, locust, sweetgum, cherry, elm, and many crop and garden species. These species can be injured by exposure to 3-hour SO<sub>2</sub> concentrations ranging from 1,570 to 2,100 µg/m<sup>3</sup>. Resistant species (potentially injured at concentrations above 2,100 µg/m<sup>3</sup> for 3 hours) include white oak, potato, cotton, dogwood, and peach (EPA, 1982a). It is important to note that because plants possess metabolisms that can convert SO<sub>2</sub> into cellular constituents, they are capable of recovery when exposed to elevated levels of SO<sub>2</sub> for short periods of time.

The maximum predicted 3-hour SO<sub>2</sub> concentration due to all sources, 537 µg/m<sup>3</sup>, is below the range of SO<sub>2</sub> concentrations reported to affect sensitive vegetative species. The annual and 24-hour SO<sub>2</sub> concentrations predicted within 8 km of the Cargill facility (55 and 182 µg/m<sup>3</sup>, respectively) represent levels that are lower than those known to cause damage to the majority of test species. A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to 1,300 µg/m<sup>3</sup> SO<sub>2</sub> for 8 hours were not visibly damaged. Radish and barley are considered good indicators of SO<sub>2</sub> pollution because of their inherent sensitivities to this gas. When these two plants were exposed to 370 and 310 µg/m<sup>3</sup> SO<sub>2</sub> for 8 hours, respectively, visible damage occurred (EPA, 1982a). By comparison of these

Table 7-1. SO<sub>2</sub> Effects Levels for Various Plant Species

Plant Species	Observed Effect Level ( $\mu\text{g}/\text{m}^3$ )	Exposure (Time)	Reference
Sensitive to tolerant	920 (20 percent displayed visible injury)	3 hours	McLaughlin and Lee, 1974
Lichens	200-400	6 hr/wk for 10 weeks	Hart <i>et al.</i> , 1988
Cypress, slash pine, live oak, mangrove	1,300	8 hours	Woltz and Howe, 1981
Jack pine seedlings	470-520	24 hours	Malhotra and Kahn, 1978
Black oak	1,310	Continuously for 1 week	Carlson, 1979

Table 7-2. Sensitivity Groupings of Vegetation Based on Visible Injury at Different SO<sub>2</sub> Exposures<sup>a</sup>

Sensitivity Grouping	SO <sub>2</sub> Concentration		Plants
	1-Hour	3-Hour	
Sensitive	1,310 - 2,620 $\mu\text{g}/\text{m}^3$ (0.5 - 1.0 ppm)	790 - 1,570 $\mu\text{g}/\text{m}^3$ (0.3 - 0.6 ppm)	Ragweeds Legumes Blackberry Southern pines Red and black oaks White ash Sumacs
Intermediate	2,620 - 5,240 $\mu\text{g}/\text{m}^3$ (1.0 - 2.0 ppm)	1,570 - 2,100 $\mu\text{g}/\text{m}^3$ (0.6 - 0.8 ppm)	Maples Locust Sweetgum Cherry Elms Tuliptree Many crop and garden species
Resistant	> 5,240 $\mu\text{g}/\text{m}^3$ (> 2.0 ppm)	> 2,100 $\mu\text{g}/\text{m}^3$ (> 0.8 ppm)	White oaks Potato Upland cotton Corn Dogwood Peach

<sup>a</sup> Based on observations over a 20-year period of visible injury occurring on over 120 species growing in the vicinities of coal-fired power plants in the southeastern United States.

Source: EPA, 1982a.

levels, it is apparent that the 24-hour total maximum predicted  $\text{SO}_2$  concentration is below the range that could potentially damage  $\text{SO}_2$ -sensitive plants. The predicted  $\text{SO}_2$  concentration will not affect vegetation in the vicinity of the plant.

### **Nitrogen Oxides**

A review of the literature (EPA, 1982b) indicates greater variability in the  $\text{NO}_2$  dose-response relationship in vegetation, and no threshold effect levels are supported. The  $\text{NO}_2$  doses known to adversely affect some animals and plants are shown in Tables 7-3 and 7-4, respectively. The maximum predicted annual average  $\text{NO}_2$  concentration due to the Cargill modification is  $0.15 \mu\text{g}/\text{m}^3$ . The predicted doses of  $\text{NO}_2$  due to the proposed modification are far lower than the doses reported to injure vegetation and animals; therefore, the proposed facility's  $\text{NO}_2$  emissions are not expected to have an adverse effect on vegetation and wildlife.

### **Combined Effects of Sulfur Dioxide and Nitrogen Dioxide**

$\text{SO}_2$  in combination with  $\text{NO}_2$  can cause vegetation effects although the studies are not as extensive as studies on single pollutant effects. Plants show varying sensitivities at various  $\text{SO}_2$  and  $\text{NO}_2$  concentration combinations for various exposure periods. A review of the literature (EPA, 1982b) indicates that a lower visible-injury threshold may occur at 2-hour  $\text{SO}_2$  and  $\text{NO}_2$  exposures of  $1,310 \mu\text{g}/\text{m}^3$  (0.5 ppm) and  $940 \mu\text{g}/\text{m}^3$  (0.5 ppm), respectively. Air dispersion modeling has shown that this threshold exposure condition does not occur.

#### **7.1.3 VISIBILITY IMPACTS**

The existing  $\text{H}_2\text{SO}_4$  plants must currently meet an opacity limitation of 10 percent. This opacity limit is expected to be met after the plant is expanded to greater capacity. This opacity level produces essentially no visible emissions and, therefore, no increase in the visible plume from the  $\text{H}_2\text{SO}_4$  plant's expansion is expected.

Since the Chassahowitzka PSD Class I area is located approximately 105 km to the northeast of the Cargill site, a visibility impact assessment of the Class I area is required. A Level I visibility screening analysis was conducted following the procedures outlined in "Workbook for Estimating Visibility Impairment" (EPA, 1980). The Level-1 screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts higher than expected). The EPA model, VISCREEN, was used for this analysis. Particulate ( $\text{H}_2\text{SO}_4$  mist) and  $\text{NO}_x$  emissions used

Table 7-3. NO<sub>2</sub> Doses Reported to Affect Plant Species Similar to Vegetation in the Region of the Cargill Bartow Facility

Species	Dose and Effect	Reference
Ryegrass	39.5 µg/m <sup>3</sup> for 6 minutes had no effect on shoot weight	Lane and Bell, 1984
Citrus	470 µg/m <sup>3</sup> for 290 days injured trees	Thompson <i>et al.</i> , 1970
Sphagnum	11.7 µg/m <sup>3</sup> averaged over 18 months compared with control of 4.8 µg/m <sup>3</sup> (exceeded 15 µg/m <sup>3</sup> 4 times) reduced growth	Press <i>et al.</i> , 1986

Table 7-4. Examples of Lowest Observed Effect Levels of Air Pollutants

Pollutant	Reported Effect	Concentration ( $\mu\text{g}/\text{m}^3$ )	Exposure
Sulfur Dioxide	Respiratory stress in guinea pigs	427 to 854	1 hour
	Respiratory stress in rats	267	7 hours/day <sup>a</sup> ; 5 day/week for 10 weeks
	Decreased abundance in deer mice	13-157	continually <sup>b</sup> for 5 months
Nitrogen Dioxide	Respiratory stress in mice	1,917	3 hours
	Respiratory stress in guinea pigs	95 to 950	8 hr/day for <sup>a</sup> 122 days

<sup>a</sup> Used to compare as a range between 3-hour and 24-hour averaging times.

<sup>b</sup> Used to compare with annual averaging times.

Source: Adapted from Newman (1980) and Newman and Schreiber (1988)

for the calculations were based upon the total allowable emissions from the Nos. 4, 5, and 6 H<sub>2</sub>SO<sub>4</sub> plants after the expansion (not just the increase in allowables due to the proposed expansion).

Model input and output results are presented in Figure 7-1. As indicated, the maximum visual impacts caused by the H<sub>2</sub>SO<sub>4</sub> plants do not exceed the screening criteria inside or outside the Class I area after the proposed expansion.

#### **7.1.4 ADDITIONAL GROWTH**

Total H<sub>2</sub>SO<sub>4</sub> production capacity for the Cargill plant will increase by 960 tons per day, representing a 14 percent increase in total capacity for this plant. No increase in jobs, payroll, and taxes in the area is expected as a result of these changes. Therefore, no significant growth-related impacts are expected due to the proposed expansion.

### **7.2 AIR QUALITY RELATED VALUES ANALYSIS**

#### **7.2.1 INTRODUCTION**

An air quality-related values (AQRVs) analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka National Wilderness Area (NWA) due to the proposed Cargill Bartow expansion. The AQRV analysis addresses the potential impacts of the pollutants SO<sub>2</sub>, NO<sub>x</sub>, and H<sub>2</sub>SO<sub>4</sub> mist. These are the pollutants for which PSD review is required.

The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.

Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register 1978).

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the Chassahowitzka

Visual Effects Screening Analysis for  
Source: CARGILL BARTOW H2SO4 PLANTS 4,5,AND 6  
Class I Area: CHASSAHOWITZKA NWA

\*\*\* Level-1 Screening \*\*\*  
Input Emissions for

Particulates	213.50	TON/YR
NOx (as NO2)	213.50	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	.00	TON/YR

\*\*\*\* Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	25.00 km
Source-Observer Distance:	105.00 km
Min. Source-Class I Distance:	105.00 km
Max. Source-Class I Distance:	124.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	6
Wind Speed:	1.00 m/s

R E S U L T S

Asterisks (\*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area  
Screening Criteria ARE NOT Exceeded

						Delta E		Contrast	
						=====		=====	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
SKY	10.	84.	105.0	84.	2.00	.035	.05	.000	
SKY	140.	84.	105.0	84.	2.00	.004	.05	-.000	
TERRAIN	10.	84.	105.0	84.	2.00	.002	.05	.000	
TERRAIN	140.	84.	105.0	84.	2.00	.001	.05	.000	

Maximum Visual Impacts OUTSIDE Class I Area  
Screening Criteria ARE NOT Exceeded

						Delta E		Contrast	
						=====		=====	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
SKY	10.	70.	99.8	99.	2.00	.037	.05	.000	
SKY	140.	70.	99.8	99.	2.00	.004	.05	-.000	
TERRAIN	10.	60.	96.0	109.	2.00	.003	.05	.000	
TERRAIN	140.	60.	96.0	109.	2.00	.001	.05	.000	

Figure 7-1  
Level - 1 Visibility Screening Analysis for Cargill No. 4, 5, and 6 H<sub>2</sub>SO<sub>4</sub>  
Plants



NWA, this AQRV analysis evaluated the effects of air quality on general vegetation types and wildlife on the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined as:

- Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass
- Marsh Islands - cabbage palm and eastern red cedar
- Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle
- Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm
- Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto
- Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

A screening approach was used which compared the maximum predicted ambient concentration of air pollutants of concern in the Chassahowitzka NWA with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted which specifically addressed the effects of air contaminants on plant species reported to occur in the NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species which can be used as models. In conducting the assessment, both direct (fumigation) and indirect (soil accumulation/uptake) exposures were considered for flora, and direct exposure (inhalation) was considered for wildlife. Maximum concentrations were predicted using the ISCST model and 5 years of meteorological data, as described in Section 6.0.

### **7.2.2 SULFUR DIOXIDE**

#### **Maximum Impacts Upon Class I Area**

In order to assess the total air quality impacts at the Class I area that can be compared to the reported effects levels, the predicted impacts due to all PSD increment affecting sources were

added to background concentrations applicable to the 3-hour, 24-hour, and annual averaging periods. The background concentrations, available from existing ambient monitoring data, are considered to be representative of impacts from sources not modeled.

In this analysis, ambient data collected during 1991-1993 from a monitoring station (Station No. 0580-003-J02) located about 15 kilometers (km) from the Class I area were used to represent background concentrations (refer to Table 7-5). This is the nearest SO<sub>2</sub> monitoring station to the Class I area. The annual concentration of 4 µg/m<sup>3</sup> and maximum 1-hour, 3-hour, and 24-hour concentrations of 241, 140, and 61 µg/m<sup>3</sup>, respectively, were used to represent background concentrations. Predicted impacts due to all increment affecting sources, as well as total cumulative impacts, are presented in Table 7-6.

#### **Airborne Exposure: Vegetation**

The gaseous concentrations (µg/m<sup>3</sup>) of sulfur dioxide (SO<sub>2</sub>) were used in the determination of impacts on vegetation. These compounds are believed to interact predominantly with foliage and this is considered the major route of entry into plants. In this assessment, 100 percent of the compound of interest was assumed to interact with the vegetation. The maximum SO<sub>2</sub> concentrations predicted for the Class I area for the 1-hour, 3-hour, 8-hour, 24-hour, and annual averaging periods are presented in Table 7-6.

SO<sub>2</sub> gas at elevated levels has long been known to cause injury to plants. Acute SO<sub>2</sub> injury usually develops within a few hours or days of exposure and symptoms include marginal and/or interveinal necrotic areas which appear water-soaked and faded-green initially. This injury generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth and possible tissue necrosis.

Many studies have been conducted to determine the effects of high concentration, short-term SO<sub>2</sub> exposure on natural community vegetation (Tables 7-1 and 7-2). Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. For example, these species are injured by exposure to 3-hour SO<sub>2</sub> concentrations from 790 to 1,570 µg/m<sup>3</sup>. Intermediate plants include locust and sweetgum. These species are injured by exposure to 3-hour SO<sub>2</sub> concentrations from 1,570 to 2,100 µg/m<sup>3</sup>. Resistant species (injured at concentrations above 2,100 µg/m<sup>3</sup> for 3 hours) include white oak and dogwood (Woltz and Howe, 1981).

Table 7-5. Summary of Continuous SO<sub>2</sub> Monitoring Data Collected Near the Chassahowitzka NWA

County	Monitoring Station ID	Monitor Location	Year	Number of Observations	Maximum Concentrations Reported ( $\mu\text{g}/\text{m}^3$ )			
					1-Hour	3-Hour	24-Hour	Annual
Citrus	0580-003-J02	Crystal River; Twin Rivers Marina	1991	7,854	236	137	30	4
			1992	8,304	241	140	61	4
			1993	3,791	189	132	23	4
Citrus	0580-005-J02	Crystal River; East of FPC Plant	1991	8,344	325	296	67	6
			1992	8,228	485	335	51	7
			1993	4,329	328	288	62	8

Table 7-6. Incremental and Cumulative SO<sub>2</sub> Impacts at the Class I Area

Averaging Time	Background SO <sub>2</sub> Concentration <sup>a</sup> (µg/m <sup>3</sup> )	Increase in SO <sub>2</sub> Impacts Due to All Increment Affecting Sources (µg/m <sup>3</sup> )	Cumulative SO <sub>2</sub> Concentration with Proposed Project (µg/m <sup>3</sup> )	Primary/Secondary Ambient Air Quality Standard (µg/m <sup>3</sup> )
Annual	4	0.26	4	60
24-hour	61	6.4	67	260
8-hour	109 <sup>b</sup>	20.4 <sup>b</sup>	129	—
3-hour	140	26.1	166	1,300
1-hour	241	29.0 <sup>c</sup>	270	—

Note: Recommended EPA averaging time factors:

24-hour / 1-hour = 0.4

8-hour / 1-hour = 0.7

3-hour / 1-hour = 0.9

<sup>a</sup> Based on maximum measured SO<sub>2</sub> concentrations near Chassahowitzka Class I area.

<sup>b</sup> Based on 3-hour concentration and averaging time factor for 8-hour/3-hour of  $0.7/0.9 = 0.78$ .

<sup>c</sup> Based on 3-hour concentration and averaging time factor for 1-hour/3-hour of  $1/0.9 = 1.11$ .

A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to  $1,300 \mu\text{g}/\text{m}^3$   $\text{SO}_2$  for 8 hours were not visibly damaged. This supports the levels cited by other researchers on the effects of  $\text{SO}_2$  on vegetation. A corroborative study (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a cross-section of plants ranging from sensitive to tolerant were visibly injured at 3-hour  $\text{SO}_2$  concentrations of  $920 \mu\text{g}/\text{m}^3$ .

Jack pine seedlings exposed to  $\text{SO}_2$  concentrations from 470 to  $520 \mu\text{g}/\text{m}^3$  for 24 hours demonstrated inhibition of foliar lipid synthesis; however, this inhibition was reversible (Malhotra and Kahn, 1978). Black oak exposed to  $1,310 \mu\text{g}/\text{m}^3$   $\text{SO}_2$  for 24 hours a day for 1 week demonstrated a 48 percent reduction in photosynthesis (Carlson, 1979).

Two lichen species indigenous to Florida exhibited signs of  $\text{SO}_2$  damage in the form of decreased biomass gain and photosynthetic rate as well as membrane leakage when exposed to concentrations of 200 to  $400 \mu\text{g}/\text{m}^3$  for 6 hours/week for 10 weeks (Hart *et al.*, 1988).

As shown in Table 7-6, a maximum total 3-hour  $\text{SO}_2$  concentration of  $166 \mu\text{g}/\text{m}^3$  would be expected in the Class I area. By comparing this concentration to those causing injury to native species, the  $\text{SO}_2$ -sensitive species (or more tolerant species) would not be damaged by the maximum predicted concentrations. By comparison with concentrations that cause plant injury, the maximum predicted 3-hour  $\text{SO}_2$  concentration of  $166 \mu\text{g}/\text{m}^3$  is approximately 20 percent of the most conservative 3-hour concentration (i.e.,  $790 \mu\text{g}/\text{m}^3$ ) that causes injury to  $\text{SO}_2$ -sensitive species.

When the predicted 8-hour and 1-hour  $\text{SO}_2$  concentrations at Chassahowitzka ( $129$  and  $270 \mu\text{g}/\text{m}^3$ , respectively) are compared to the concentrations causing injury to native species, it is evident that  $\text{SO}_2$ -sensitive species (or more tolerant species) would not be damaged by the predicted concentrations.  $\text{SO}_2$  concentrations predicted in the wilderness area are less than 25 percent of the most conservative 1-hour concentration ( $1,300 \mu\text{g}/\text{m}^3$ ) that caused injury to  $\text{SO}_2$ -sensitive species.

The maximum total 24-hour and annual  $\text{SO}_2$  concentrations of  $67$  and  $4 \mu\text{g}/\text{m}^3$ , respectively, predicted within the Class I area represent levels which are lower than those known to cause damage to test species. By comparison of these levels, it is apparent that the maximum predicted

24-hour concentrations are well below the 24-hour concentrations that cause damage in SO<sub>2</sub>-sensitive plants (i.e., 470 µg/m<sup>3</sup>). The maximum annual concentration of 0.26 µg/m<sup>3</sup> due to the proposed expansion adds only slightly to the background levels and poses a minimal threat to area vegetation.

#### **Airborne Exposure: Soils**

The majority of the soil in the Class I area is classified as Weekiwachee-Durbin muck. This is an euic, hyperthermic typic sulfhemist that is characterized by high levels of sulfur and organic matter. This soil is flooded daily with the advent of high tide and the pH ranges between 6.1 and 7.8. The upper level of this soil may contain as much as 4 percent sulfur (USDA, 1991).

