Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

May 27, 2003

Ms. Jeaneanne M. Gettle
Acting Chief
Air Permits Section
U.S. EPA, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

RE: Cargill Fertilizer, Inc., Green Bay Facility
Ammoniated Phosphates and Phosphoric Acid System
DEP File No. 1050053-033-AC, PSD-FL-334

Dear Ms. Gettle:

Enclosed for your review and comment is a PSD application submitted by Cargill Fertilizer, Inc. for proposed modifications at their Green Bay Facility in Bartow, Polk County, Florida.

Your comments may be forwarded to my attention at the letterhead address or faxed to the Bureau of Air Regulation at 850/921-9533. If you have any questions, please contact Syed Arif, review engineer, at 850/921-9528.

Sincerely,

Patty Adams

for Al Linero, P.E.
Administrator
New Source Review Section

AAL/pa
Enclosure
cc: Syed Arif

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

May 27, 2003

Mr. John Bunyak, Chief
Policy, Planning & Permit Review Branch
NPS – Air Quality Division
Post Office Box 25287
Denver, Colorado 80225

RE: Cargill Fertilizer, Inc., Green Bay Facility
Ammoniated Phosphates and Phosphoric Acid System
DEP File No. 1050053-033-AC, PSD-FL-334

Dear Mr. Bunyak:

Enclosed for your review and comment is a PSD application submitted by Cargill Fertilizer, Inc. for proposed modifications at their Green Bay Facility in Bartow, Polk County, Florida.

Your comments may be forwarded to my attention at the letterhead address or faxed to the Bureau of Air Regulation at 850/921-9533. If you have any questions, please contact Syed Arif, review engineer, at 850/921-9528.

Sincerely,

Patty Adams

for Al Linero, P.E.
Administrator
New Source Review Section

AAL/pa
Enclosure
cc: Syed Arif

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

TRANSMITTAL LETTER

To: Ms. Trina Vielhauer
Chief, Bureau of Air Regulations

Date: May 23, 2003
Project No.: 0337506

RECEIVED

MAY 27 2003

BUREAU OF AIR REGULATION

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2	**Additional Bound Copies**	**Cargill Fertilizer, Inc. – Green Bay Facility** **PSD Application for Fertilizer Plants and Phosphoric Acid System Modifications**

Remarks:

P:\Projects\2003\0337506 Cargill - Green Bay\4\4.1\T052303.doc

1

PSD APPLICATION FOR THE AMMONIATED PHOSPHATES FERTILIZER PLANTS AND PHOSPHORIC ACID SYSTEM

CARGILL FERTILIZER, INC.
GREEN BAY FACILITY
BARTOW, FLORIDA

PSD-Fl-334

Prepared For:
Cargill Fertilizer, Inc.
4390 CR 640 West
Bartow, FL 33830

Prepared By:
Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

April 2003

0337506

DISTRIBUTION:
4 Copies - FDEP
2 Copies - Cargill Fertilizer, Inc.
2 Copies - Golder Associates Inc.

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

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

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Cargill Fertilizer, Inc.**	
2. Site Name: **Green Bay Facility**	
3. Facility Identification Number: **1050053** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **4390 C.R. 640 West** City: **Bartow** County: **Polk** Zip Code: **33830**	
5. Relocatable Facility? [ ] Yes [**X**] No	6. Existing Permitted Facility? [**X**] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **Taylor Abel, EH&S Superintendent**
2. Application Contact Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **4390 C.R. 640 West** City: **Bartow** State: **FL** Zip Code: **33830**
3. Application Contact Telephone Numbers: Telephone: (**863**) **519-1371** Fax: (**863**) **519-1213**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	4-30-03
2. Permit Number:	1050053-033-AC
3. PSD Number (if applicable):	PSD-FL-334
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit 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:____________________

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: ____________________

Operation permit number to be revised: ____________________

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected:____________________

[ ] Title V air operation permit revision 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 number to be revised:____________________

Reason for revision:____________________

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[X] Air construction permit to construct or modify one or more emissions units.