The greatest threat to soils from increased SO<sub>2</sub> deposition is a decrease in pH or an increase of sulfur to levels considered unnatural or potentially toxic. Although ground deposition was not calculated, it is evident that the amount of SO<sub>2</sub> deposited would be inconsequential in light of the inherent sulfur content. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any rise in acidity in the soil would be buffered by this activity.

#### **Airborne Exposure: Wildlife**

The predicted SO<sub>2</sub> concentrations are well below the lowest observed effects levels in animals, e.g., less than 427 µg/m<sup>3</sup> for 1 hour and below the threshold effect level for NO<sub>x</sub>, e.g., less than 1,917 µg/m<sup>3</sup> for 3 hours (Newman and Schreiber, 1988). Given these conditions, the proposed source's emissions poses no risk to wildlife. Because predicted levels are below those known to cause effect to vegetation, there is also no risk.

#### **7.2.3 H<sub>2</sub>SO<sub>4</sub> MIST**

The maximum 1-hour H<sub>2</sub>SO<sub>4</sub> mist concentration due to the Cargill H<sub>2</sub>SO<sub>4</sub> plants only is predicted to be 1.1 µg/m<sup>3</sup> (based on a 3-hour impact of 1.0 µg/m<sup>3</sup> and averaging time factor of 1/0.9). This is approximately 0.00027 parts per million (ppm) in the Class I area. Although literature pertaining to the effects of H<sub>2</sub>SO<sub>4</sub> on terrestrial vegetation could not be obtained, effects on aquatic macrophytes were acquired.

In a study in which the aquatic plants, hydrilla, naiad, and vallisneria were exposed to concentrations of 27 or 80 ppm of H<sub>2</sub>SO<sub>4</sub>, mild burning was observed around the base of the

plants which came into contact with undiluted acid. In jars in which these same concentrations of acid were added homogeneously (i.e., mixed before plant exposure), no plant damage was observed. Because aquatic plants have a poorly developed (if existing) cuticle, they serve to indicate phytotoxicity to a greater extent than terrestrial plants. The potential phytotoxic assessment in this case is therefore more conservative than using terrestrial plant information. The maximum 1-hour  $\text{H}_2\text{SO}_4$  mist concentration of  $1.1 \mu\text{g}/\text{m}^3$  (0.00027 ppm) in the Class I area is  $1.1^{-6}$  to  $3.8^{-7}$  of the values that caused either mild burning or no effects at all on aquatic vegetation.

#### **7.2.4 NITROGEN DIOXIDE**

Acute  $\text{NO}_2$  injury symptoms are manifest as water-soaked lesions, which first appear on the upper surface, followed by rapid tissue collapse. Low-concentration, long-term exposures do not induce the lesions associated with acute exposures but may still result in some growth suppression. A review of the literature (EPA, 1982b) indicates greater variability in the  $\text{NO}_2$  dose-response relationship in vegetation, and no threshold effect levels are supported. The  $\text{NO}_2$  doses known to adversely affect some plants are shown in Table 7-3.

The maximum predicted annual average  $\text{NO}_2$  concentration due to the Cargill modification is predicted to be  $0.0029 \mu\text{g}/\text{m}^3$ . No representative nearby  $\text{NO}_2$  monitoring data are available to provide background conditions. The predicted doses of  $\text{NO}_2$  in the Chassahowitzka NWA due to the proposed facility are far lower than the doses reported to injure vegetation and animals; therefore, the proposed facility's  $\text{NO}_2$  emissions are not expected to have an adverse effect on vegetation AQRVs at Chassahowitzka NWA.

#### **7.2.5 COMBINED EFFECTS OF SULFUR DIOXIDE AND NITROGEN DIOXIDE**

$\text{SO}_2$  in combination with  $\text{NO}_2$  can cause vegetation effects below injury threshold for each of these pollutants individually. Plants show varying sensitivities at various  $\text{SO}_2$  and  $\text{NO}_2$  concentration combinations for various exposure periods. A review of the literature (EPA, 1982b) indicates that a lower visible-injury threshold may occur at 2-hour  $\text{SO}_2$  and  $\text{NO}_2$  exposures of  $1,310 \mu\text{g}/\text{m}^3$  (0.5 ppm) and  $940 \mu\text{g}/\text{m}^3$  (0.5 ppm), respectively. Air dispersion modeling has shown that this threshold exposure condition will not occur at Chassahowitzka NWA.

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**(Page 1 of 2)**

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## **APPENDIX A**

### **SO<sub>2</sub> EMISSION RATE CALCULATIONS FOR FUEL BURNING SOURCES AT CARGILL BARTOW FACILITY**

**APPENDIX A**  
**SO<sub>2</sub> EMISSION RATE CALCULATIONS FOR FUEL BURNING SOURCES**  
**AT CARGILL BARTOW FACILITY**

**No. 3 Fertilizer Plant**

Maximum heat input to dryer: 20.0 MMBtu/hr

Fuel oil heating value: 144,500 Btu/gal

Maximum fuel usage rate: 138.4 gal/hr

AP-42 emission factor:  $157 \times S$  lb/1,000 gal (S = percent sulfur in fuel)

2.4 percent sulfur fuel oil

$138.4 \text{ gal/hr} \times (157 \times 2.4 \text{ lb SO}_2/10^3 \text{ gal fuel}) = 52.1 \text{ lb SO}_2/\text{hr}$

$52.1 \text{ lb/hr} \times 8,760 \text{ hr/yr} \div 2,000 \text{ lb/ton} = 228.4 \text{ TPY}$

**Auxiliary Boiler**

Maximum heat input to dryer: 64.0 MMBtu/hr

Fuel oil heating value: 144,500 Btu/gal

Maximum fuel usage rate:  $64.0 \text{ MMBtu/hr} \div 144,500 \text{ Btu/gal} = 442.9 \text{ gal/hr}$

AP-42 emission factor:  $157 \times S$  lb/1,000 gal

2.4 percent sulfur fuel oil

$442.9 \text{ gal/hr} \times (157 \times 2.4 \text{ lb SO}_2/10^3 \text{ gal fuel}) = 166.9 \text{ lb SO}_2/\text{hr}$

Boiler limited to 400 hr/yr on fuel oil

$166.9 \text{ lb/hr} \times 400 \text{ hr/yr} \div 2,000 \text{ lb/ton} = 33.4 \text{ TPY}$

**No. 4 Fertilizer Plant**

Maximum SO<sub>2</sub> emissions obtained from recent PSD permit application for the No. 4 Fertilizer Plant:

100.5 lb/hr; 37.7 TPY

## **APPENDIX B**

### **CONTINUOUS SO<sub>2</sub> EMISSION FROM SULFURIC ACID PLANTS**

# Table B - 1

SO2 emissions from #4 Sulfuric Acid Plant

Cargill Fertilizer, Inc. Bartow, FL

Date	#4 Plant SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
05/24/94	-----	-----		Yes
05/25/94	305.00	6.58	3.28	
05/26/94	293.71	4.3	2.73	
05/27/94	301.92	4.3	2.81	
05/28/94	309.71	4.3	2.88	
05/29/94	324.46	4.3	3.01	
05/30/94	318.67	4.3	2.96	
05/31/94	311.71	4.3	2.90	
06/01/94	-----	-----		Yes
06/02/94	349.21	3.9	3.17	
06/03/94	365.63	3.8	3.30	
06/04/94	302.96	4.4	2.83	
06/05/94	271.21	4.6	2.57	
06/06/94	264.42	4.55	2.49	
06/07/94	233.89	6.94	2.58	
06/08/94	-----	-----		Yes
06/09/94	73.13	5.67	0.74	
06/10/94	164.75	5.1	1.61	
06/11/94	201.58	5.1	1.97	
06/12/94	199.38	5	1.93	
06/13/94	199.21	5	1.93	
06/14/94	199.08	5.1	1.94	
06/15/94	193.33	5.1	1.89	
06/16/94	199.13	5	1.93	
06/17/94	-----	-----		Yes
06/18/94	190.79	4.4	1.78	
06/19/94	195.58	4.62	1.85	
06/20/94	144.04	4.9	1.39	
06/21/94	202.71	4.5	1.91	
06/22/94	213.54	4.6	2.02	
06/23/94	-----	-----		Yes
06/24/94	256.96	4.4	2.40	
06/25/94	259.08	4.3	2.41	
06/26/94	239.75	4.3	2.23	
06/27/94	242.67	4.3	2.25	
06/28/94	255.88	4.3	2.38	
06/29/94	259.75	4.4	2.43	
06/30/94	248.00	4.5	2.33	
07/01/94	226.79	4.2	2.09	
07/02/94	283.13	3.8	2.55	
07/03/94	261.96	3.8	2.36	
07/04/94	246.25	3.9	2.23	

Note: \* Yes = Plant downtime occurred on this day.

Table B-1 (continued) #4SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
07/05/94	244.33	4	2.23	
07/06/94	242.50	4.07	2.22	
07/07/94	268.00	3.92	2.43	
07/08/94	289.04	3.9	2.62	
07/09/94	288.71	4.1	2.65	
07/10/94	287.25	4.1	2.64	
07/11/94	294.79	4.1	2.71	
07/12/94	-----	-----		Yes
07/13/94	305.83	4.3	2.84	
07/14/94	293.38	4.3	2.73	
07/15/94	292.38	4.3	2.72	
07/16/94	293.00	4.3	2.72	
07/17/94	291.08	4.3	2.70	
07/18/94	291.00	4.3	2.70	
07/19/94	-----	-----		Yes
07/20/94	268.50	4.4	2.51	
07/21/94	255.83	4.5	2.41	
07/22/94	272.79	4.92	2.63	
07/23/94	179.00	5.24	1.76	
07/24/94	200.75	4.8	1.92	
07/25/94	172.45	9.21	2.27	
07/26/94	-----	-----		Yes
07/27/94	199.50	4.68	1.90	
07/28/94	222.04	4.4	2.08	
07/29/94	-----	-----		Yes
07/30/94	-----	-----		Yes
07/31/94	285.08	4.3	2.65	
08/01/94	-----	-----		Yes
08/02/94	-----	-----		Yes
08/03/94	208.63	4.8	2.00	
08/04/94	219.25	4.7	2.09	
08/05/94	-----	-----		Yes
08/06/94	261.83	4.3	2.43	
08/07/94	264.58	4.4	2.47	
08/08/94	271.54	4.4	2.54	
08/09/94	274.25	4.4	2.56	
08/10/94	268.83	4.3	2.50	
08/11/94	265.25	4.35	2.47	
08/12/94	282.08	4.3	2.62	
08/13/94	281.79	4.3	2.62	
08/14/94	285.50	4.3	2.65	
08/15/94	285.25	4.3	2.65	
08/16/94	286.13	6.25	3.01	
08/17/94	-----	-----		Yes
08/18/94	-----	-----		Yes

Note: \* Yes = Plant downtime occurred on this day.

Table B-1 (continued) #4SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
08/19/94	-----	-----		Yes
08/20/94	-----	-----		Yes
08/21/94	312.21	3.7	2.80	
08/22/94	-----	-----		Yes
08/23/94	314.67	3.7	2.82	
08/24/94	313.96	3.7	2.82	
08/25/94	-----	-----		Yes
08/26/94	305.75	3.8	2.76	
08/27/94	312.54	3.9	2.84	
08/28/94	322.38	3.7	2.89	
08/29/94	-----	-----		Yes
08/30/94	275.46	4	2.51	
08/31/94	-----	-----		Yes
09/01/94	-----	-----		Yes
09/02/94	259.00	3.8	2.34	
09/03/94	265.92	3.9	2.41	
09/04/94	272.96	3.9	2.48	
09/05/94	269.42	3.9	2.44	
09/06/94	267.58	3.8	2.41	
09/07/94	281.96	3.8	2.54	
09/08/94	290.92	3.8	2.62	
09/09/94	168.38	6.2	1.76	
09/10/94	-----	-----		Yes
09/11/94	-----	-----		Yes
09/12/94	-----	-----		Yes
09/13/94	-----	-----		Yes
09/14/94	-----	-----		Yes
09/15/94	-----	-----		Yes
09/16/94	-----	-----		Yes
09/17/94	-----	-----		Yes
09/18/94	-----	-----		Yes
09/19/94	-----	-----		Yes
09/20/94	-----	-----		Yes
09/21/94	-----	-----		Yes
09/22/94	-----	-----		Yes
09/23/94	-----	-----		Yes
09/24/94	-----	-----		Yes
09/25/94	-----	-----		Yes
09/26/94	-----	-----		Yes
09/27/94	-----	-----		Yes
09/28/94	-----	-----		Yes
09/29/94	-----	-----		Yes
09/30/94	-----	-----		Yes
10/01/94	116.58	3.9	1.06	
10/02/94	213.13	?	1.58	
10/03/94	-----	-----		Yes

Note: \* Yes = Plant downtime occurred on this day.

Table B-1 (continued) #4SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
10/04/94	276.88	4	2.53	
10/05/94	379.50	4.3	3.53	
10/06/94	368.04	4.3	3.42	
10/07/94	369.42	4.3	3.43	
10/08/94	380.46	4.3	3.53	
10/09/94	374.25	4.3	3.48	
10/10/94	-----	-----		Yes
10/11/94	-----	-----		Yes
10/12/94	380.38	4.59	3.60	
10/13/94	-----	-----		Yes
10/14/94	267.33	4.81	2.56	
10/15/94	261.42	5.2	2.57	
10/16/94	273.83	4.9	2.64	
10/17/94	278.58	4.9	2.68	
10/18/94	285.13	4.8	2.73	
10/19/94	295.96	4.8	2.83	
10/20/94	295.29	4.8	2.83	
10/21/94	309.71	4.7	2.95	
10/22/94	323.42	4.65	3.07	
10/23/94	327.83	4.6	3.10	
10/24/94	331.88	4.6	3.14	
10/25/94	316.62	4.7	3.01	
10/26/94	294.00	4.7	2.80	
10/27/94	328.17	4.6	3.10	
10/28/94	327.21	4.6	3.10	
10/29/94	303.00	4.8	2.90	
10/30/94	336.08	4.6	3.18	
10/31/94	354.71	4.5	3.34	
11/01/94	323.83	4.6	3.06	
11/02/94	-----	-----		Yes
11/03/94	-----	-----		Yes
11/04/94	-----	-----		Yes
11/05/94	-----	-----		Yes
11/06/94	356.79	4.4	3.34	
11/07/94	363.33	4.45	3.41	
11/08/94	378.29	4.4	3.54	
11/09/94	392.33	4.4	3.67	
11/10/94	381.21	4.4	3.56	
11/11/94	371.42	4.5	3.49	
11/12/94	362.54	4.5	3.41	
11/13/94	351.50	4.5	3.31	
11/14/94	345.08	4.5	3.25	
11/15/94	341.88	4.5	3.21	
11/16/94	339.58	4.5	3.19	
11/17/94	334.79	4.5	3.15	
11/18/94	337.00	4.5	3.17	

Note: \* Yes = Plant downtime occurred on this day.

Table B-1 (continued) #4SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	344.58	4.4	3.22	
11/20/94	275.67	4.63	2.61	
11/21/94	352.04	4.4	3.29	
11/22/94	351.96	4.4	3.29	
11/23/94	345.42	4.4	3.23	
11/24/94	351.25	4.4	3.28	
11/25/94	357.42	4.4	3.34	
11/26/94	348.29	4.4	3.26	
11/27/94	351.79	4.4	3.29	
11/28/94	349.33	4.4	3.27	
11/29/94	344.29	4.45	3.23	
11/30/94	340.17	4.5	3.20	
12/01/94	343.46	4.4	3.21	
12/02/94	345.79	4.4	3.23	
12/03/94	342.04	4.4	3.20	
12/04/94	346.96	4.4	3.24	
12/05/94	349.46	4.4	3.27	
12/06/94	356.42	4.4	3.33	
12/07/94	359.63	4.4	3.36	
12/08/94	363.00	4.4	3.39	
12/09/94	359.46	4.4	3.36	
12/10/94	333.71	4.3	3.10	
12/11/94	344.54	4.3	3.20	
12/12/94	336.04	4.3	3.12	
12/13/94	333.46	4.3	3.10	
12/14/94	326.17	4.3	3.03	
12/15/94	-----	-----		Yes
12/16/94	-----	-----		Yes
12/17/94	381.92	4.3	3.55	
12/18/94	376.42	4.3	3.50	
12/19/94	375.88	4.3	3.49	
Number				169
Max				3.67
Avg				2.55
Std dev				0.88
95% CI				4.27

Note: \* Yes = Plant downtime occurred on this day.

$$95\% \text{ CI} = (1.96 \times \text{Std dev}) + \text{Avg}$$

## Table B-2

SO<sub>2</sub> emissions from #5 Sulfuric Acid Plant  
Cargill Fertilizer, Inc. Bartow, FL

Date	#5 Plant SO <sub>2</sub> emissions (ppm)	%O <sub>2</sub> (%)	SO <sub>2</sub> emissions (lb/ton)	Plant Down? *
05/24/94	394.70	4.1	3.62	
05/25/94	394.63	4.1	3.62	
05/26/94	330.08	4.1	3.03	
05/27/94	400.46	4.1	3.68	
05/28/94	392.54	4.15	3.61	
05/29/94	384.04	4.15	3.54	
05/30/94	394.83	4.15	3.64	
05/31/94	398.54	4.1	3.66	
06/01/94	399.25	4.1	3.67	
06/02/94	408.54	4.1	3.75	
06/03/94	396.46	4.2	3.66	
06/04/94	393.13	4.1	3.61	
06/05/94	394.21	4.1	3.62	
06/06/94	406.83	4.1	3.74	
06/07/94	413.50	4.05	3.79	
06/08/94	363.04	4.1	3.33	
06/09/94	308.67	4.48	2.90	
06/10/94	395.46	4.1	3.63	
06/11/94	395.17	4.1	3.63	
06/12/94	398.88	4.1	3.66	
06/13/94	400.54	4.1	3.68	
06/14/94	404.50	3.9	3.67	
06/15/94	-----	-----		Yes
06/16/94	402.54	3.7	3.61	
06/17/94	414.21	3.7	3.72	
06/18/94	418.46	3.7	3.75	
06/19/94	423.54	3.75	3.81	
06/20/94	422.08	3.8	3.81	
06/21/94	419.75	3.8	3.79	
06/22/94	411.00	3.8	3.71	
06/23/94	421.42	3.8	3.80	
06/24/94	409.71	3.7	3.67	
06/25/94	410.58	3.8	3.70	
06/26/94	410.13	3.9	3.72	
06/27/94	407.75	3.9	3.70	
06/28/94	402.67	4	3.68	
06/29/94	410.17	3.9	3.72	
06/30/94	412.96	3.9	3.75	
07/01/94	415.71	4	3.79	
07/02/94	409.71	3.9	3.72	
07/03/94	411.21	3.9	3.73	
07/04/94	417.25	3.9	3.79	

Note: \* Yes = Plant downtime occurred on this day.

Table B – 2 (continued) #5SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
07/05/94	414.75	3.9	3.76	
07/06/94	-----	-----		Yes
07/07/94	178.08	5.3	1.76	
07/08/94	181.67	5.3	1.80	
07/09/94	180.38	5.3	1.78	
07/10/94	179.79	5.3	1.78	
07/11/94	179.50	5.3	1.77	
07/12/94	180.96	5.3	1.79	
07/13/94	187.96	5.3	1.86	
07/14/94	-----	-----		Yes
07/15/94	247.21	6.18	2.59	
07/16/94	287.29	4.6	2.72	
07/17/94	268.00	4.8	2.57	
07/18/94	217.50	5.1	2.12	
07/19/94	249.75	4.8	2.39	
07/20/94	-----	-----		Yes
07/21/94	256.46	4.5	2.41	
07/22/94	221.25	4.8	2.12	
07/23/94	146.71	6.05	1.52	
07/24/94	156.87	5.95	1.62	
07/25/94	182.75	5.01	1.77	
07/26/94	201.29	4.84	1.93	
07/27/94	181.29	5.12	1.77	
07/28/94	212.88	4.7	2.03	
07/29/94	242.25	4.65	2.30	
07/30/94	239.50	4.7	2.28	
07/31/94	241.13	4.7	2.30	
08/01/94	248.83	4.5	2.34	
08/02/94	247.00	4.6	2.34	
08/03/94	-----	-----		Yes
08/04/94	-----	-----		Yes
08/05/94	236.42	4.65	2.24	
08/06/94	237.63	4.6	2.25	
08/07/94	235.71	4.7	2.24	
08/08/94	236.50	4.7	2.25	
08/09/94	251.71	4.7	2.40	
08/10/94	254.92	4.7	2.43	
08/11/94	255.88	4.7	2.44	
08/12/94	253.79	4.7	2.42	
08/13/94	260.50	4.7	2.48	
08/14/94	264.47	4.65	2.51	
08/15/94	278.00	4.5	2.61	
08/16/94	279.42	4.5	2.63	
08/17/94	-----	-----		Yes
08/18/94	258.58	4.5	2.43	

Note: \* Yes = Plant downtime occurred on this day.

Table B-2 (continued) #5SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
08/19/94	268.04	4.55	2.53	
08/20/94	261.83	4.6	2.48	
08/21/94	261.13	4.65	2.48	
08/22/94	283.88	4.5	2.67	
08/23/94	289.33	4.5	2.72	
08/24/94	293.17	4.5	2.76	
08/25/94	298.79	4.45	2.80	
08/26/94	306.21	3.8	2.76	
08/27/94	325.83	3.9	2.96	
08/28/94	305.96	4.4	2.86	
08/29/94	299.46	4.4	2.80	
08/30/94	297.17	4.4	2.78	
08/31/94	295.54	4.5	2.78	
09/01/94	-----	-----		Yes
09/02/94	293.63	4.4	2.74	
09/03/94	299.33	4.4	2.80	
09/04/94	306.67	4.4	2.87	
09/05/94	318.67	4.3	2.96	
09/06/94	323.29	4.3	3.00	
09/07/94	334.79	4.2	3.09	
09/08/94	-----	-----		Yes
09/09/94	328.13	4.3	3.05	
09/10/94	321.50	4.3	2.99	
09/11/94	330.17	4.3	3.07	
09/12/94	338.96	4.2	3.13	
09/13/94	338.42	4.3	3.14	
09/14/94	334.33	4.3	3.11	
09/15/94	339.63	4.3	3.16	
09/16/94	-----	-----		Yes
09/17/94	306.29	4	2.80	
09/18/94	318.58	4	2.91	
09/19/94	315.96	4	2.88	
09/20/94	309.71	4	2.83	
09/21/94	320.29	4	2.92	
09/22/94	315.83	4	2.88	
09/23/94	329.25	3.9	2.99	
09/24/94	320.92	3.9	2.91	
09/25/94	323.50	4	2.95	
09/26/94	329.21	4	3.00	
09/27/94	310.96	4.1	2.86	
09/28/94	-----	-----		Yes
09/29/94	367.38	4.1	3.37	
09/30/94	375.21	4.05	3.43	
10/01/94	376.00	4.1	3.45	
10/02/94	378.71	?	2.80	
10/03/94	383.67	4	3.50	

Note: \* Yes = Plant downtime occurred on this day.

Table B-2 (continued) #5SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
10/04/94	392.38	4	3.58	
10/05/94	396.79	4	3.62	
10/06/94	403.96	3.9	3.67	
10/07/94	407.29	3.9	3.70	
10/08/94	408.71	3.9	3.71	
10/09/94	405.88	3.9	3.68	
10/10/94	411.29	3.9	3.73	
10/11/94	413.50	3.9	3.75	
10/12/94	414.08	3.9	3.76	
10/13/94	420.67	3.9	3.82	
10/14/94	-----	-----		Yes
10/15/94	420.17	3.9	3.81	
10/16/94	420.17	3.9	3.81	
10/17/94	406.25	4	3.71	
10/18/94	-----	-----		Yes
10/19/94	-----	-----		Yes
10/20/94	388.96	4.38	3.63	
10/21/94	391.42	4.1	3.59	
10/22/94	363.08	4.1	3.33	
10/23/94	361.00	4	3.30	
10/24/94	370.04	4	3.38	
10/25/94	376.04	3.8	3.39	
10/26/94	419.75	3.75	3.78	
10/27/94	414.42	3.8	3.74	
10/28/94	418.18	3.8	3.77	
10/29/94	418.92	3.8	3.78	
10/30/94	409.58	3.85	3.71	
10/31/94	391.71	3.9	3.55	
11/01/94	392.96	3.9	3.57	
11/02/94	397.96	3.9	3.61	
11/03/94	411.08	3.85	3.72	
11/04/94	398.83	3.9	3.62	
11/05/94	405.54	3.9	3.68	
11/06/94	413.58	3.9	3.75	
11/07/94	408.96	3.9	3.71	
11/08/94	408.46	3.9	3.71	
11/09/94	422.17	3.9	3.83	
11/10/94	383.00	3.9	3.48	
11/11/94	359.58	3.9	3.26	
11/12/94	359.75	4	3.28	
11/13/94	353.50	4	3.23	
11/14/94	-----	-----		Yes
11/15/94	380.83	3.9	3.46	
11/16/94	412.42	3.7	3.70	
11/17/94	414.92	3.7	3.72	
11/18/94	404.46	3.8	3.65	

Note: \* Yes = Plant downtime occurred on this day.

Table B-2 (continued) #5SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	401.96	3.9	3.65	
11/20/94	392.54	3.9	3.56	
11/21/94	-----	-----		Yes
11/22/94	373.71	4	3.41	
11/23/94	361.50	4	3.30	
11/24/94	364.21	4.1	3.34	
11/25/94	362.17	4.1	3.33	
11/26/94	356.83	4.1	3.28	
11/27/94	354.29	4.1	3.25	
11/28/94	354.46	4.1	3.25	
11/29/94	357.88	4.1	3.29	
11/30/94	350.08	4.2	3.23	
12/01/94	342.96	4.1	3.15	
12/02/94	371.46	4	3.39	
12/03/94	373.42	4	3.41	
12/04/94	373.33	4	3.41	
12/05/94	371.83	4	3.39	
12/06/94	-----	-----		Yes
12/07/94	-----	-----		Yes
12/08/94	276.12	4.4	2.58	
12/09/94	249.21	4.4	2.33	
12/10/94	-----	-----		Yes
12/11/94	244.83	4.6	2.32	
12/12/94	238.50	4.5	2.24	
12/13/94	243.88	4.5	2.29	
12/14/94	247.21	4.5	2.32	
12/15/94	246.17	4.5	2.31	
12/16/94	245.00	4.5	2.30	
12/17/94	250.08	4.5	2.35	
12/18/94	249.04	4.5	2.34	
12/19/94	247.29	4.4	2.31	
	Number		203	
	Max		3.83	
	Avg		2.91	
	Std dev		0.95	
	95% CI		4.77	

Note: \* Yes = Plant downtime occurred on this day.  
95% CI = (1.96 x Std dev) + Avg

Table B-3

SO2 emissions from #6 Sulfuric Acid Plant  
Cargill Fertilizer, Inc. Bartow, FL

Date	#6 Plant SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
05/24/94	388.50	4.2	3.59	
05/25/94	379.58	4.2	3.51	
05/26/94	327.79	4	2.99	
05/27/94	380.88	4.17	3.51	
05/28/94	381.46	4.26	3.54	
05/29/94	386.58	4.07	3.54	
05/30/94	367.54	4.1	3.37	
05/31/94	371.96	4	3.40	
06/01/94	-----	-----		Yes
06/02/94	391.83	3.9	3.56	
06/03/94	384.75	4.25	3.56	
06/04/94	340.96	4.39	3.19	
06/05/94	337.21	4.2	3.11	
06/06/94	347.50	4.1	3.19	
06/07/94	373.92	4.1	3.43	
06/08/94	349.04	4.7	3.32	
06/09/94	262.21	4.4	2.45	
06/10/94	374.17	4.18	3.45	
06/11/94	388.62	4.1	3.57	
06/12/94	375.33	4.1	3.45	
06/13/94	356.00	4.1	3.27	
06/14/94	358.83	4.13	3.30	
06/15/94	-----	-----		Yes
06/16/94	368.71	4.13	3.39	
06/17/94	369.42	4.1	3.39	
06/18/94	345.79	3.45	3.06	
06/19/94	358.83	3.8	3.24	
06/20/94	332.71	3.9	3.02	
06/21/94	319.46	4.3	2.97	
06/22/94	271.67	5.33	2.69	
06/23/94	384.33	4	3.51	
06/24/94	385.67	4.18	3.56	
06/25/94	370.50	4.17	3.42	
06/26/94	396.38	4.03	3.62	
06/27/94	407.17	4.02	3.72	
06/28/94	375.00	4.1	3.44	
06/29/94	-----	-----		Yes
06/30/94	-----	-----		Yes
07/01/94	375.67	3.8	3.39	
07/02/94	381.58	3.76	3.43	
07/03/94	371.08	3.83	3.35	
07/04/94	382.46	3.75	3.44	

Note: \* Yes = Plant downtime occurred on this day.

Table B-3 (continued) #6SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
07/05/94	351.33	3.9	3.19	
07/06/94	355.71	3.97	3.24	
07/07/94	340.21	4	3.11	
07/08/94	323.92	4	2.96	
07/09/94	370.46	3.88	3.36	
07/10/94	396.42	3.85	3.59	
07/11/94	388.54	4.2	3.59	
07/12/94	344.54	4.1	3.16	
07/13/94	334.83	4.06	3.07	
07/14/94	-----	-----		Yes
07/15/94	192.47	9.38	2.57	
07/16/94	345.00	4.18	3.18	
07/17/94	381.71	4.15	3.52	
07/18/94	383.83	4.23	3.55	
07/19/94	345.88	5.15	3.39	
07/20/94	352.25	4.17	3.25	
07/21/94	-----	-----		Yes
07/22/94	298.04	4.97	2.88	
07/23/94	247.25	5.22	2.43	
07/24/94	279.25	4.43	2.61	
07/25/94	375.29	3.97	3.42	
07/26/94	349.79	4.05	3.20	
07/27/94	-----	-----		Yes
07/28/94	311.12	4.1	2.86	
07/29/94	361.67	3.8	3.26	
07/30/94	360.17	3.9	3.27	
07/31/94	364.50	3.92	3.31	
08/01/94	-----	-----		Yes
08/02/94	347.96	3.9	3.16	
08/03/94	354.13	4	3.23	
08/04/94	-----	-----		Yes
08/05/94	-----	-----		Yes
08/06/94	-----	-----		Yes
08/07/94	378.25	4	3.45	
08/08/94	363.13	3.92	3.30	
08/09/94	365.88	4	3.34	
08/10/94	360.58	3.98	3.29	
08/11/94	375.42	4	3.43	
08/12/94	382.46	3.9	3.47	
08/13/94	375.25	3.88	3.40	
08/14/94	386.53	3.9	3.51	
08/15/94	-----	-----		Yes
08/16/94	-----	-----		Yes
08/17/94	-----	-----		Yes
08/18/94	-----	-----		Yes

Note: \* Yes = Plant downtime occurred on this day.

Table B-3 (continued) #6SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
08/19/94	-----	-----		Yes
08/20/94	341.88	4.22	3.16	
08/21/94	328.38	4.12	3.02	
08/22/94	348.88	4.05	3.19	
08/23/94	355.17	4	3.24	
08/24/94	-----	-----		Yes
08/25/94	377.58	4.05	3.46	
08/26/94	373.04	3.54	3.32	
08/27/94	384.54	3.56	3.42	
08/28/94	377.50	4	3.45	
08/29/94	387.25	4	3.53	
08/30/94	388.58	4	3.55	
08/31/94	387.54	4.05	3.55	
09/01/94	374.46	4.13	3.44	
09/02/94	364.96	4.1	3.35	
09/03/94	-----	-----		Yes
09/04/94	267.29	4.46	2.51	
09/05/94	335.33	4.25	3.11	
09/06/94	327.33	4.15	3.01	
09/07/94	-----	-----		Yes
09/08/94	359.71	4.13	3.31	
09/09/94	-----	-----		Yes
09/10/94	361.04	4.1	3.31	
09/11/94	354.25	4.1	3.25	
09/12/94	317.71	4.3	2.95	
09/13/94	353.50	4.1	3.25	
09/14/94	387.71	4.1	3.56	
09/15/94	396.46	4.1	3.64	
09/16/94	-----	-----		Yes
09/17/94	324.00	4.24	3.00	
09/18/94	322.29	4.2	2.98	
09/19/94	349.08	4.1	3.21	
09/20/94	366.63	4.08	3.36	
09/21/94	372.33	4.05	3.41	
09/22/94	370.63	4	3.38	
09/23/94	376.00	4.1	3.45	
09/24/94	355.96	4.08	3.26	
09/25/94	-----	-----		Yes
09/26/94	341.00	4.1	3.13	
09/27/94	374.29	4.2	3.46	
09/28/94	374.67	4.2	3.46	
09/29/94	362.17	4.2	3.35	
09/30/94	371.25	4.1	3.41	
10/01/94	370.54	4.2	3.42	
10/02/94	365.29	4.2	3.37	
10/03/94	364.83	4.2	3.37	

Note: \* Yes = Plant downtime occurred on this day.

Table B-3 (continued) #6SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
10/04/94	398.21	4	3.63	
10/05/94	-----	-----		Yes
10/06/94	377.67	4.1	3.47	
10/07/94	-----	-----		Yes
10/08/94	374.08	4.2	3.46	
10/09/94	-----	-----		Yes
10/10/94	388.29	4.61	3.68	
10/11/94	-----	-----		Yes
10/12/94	380.42	4.43	3.56	
10/13/94	389.96	5	3.78	
10/14/94	388.63	4.3	3.61	
10/15/94	402.17	4.3	3.74	
10/16/94	400.08	4.3	3.72	
10/17/94	399.54	4.4	3.73	
10/18/94	392.63	4.43	3.68	
10/19/94	380.63	4.4	3.56	
10/20/94	374.46	4.45	3.51	
10/21/94	389.92	4.4	3.64	
10/22/94	367.42	4.43	3.44	
10/23/94	366.38	4.44	3.43	
10/24/94	393.83	4.35	3.67	
10/25/94	-----	-----		Yes
10/26/94	383.54	4.3	3.56	
10/27/94	394.96	4.1	3.63	
10/28/94	395.64	4.15	3.64	
10/29/94	385.83	4.15	3.55	
10/30/94	338.25	4.54	3.19	
10/31/94	294.04	4.37	2.74	
11/01/94	337.13	4.3	3.13	
11/02/94	375.71	4.1	3.45	
11/03/94	-----	-----		Yes
11/04/94	287.67	4.5	2.71	
11/05/94	333.17	4.3	3.10	
11/06/94	343.54	4.4	3.21	
11/07/94	351.21	4.25	3.25	
11/08/94	359.92	4.3	3.34	
11/09/94	355.33	4.45	3.33	
11/10/94	343.79	4.35	3.20	
11/11/94	346.63	4.4	3.24	
11/12/94	349.46	4.4	3.27	
11/13/94	343.00	4.4	3.21	
11/14/94	360.29	4.4	3.37	
11/15/94	351.88	4.4	3.29	
11/16/94	370.92	4.3	3.45	
11/17/94	347.04	4.4	3.24	
11/18/94	387.92	4.3	3.60	

Note: \* Yes = Plant downtime occurred on this day.