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

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1.	Name and Title of Owner/Authorized Representative or Responsible Official: **Mr. E.O. Morris, Vice President**
2.	Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **8813 Highway 41 South** City: **Riverview** State: **FL** Zip Code: **33569**
3.	Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: **(813) 671 - 6158** Fax: **(813) 671 - 6149**
4.	Owner/Authorized Representative or Responsible Official Statement: *I, the undersigned, am the owner or authorized representative*(check here [ ], if so) or the responsible official (check here [* **X** *], if so) 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. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained 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. 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 emissions unit.* E.O. Morris (signature) 4/17/03 Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1.	Professional Engineer Name: **David A. Buff** Registration Number: **19011**
2.	Professional Engineer Mailing Address: Organization/Firm: **Golder Associates Inc.*** Street Address: **6241 NW 23rd Street, Suite 500** City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3.	Professional Engineer Telephone Numbers: Telephone: **(352) 336 - 5600** Fax: **(352) 336 - 6603**

*** Board of Professional Engineers Certificate of Authorization #00001670**

4. Professional Engineer Statement:

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

(1) To the best of my knowledge, there is reasonable assurance 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; and

(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.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify 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.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that 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.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further 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.

David A. Buff

Signature

4/29/03

Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
007	South AP Fertilizer Plant	AC1A	
013, 016, 017	Phosphoric Acid Plant	AC1A	
014, 015, 037	Phosphoric Acid Tanks	AC1A	
029	North AP Fertilizer Plant	AC1A	

Application Processing Fee

Check one: [X] Attached - Amount: $: $7,500.00 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **This application is for the proposed modification of the Phosphoric Acid Production System, the South DAP Fertilizer Plant, and the North MAP/DAP Fertilizer Plant. The North and South Fertilizer Plants will be renamed the South AP Fertilizer Plant and the North AP Fertilizer Plant. Both plants will be capable of producing MAP and DAP. The Phosphoric Acid Plants (Plant No. 1 – North, Plant No. 1 – South, and Plant No. 2) will be combined into one production system.**
2. Projected or Actual Date of Commencement of Construction: **01 June 2003**
3. Projected Date of Completion of Construction: **01 June 2007**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **409.5** North (km): **3080.1**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **27 / 50 / 39** Longitude (DD/MM/SS): **81 / 56 / 26**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **28**	6. Facility SIC(s): **2874, 2819**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Taylor Abel, EH&S Superintendent**
2. Facility Contact Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **4390 C.R. 640 West** City: **Bartow** State: **FL** Zip Code: **33830**
3. Facility Contact Telephone Numbers: Telephone: (**863**) **519 - 1371** Fax: (**863**) **519 - 1213**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [ ] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [X] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [ ] One or More Emissions Units Subject to NSPS?	
7. [X] One or More Emission Units Subject to NESHAP?	
8. [ ] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	

List of Applicable Regulations

62-212.400 – PSD Preconstruction Review	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
PM	**A**				**Particulate Matter – Total**
PM_{10}	**A**				**Particulate Matter – PM_{10}**
FL	**A**				**Fluorides - Total**
SO_2	**A**				**Sulfur Dioxide**
NO_X	**A**				**Nitrogen Oxides**
H107	**A**				**Hydrogen Fluoride**
SAM	**A**				**Sulfuric Acid Mist**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

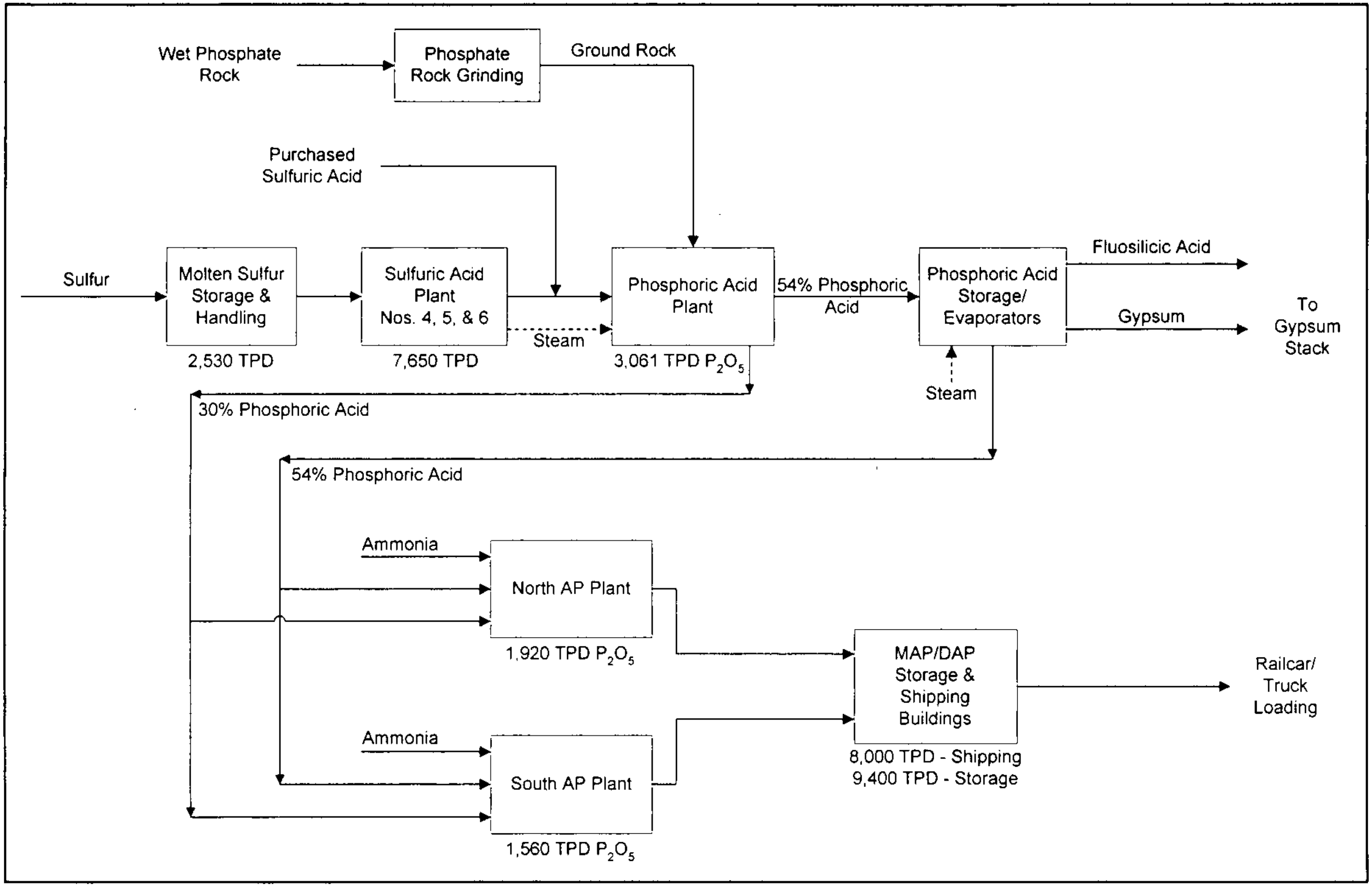
1. Area Map Showing Facility Location: [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested	
2. Facility Plot Plan: [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested	
3. Process Flow Diagram(s): [X] Attached, Document ID: CG-FI-C3 [ ] Not Applicable [ ] Waiver Requested	
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID: ________ [X] Not Applicable [ ] Waiver Requested	
5. Fugitive Emissions Identification: [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested	
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: PSD Report [ ] Not Applicable	
7. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [ ] Attached, Document ID:________ [X] Not Applicable
9. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:________ [ ] Equipment/Activities On site but Not Required to be Individually Listed [X] Not Applicable
10. Alternative Methods of Operation: [ ] Attached, Document ID:__________ [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [X] Not Applicable
12. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:________[X] Not Applicable
13. Risk Management Plan Verification: [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:________) or previously submitted to DEP (Date and DEP Office:________________________) [ ] Plan to be submitted to CEPPO (Date required:__________________________) [X] Not Applicable
14. Compliance Report and Plan: [ ] Attached, Document ID:________ [X] Not Applicable
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:________ [X] Not Applicable