Table B-3 (continued) #6SAP

Date	SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	383.04	4.3	3.56	
11/20/94	373.54	4.4	3.49	
11/21/94	367.08	4.4	3.43	
11/22/94	361.25	4.3	3.36	
11/23/94	348.29	4.4	3.26	
11/24/94	363.33	4.25	3.37	
11/25/94	345.71	4.3	3.21	
11/26/94	353.54	4.3	3.28	
11/27/94	359.38	4.2	3.32	
11/28/94	365.08	4.2	3.37	
11/29/94	358.50	4.2	3.31	
11/30/94	348.46	4.2	3.22	
12/01/94	358.79	4.4	3.35	
12/02/94	349.54	4.35	3.26	
12/03/94	357.04	4.25	3.31	
12/04/94	358.13	4.27	3.32	
12/05/94	365.25	4.25	3.38	
12/06/94	369.00	4.2	3.41	
12/07/94	384.38	4.2	3.55	
12/08/94	378.46	4.4	3.54	
12/09/94	378.08	4.3	3.51	
12/10/94	-----	-----		Yes
12/11/94	351.21	4.4	3.28	
12/12/94	357.08	4.2	3.30	
12/13/94	349.33	4.3	3.25	
12/14/94	-----	-----		Yes
12/15/94	361.54	4.1	3.32	
12/16/94	380.25	4.2	3.51	
12/17/94	379.38	4.2	3.50	
12/18/94	390.63	4.15	3.60	
12/19/94	386.50	4.2	3.57	
Number				192
Max				3.78
Avg				3.13
Std dev				0.84
95% CI				4.77

Note: \* Yes = Plant downtime occurred on this day.

$$95\% \text{ CI} = (1.96 \times \text{Std dev}) + \text{Avg}$$

## **APPENDIX C**

### **SO<sub>2</sub> EMISSION INVENTORIES FOR**

- **AAQS**
- **PSD CLASS II**
- **PSD CLASS I**

Table C-1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
30ORL490001	Kissimmee Utility Authority	01	32.10	50600	42500	18.3	3.66	422.0	38.00
		05	2.09			16.2	0.85	477.6	2.87
		09	1.86			8.5	0.91	505.4	2.43
		10	1.83			8.5	0.91	505.4	2.43
		11	1.41			13.4	0.79	505.4	1.63
		12	1.41			13.4	0.73	505.4	1.92
		13	1.41			13.4	0.79	505.4	1.63
		14	1.41			13.4	0.61	505.4	4.38
		15	1.41			13.4	0.79	505.4	1.63
		11-15	7.05			13.4	0.73	505.4	1.92
30ORL490014	Florida Power Osceola	01	45.51	36800	39200	7.9	4.24	703.7	18.06
		02	45.51			7.9	4.24	703.7	18.06
		03	45.51			4.6	4.24	505.4	18.06
		04	45.51			7.9	4.24	703.7	18.06
		05	45.51			7.9	4.24	703.7	18.06
		06	45.51			7.9	4.24	703.7	18.06
		01-06	273.06	36800	39200	7.9	4.24	703.7	18.06
		07	27.97			15.2	4.21	834.8	0.05
		08	27.97			15.2	4.21	834.8	0.05
		09	27.97			15.2	4.21	834.8	0.05
		10	27.97			15.2	3.96	699.0	0.06
		07-10	111.88			15.2	4.21	834.8	0.05
		11	51.28			15.2	7.04	895.9	0.03
		12	51.28			15.2	7.04	895.9	0.03
		11-12	102.56			15.2	7.04	895.9	0.03

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40HIL290005	CF Industries, Inc. Zephyrhills	01	19.97	–21500	29200	7.6	1.07	560.9	17.74
		02	44.10			33.5	1.52	316.5	19.68
		03	44.10			33.5	1.52	316.5	19.68
		02,03	88.20			33.5	1.52	316.5	19.68
		07	54.56			60.7	2.44	352.6	16.40
		08	54.56			60.7	2.44	337.6	9.70
		10	2.96			28.7	3.05	326.5	7.93
		11	13.18			54.9	2.80	331.5	13.32
		12	13.18			54.9	2.80	313.7	8.18
		16	13.18			54.9	2.80	324.8	9.78
		17	11.34			54.9	2.80	333.1	13.37
		11,12,16,	50.88			54.9	2.80	331.5	13.32
		22	0.11			2.4	0.27	373.1	1.63
		23	0.01			3.7	0.09	373.1	1.65
		24	0.16			3.7	0.09	373.1	1.65
		23,24	0.17			3.7	0.09	373.1	1.65
40HIL290008	Cargill/ Gardinier Riverview	05	4.01	–46100	–4400	40.5	2.13	315.4	15.38
		04	46.20			45.6	2.29	340.0	12.64
		05	52.50			45.6	2.44	339.0	13.38
		06	67.20			45.6	2.74	350.0	12.66
		41	0.16			12.2	0.51	322.0	9.28
		55	0.96			40.4	2.13	319.0	16.09
		AA	1.90			38.4	2.44	325.0	12.35
40HIL290018	Lafarge Corp.	29	583.76	–51800	3800	44.5	2.44	494.8	40.24

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40HIL290038	TECO – Hookers Point	01	41.33	–51500	–4200	85.3	3.44	419.3	6.19
		02	41.33			85.3	3.44	438.1	5.49
		C2A	82.66			85.3	3.44	419.3	5.49
		03	57.04			85.3	3.66	434.3	8.17
		04	56.96			85.3	3.66	422.0	7.34
		C2B	114.00			85.3	3.66	422.0	7.34
		05	84.55			85.3	3.44	448.2	10.98
		06	107.86			85.3	2.87	434.3	22.26
40HIL290039	TECO – Big Bend	01,02	5292.00	–47600	–11800	149.4	7.32	422.0	28.65
		03	2646.00			149.4	7.32	417.6	14.33
		04	653.94			149.4	7.32	342.2	19.81
		05	41.55			22.9	4.27	770.9	8.17
		06	41.55			22.9	4.27	770.9	8.17
		C2	83.11			22.9	4.27	770.9	8.17
		07	11.87			10.7	3.17	816.5	5.55
40HIL290040	TECO – Gannon	01	380.14	–49500	700	93.3	3.17	427.0	24.08
		02	380.14			93.3	3.17	427.0	24.08
		C2	760.28			93.3	3.17	427.0	24.08
		03	483.59			93.3	3.35	422.0	30.18
		04	567.30			93.3	3.05	438.2	21.95
		05	690.70			93.3	3.29	415.4	37.70
		06	1148.49			93.3	5.33	417.6	23.47
		07	11.89			10.7	3.35	816.5	5.00

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40HIL290057	Gulf Coast Lead	01	48.41	–45500	6700	45.7	0.61	344.3	37.59
40HIL290102	Mobil Oil Big Four Mine	01	16.35	–14700	–19100	30.5	1.82	334.0	7.26
		AA	0.60			7.6	0.41	505.0	8.20
40HIL290127	Tampa McKay Bay Refuse–to–Energy	01	5.36	–49500	5100	45.7	1.30	500.0	12.30
		02	5.36			45.7	1.30	500.0	12.30
		03	5.36			45.7	1.30	500.0	12.30
		04	5.36			45.7	1.30	500.0	12.30
		C4	21.44			45.7	1.30	500.0	12.30
40MAN410010	FPL – Manatee	01	1198.89	–42300	–32700	152.1	7.98	425.9	23.61
		02	1198.89			152.1	7.92	425.9	23.98
		C2	2397.78			152.1	7.98	425.9	23.61
40PNL520011	FPC – Bartow	01	448.31	–67100	–4200	91.40	2.74	428.7	36.27
		02	448.31			91.40	2.74	424.8	31.09
		C2A	896.62			91.40	2.74	424.8	31.09
		03	710.01			91.40	3.35	408	34.44
		04	1.81			9.10	0.91	541.5	5.18
		05	71.72			13.70	5.27	772.0	22.25
		06	71.72			13.70	5.27	772.0	22.25
		08	49.46			13.70	5.27	772.0	22.25
		C3B	192.89			13.70	5.27	772.0	22.25
		01	92.53	–4700	–29600	27.40	4.42	396.0	24.38
40TPA250015	TECO – Hardee	02	92.53			27.40	4.42	396.0	24.38

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40TPA510002 Lykes, Pasco. Co.		03	92.53			22.90	5.49	785.0	31.39
		02	29.35	–26000	52400	22.9	0.79	327.6	33.71
		03	29.35			9.1	0.27	372.0	330.09
		05	0.01			16.2	1.22	449.8	0.74
		06	0.01			16.2	1.34	449.8	0.31
40TPA530002 Citrus World, Inc.		07	0.02			17.1	1.80	477.6	0.54
		01	23.74	31600	500	22.9	0.98	322.6	10.88
		07	11.870			22.9	0.76	325.4	12.30
		01,07	35.610			22.9	0.76	325.4	12.30
		04	0.0004			12.2	1.10	505.4	1.50
		03	0.0001			12.2	1.10	505.4	1.50
		17	0.0001			12.2	1.10	505.4	1.50
		03,04,17	0.0006	31600	500	12.2	1.10	505.4	1.50
		13	23.74			24.4	0.76	313.1	22.15
		01	93.30	–300	15950	50.3	3.05	433.0	5.49
40TPA530003 Lakeland Power/Larsen		02	0.40			50.3	3.05	444.0	6.40
		03	2.80			50.3	3.05	444.0	6.40
		04	18.70			50.3	3.05	444.0	6.71
		C3	21.90			50.3	3.05	444.0	6.40
		06	0.20			9.8	1.52	700.0	171.30
		07	0.01			9.8	1.52	700.0	171.30
		C2	0.21			9.8	1.52	700.0	171.30

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
		AA	29.11			30.5	5.79	783.2	28.22
40TPA530004	Lakeland Power/McIntosh	01	352.54	–1000	19000	45.7	2.74	419.3	23.77
		02	1.47			6.1	0.79	652.6	23.47
		03	1.46			6.1	0.79	652.6	23.47
		C2	2.93			6.1	0.79	652.6	23.47
		04	8.32			11.0	2.80	791.5	0.30
		05	25.67			47.6	3.17	402.6	21.03
		06	500.10			76.2	4.88	350.0	32.61
40TPA530007	Owens–Brockway Glass Container	01	2.62	13900	16000	22.9	0.91	629.3	22.71
		02	2.80			26.2	0.91	632.6	18.57
40TPA530009	Florida Tile Industries	10	0.03	–4100	15600	12.2	0.61	338.7	0.32
		11	0.03			12.2	0.61	491.5	0.91
40TPA530013	FMC Corp/Citrus Machinery	01	0.05	300	15800	12.2	0.34	347.0	2.67
40TPA530015	Florida Juice Partners, LTD.	01	0.040	–10500	15000	27.4	0.91	333.1	7.37
		02	0.001			10.1	0.61	447.0	5.45
		03	0.001			10.4	0.91	447.0	9.25
40TPA530023	Coca Cola	01	18.02	12100	16900	28.3	1.07	333.1	16.84
		03	0.52			30.5	0.98	344.8	15.16
		08	21.52			12.2	1.22	434.8	18.35
40TPA530027	IMC Noralyn Mine Road	01	1.24	5200	–6500	23.2	1.98	394.0	17.30
		02	13.30			16.8	2.83	341.0	8.82

Table C-1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40TPA530037	SFE Citrus Processors	01	5.58	12200	17400	28.0	1.43	347.0	7.20
		02	4.75			10.7	0.91	574.8	2.16
		03	6.53			9.8	1.37	505.4	0.96
40TPA530045	Orange-CO of Florida	02	0.001	9200	-3200	6.1	0.70	526.5	7.70
		04	0.001			6.1	0.30	408.1	0.45
		05	0.001			11.0	0.67	483.1	8.50
		06	0.75			27.1	0.94	348.1	11.48
40TPA530047	Mobil Chem Co. Nichols	01	32.20	-11100	-1500	24.4	2.29	344.3	12.65
		02	31.63			24.4	2.29	344.3	12.65
		C2	63.82			24.4	2.29	344.3	12.65
		04	2.44			25.9	2.29	338.7	16.10
40TPA530048	Royster Mulberry Phosphate	02	35.70	-2800	-1600	61.0	2.13	366.5	9.90
		05	9.30			31.1	2.68	316.5	8.17
		09	12.91			13.7	1.13	505.4	11.34
40TPA530051	U. S. Agri-Chemicals Fort Meade	06	6.43	6500	-17800	21.3	1.13	477.6	14.97
		16	46.24			53.3	2.59	355.4	10.04
		17	46.24			53.3	2.59	355.4	10.04
40TPA530052	CF Industries Bartow Bonnie Mine Rd	DAP 1-3	3.97	-1100	-4400	36.4	2.13	339.0	16.11
		05	50.40			62.8	2.13	361.0	10.88
		06	50.40			62.8	2.13	370.0	7.28

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40TPA530053 Farmland Industries	--	SAP 7	42.00			67.1	2.40	351.0	9.87
		AA	0.52			11	0.8	588.6	13.5
		03	33.58	0	7300	30.5	2.29	355.0	9.27
		04	33.58			30.5	2.29	355.0	9.27
		C2	67.16			30.5	2.29	355.0	9.27
		05	50.40			45.7	2.44	355.4	11.58
		28	2.34			29.0	1.68	605.4	3.35
40TPA530055 IMC–Agrico Chem.–S. Pierce		01	8.0	–2000	–15500	10.70	1.46	494.3	15.76
		05	56.75			45.70	1.60	350.0	39.06
		04	56.75			45.70	1.60	350.0	39.06
		C2	113.50			45.70	1.60	350.0	39.06
40TPA530057 Conserve Chemicals/IMC Agrico Nichols		16	0.20	–11100	–2600	11.89	0.98	533.0	8.84
		12	3.34			24.67	2.29	328.0	3.78
		05	42.0			45.72	2.29	352.0	10.30
		15	0.18			8.20	0.61	533.2	13.75
40TPA530059 IMC – New Wales		02	60.96	–12900	–7900	61.0	2.59	349.8	15.33
		03	60.96			61.0	2.59	349.8	15.33
		04	60.96			61.0	2.59	349.8	15.33
		C3	182.88			61.0	2.59	349.8	15.33
		09	9.40			40.5	2.13	313.7	15.18
		10	21.68			40.5	1.83	316.5	20.66

Table C–1. Summary of Individual Source Emission and Operating Parameters SO2 AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO2 Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
		27	6.96			44.2	1.37	313.7	18.53
		42	60.96			60.7	2.59	349.8	15.30
		44	60.96			60.7	2.59	349.8	15.30
		C2	121.92			60.7	2.59	349.8	15.30
		45	2.77			36.6	1.83	319.3	20.15
		46	2.77			36.6	1.83	319.3	20.15
40TPA530082	Macasphalt Winter Haven	01	1.38	13600	14700	12.2	0.37	335.9	257.82
40TPA530095	Lakeland Regional Medical Center	02	4.60	–3100	17500	36.6	1.07	477.6	3.64
40TPA530100	Schering Berlin Polymers, Inc.	01	0.02	1200	12100	7.6	0.61	449.8	182.96
		02	0.02			9.1	0.61	449.8	114.00
		03	0.02			9.1	0.46	449.8	100.68
		C2	0.04			9.1	0.46	449.8	100.68
		05	0.10			10.7	0.34	755.4	7.78
		06	0.02			10.7	0.46	449.8	4.02
		07	0.02			10.7	0.46	449.8	5.17
		C2	0.04			10.7	0.46	449.8	4.02
		08	1.30			6.4	0.61	699.8	8.26
40TPA530146	Pavex Corporaton	01	8.08	3500	–600	7.62	1.10	408.2	17.67
	Panda Kathleen	01	0.73	–10800	14600	45.7	5.33	372.0	14.57
	SECI Hardee (50% I)	01	13.00	–4400	–29300	27.4	5.79	413.7	14.02

Table C – 1. Summary of Individual Source Emission and Operating Parameters SO<sub>2</sub> AAQS Modeling Analysis

APIS Number	Facility	APIS Source Number	Maximum SO <sub>2</sub> Emissions (g/sec)	Location Relative To Cargill Bartow*		Stack Data		Operating Data	
				X (m)	Y (m)	Height (m)	Diameter (m)	Temperature (K)	Velocity (m/sec)
40TPA530182	Geologic Recovery Systems	01	4.66	-7700	-1000	7.9	0.82	1088.7	29.92
NA	FPC Polk County Site		24.70	4800	-12900	34.4	4.11	400.0	40.54
NA	Mulburry Cogeneration		12.70	4100	-6200	38.1	15.00	377.0	18.87
			0.65			38.1	1.98	422.0	9.31
NA	TECO – Polk Power		0.33	-7000	-19300	6.1	0.90	533.0	13.10
			49.67			45.7	5.80	400.0	16.79
			7.82			60.7	1.07	1033.0	9.14

<sup>1</sup> For TECO – Big Bend, the emission rate shown is for 3-hour averaging time. The emission rate shown in parenthesis is used for the 24-hour and annual averaging times.

<sup>2</sup> For TECO – Gannon, the emission rate shown is for the 3-hour and 24-hour averaging times. The emission rate shown in parenthesis is used the annual averaging time.

Table C-2. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class II Modeling Analysis

APIS ID #	Facility/Source Description	Facility Location UTM E,N (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
		Relative X,Y (m) ^ a		(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
30ORL490014	Florida Power Corp. Osceola	446	3126									
	92.97 MW Simple Cycle Combustion	36800	39200	50	15.2	13.8	4.21	0.2	0.05	1043	834.8	27.97
	92.97 MW Simple Cycle Combustion			50	15.2	13.8	4.21	0.2	0.05	1043	834.8	27.97
	92.97 MW Simple Cycle Combustion			50	15.2	13.8	4.21	0.2	0.05	1043	834.8	27.97
	92.97 MW Simple Cycle Combustion			50	15.2	13.0	3.96	0.2	0.06	800	699.0	27.97
	185.5 MW Simple Cycle Combustion			50	15.2	23.1	7.04	0.1	0.03	1153	895.9	51.28
	185.5 MW Simple Cycle Combustion			50	15.2	23.1	7.04	0.1	0.03	1153	895.9	51.28
40HIL290005	CF Industries, Inc. Zephyrhills A+B	388	3116									
		-21500	29200	110.0	33.5	4.9	1.50	64.0	19.50	109	316.0	88.20
	D			198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	54.60
	C			198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	54.60
				198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	109.2
	Baseline C			198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	-50.40
	Baseline D			198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	-50.40
				198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	-100.8
	Baseline A+B			61.7	18.8	5.0	1.52	61.7	18.80	109	316.0	-105.00
40HIL290127	Tampa McKay Bay Refuse-to-Energy West	360	3091.9									
		-49500	5100	149.9	45.7	4.3	1.30	69.9	21.30	440	500.0	5.36
	Mid-West			149.9	45.7	4.3	1.30	69.9	21.30	440	500.0	5.36
	Mid-East			149.9	45.7	4.3	1.30	69.9	21.30	440	500.0	5.36
	East			149.9	45.7	4.3	1.30	69.9	21.30	440	500.0	5.36
				149.9	45.7	4.3	1.30	69.9	21.30	440	500.0	21.44
NA	Borden Hillsborough	394.6	3069.6	100.0	30.5	6.0	1.82	48.5	14.79	160	344.0	-6.48
		-14900	-17200									
40HIL290008	Cargill/Gardinier Riverview SAP 4,5,6	363.4	3082.4									
		-46100	-4400	74.1	22.6	5.0	1.52	23.0	7.00	194	363.0	-187.59
	SAP 7			149.6	45.6	7.5	2.29	30.2	9.20	152	340.0	-26.26
	SAP 8			149.6	45.6	8.0	2.44	45.7	13.93	151	339.0	-41.17
	SAP 9 Baseline			149.6	45.6	9.0	2.74	33.8	10.30	170	350.0	-54.60

Table C-2. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class II Modeling Analysis

APIS ID #	Facility/Source Description	Facility Location UTM E,N (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO <sub>2</sub> Emissions (g/s)
		Relative X,Y (m) ^ a		(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
	SAP 9 Proposed Mod.			149.6	45.6	9.0	2.74	41.5	12.66	170	350.0	67.20
40TPA530052	CF Industries Bartow Bonnie Mine Rd	408.4	3082.4									
	DAP 1-3	-1100	-4400	119.4	36.4	7.0	2.13	52.9	16.11	151	339.0	3.97
	DAP 5			206.0	62.8	7.0	2.13	35.7	10.88	190	361.0	50.40
	DAP 6			206.0	62.8	7.0	2.13	23.9	7.28	206	370.0	50.40
	DAP 7			220.0	67.1	7.9	2.40	32.2	9.80	172	351.0	42.00
	SAP 1			100.0	30.5	4.5	1.37	40.0	12.20	170	350.0	-60.90
	SAP 2			100.0	30.5	5.5	1.68	34.0	10.37	170	350.0	-110.25
	SAP 3			100.0	30.5	9.0	2.74	14.0	4.27	196	364.0	-107.10
	SAP 4			100.0	30.5	7.0	2.13	26.0	7.93	185	358.0	-174.83
	SAP 5			206.0	62.8	7.0	2.13	35.0	10.67	185	358.0	-226.80
	SAP 6			206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	-170.10
				206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	-396.90
NA	Dolime Dryers	404.8	3069.5									
	Boilers	-4700	-17300	90.0	27.4	5.0	1.52	67.8	20.67	140	333.0	-5.68
				90.0	27.4	2.0	0.61	23.8	7.25	430	494.1	-4.52
NA	Estech/Swift Polk Dryer	411.5	3074.2									
	Dryer	2000	-12600	60.0	18.3	9.7	2.95	27.8	8.47	151	339.0	-23.94
	SAP			61.5	18.8	9.7	2.95	16.6	5.06	152	340.0	-22.80
				101.0	30.8	7.0	2.13	12.8	3.90	185	358.0	-92.87
40TPA530053	Farmland Industries – Green Bay	409.5	3079.5									
	1,2 H <sub>2</sub> SO <sub>4</sub>	0	-7300	100.0	30.5	4.5	1.37	66.2	20.18	100	311.0	-83.98
	3,4 H <sub>2</sub> SO <sub>4</sub>			100.0	30.5	7.5	2.29	30.4	9.27	179	355.0	67.16
	5 H <sub>2</sub> SO <sub>4</sub>			150.0	45.7	8.0	2.44	38.0	11.58	179	355.0	50.40
NA	FPC Polk County Site	414.3	3073.9	113.0	34.4	13.5	4.11	133.0	40.54	260	400.0	24.70
		4800	-12900									
40TPA250015	TECO – Hardee	404.9	3057.1	303.6	92.53	27.4	4.42	80.0	24.38	253	396.0	92.53
		-4600	-29700	303.6	92.53	27.4	4.42	80.0	24.38	253	396.0	92.53
				303.6	92.53	22.9	5.49	103.0	31.39	953	785.0	92.53