ATTACHMENT CG-FI-C3

PROCESS FLOW DIAGRAM



Attachment CG-FI-C3
Cargill - Green Bay
Future Facility Flow Diagram

Process Flow Legend

Solid/Liquid	——→
Gas	– – – →
Steam	·········→

Filename: 0337506/4/4.4/4.4.1/CG-FI-C3.VSD

Date: 04/23/03

Golder Associates

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J 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
(All Emissions Units)

Emissions Unit Description and Status

1. 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, a 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.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
South AP Plant (Ammoniated Phosphates Fertilizers Manufacturing)

4. Emissions Unit Identification Number: [ ] No ID
ID: **007** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**28**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **053 Five Venturi/Cyclonic Scrubbers** **038 Ammonia Vaporizer**	
2. Control Device or Method Code(s): **053, 038**	

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:
2. Generator Nameplate Rating:	MW
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:			**60**	mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:			**1,560 TPD (100% P_2O_5)**	
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:				
	24	hours/day	**7**	days/week
	52	weeks/year	**8,760**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 63.620(a) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.620(b)(1) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.620(e) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.622(a) Standards for existing DAP/MAP Plants
40 CFR 63.624 Wet Scrubber operating requirements
40 CFR 63.625(a) Monitoring requirements
40 CFR 63.625(b) Monitoring requirements
40 CFR 63.625(c) Monitoring requirements
40 CFR 63.625(f) Monitoring requirements
40 CFR 63.626(a)(1) Performance tests and compliance
40 CFR 63.626(b) Performance tests and compliance
40 CFR 63.626(c) Performance tests and compliance
40 CFR 63.627(a) Notification, recordkeeping, and reporting
40 CFR 63.627(b) Notification, recordkeeping, and reporting
40 CFR 63.627(c) Notification, recordkeeping, and reporting
40 CFR 63.628 Applicability of general provisions
40 CFR 63.630(a) Compliance dates
40 CFR 63.631 Exemption from NSPS
62-212.400(7)(b) PSD
62-296.320(b) General VE Standard
62-296.403 Phosphate processing
62-297.310 Compliance Testing
62-297.401 Compliance Test Methods

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **AP Plants**	2. Emission Point Type Code: **3**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Stack A
Stack B

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **129.5** feet	7. Exit Diameter: **8.0** feet
8. Exit Temperature: **97** °F	9. Actual Volumetric Flow Rate: **150,000** acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: East (km): North (km):

14. Emission Point Comment (limit to 200 characters):

Stack/vent information represents Stack B while operating in MAP mode. Refer to Table 2-2 in PSD Report for a summary of stack/vent information for the South AP Plant.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Chemical Manufacturing; Ammonium Phosphates; Ammoniator/Granulator.**		
2. Source Classification Code (SCC): **3-01-030-02**	3. SCC Units: **Tons P_2O_5 Produced**	
4. Maximum Hourly Rate: **65**	5. Maximum Annual Rate: **569,400**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Maximum Hourly Rate based on a maximum daily P_2O_5 input rate of 1,560 TPD.**		