Table C-2. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class II Modeling Analysis

APIS ID #	Facility/Source Description	Facility Location UTM E,N (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
		Relative X,Y (m) ^ a		(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
40TPA530057	IMC-Agrico/Conserve Nichols	398.4	3084.2									
	--	-11100	-2600	100.0	30.5	5.9	1.80	62.0	18.90	95	308.0	-15.20
	H2SO4 #1			150.0	45.7	7.5	2.29	33.8	10.30	174	352.0	42.00
	Rock Dryer			80.0	24.4	5.0	1.52	42.3	12.90	151	339.0	-3.88
40TPA530059	Sulf Acid Plt #1	396.6	3078.9									
	Sulf Acid Plt #2	-12900	-7900	200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	60.96
	Sulf Acid Plt #3			200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	60.96
				200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	182.88
	DAP Plant #1			132.9	40.5	7.0	2.13	49.8	15.18	105	313.7	9.40
	Granulation Plant			145.0	44.2	4.5	1.37	60.8	18.53	105	313.7	6.96
	Sulf Acid Plt #4			199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	60.96
	Sulf Acid Plt #5			199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	60.96
				199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	121.92
	DAP Plant #2			120.1	36.6	6.0	1.83	66.1	20.15	115	319.3	2.77
	Rock Dryer			69.0	21.0	7.0	2.13	61.0	18.60	165	347.0	-34.27
	SAP 1,2,3 Baseline			200.1	61.0	8.5	2.60	46.9	14.28	170	350.0	-146.00
NA	IMC-Agrico Pierce	404.1	3079.0									
	Dryers 1,2	-5400	-7800	80.0	24.4	5.0	1.52	42.5	12.94	151	339.0	-24.32
	Dryers 3,4			80.0	24.4	8.0	2.43	61.7	18.82	151	339.0	-23.00
40TPA530055	IMC-Agrico South Pierce	407.5	3071.3									
	Baseline	-2000	-15500	150.0	45.7	5.2	1.60	86.6	26.40	170	350.0	-75.60
	#10,11			150.0	45.7	5.2	1.60	128.1	39.06	170	350.0	113.50
	DAP			125.0	38.1	10.2	3.10	47.9	14.60	131	328.0	4.41
30ORL490001	Kissimmee Utilites Exist	460.1	3129.3	60.0	18.3	12.0	3.66	124.7	38.00	300	422.0	32.10
40TPA530080	Imperial Phosphates (Brewer)	404.8	3069.5	90.0	27.4	7.5	2.29	50.0	15.25	151	339.0	-19.26
		-4700	-17300									
40TPA530003	Lakeland Utilities Larsen CT	409.2	3102.8	100.0	30.5	19.0	5.79	92.6	28.22	950	783.2	29.11

Table C-2. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class II Modeling Analysis

APIS ID #	Facility/Source Description	Facility Location UTM E,N (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
		Relative X,Y (m) ^ a		(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
		-300	15950									
40TPA530004	Lakeland Utilities McIntosh 3	408.5	3105.8	250.0	76.2	16.0	4.88	107.0	32.61	170	350.0	500.10
		-1000	19000									
40TPA530060	Mobil Electrophos Division	405.6	3079.4									
	Boiler	-3900	-7400	24.0	7.3	3.0	0.91	10.6	3.23	376	464.0	-6.53
	Boiler			20.0	6.1	3.0	0.91	25.3	7.71	376	464.0	-10.05
	Rock Dryer			60.0	18.3	6.0	1.83	22.3	6.79	170	350.0	-21.81
	Calclner			84.0	25.6	7.0	2.13	22.9	6.97	91	306.0	-7.11
	Coke Dryer			60.0	18.3	2.3	0.70	75.0	22.87	120	322.0	-3.17
	Furnace			96.0	29.3	7.0	2.13	28.0	8.52	106	314.0	-47.25
40HIL290102	Mobil Big Four Mine /AMAX	394.80	3067.7									
	Dryer	-14700	-19100	27.0	8.2	1.3	0.41	24.8	7.57	449	505.0	0.60
				100.0	30.5	6.0	1.82	23.8	7.26	142	334.0	16.35
40TPA530047	Mobil Mining & Minerals Nichols	398.4	3085.3									
	Rock Surge Dryer	-11100	-1500	85.0	25.9	7.5	2.29	52.8	16.10	150	338.7	2.44
	Boiler			93.2	28.4	3.6	1.09	63.1	19.24	152	340.0	-13.89
	Boiler			13.0	4.0	2.6	0.80	5.9	1.80	480	522.0	-0.87
NA	Mulberry Cogeneration	413.6	3080.6									
	CT	4100	-6200	125.0	38.1	15.0	4.57	61.9	18.87	219	377.0	12.70
	Duct Burner			125.0	38.1	6.5	1.98	30.5	9.31	300	422.0	0.65
40TPA530048	Mulberry Phosphates (Royster)	406.8	3085.1									
	Unit #1	-2800	-1600	167.3	51.0	7.0	2.13	32.5	9.90	181	356.0	-257.60
	Unit #2			200.0	61.0	7.0	2.13	32.5	9.90	200	366.5	35.70
40HIL290039	TECO Big Bend	361.9	3075.0									
	Unit 3 (24-hr)	-47600	-11800	490.0	149.4	24.0	7.32	47.0	14.33	293	418.0	-1218.00
	Unit 4			490.0	149.4	24.0	7.32	65.0	19.81	156	342.2	653.94
	Units 1,2 (24-hr)			490.0	149.4	24.0	7.32	94.0	28.65	300	422.0	-2436.00
NA	TECO Polk Power	402.50	3067.35									
	Aux Boiler	-7000	-19450	20.0	6.1	3.0	0.90	43.0	13.10	500	533.0	0.33
	IGCC			150.0	45.7	19.0	5.80	55.1	16.79	260	400.0	49.67

Table C-2. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class II Modeling Analysis

APIS ID #	Facility/Source Description	Facility Location UTM E,N (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
		Relative X,Y (m) ^ a		(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
	Thermal Ox + Tail Gas			199.0	60.7	3.5	1.07	30.0	9.14	1400	1033.0	7.82
40TPA530050	US Agri-Chem Bartow Dryer SAP	413.2 3700	3086.3 ~500	51.8 95.0	15.8 29.0	6.0 7.0	1.83 2.12	32.8 24.6	10.01 7.50	138 89	332.0 305.0	-3.41 -42.00
40TPA530051	US Agri-Chem Ft Meade H2SO4 X	416.0 6500	3069.0 -17800	95.0	29.0	9.9	3.02	22.2	6.77	106	314.0	-78.80
	H2SO4 1			175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
	H2SO4 2			175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
	GTSP			93.0	28.3	5.0	1.52	57.7	17.60	134	330.0	-18.27
NA	Panda Kathleen	398.7 -10800	3101.4 14600	150.0	45.7	17.5	5.33	47.8	14.57	210	372.0	0.73
NA	SECI HD3(Hardee 50% I)	404.9 -4400	3057.4 -29300	89.9	27.4	19.0	5.79	46.2	14.09	286	414.0	13.00

Note : The APIS source number is shown for SO2 PSD increment consuming sources that are also included in the AAQS inventory.

^ a Locations are relative to the Cargill Bartow plant(UTM location East,North (km) of 409.5, 3086.8)

Note: TECO PPS= TECO Polk Power Station

APIS data were obtained from APIS Report AIR07 (9/93) provided by FDEP . Where differences between APIS data and inventory are noted, the APIS data is not incorporated.

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
40TPA270024		Asphalt Pavers 3	359.9	3162.4	40.0	12.2	4.5	1.37	34.7	10.58	219	377.0	2.25
40TPA270015		Asphalt Pavers 4	361.4	3168.4	28.0	8.5	3.5	1.08	35.9	10.95	184	357.4	2.25
40TPA530221		Auburndale Cogeneration	420.8	3103.3	160.1	48.8	18.0	5.50	46.9	14.30	280	411.0	6.40
NA		Borden Hillsborough	394.6	3069.6	100.0	30.5	6.0	1.82	48.5	14.79	160	344.0	–6.48
NA		Borden Polk	414.5	3109.0	56.0	17.1	7.7	2.34	27.1	8.26	140	333.0	–5.29
40HIL290008		Cargill/Gardiner Riverview											
		SAP 4,5,6	363.4	3082.4	74.1	22.6	5.0	1.52	23.0	7.00	194	363.0	–187.70
		SAP 7			149.6	45.6	7.5	2.29	30.2	9.20	152	340.0	–26.25
		SAP 8			149.6	45.6	8.0	2.44	45.7	13.93	151	339.0	–41.16
		SAP 9 Baseline			149.6	45.6	9.0	2.74	33.8	10.30	170	350.0	–54.60
	06	SAP 9 Proposed Mod.			149.6	45.6	9.0	2.74	41.5	12.66	170	350.0	67.20
40TPA530046		Cargill/Seminole Bartow											
		SAP 1	409.8	3087.0	150.0	45.7	4.5	1.37	54.1	16.50	174	352.0	–108.00
		SAP 2			150.0	45.7	4.5	1.37	54.1	16.50	174	352.0	–108.00
					150.0	45.7	4.5	1.37	54.1	16.50	174	352.0	–216.00
		SAP 3 baseline			150.0	45.7	5.0	1.52	54.8	16.70	100	311.0	–52.50
	12,32,33	SAP 4,5,6 current			200.0	61.0	6.8	2.06	60.5	18.45	158	343.0	163.80
		Dryer			50.0	15.2	6.7	2.04	56.8	17.32	129	327.0	–39.41
40TPA530052		CF Industries Bartow Bonnie Mine Rd											
--		DAP 1–3	408.4	3082.4	119.4	36.4	7.0	2.13	52.9	16.11	151	339.0	3.97
05		SAP 5			206.0	62.8	7.0	2.13	35.7	10.88	190	361.0	50.40
06		SAP 6			206.0	62.8	7.0	2.13	23.9	7.28	206	370.0	50.40
--		SAP 7			220.0	67.1	7.9	2.40	32.2	9.80	172	351.0	42.00
		SAP 1			100.0	30.5	4.5	1.37	40.0	12.20	170	350.0	–60.90
		SAP 2			100.0	30.5	5.5	1.68	34.0	10.37	170	350.0	–110.25
		SAP 3			100.0	30.5	9.0	2.74	14.0	4.27	196	364.0	–107.10
		SAP 4			100.0	30.5	7.0	2.13	26.0	7.93	185	358.0	–174.83
		SAP 5			206.0	62.8	7.0	2.13	35.0	10.67	185	358.0	–226.80
		SAP 6			206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	–170.10

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO<sub>2</sub> PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO <sub>2</sub> Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
					206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	–396.9
40HIL290005		CF Industries Zephyrhills A+B	388.0	3116.0	110.0	33.5	4.9	1.50	64.0	19.50	109	316.0	88.20
		D			198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	54.60
		C			198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	54.60
					198.0	60.4	8.0	2.44	58.3	17.77	176	353.0	109.2
		Baseline C			198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	–50.40
		Baseline D			198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	–50.40
					198.0	60.4	8.0	2.44	53.8	16.40	176	353.0	–100.8
		Baseline A+B			61.7	18.8	5.0	1.52	61.7	18.80	109	316.0	–105.00
NA		CLM Chemical	361.8	3088.3	98.4	30.0	2.0	0.61	65.6	20.00	215	375.0	21.02
40TPA510066		Couch Const–Zephyrhills (Asphalt)	390.3	3129.4	20.0	6.1	4.5	1.38	68.9	21.00	300	422.0	3.54
40TPA510041		Couch Const–Odessa (Asphalt)	340.7	3119.5	30.0	9.1	4.6	1.40	73.2	22.30	325	436.0	7.25
		Dris Paving (Asphalt)	340.6	3119.2	40.0	12.2	10.0	3.05	21.2	6.47	151	339.0	0.23
NA		Dolime Dryers	404.8	3069.5	90.0	27.4	5.0	1.52	67.8	20.67	140	333.0	–5.68
		Boilers			90.0	27.4	2.0	0.61	23.8	7.25	430	494.1	–4.52
NA		Estech/Swift Polk Dryer	411.5	3074.2	60.0	18.3	9.7	2.95	27.8	8.47	151	339.0	–23.94
		Dryer			61.5	18.8	9.7	2.95	16.6	5.06	152	340.0	–22.80
		SAP			101.0	30.8	7.0	2.13	12.8	3.90	185	358.0	–92.87
NA		Evans Packing	383.3	3135.8	40.4	12.3	1.3	0.40	30.2	9.20	379	466.2	0.20
40TPA270017		E R Jahna (Lime Dryer)	386.7	3155.8	35.0	10.7	6.0	1.83	29.5	8.99	129	327.0	0.82

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO<sub>2</sub> PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO <sub>2</sub> Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
40TPA530053		Famland Industries – Green Bay Plant											
	03,04	1,2 H <sub>2</sub> SO <sub>4</sub>	409.5	3079.5	100.0	30.5	4.5	1.37	66.2	20.18	100	311.0	–83.98
		3,4 H <sub>2</sub> SO <sub>4</sub>			100.0	30.5	7.5	2.29	30.4	9.27	179	355.0	67.16
	05	5 H <sub>2</sub> SO <sub>4</sub>			150.0	45.7	8.0	2.44	38.0	11.58	179	355.0	50.40
NA		FDOC Boiler #3	382.2	3166.1	30.0	9.1	2.0	0.61	15.0	4.57	401	478.0	2.99
40TPA270021		FL Crushed Stone Kiln 1	360.0	3162.4	320.2	97.6	16.0	4.88	91.2	27.80	385	469.3	98.40
40TPA270010		FL Mining and Materials Kiln	356.2	3169.9	105.0	32.0	14.0	4.27	32.5	9.90	250	394.3	1.45
40TPA090004		FPC – Crystal River											
		Crystal River 1	334.2	3204.5	498.7	152.0	15.0	4.57	138.1	42.10	300	422.0	–314.00
		Crystal River 2			502.0	153.0	16.0	4.88	138.1	42.10	300	422.0	–1859.00
		Crystal River 4			584.6	178.2	25.5	7.77	68.9	21.00	253	396.0	1008.80
		Crystal River 5			584.6	178.2	25.5	7.77	68.9	21.00	253	396.0	1008.80
					584.6	178.2	25.5	7.77	68.9	21.00	253	396.0	2017.6
30ORL640028		FPC Debary	467.5	3197.2	50.0	15.2	13.8	4.21	184.4	56.21	1016	819.8	466.40
30ORL490014		FPC Intercession City											
	07	4 CTs 7EA	446.3	3126.0	50.0	15.2	13.8	4.21	184.4	56.21	1016	819.8	124.40
	08	2 CTs 7FA			50.0	15.2	23.1	7.04	105.2	32.07	1126	880.8	110.40
NA		FPC Polk County Site	414.3	3073.9	113.0	34.4	13.5	4.11	133.0	40.54	260	400.0	24.70
NA		General Portland Cement #4	358.0	3090.6	118.0	36.0	9.0	2.74	57.8	17.61	450	505.2	–62.99
NA		General Portland Cement #5	358.0	3090.6	149.0	45.4	12.5	3.81	19.0	5.80	430	494.1	–69.30
40HIL290261		Hillsborough Cty RRF	368.2	3092.7	220.0	67.1	11.5	3.51	55.0	16.76	430	494.3	22.17
NA		Hospital Corp of America											
		Boiler #1	333.4	3141.0	36.0	11.0	1.0	0.31	13.1	4.00	500	533.0	0.08
		Boiler #2			36.0	11.0	1.0	0.31	13.1	4.00	500	533.0	0.08
					36.0	11.0	1.0	0.31	13.1	4.00	500	533.0	0.16

Table C-3. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
40TPA530057		IMC-Agrico/Conserve Nichols											
	05	--	398.4	3084.2	100.0	30.5	5.9	1.80	62.0	18.90	95	308.0	-15.20
		H2SO4 #1			150.0	45.7	7.5	2.29	33.8	10.30	174	352.0	42.00
		Rock Dryer			80.0	24.4	5.0	1.52	42.3	12.90	151	339.0	-3.88
40TPA530059		IMC-Agrico New Wales											
	44	Sulf Acid Plt #1	396.6	3078.9	200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	60.96
	46	Sulf Acid Plt #2			200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	60.96
	02	Sulf Acid Plt #3			200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	60.96
	42				200.1	61.0	8.5	2.59	50.3	15.33	170	349.8	182.88
		DAP Plant #1			132.9	40.5	7.0	2.13	49.8	15.18	105	313.7	9.40
	27	Granulation Plant			145.0	44.2	4.5	1.37	60.8	18.53	105	313.7	6.96
		Sulf Acid Plt #4			199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	60.96
		Sulf Acid Plt #5			199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	60.96
					199.1	60.7	8.5	2.59	50.2	15.30	170	349.8	121.92
		DAP Plant #2			120.1	36.6	6.0	1.83	66.1	20.15	115	319.3	2.77
		Rock Dryer			69.0	21.0	7.0	2.13	61.0	18.60	165	347.0	-34.27
		SAP 1,2,3 Baseline			200.1	61.0	8.5	2.60	46.9	14.28	170	350.0	-146.00
NA		IMC-Agrico Pierce											
		Dryers 1,2	404.1	3079.0	80.0	24.4	5.0	1.52	42.5	12.94	151	339.0	-24.32
		Dryers 3,4			80.0	24.4	8.0	2.43	61.7	18.82	151	339.0	-23.00
40TPA530055		IMC-Agrico South Pierce											
		Baseline	407.5	3071.3	150.0	45.7	5.2	1.60	86.6	26.40	170	350.0	-75.60
	04,05	#10,11			150.0	45.7	5.2	1.60	128.1	39.06	170	350.0	113.50
	10	DAP			125.0	38.1	10.2	3.10	47.9	14.60	131	328.0	4.41
40TPA530080		Imperial Phosphates (Brewster)	404.8	3069.5	90.0	27.4	7.5	2.29	50.0	15.25	151	339.0	-19.26
NA		Kissimmee Utilities	447.7	3127.9	40.0	12.2	10.0	3.05	95.5	29.10	718	654.0	29.40
30ORL490001		Kissimmee Utilities Exist	460.1	3129.3	60.0	18.3	12.0	3.66	124.7	38.00	300	422.0	32.10