Segment Description and Rate: Segment 2 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use; Distillate Oil; Phosphate Fertilizer Dryer.**		
2. Source Classification Code (SCC): **3-90-005-99**	3. SCC Units: **1000 Gallons Burned**	
4. Maximum Hourly Rate: **0.444**	5. Maximum Annual Rate: **3,893**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135**
10. Segment Comment (limit to 200 characters): **Maximum Hourly Rate based on heat input rate of 60 MMBtu/hr.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 3 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use; Natural Gas; Phosphate Fertilizer Dryer.**		
2. Source Classification Code (SCC): **3-90-006-99**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.06**	5. Maximum Annual Rate: **525.6**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,000**
10. Segment Comment (limit to 200 characters): **Maximum hourly rate based on heat input rate of 60.0 MMBtu/hr.**		

Segment Description and Rate: Segment 4 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use; Liquefied Petroleum Gas; Phosphate Fertilizer Dryer.**		
2. Source Classification Code (SCC): **3-90-010-99**	3. SCC Units: **1000 Gallons Burned**	
4. Maximum Hourly Rate: **0.663**	5. Maximum Annual Rate: **5,808**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: *	8. Maximum % Ash:	9. Million Btu per SCC Unit: **90.5**
10. Segment Comment (limit to 200 characters): **Maximum hourly rate based on heat input rate of 60 MMBtu/hr.** *** Maximum sulfur content = 15 grains/100 ft^3.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	053		EL
PM_{10}	053		NS
FL	053	038	EL
SO_2			EL
NO_x			NS
H107	053	038	NS
CO			NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **11.05** lb/hour **48.40** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.17 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.17 lb/ton P_2O_5 x 65 ton/hr P_2O_5 = 11.05 lb/hr** **11.05 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 48.40 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Represents total emissions from Stacks A and B combined.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.17 lb/ton P_2O_5**	4. Equivalent Allowable Emissions: **11.05** lb/hour **48.40** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Emission Test using EPA Method 5.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **11.05** lb/hour **48.40** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.17 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.17 lb/ton P_2O_5 x 65 ton/hr P_2O_5 = 11.05 lb/hr** **11.05 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 48.40 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Represents total emissions from Stacks A and B combined.**	

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **FL**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.60** lb/hour **11.39** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.04 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.04 lb/ton P_2O_5 x 65 ton/hr P_2O_5 = 2.60 lb/hr** **2.60 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 11.39 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Represents total emissions from Stacks A and B combined.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.04 lb/ton P_2O_5**	4. Equivalent Allowable Emissions: **2.60** lb/hour **11.39** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack emissions test using EPA Method 13A or 13B.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3.16** lb/hour **13.82** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **142 S lb/Mgal** Reference: **AP-42**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **See Part B, PSD Report.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **S = 0.05 %**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05 % Sulfur Fuel Oil**	4. Equivalent Allowable Emissions: **3.16** lb/hour **13.82** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel oil analysis and usage.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Based on fuel oil firing.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [ ] Rule [X] Other
3. Requested Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE test using EPA Method 9.**	
5. Visible Emissions Comment (limit to 200 characters): **Rule 62-296.320(4)(b), F.A.C. and Permit No. 1050053-012-AV. Applies to both Stacks A and B.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 11

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across R/G Primary High Mole Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 11

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across Dryer Primary Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 3 of 11

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[**X**] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across Screens and Mills Primary Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 4 of 11

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across Cooler Primary Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 5 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow (recovery solution) of R/G High Mole Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 6 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of R/G Low Mole Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 7 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Dryer Primary Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 8 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Screen and Mills Primary Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 9 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Cooler Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 10 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **R/G Low Mole Venturi/Cyclonic Scrubber fan. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 11 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Mass flow of phosphorous-bearing feed material to process. Based on 40 CFR 63.625(a).**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: CG-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_______ [ ] Previously submitted, Date:_______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD Report [ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_______ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
    [ ] Attached, Document ID:________ [X] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
    [ ] Attached, Document ID:________ [X] Not Applicable

13. Identification of Additional Applicable Requirements
    [ ] Attached, Document ID:________ [X] Not Applicable

14. Compliance Assurance Monitoring Plan
    [ ] Attached, Document ID:________ [X] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

    [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
    Attached, Document ID:________

    [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
    Attached, Document ID:________

    [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
    Attached, Document ID:________

    [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
    Attached, Document ID:________

    [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
    Attached, Document ID:________

    [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
    Attached, Document ID:________

    [X] Not Applicable

ATTACHMENT CG-EU1-J2

FUEL ANALYSIS

ATTACHMENT CG-EU1-J2

SOUTH AP PLANT FUEL ANALYSIS

Fuel	Density	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Natural Gas	0.048 lb/scf	<0.01	<0.001	0.62	--	1,000 Btu/scf
No. 2 Fuel Oil	6.83 lb/gal	<0.01	0.05	0.006	<0.01	135,000 Btu/gal
LPG	4.20 lb/gal	0	(15 grains/100ft^3)	0	0	90,500 Btu/gal

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J 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
(All Emissions Units)

Emissions Unit Description and Status

1. 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).

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a 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.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Phosphoric Acid Plant

4. Emissions Unit Identification Number: [ ] No ID
ID: **013, 016, 017** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**28**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

A potential exists for fugitive emissions of F to occur from this EU. It is our understanding, based on past FDEP interpretations and permitting history, that these emissions are not regulated under federal/state/local emission standards. Consists of a reactor, four filters, digester system, filtrate tanks, and two slurry coolers.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **013 Poly-Con Wet Scrubber** **013 Two Arco Cyclonic Jet Scrubbers** **050 Two Packed-Bed Pond Water Scrubbers**
2. Control Device or Method Code(s): **013, 050**

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:
2. Generator Nameplate Rating:	MW
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:				mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:			127.53	TPH P_2O_5
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:				
	24	hours/day	7	days/week
	52	weeks/year	8,760	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 63.600(a) NESHAPs for Phosphoric Acid Manufacturing
40 CFR 63.600(b)(1) NESHAPs for Phosphoric Acid Manufacturing
40 CFR 63.600(c) NESHAPs for Phosphoric Acid Manufacturing
40 CFR 63.600(e) NESHAPs for Phosphoric Acid Manufacturing
40 CFR 63.602(a) Standards for existing sources
40 CFR 63.604 Operating Requirements
40 CFR 63.605(a)(1) Monitoring Requirements
40 CFR 63.605(b)(1) Monitoring Requirements
40 CFR 63.605(c) Monitoring Requirements
40 CFR 63.605(d) Monitoring Requirements
40 CFR 63.606(a)(1) Performance tests and compliance provisions
40 CFR 63.606(b) Performance tests and compliance provisions
40 CFR 63.606(c) Performance tests and compliance provisions
40 CFR 63.607(a) Notification, recordkeeping, and reporting
40 CFR 63.607(b) Notification, recordkeeping, and reporting
40 CFR 63.607(c) Notification, recordkeeping, and reporting
40 CFR 63.608 Applicability of general provisions
40 CFR 63.609(a) Compliance dates
40 CFR 63.610 Exemption from NSPS
62-212.400(7)(b) PSD-Operation Permits
62-296.403 Phosphate Processing
62-297.310 General Compliance Test Requirements
62-297.401 Compliance Test Methods

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **Phosphoric Acid Plant**	2. Emission Point Type Code: **3**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Phosphoric Acid Plant No. 1 – North Train
Phosphoric Acid Plant No. 1 – South Train
Phosphoric Acid Plant No. 2

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **110** feet	7. Exit Diameter: **3.0** feet
8. Exit Temperature: **114** °F	9. Actual Volumetric Flow Rate: **21,300** acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: East (km): North (km):