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
40TPA530003		Lakeland Utilities Larsen CT	409.2	3102.8	100.0	30.5	19.0	5.79	92.6	28.22	950	783.2	29.11
40TPA530004	06	Lakeland Utilities McIntosh 3	408.5	3105.8	250.0	76.2	16.0	4.88	107.0	32.61	170	350.0	500.10
NA		Lake Cogen	434.0	3198.8	100.0	30.5	11.0	3.35	56.2	17.13	232	384.3	5.04
40HIL290127		McKay Bay RRF	360.0	3091.9	150.0	45.7	4.3	1.30	69.9	21.30	440	500.0	21.44
40TPA530060		Mobil Electrophos Division											
		Boiler	405.6	3079.4	24.0	7.3	3.0	0.91	10.6	3.23	376	464.0	–6.53
		Boiler			20.0	6.1	3.0	0.91	25.3	7.71	376	464.0	–10.05
		Rock Dryer			60.0	18.3	6.0	1.83	22.3	6.79	170	350.0	–21.81
		Calcliner			84.0	25.6	7.0	2.13	22.9	6.97	91	306.0	–7.11
		Coke Dryer			60.0	18.3	2.3	0.70	75.0	22.87	120	322.0	–3.17
		Furnace			96.0	29.3	7.0	2.13	28.0	8.52	106	314.0	–47.25
40HIL290102		Mobil Big Four Mine /AMAX											
		Dryer	394.80	3067.72	27.0	8.2	1.3	0.41	24.8	7.57	449	505.0	0.60
	01	Dryer	394.85	3069.77	100.0	30.5	6.0	1.82	23.8	7.26	142	334.0	16.35
40TPA530047		Mobil Mining & Minerals Nichols											
		Rock Surge Dryer	398.4	3085.3	85.0	25.9	7.5	2.29	52.8	16.10	150	338.7	2.44
		Boiler			93.2	28.4	3.6	1.09	63.1	19.24	152	340.0	–13.89
		Boiler			13.0	4.0	2.6	0.80	5.9	1.80	480	522.0	–0.87
NA		Mulberry Cogeneration											
		CT	413.6	3080.6	125.0	38.1	15.0	4.57	61.9	18.87	219	377.0	12.70
		Duct Burner			125.0	38.1	6.5	1.98	30.5	9.31	300	422.0	0.65
40TPA530048		Mulberry Phosphates (Royster)											
		Unit #1	406.7	3085.2	167.3	51.0	7.0	2.13	32.5	9.90	181	356.0	–257.60
	02	Unit #2			200.0	61.0	7.0	2.13	32.5	9.90	200	366.5	35.70
NA		New Pt Richey Hospital											
		Boiler #1	331.2	3124.5	36.0	11.0	1.0	0.31	12.7	3.88	520	544.0	0.06
		Boiler #2			36.0	11.0	1.0	0.31	12.7	3.88	520	544.0	0.03
					36.0	11.0	1.0	0.31	12.7	3.88	520	544.0	0.09
NA		Oman Construction	359.8	3164.9	25.0	7.6	6.0	1.83	20.6	6.29	165	347.0	2.09

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
30ORL480137		Orlando Utilities Commission – Stanton Unit 1	483.5	3150.6	550.0	167.6	19.0	5.80	70.9	21.60	127	325.7	601.00
		Unit 2 (24–hour)			550.0	167.6	19.0	5.80	77.1	23.50	124	324.2	91.80
40TPA510028		Overstreet Paving	355.9	3143.7	30.0	9.1	4.3	1.30	52.5	16.00	275	408.0	3.67
40TPA510056		Pasco Cty RRF	347.1	3139.2	275.0	83.8	10.0	3.05	51.0	15.54	250	394.3	14.10
NA		Pasco Cogen	385.6	3139.0	100.0	30.5	11.0	3.35	56.2	17.13	232	384.3	5.04
40PNL520117		Pinellas RRF	335.3	3084.4	161.0	49.1	9.0	2.74	88.0	26.82	450	505.5	64.26
30ORL48109		Reedy Creek Energy Services– EPCOT Generator 1	442.0	3139.0	17.0	5.2	1.8	0.55	144.8	44.12	650	616.5	1.83
		Generator 2			17.0	5.2	1.8	0.55	144.8	44.12	650	616.5	1.83
					17.0	5.2	1.8	0.55	144.8	44.12	650	616.5	3.66
30ORL480110		Reedy Creek Energy Services	443.1	3144.3	65.0	19.8	11.2	3.41	51.0	15.56	285	413.7	0.15
NA		Ridge Cogeneration	416.7	3100.4	325.0	99.1	10.0	3.05	47.6	14.50	170	350.0	13.80
40PNL520042		Stauffer Shutdown Boiler	325.6	3116.7	24.0	7.3	3.0	0.91	10.6	3.23	376	464.0	–4.86
		Dryer			60.0	18.3	2.3	0.70	75.0	22.87	120	322.0	–1.50
		Furnace			160.8	49.0	3.9	1.20	11.8	3.60	143	335.0	–50.93
		Kiln			84.0	25.6	7.0	2.13	22.9	6.97	91	306.0	–7.36
		Roaster			84.0	25.6	3.0	0.91	22.9	6.97	120	322.0	–0.45
40TPA250015	01 02 03	TECO – Hardee	404.9	3057.1	89.9	27.40	14.5	4.42	80.0	24.38	253	396.0	92.53
					89.9	27.40	14.5	4.42	80.0	24.38	253	396.0	92.53
					75.1	22.90	18.0	5.49	103.0	31.39	953	785.0	92.53
40HIL290039	04	TECO Big Bend Unit 3 (24–hr)	361.9	3075.0	490.0	149.4	24.0	7.32	47.0	14.33	293	418.0	–1218.00
		Unit 4			490.0	149.4	24.0	7.32	65.0	19.81	156	342.2	653.94

Table C–3. Summary of Individual Source Emission and Operating Parameters for the SO2 PSD Class I Modeling Analysis.

APIS ID #	APIS Source No.	Facility/Source Description	UTM Location (km)		Stack Height		Stack Diameter		Exit Velocity		Exit Temperature		Maximum SO2 Emissions (g/s)
			East	North	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(F)	(K)	
NA		Units 1,2 (24–hr)			490.0	149.4	24.0	7.32	94.0	28.65	300	422.0	–2436.00
		TECO Polk Power											
		Aux Boiler	402.50	3067.35	20.0	6.1	3.0	0.90	43.0	13.10	500	533.0	0.33
		IGCC	402.48	3067.36	150.0	45.7	19.0	5.80	55.1	16.79	260	400.0	49.67
		Thermal Ox + Tail Gas	402.28	3067.41	199.0	60.7	3.5	1.07	30.0	9.14	1400	1033.0	7.82
40TPA530050		US Agri–Chem Bartow											
		Dryer	413.2	3086.3	51.8	15.8	6.0	1.83	32.8	10.01	138	332.0	–3.41
		SAP			95.0	29.0	7.0	2.12	24.6	7.50	89	305.0	–42.00
40TPA530051		US Agri–Chem Ft Meade											
		H2SO4 X	416.0	3069.0	95.0	29.0	9.9	3.02	22.2	6.77	106	314.0	–78.80
	16	H2SO4 1			175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
	17	H2SO4 2			175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
					175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	92.48
		GTSP			93.0	28.3	5.0	1.52	57.7	17.60	134	330.0	–18.27
NA		Panda Kathleen	398.7	3101.4	150.0	45.7	17.5	5.33	47.8	14.57	210	372.0	0.73
NA		SECI (Hardee 50% I)	404.9	3057.4	89.9	27.4	19.0	5.79	46.2	14.09	286	414.0	13.00
NA		GRU	365.5	3292.7	51.8	15.8	14.1	4.30	151.0	46.02	1000	811.0	5.65

Notes: The APIS source number is shown for SO2 PSD increment consuming sources that are also included in the AAQS inventory.

Note: TECO PPS= TECO Polk Power Station

APIS data were obtained from APIS Report AIR07 (9/93) provided by FDEP. Where differences between APIS data and inventory are noted, the APIS data is not incorporated.

## **APPENDIX D**

### **SOURCE CONTRIBUTIONS TO MAXIMUM PREDICTED 24- AND 3-HOUR AAQS AND PSD CLASS II INCREMENT CONSUMPTION VALUES**

\*\*\* ISCEV2 - VERSION 92273 \*\*\*      \*\*\* 1984 CARGILL BARTOW- PROPOSED H2SO4 PLANT EXPANSION      5/8/95      \*\*\*      05/09/95  
 \*\*\* SO2 AAQS - 24-HOUR REFINEMENT AROUND (230 DEG, 2500 M)      \*\*\*      13:58:58  
 \*\*\* MODELING OPTIONS USED: CONC RURAL FLAT      PAGE 13

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H24001 \*\*\*

---> AVE. PER.: 24 HRS; END DATE: 84062524; LOCATION (XR,YR,ZELEV,ZFLAG): -2048.83 -1600.72 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDAP4 , CBTDAP3 , CBTAUX8L, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 ,  
 CGRIV04 , CGRIV05 , CGRIV06 , CGRIV41 , CGRIV55 , CGRIVAA , CITWOR07, CITWOR17, CITWOR13, CFBON05 , CFBON06 , CFBONAA ,  
 CFBONAB , CFBONAC , IMCNMR01, IMCNMR02, USAGFM06, USAGFM16, USAGFM17, FARMLC2 , FARML05 , FARML28 , FPCBTC2A, . . . ,

\*\*\* GROUP VALUE = 171.66461 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTSAP4	0.00000	CBTSAP5	0.00000	CBTSAP6	0.00000
CBTDAP4	0.00000	CBTDAP3	0.00000	CBTAUX8L	0.00000
TPSHRD1A	0.00000	TPSHRD1B	0.00000	TPSHRD2A	0.00000
SECIHD3	0.00000	CGRIV04	1.13276	CGRIV05	1.27337
CGRIV06	1.58735	CGRIV41	0.00733	CGRIV55	0.02555
CGRIVAA	0.05108	CITWOR07	0.00000	CITWOR17	0.00000
CITWOR13	0.00000	CFBON05	0.00000	CFBON06	0.00000
CFBONAA	0.00000	CFBONAB	0.00000	CFBONAC	0.00000
IMCNMR01	0.00000	IMCNMR02	0.00000	USAGFM06	0.00000
USAGFM16	0.00000	USAGFM17	0.00000	FARMLC2	0.00000
FARML05	0.00000	FARML28	0.00000	FPCBTC2A	6.83573
FPCBT03	5.11413	FPCBT04	0.02913	FPCBTC3B	1.20739
FPCIN16	0.00000	FPCIN07	0.00000	FPCIN08	0.00000
FPCPKNA	0.00000	FPLMNC2	0.00001	MACASPDH	0.00000
GLEAD01	0.25862	TMKBAY	0.12707	LYKPA02	0.04988
LYKPA03	0.09430	LYKPAC2	0.00005	LYKPA07	0.00004
OBGC01	0.00000	OBGC02	0.00000	FTI10	0.00000
FTI11	0.00000	FMCCM01	0.00000	FJC001	0.00000
FJC002	0.00000	FJC003	0.00000	COKE01	0.00000
COKE03	0.00000	COKE08	0.00000	SFECIT01	0.00000
SFECIT02	0.00000	SFECIT03	0.00000	ORANCO02	0.00000
ORANCO04	0.00000	ORANCO05	0.00000	ORANCO06	0.00000
AGCSOP01	0.00000	AGCSOPC2	0.00000	IANIC16	0.07512
IANIC12	1.00929	IANIC05	7.01940	IANIC15	0.08829
IMCNWC3	2.35167	IMCNW09	0.32703	IMCNW010	0.72904
IMCNW027	0.24218	IMCNW0C2	1.58241	IMCNW045	0.06514
IMCNW046	0.06514	LAKRMC02	0.00000	SBPOLY01	0.00000
SBPOLC23	0.00000	SBPOLY05	0.00000	SBPOLC67	0.00000
SBPOLY08	0.00000	PAVEX01	0.00000	PANDKAT1	0.00000
GEORECS1	0.96672	LAFRG29	3.34994	LAKLR01	0.00000
LAKLRC3	0.00000	LAKLRC2	0.00000	LAKLRAA	0.00000
LAKMC01	0.00000	LAKMCC2	0.00000	LAKMC04	0.00000
LAKMC05	0.00000	LAKMC06	0.00000	MBNICC2	9.84171
MBNIC04	0.36682	MBL#401	0.00044	MBL#4AA	0.00002
MULCNA	0.00000	MULCNA	0.00000	MLPHS02	8.54692
MLPHS05	26.19685	MLPHS09	45.50645	TECBBC2A	6.68330
TECBBC03	4.12499	TECBBC04	2.92206	TECBBC2B	0.70532
TECBBC07	0.14220	TECGNC2	5.81113	TECGN03	3.52664
TECGN04	4.39678	TECGN05	4.90319	TECGN06	7.20557
TECGN07	0.14253	TECHKC2A	1.12753	TECHKC2B	1.49837

\*\*\* ISCEV2 - VERSION 92273 \*\*\*      \*\*\* 1984 CARGILL BARTOW- PROPOSED H2SO4 PLANT EXPANSION      5/8/95      \*\*\*      05/09/95  
    \*\*\* SO2 AAQS - 24-HOUR REFINEMENT AROUND (230 DEG, 2500 M)      \*\*\*      13:58:58  
 \*\*\* MODELING OPTIONS USED: CONC    RURAL    FLAT      PAGE 14

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H24001 \*\*\*

---> AVE. PER.: 24 HRS; END DATE: 84062524; LOCATION (XR,YR,ZELEV,ZFLAG): -2048.83 -1600.72 0.00 0.00 (M)

GROUP ID: ALL      OF SOURCES: CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDAP4 , CBTDAP3 , CBTAUXBL, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 ,  
                          CGRIV04 , CGRIV05 , CGRIV06 , CGRIV41 , CGRIV55 , CGRIVAA , CITWOR07, CITWOR17, CITWOR13, CFBON05 , CFBON06 , CFBONAA ,  
                          CFBONAB , CFBONAC , IMCNMR01, IMCNMR02, USAGFM06, USAGFM16, USAGFM17, FARMLC2 , FARML05 , FARML28 , FPCBTC2A, . . . ,

\*\*\* GROUP VALUE =      171.66461 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
-----	-----	-----	-----	-----	-----
TECHK05	1.05769	TECHK06	1.29293	TECPKAA	0.00000
TECPKAB	0.00000	TECPKAC	0.00000	KUA01	0.00000
KUA05	0.00000	KUA09	0.00000	KUA10	0.00000
KUA1115	0.00000	CFIPCP01	0.00000	CFIPCP23	0.00000
CFIPCP07	0.00000	CFIPCP08	0.00000	CFIPCP10	0.00000
CFIPCP17	0.00000	CFIPCP22	0.00000	CFIPCP24	0.00000

\*\*\* ISCEV2 - VERSION 92273 \*\*\*      \*\*\* 1985 CARGILL BARTOW- PROPOSED H2SO4 PLANT EXPANSION      5/8/95      \*\*\*      05/09/95  
 \*\*\* S02 AAQS - 3-HOUR REFINEMENT AROUND (160 DEG, 1131 M)      \*\*\*      13:59:36  
 \*\*\* MODELING OPTIONS USED: CONC RURAL FLAT      PAGE 11

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H03001 \*\*\*

---> AVE. PER.: 3 HRS; END DATE: 85011206; LOCATION (XR,YR,ZELEV,ZFLAG): 350.43 -1078.50 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDA4 , CBTDA3 , CBTAUXBL, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 ,  
 CGRIV04 , CGRIV05 , CGRIV06 , CGRIV41 , CGRIV55 , CGRIVAA , CITWOR07, CITWOR17, CITWOR13, CFBON05 , CFBON06 , CFBONAA ,  
 CFBONAB , CFBONAC , IMCNMR01, IMCNMR02, USAGFM06, USAGFM16, USAGFM17, FARMLC2 , FARML05 , FARML28 , FPCBTC2A, . . . ,

\*\*\* GROUP VALUE = 527.47815 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTSAP4	21.70231	CBTSAP5	18.23086	CBTSAP6	29.73953
CBTDAP4	0.03149	CBTDAP3	42.57483	CBTAUXBL	193.89192
TPSHRD1A	0.00000	TPSHRD1B	0.00000	TPSHRD2A	0.00000
SECIHD3	0.00000	CGRIV04	0.00000	CGRIV05	0.00000
CGRIV06	0.00000	CGRIV41	0.00000	CGRIV55	0.00000
CGRIVAA	0.00000	CITWOR07	0.00000	CITWOR17	0.00000
CITWOR13	0.00000	CFBON05	0.00000	CFBON06	0.00000
CFBONAA	0.00000	CFBONAB	0.00000	CFBONAC	0.00000
IMCNMR01	0.00000	IMCNMR02	0.00000	USAGFM06	0.00000
USAGFM16	0.00000	USAGFM17	0.00000	FARMLC2	50.98709
FARML05	31.53147	FARML28	1.94010	FPCBTC2A	0.00000
FPCBT03	0.00000	FPCBT04	0.00000	FPCBTC3B	0.00000
FPCIN16	0.00000	FPCIN07	0.00000	FPCIN08	0.00000
FPCPKNA	0.00000	FPLMNC2	0.00000	MACASPDH	0.00000
GLEAD01	0.00000	TMKBAY	0.00000	LYKPA02	0.00000
LYKPA03	0.00000	LYKPAC2	0.00000	LYKPA07	0.00000
OBGC01	0.00000	OBGC02	0.00000	FTI10	0.00000
FTI11	0.00000	FMCCM01	0.01192	FJC001	0.00000
FJC002	0.00000	FJC003	0.00000	COKE01	0.00000
COKE03	0.00000	COKE08	0.00000	SFECIT01	0.00000
SFECIT02	0.00000	SFECIT03	0.00000	ORANCO02	0.00000
ORANCO04	0.00000	ORANCO05	0.00000	ORANCO06	0.00000
AGCSOP01	0.00000	AGCSOPC2	0.00000	IANIC16	0.00000
IANIC12	0.00000	IANIC05	0.00000	IANIC15	0.00000
IMCNWC3	0.00000	IMCNW09	0.00000	IMCNW010	0.00000
IMCNW027	0.00000	IMCNW0C2	0.00000	IMCNW045	0.00000
IMCNW046	0.00000	LAKRMC02	0.05620	SBPOLY01	0.00092
SBPOLC23	0.00216	SBPOLY05	0.00527	SBPOLC67	0.00211
SBPOLY08	0.07320	PAVEX01	0.00000	PANDKAT1	0.00000
GEORECS1	0.00000	LAFRG29	0.00000	LAKLR01	22.77488
LAKLRC3	5.17313	LAKLRC2	0.01429	LAKLRAA	0.48063
LAKMC01	57.17596	LAKMCC2	0.87205	LAKMC04	2.37026
LAKMC05	4.02073	LAKMC06	43.81482	MBNICC2	0.00000
MBNIC04	0.00000	MBL#401	0.00000	MBL#4AA	0.00000
MULCNA	0.00000	MULCNNB	0.00000	MLPHS02	0.00000
MLPHS05	0.00000	MLPHS09	0.00000	TECBBC2A	0.00000
TECBB03	0.00000	TECBB04	0.00000	TECBBC2B	0.00000
TECBB07	0.00000	TECGNC2	0.00000	TECGN03	0.00000
TECGN04	0.00000	TECGN05	0.00000	TECGN06	0.00000
TECGN07	0.00000	TECHKC2A	0.00000	TECHKC2B	0.00000

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1985 CARGILL BARTOW- PROPOSED H2SO4 PLANT EXPANSION

5/8/95

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05/09/95

\*\*\* SO2 AAQS - 3-HOUR REFINEMENT AROUND (160 DEG, 1131 M)

\*\*\*

13:59:36

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 12

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H03001 \*\*\*

---> AVE. PER.: 3 HRS; END DATE: 85011206; LOCATION (XR,YR,ZELEV,ZFLAG): 350.43 -1078.50 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDAP4 , CBTDAP3 , CBTAUXBL, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 , CGRIV04 , CGRIV05 , CGRIV06 , CGRIV41 , CGRIV55 , CGRIVAA , CITWOR07, CITWOR17, CITWOR13, CFBON05 , CFBON06 , CFBONAA , CFBONAB , CFBONAC , IMCNMR01, IMCNMR02, USAGFM06, USAGFM16, USAGFM17, FARMLC2 , FARML05 , FARML28 , FPCBTC2A, . . . ,

\*\*\* GROUP VALUE = 527.47815 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
TECHK05	0.00000	TECHK06	0.00000	TECPKAA	0.00000
TECPKAB	0.00000	TECPKAC	0.00000	KUA01	0.00000
KUA05	0.00000	KUA09	0.00000	KUA10	0.00000
KUA1115	0.00000	CFIPCP01	0.00000	CFIPCP23	0.00000
CFIPCP07	0.00000	CFIPCP08	0.00000	CFIPCP10	0.00000
CFIPCP17	0.00000	CFIPCP22	0.00000	CFIPCP24	0.00000

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1984 Cargill Bartow PSD CLASS II SO2

5/3/95

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05/06/95

\*\*\* additional 24-hr refinement around (236,14500)

\*\*\*

16:41:03

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 10

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H24001 \*\*\*

---> AVE. PER.: 24 HRS; END DATE: 84081324; LOCATION (XR,YR,ZELEV,ZFLAG): -12021.04 -8108.30 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTDAP4 , CBTSAP12, CBTSAP3 , CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDRYER, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIRD3 , BORDHIL , CGRIV09 , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CFBON05 , CFBON06 , CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , DOLIMEDR, DOLIMEBL, ESTDRY1 , ESTDRY2 , ESTSAP , FARMLC2 , FARML05 , . . . ,

\*\*\* GROUP VALUE = 37.52449 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTDAP4	0.00000	CBTSAP12	0.00000	CBTSAP3	0.00000
CBTSAP4	0.00000	CBTSAP5	0.00000	CBTSAP6	0.00000
CBTDRYER	0.00000	TPSHRD1A	0.00000	TPSHRD1B	0.00000
TPSHRD2A	0.00000	SECIRD3	0.00000	BORDHIL	-0.00435
CGRIV09	0.52228	CGRIV456	-1.63704	CGRIV7	-0.20696
CGRIV8	-0.32231	CGRIV9B	-0.42619	CFBON05	0.00000
CFBON06	0.00000	CFBONAB	0.00000	CFBONAC	0.00000
CFBON1	0.00000	CFBON2	0.00000	CFBON3	0.00000
CFBON4	0.00000	CFBON56	0.00000	DOLIMEDR	-0.22829
DOLIMEBL	-0.20472	ESTDRY1	-0.00902	ESTDRY2	-0.00908
ESTSAP	-0.03144	FARMLC2	0.00000	FARML05	0.00000
FARML12	0.00000	FPCIN07	0.00000	FPCIN08	0.00000
FPCPKC2	0.00009	IANIC05	0.00000	IANIC	0.00000
IANICDRY	0.00000	IMCNWC3	61.46910	IMCNW09	6.71740
IMCNW027	4.94759	IMCNWOC2	41.16784	IMCNW046	1.61636
IMCNWDRY	-22.73128	IMCNWAL	-50.63589	IAPRC12	0.00000
IAPRC34	0.00000	IASOUC2	2.40673	IASOU10	0.10117
IASOUB	-1.71699	IMPR LX	-0.70833	LAKLRAA	0.00000
LAKMC06	0.00000	MOBELE1	0.00000	MOBELE2	0.00000
MOBELE3	0.00000	MOBELE4	0.00000	MOBELE5	0.00000
MOBELE6	0.00000	MBNIC04	0.00000	MBNIC1	0.00000
MBNIC2	0.00000	MBL#401	0.00158	MBL#4AA	0.00006
MULCNAA	0.00000	MULCNAB	0.00000	MLPHS02	0.00000
MLPHS1	0.00000	TECBB04	0.09062	TECBB3X	-0.13618
TECBB12X	-0.27231	TECPKAA	0.00000	TECPKAB	0.00000
TECPKAC	0.00000	UAGBAR1	0.00000	UAGBAR2	0.00000
UAFTMC2	3.58956	UAFTMX	-4.83349	UAFTMGT	-1.11011
PANDKAT	0.00000	KISSEX	0.00000	CFIPC07	0.00000
CFIPC08	0.00000	MCKAY	0.11808		

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1985 Cargill Bartow PSD CLASS II SO2

5/3/95

\*\*\*

05/06/95

\*\*\* ADDITIONAL 3-HOUR REFINEMENT AROUND (240,14200)

\*\*\*

16:43:44

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 10

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H03001 \*\*\*

---> AVE. PER.: 3 HRS; END DATE: 85110215; LOCATION (XR,YR,ZELEV,ZFLAG): -12507.06 -6932.78 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTDAP4 , CBTSAP12, CBTSAP3 , CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDRYER, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 , BORDHIL , CGRIV09 , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CFBON05 , CFBON06 , CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , DOLIMEDR, DOLIMEBL, ESTDRY1 , ESTDRY2 , ESTSAP , FARMLC2 , FARML05 , . . . ,

\*\*\* GROUP VALUE = 216.97237 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTDAP4	0.00000	CBTSAP12	0.00000	CBTSAP3	0.00000
CBTSAP4	0.00000	CBTSAP5	0.00000	CBTSAP6	0.00000
CBTDRYER	0.00000	TPSHRD1A	0.00000	TPSHRD1B	0.00000
TPSHRD2A	0.00000	SECIHD3	0.00000	BORDHIL	-0.44018
CGRIV09	0.00000	CGRIV456	0.00000	CGRIV7	0.00000
CGRIV8	0.00000	CGRIV9B	0.00000	CFBON05	0.00000
CFBON06	0.00000	CFBONAB	0.00000	CFBONAC	0.00000
CFBON1	0.00000	CFBON2	0.00000	CFBON3	0.00000
CFBON4	0.00000	CFBON56	0.00000	DOLIMEDR	0.00000
DOLIMEBL	0.00000	ESTDRY1	0.00000	ESTDRY2	0.00000
ESTSAP	0.00000	FARMLC2	0.00000	FARML05	0.00000
FARML12	0.00000	FPCIN07	0.00000	FPCIN08	0.00000
FPCPKC2	0.00000	IANIC05	0.00000	IANIC	0.00000
IANICDRY	0.00000	IMCNWC3	290.04211	IMCNW09	43.29385
IMCNW027	32.84969	IMCNW0C2	194.47461	IMCNW046	10.13283
IMCNWDRY	-110.59728	IMCNWAL	-243.20842	IAPRC12	0.00000
IAPRC34	0.00000	IASOUC2	0.00000	IASOU10	0.00000
IASOUB	0.00000	IMPR LX	0.00000	LAKLRAA	0.00000
LAKMC06	0.00000	MOBELE1	0.00000	MOBELE2	0.00000
MOBELE3	0.00000	MOBELE4	0.00000	MOBELE5	0.00000
MOBELE6	0.00000	MBNIC04	0.00000	MBNIC1	0.00000
MBNIC2	0.00000	MBL#401	0.40805	MBL#4AA	0.01713
MULCNAA	0.00000	MULCNAB	0.00000	MLPHS02	0.00000
MLPHS1	0.00000	TECBB04	0.00000	TECBB3X	0.00000
TECBB12X	0.00000	TECPKAA	0.00000	TECPKAB	0.00000
TECPKAC	0.00000	UAGBAR1	0.00000	UAGBAR2	0.00000
UAFTMC2	0.00000	UAFTMX	0.00000	UAFTMTGT	0.00000
PANDKAT	0.00000	KISSEX	0.00000	CFIPC07	0.00000
CFIPC08	0.00000	MCKAY	0.00000		

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1986 Cargill Bartow PSD CLASS II SO2

5/3/95

\*\*\*

05/12/95

\*\*\* ADDITIONAL 3-HOUR REFINEMENT AROUND (238,14500)

\*\*\*

10:05:55

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 10

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H2H03001 \*\*\*

---> AVE. PER.: 3 HRS; END DATE: 86080112; LOCATION (XR,YR,ZELEV,ZFLAG): -12244.59 -7951.73 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTDAP4 , CBTSAP12, CBTSAP3 , CBTSAP4 , CBTSAP5 , CBTSAP6 , CBTDRYER, TPSHRD1A, TPSHRD1B, TPSHRD2A, SECIHD3 , BORDHIL , CGRIV09 , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CFBON05 , CFBON06 , CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , DOLIMEDR, DOLIMEBL, ESTDRY1 , ESTDRY2 , ESTSAP , FARMLC2 , FARML05 , . . . ,

\*\*\* GROUP VALUE = 237.06458 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTDAP4	0.00000	CBTSAP12	0.00000	CBTSAP3	0.00000
CBTSAP4	0.00000	CBTSAP5	0.00000	CBTSAP6	0.00000
CBTDRYER	0.00000	TPSHRD1A	0.00000	TPSHRD1B	0.00000
TPSHRD2A	0.00000	SECIHD3	0.00000	BORDHIL	0.00000
CGRIV09	1.65500	CGRIV456	-4.85272	CGRIV7	-0.64674
CGRIV8	-1.01394	CGRIV9B	-1.34470	CFBON05	0.00000
CFBON06	0.00000	CFBONAB	0.00000	CFBONAC	0.00000
CFBON1	0.00000	CFBON2	0.00000	CFBON3	0.00000
CFBON4	0.00000	CFBON56	0.00000	DOLIMEDR	0.00000
DOLIMEBL	0.00000	ESTDRY1	0.00000	ESTDRY2	0.00000
ESTSAP	0.00000	FARMLC2	0.00000	FARML05	0.00000
FARML12	0.00000	FPCIN07	0.00000	FPCIN08	0.00000
FPCPKC2	0.00000	IANIC05	0.00000	IANIC	0.00000
IANICDRY	0.00000	IMCNWC3	330.80725	IMCNW09	23.21179
IMCNW027	17.23083	IMCNW0C2	221.01331	IMCNW046	6.47480
IMCNWDRY	-80.67448	IMCNWAL	-269.21512	IAPRC12	0.00000
IAPRC34	0.00000	IASOUC2	0.00000	IASOU10	0.00000
IASOUB	0.00000	IMPRX	0.00000	LAKLRAA	0.00000
LAKMC06	0.00000	MOBELE1	0.00000	MOBELE2	0.00000
MOBELE3	0.00000	MOBELE4	0.00000	MOBELE5	0.00000
MOBELE6	0.00000	MBNIC04	0.00000	MBNIC1	0.00000
MBNIC2	0.00000	MBL#401	0.00000	MBL#4AA	0.00000
MULCNAA	0.00000	MULCNAB	0.00000	MLPHS02	0.00000
MLPHS1	0.00000	TECBB04	6.51494	TECBB3X	-12.13677
TECBB12X	0.00000	TECPKAA	0.00000	TECPKAB	0.00000
TECPKAC	0.00000	UAGBAR1	0.00000	UAGBAR2	0.00000
UAFTMC2	0.00000	UAFTMX	0.00000	UAFTMGT	0.00000
PANDKAT	0.00000	KISSEX	0.00000	TMKBAY	0.04114
CFZEPB	-0.00001	CFZEP	0.00001	CFZEP1	0.00001
CFZEP2	-0.00001				

## **APPENDIX E**

### **24- AND 3-HOUR PSD CLASS I ANALYSIS SIGNIFICANT IMPACT ANALYSIS AND SOURCE CONTRIBUTIONS ISCST 2 OUTPUT DETAIL EVENT 2 OUTPUT DETAIL**

**PSD CLASS I  
SOURCE CONTRIBUTIONS**

**24-HOUR**

**3-HOUR**

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1986 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

\*\*\* 05/06/95

\*\*\* IMPACTS AT CHASSAHOVITZKA NWR

\*\*\* 16:05:04

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 12

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H1H24001 \*\*\*

---> AVE. PER.: 24 HRS; END DATE: 86053124; LOCATION (XR,YR,ZELEV,ZFLAG): 343000.00 3176200.00 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTDA4 , CBTSA12, CBTSA3 , CBTDRYER, CBTSA4 , CBTSA5 , CBTSA6 , TPSHRD1A, TPSHRD1B, TPSHRD2A, ASPHALT3, ASPHALT4, AUBURN , BORDHIL , BORDPLK , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CGRIV09 , CFBON05 , CFBON06 , CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , CFZEPB , CFZEP , CFZEP1 , CFZEP2 , . . . ,

\*\*\* GROUP VALUE = 6.35823 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTDA4	0.00000	CBTSA12	-0.00646	CBTSA3	-0.00158
CBTDRYER	-0.00137	CBTSA4	0.00156	CBTSA5	0.00156
CBTSA6	0.00156	TPSHRD1A	0.85904	TPSHRD1B	0.85904
TPSHRD2A	0.42612	ASPHALT3	0.04835	ASPHALT4	0.00011
AUBURN	0.01136	BORDHIL	-0.01612	BORDPLK	-0.01290
CGRIV456	-0.00251	CGRIV7	-0.00029	CGRIV8	-0.00045
CGRIV9B	-0.00059	CGRIV09	0.00072	CFBON05	0.00032
CFBON06	0.00032	CFBONAB	0.00026	CFBONAC	0.00003
CFBON1	-0.00040	CFBON2	-0.00073	CFBON3	-0.00071
CFBON4	-0.00115	CFBON56	-0.00248	CFZEPB	-0.00651
CFZEP	0.00704	CFZEP1	0.00639	CFZEP2	-0.00834
CLM	0.00030	COUCHZEP	0.02848	COUCHODE	0.01160
DRIS	0.00035	DOLIMEDR	-0.04577	DOLIMEBL	-0.03926
ESTDRY1	-0.00008	ESTDRY2	-0.00008	ESTSAP	-0.00030
EVANS	0.00203	ERJAHNA	0.01028	FARML12	-0.00040
FARMLC2	0.00032	FARML05	0.00023	FDOC	0.00000
FCS1	0.28777	FMM	0.02195	CRYRIV1B	-0.21770
CRYRIV2B	-1.28288	CRYRIV45	1.36458	DEBARY	0.01160
FPCIN07	0.20774	FPCIN08	0.11694	FPCPKC2	0.00013
GPCEM4B	-0.00280	GPCEM5B	-0.00303	HCRRF	0.07342
HCOA12	0.00003	IANIC05	0.06652	IANIC	-0.03649
IANICDRY	-0.01052	IMCNWC3	1.80526	IMCNW09	0.15889
IMCNW027	0.11377	IMCNWOC2	1.21059	IMCNW046	0.03681
IMCNWDY	-0.83512	IMCNWAL	-1.45579	IAPRC12	-0.00579
IAPRC34	-0.00490	IASOUC2	0.04812	IASOU10	0.00222
IASOUB	-0.03357	IMPR LX	-0.14719	KISSUT	0.03100
KISSEX	0.00001	LAKLRAA	0.06188	LAKMC06	1.48250
LAKECOGN	0.05708	MCKAY	0.00042	MOBELE1	-0.00046
MOBELE2	-0.00069	MOBELE3	-0.00083	MOBELE4	-0.00023
MOBELE5	-0.00013	MOBELE6	-0.00137	MBL#4AA	0.00228
MBL#401	0.05547	MBNIC04	0.00373	MBNIC1	-0.02196
MBNIC2	-0.00351	MULCNAA	0.00024	MULCNAB	0.00001
MLPHS02	0.00026	MULPHS1	-0.00191	NEWPTR12	0.00002
OMAN	0.38077	OUC1	0.00000	OUC2	0.00000
OVERST	0.00069	PASCORRF	0.00877	PASCOGN	0.02422
PNLRRF	0.05064	EPCOT12	0.00000	REEDY	0.00000
RIDGE	0.03510	STAUFR1	-0.00023	STAUFR2	-0.00007
STAUFR3	-0.00211	STAUFR4	-0.00032	STAUFR5	-0.00002
TECBB04	0.01293	TECBB3X	-0.02410	TECBB12X	0.00000
TECPKAA	0.01589	TECPKAB	0.37352	TECPKAC	0.08284

\*\*\* ISCEV2 - VERSION 92273 \*\*\*      \*\*\* 1986 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95      \*\*\*      05/06/95  
\*\*\* IMPACTS AT CHASSAHOWITZKA NWR      \*\*\*      16:05:04  
\*\*\* MODELING OPTIONS USED: CONC    RURAL    FLAT      \*\*\*      PAGE 13

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H1H24001 \*\*\*

---> AVE. PER.: 24 HRS; END DATE: 86053124; LOCATION (XR,YR,ZELEV,ZFLAG): 343000.00 3176200.00      0.00      0.00 (M)

GROUP ID: ALL      OF SOURCES: CBTDAP4 , CBTSAP12, CBTSAP3 , CBTDRYER, CBTSAP4 , CBTSAP5 , CBTSAP6 , TPSHRD1A, TPSHRD1B, TPSHRD2A,  
ASPHALT3, ASPHALT4, AUBURN , BORDHIL , BORDPLK , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CGRIV09 , CFBON05 , CFBON06 ,  
CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , CFZEPB , CFZEP , CFZEP1 , CFZEP2 , . . . ,

\*\*\* GROUP VALUE =      6.35823 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
UAGBAR1	-0.00042	UAGBAR2	-0.00453	UAFTMC2	0.00026
UAFTMX	-0.00024	UAFTMGT	-0.00005	PANKATH	0.00003
SECI50L	0.12014	GRU	0.00131		

\*\*\* ISCEV2 - VERSION 92273 \*\*\*

\*\*\* 1986 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

\*\*\* 05/06/95

\*\*\* IMPACTS AT CHASSAHOWITZKA NWR

\*\*\* 16:05:04

\*\*\* MODELING OPTIONS USED: CONC RURAL FLAT

PAGE 14

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H1H03001 \*\*\*

---> AVE. PER.: 3 HRS; END DATE: 86111706; LOCATION (XR,YR,ZELEV,ZFLAG): 341100.00 3183400.00 0.00 0.00 (M)

GROUP ID: ALL OF SOURCES: CBTDA4 , CBTSA12, CBTSA3 , CBTDRYER, CBTSA4 , CBTSA5 , CBTSA6 , TPSHRD1A, TPSHRD1B, TPSHRD2A, ASPHALT3, ASPHALT4, AUBURN , BORDHIL , BORDPLK , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CGRIV09 , CFBON05 , CFBON06 , CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , CFZEPB , CFZEP , CFZEP1 , CFZEP2 , . . . ,

\*\*\* GROUP VALUE = 26.09411 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
CBTDAP4	0.00000	CBTSAP12	-0.00011	CBTSAP3	-0.00003
CBTDRYER	-0.00004	CBTSAP4	0.00002	CBTSAP5	0.00002
CBTSAP6	0.00002	TPSHRD1A	3.49108	TPSHRD1B	3.49108
TPSHRD2A	2.20117	ASPHALT3	1.14128	ASPHALT4	0.00000
AUBURN	0.00062	BORDHIL	-0.60012	BORDPLK	-0.00518
CGRIV456	0.00000	CGRIV7	0.00000	CGRIV8	0.00000
CGRIV9B	0.00000	CGRIV09	0.00000	CFBON05	0.00059
CFBON06	0.00060	CFBONAB	0.00048	CFBONAC	0.00006
CFBON1	-0.00102	CFBON2	-0.00183	CFBON3	-0.00177
CFBON4	-0.00287	CFBON56	-0.00467	CFZEPB	-0.00029
CFZEP	0.00032	CFZEP1	0.00038	CFZEP2	-0.00057
CLM	0.00000	COUCHZEP	0.54948	COUCHODE	0.00000
DRIS	0.00000	DOLIMEDR	-0.09099	DOLIMEBL	-0.07480
ESTDRY1	-0.00259	ESTDRY2	-0.00249	ESTSAP	-0.00855
EVANS	0.05352	ERJAHNA	0.00000	FARML12	-0.00273
FARMLC2	0.00210	FARML05	0.00131	FDOC	0.00000
FCS1	0.47080	FMM	0.00000	CRYRIV1B	0.00000
CRYRIV2B	0.00000	CRYRIV45	0.00000	DEBARY	0.00000
FPCIN07	0.00000	FPCIN08	0.00000	FPCPKC2	0.00017
GPCEM4B	0.00000	GPCEM5B	0.00000	HCRRF	0.00000
HCOA12	0.00000	IANIC05	0.31201	IANIC	-0.13941
IANICDRY	-0.03843	IMCNWC3	4.62701	IMCNW09	0.31170
IMCNW027	0.22615	IMCNWOC2	3.09347	IMCNW046	0.08093
IMCNWDRY	-1.42805	IMCNWAL	-3.70959	IAPRC12	-0.05590
IAPRC34	-0.05033	IASOUC2	0.31945	IASOU10	0.01352
IASOUB	-0.21720	IMPR LX	-0.30143	KISSUT	0.00000
KISSEX	0.00000	LAKLRAA	0.39871	LAKMC06	8.61560
LAKECOGN	0.00000	MCKAY	0.00000	MOBELE1	-0.00820
MOBELE2	-0.01249	MOBELE3	-0.01871	MOBELE4	-0.00552
MOBELE5	-0.00279	MOBELE6	-0.03423	MBL#4AA	0.13875
MBL#401	1.60291	MBNIC04	0.01797	MBNIC1	-0.10306
MBNIC2	-0.01125	MULCNAA	0.00000	MULCNAB	0.00000
MLPHS02	0.00040	MULPHS1	-0.00316	NEWPTR12	0.00000
OMAN	0.01606	OUC1	0.00000	OUC2	0.00000
OVERST	0.00724	PASCORRF	0.00000	PASCOGN	0.00226
PNLRRF	0.00000	EPCOT12	0.00000	REEDY	0.00000
RIDGE	0.12581	STAUF R1	0.00000	STAUF R2	0.00000
STAUF R3	0.00000	STAUF R4	0.00000	STAUF R5	0.00000
TECBB04	0.00000	TECBB3X	0.00000	TECBB12X	0.00000
TECPKAA	0.02037	TECPKAB	1.03433	TECPKAC	0.19790

\*\*\* ISCEV2 - VERSION 92273 \*\*\*      \*\*\* 1986 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95      \*\*\*      05/06/95  
\*\*\* IMPACTS AT CHASSAHOWITZKA NWR      \*\*\*      16:05:04  
\*\*\* MODELING OPTIONS USED: CONC    RURAL    FLAT      \*\*\*      PAGE 15

\*\*\* SOURCE CONTRIBUTIONS FOR EVENT: H1H03001 \*\*\*

---> AVE. PER.:    3 HRS;    END DATE: 86111706;    LOCATION (XR,YR,ZELEV,ZFLAG): 341100.00 3183400.00      0.00      0.00 (M)

GROUP ID: ALL      OF SOURCES: CBTDAP4 , CBTSAP12, CBTSAP3 , CBTDRYER, CBTSAP4 , CBTSAP5 , CBTSAP6 , TPSHRD1A, TPSHRD1B, TPSHRD2A,  
ASPHALT3, ASPHALT4, AUBURN , BORDHIL , BORDPLK , CGRIV456, CGRIV7 , CGRIV8 , CGRIV9B , CGRIV09 , CFBON05 , CFBON06 ,  
CFBONAB , CFBONAC , CFBON1 , CFBON2 , CFBON3 , CFBON4 , CFBON56 , CFZEPB , CFZEP , CFZEP1 , CFZEP2 , . . . ,

\*\*\* GROUP VALUE =      26.09411 \*\*\*

SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION	SOURCE ID	CONTRIBUTION
-----	-----	-----	-----	-----	-----
UAGBAR1	-0.00021	UAGBAR2	-0.00183	UAFTMC2	0.00229
UAFTMX	-0.00262	UAFTMGT	-0.00061	PANKATH	0.00000
SECI50L	0.46985	GRU	0.00000		

## **ISCST2 MAXIFILES FOR ALL SOURCES**

\* ISCST2 (93109): 1982 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

\* MODELING OPTIONS USED:

\* CONC RURAL FLAT

\* MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.00

\* FOR SOURCE GROUP: ALL

\* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
24	ALL	82061024	340300.00000	3167700.00000	0.00	0.00	5.01933 H 2H
24	ALL	82061024	340300.00000	3169800.00000	0.00	0.00	5.38318 H 2H
24	ALL	82071524	340300.00000	3169800.00000	0.00	0.00	5.64446 H
24	ALL	82071524	340700.00000	3171900.00000	0.00	0.00	5.66367 H 2H
24	ALL	82090924	340700.00000	3171900.00000	0.00	0.00	5.27026 H 3H
24	ALL	82101224	340300.00000	3165700.00000	0.00	0.00	5.88755 H
24	ALL	82101224	340300.00000	3167700.00000	0.00	0.00	5.24247 H
24	ALL	82120124	340700.00000	3171900.00000	0.00	0.00	5.67567 H
24	ALL	82120124	342000.00000	3174000.00000	0.00	0.00	5.13405 H

DAYS

6/10

7/15

9/9

\* ISCST2 (93109): 1983 CARGILL BARTOW SO2 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

\* MODELING OPTIONS USED:

\* CONC RURAL FLAT

\* MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.00

\* FOR SOURCE GROUP: ALL

\* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
24	ALL	83050124	340300.00000	3165700.00000	0.00	0.00	5.71539 <i>it</i>
24	ALL	83050124	340300.00000	3167700.00000	0.00	0.00	5.53286 <i>H</i>
24	ALL	83062924	343700.00000	3178300.00000	0.00	0.00	5.05816 <i>H</i>
24	ALL	83073024	340300.00000	3165700.00000	0.00	0.00	5.11746 <i>H3 it</i>
24	ALL	83073024	340300.00000	3167700.00000	0.00	0.00	5.06289 <i>H2 H</i>
24	ALL	83073024	340300.00000	3169800.00000	0.00	0.00	5.81576 <i>H</i>
24	ALL	83103024	340300.00000	3165700.00000	0.00	0.00	5.39111 <i>H2 it</i>
24	ALL	83121024	331500.00000	3183400.00000	0.00	0.00	5.05282 <i>H</i>

Days

7/30

10/30

ISCST2 (93109): 1984 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

MODELING OPTIONS USED:

CONC RURAL FLAT

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.00

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

IVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
24	ALL	84032324	340300.00000	3167700.00000	0.00	0.00	5.19138 H 2 H
24	ALL	84032324	340300.00000	3169800.00000	0.00	0.00	5.07892 H 2 H
24	ALL	84052224	340300.00000	3169800.00000	0.00	0.00	5.46516 H
24	ALL	84052224	340700.00000	3171900.00000	0.00	0.00	6.20607 H
24	ALL	84052224	342000.00000	3174000.00000	0.00	0.00	5.54135 H
24	ALL	84061724	342000.00000	3174000.00000	0.00	0.00	5.40310 H 2 H
24	ALL	84061724	343000.00000	3176200.00000	0.00	0.00	5.21945 H
24	ALL	84071524	340300.00000	3167700.00000	0.00	0.00	5.22912 H
24	ALL	84082624	343700.00000	3178300.00000	0.00	0.00	5.06985 H

Days

3/23

6/17

ISCST2 (93109): 1985 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

MODELING OPTIONS USED:

CONC RURAL FLAT  
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.00  
FOR SOURCE GROUP: ALL  
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
24	ALL	85092424	340300.00000	3165700.00000	0.00	0.00	5.67563 H
24	ALL	85111224	340300.00000	3167700.00000	0.00	0.00	5.48466 H 2 H
24	ALL	85111224	340300.00000	3169800.00000	0.00	0.00	6.62490 H
24	ALL	85111224	340700.00000	3171900.00000	0.00	0.00	5.14205 H 2 H
24	ALL	85111624	340300.00000	3165700.00000	0.00	0.00	5.54306 H 2 H
24	ALL	85111624	340300.00000	3167700.00000	0.00	0.00	5.55606 H
24	ALL	85112724	340300.00000	3169800.00000	0.00	0.00	5.54807 H 2 H
24	ALL	85112724	340700.00000	3171900.00000	0.00	0.00	5.48799 H

DAYS  
11/12  
11/16  
11/27

## MODELING OPTIONS USED:

CONC RURAL FLAT

MAXI-FILE FOR 24-HR VALUES &gt;= A THRESHOLD OF 5.00

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
24	ALL	86020124	340300.00000	3165700.00000	0.00	0.00	5.72076 H 2 H
24	ALL	86020124	340300.00000	3167700.00000	0.00	0.00	6.21314 H
24	ALL	86020124	340300.00000	3169800.00000	0.00	0.00	5.44855 H 2 H
24	ALL	86030824	343000.00000	3176200.00000	0.00	0.00	5.11023 H 5 H
24	ALL	86053124	342000.00000	3174000.00000	0.00	0.00	6.15024 H
24	ALL	86053124	343000.00000	3176200.00000	0.00	0.00	6.35823 H 2 H
24	ALL	86053124	339000.00000	3183400.00000	0.00	0.00	5.60381 H
24	ALL	86053124	336500.00000	3183400.00000	0.00	0.00	5.60823 H
24	ALL	86060124	340700.00000	3171900.00000	0.00	0.00	5.32019 H 3 H
24	ALL	86060124	342000.00000	3174000.00000	0.00	0.00	6.14964 H 2 H
24	ALL	86060124	343000.00000	3176200.00000	0.00	0.00	5.55869 H 4 H
24	ALL	86061424	340300.00000	3165700.00000	0.00	0.00	5.97308 H
24	ALL	86061424	340300.00000	3167700.00000	0.00	0.00	5.07529 H 2 H
24	ALL	86062424	340700.00000	3171900.00000	0.00	0.00	5.15555 H 5 H
24	ALL	86070524	342000.00000	3174000.00000	0.00	0.00	5.43405 H 3 H
24	ALL	86071224	343000.00000	3176200.00000	0.00	0.00	6.43195 H
24	ALL	86071224	343700.00000	3178300.00000	0.00	0.00	6.51228 H
24	ALL	86071224	342400.00000	3180600.00000	0.00	0.00	6.15110 H
24	ALL	86071224	341100.00000	3183400.00000	0.00	0.00	5.76494 H
24	ALL	86071224	339000.00000	3183400.00000	0.00	0.00	5.07464 H 2 H
24	ALL	86083024	340300.00000	3169800.00000	0.00	0.00	6.04297 H
24	ALL	86083024	340700.00000	3171900.00000	0.00	0.00	6.14659 H
24	ALL	86092724	340300.00000	3169800.00000	0.00	0.00	5.37471 H 3 H
24	ALL	86092724	340700.00000	3171900.00000	0.00	0.00	5.24156 H 4 H
24	ALL	86110524	340700.00000	3171900.00000	0.00	0.00	5.54813 H 2 H
24	ALL	86110524	342000.00000	3174000.00000	0.00	0.00	5.16962 H 5 H
24	ALL	86110724	340300.00000	3165700.00000	0.00	0.00	5.25385 H 3 H
24	ALL	86111124	343700.00000	3178300.00000	0.00	0.00	5.13268 H 2 H
24	ALL	86121924	342000.00000	3174000.00000	0.00	0.00	5.19635 H 4 H
24	ALL	86121924	343000.00000	3176200.00000	0.00	0.00	5.68240 H 3 H

Days

2/1

3/8

5/31

6/11

6/14

6/24

7/5

7/12

9/27

11/5

~~11/5~~

11/7

11/11

12/14

86071224	3437003178300	6.51228 H
86111124	3437003178300	5.13268
86071224	3430003176200	6.43195 H
86053124	3430003176200	6.35823
86121924	3430003176200	5.6824
86060124	3430003176200	5.55869
86030824	3430003176200	5.11023
86071224	3424003180600	6.1511 H
86053124	3420003174000	6.15024 H
86060124	3420003174000	6.14964
86070524	3420003174000	5.43405
86121924	3420003174000	5.19635
86110524	3420003174000	5.16962
86071224	3411003183400	5.76494 H
86083024	3407003171900	6.14659 H
86110524	3407003171900	5.54813
86060124	3407003171900	5.32019
86092724	3407003171900	5.24156
86062424	3407003171900	5.15555
86083024	3403003169800	6.04297 H
86020124	3403003169800	5.44855
86092724	3403003169800	5.37471
86020124	3403003167700	6.21314 H
86061424	3403003167700	5.07529
86061424	3403003165700	5.97308 H
86020124	3403003165700	5.72076
86110724	3403003165700	5.25385
86053124	3390003183400	5.60381 H
86071224	3390003183400	5.07464
86053124	3365003183400	5.60823 H

1986 Exceedance (29-142) p 2/2  
Sorted by Receptor  
Location

\* ISCST2 (93109): 1986 CARGILL BARTOW S02 PSD CLASS 1 SCREENING ANALYSIS 5/1/95

\* MODELING OPTIONS USED:

\* CONC RURAL FLAT

\* MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00

\* FOR SOURCE GROUP: ALL

\* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	CONC
3	ALL	86072403	340300.00000	3165700.00000	0.00	0.00	28.52634 H
3	ALL	86102603	342400.00000	3180600.00000	0.00	0.00	26.25865 H
3	ALL	86102603	341100.00000	3183400.00000	0.00	0.00	28.05000 H
3	ALL	86111706	341100.00000	3183400.00000	0.00	0.00	26.09410 S

DAYS  
11/17

**ISCST2 MAXIFILES FROM PROJECT ONLY  
ON CLASS I VIOLATION DAYS**

BEST AVAILABLE COPY

ST2 (93109): 1982 CARGILL BARTOW / H2SO4 EXPANSION SO2 5/2/95

ELING OPTIONS USED:

NC RURAL FLAT DFAULT  
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 0.07  
FOR SOURCE GROUP: PROJECT  
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
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BEST AVAILABLE COPY

2ST2 (93109): 1983 CARGILL BARTOW / H2SO4 EXPANSION SO2

5/2/95

MODELING OPTIONS USED:

0NC RURAL FLAT DFAULT

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 0.07

FOR SOURCE GROUP: PROJECT

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
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BEST AVAILABLE COPY

IST2 (93109): 1984 CARGILL BARTOW / H2SO4 EXPANSION SO2

5/2/95

MODELING OPTIONS USED:

JNC RURAL FLAT DFAULT

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 0.07

FOR SOURCE GROUP: PROJECT

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
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# BEST AVAILABLE COPY

CST2 (93109): 1985 CARGILL BARTOW / H2SO4 EXPANSION SO2

5/2/95

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 0.07

FOR SOURCE GROUP: PROJECT

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
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# BEST AVAILABLE COPY

CST2 (93109): 1986 CARGILL BARTOW / H2SO4 EXPANSION SO2

5/2/95

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 0.07

FOR SOURCE GROUP: PROJECT

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
PROJECT	86071224	340300.00000	3165700.00000	0.00	0.00	0.13597
PROJECT	86071224	340300.00000	3167700.00000	0.00	0.00	0.08265
PROJECT	86111724	340300.00000	3165700.00000	0.00	0.00	0.08962
PROJECT	86111724	340300.00000	3167700.00000	0.00	0.00	0.09230

## ANALYSIS:

7/12 - 24 violation located at 339000, 3183400 - NO MATCH WITH PROJECT

11/17 - NO 24-HR VIOLATIONS OCCURRED (ONLY 3-HR)

# BEST AVAILABLE COPY

CST2 (93109): 1986 CARGILL BARTOW / H2SO4 EXPANSION SO2

5/2/95

DELING OPTIONS USED:

ONC RURAL FLAT DFAULT

MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 0.48

FOR SOURCE GROUP: PROJECT

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

GRP	DATE	X	Y	ELEV	FLAG	CONC
PROJECT	86071221	340300.00000	3165700.00000	0.00	0.00	0.86111
PROJECT	86071221	340300.00000	3167700.00000	0.00	0.00	0.52346
PROJECT	86111706	340300.00000	3165700.00000	0.00	0.00	0.71024
PROJECT	86111706	340300.00000	3167700.00000	0.00	0.00	0.73763
PROJECT	86111706	340300.00000	3169800.00000	0.00	0.00	0.51670

ANALYSIS:

7/12 - NO 3-HR VIOLATION OCCURRED

11/17 - VIOLATION OCCURRED AT 34,100, 3183,400. - NO MATCH WITH PROJECT