14. Emission Point Comment (limit to 200 characters):

Stack parameters are for PAP No. 2. Parameters for all scrubbers shown in PSD Report. Exit temperature and flow rate updated from recent stack test data.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Phosphoric Acid: Wet Process: Reactor**		
2. Source Classification Code (SCC): **3-01-016-01**	3. SCC Units: **Tons Phosphate Rock**	
4. Maximum Hourly Rate: **413**	5. Maximum Annual Rate: **3,617,880**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Rates are based on an assumed phosphate rock P_2O_5 content of 30.9% and the maximum process rate of 127.53 TPH P_2O_5.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
FL	013	050	EL
H107	013	050	NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **FL**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.53** lb/hour **6.70** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.012 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **127.53 ton/hr P_2O_5 x 0.012 lb/ton P_2O_5 = 1.53 lb/hr** **1.53 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 6.70 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Fluoride emission limits are from Title V Permit No. 0570008-014-AV and are the proposed BACT limits.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.012 lb/ton P_2O_5**	4. Equivalent Allowable Emissions: **1.53** lb/hour **6.70** tons/year
5. Method of Compliance (limit to 60 characters): **Stack testing of each scrubber using EPA Methods 13A or 13B.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Maximum emissions are limited to the lesser of 1.53 lb/hr or 0.012 lb/ton P_2O_5 input.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 11

1. Parameter Code: FLOW	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Water flow. PAP No. 1 – North Train. Packed Bed Scrubber – First Stage. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Water flow. PAP No. 1 – North Train. Packed Bed Scrubber – Second Stage. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 3 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement: [**X**] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Water flow. PAP No. 1 – South Train. Arco Cyclonic Jet Scrubber – First Stage. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 4 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Water flow. PAP No. 1 – South Train. Arco Cyclonic Jet Scrubber – Second Stage. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 5 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **PAP No. 1 – North Train. Packed Bed Scrubber – First Stage fan. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 6 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **PAP No. 1 – North Train. Packed Bed Scrubber – Second Stage fan. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 7 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **PAP No. 1 – South Train. Arco Cyclonic Jet Scrubber – First Stage fan. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 8 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **PAP No. 1 – South Train. Arco Cyclonic Jet Scrubber – Second Stage fan. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 9 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Water flow of PAP No. 2 Poly Con Spray Scrubber. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 10 of 11

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **PAP No. 2 Poly Con Scrubber fan. Based on proposed MACT (40 CFR 63, Subpart AA) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 11 of 11

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[**X**] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Mass flow of phosphorous-bearing feed material to process. Based on 40 CFR 63.625(a).**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD Report [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:______ [ ] Previously submitted, Date:______ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD Report [ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: ______ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:________ [X] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:________ [X] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:________ [X] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:________ [X] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:________

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:________

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:________

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:________

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:________

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:________

[X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J 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
(All Emissions Units)

Emissions Unit Description and Status

1. 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).

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a 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.

2. Regulated or Unregulated Emissions Unit? (Check one)

[ ] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Phosphoric Acid Tanks (2 storage, 1 aging, 1 clarifying, 4 blending)

4. Emissions Unit Identification Number: [ ] No ID
ID: **014, 015, 037** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**28**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **013 Two Poly-Con Wet Scrubbers**
2. Control Device or Method Code(s): **013**

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:
2. Generator Nameplate Rating:	MW
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram?	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: East (km): North (km):		
14. Emission Point Comment (limit to 200 characters):		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Storage and Transport; Inorganic Chemical Storage; All Storage Types; Working Loss.**		
2. Source Classification Code (SCC): **A252-09-950-00**	3. SCC Units: **1000 Gallon Years Throughput**	
4. Maximum Hourly Rate: **34.1**	5. Maximum Annual Rate: **298,707**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Phosphoric acid throughput from Phosphoric Acid Plant.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Storage and Transport; Inorganic Chemical Storage; All Storage Types; Breathing Loss.**		
2. Source Classification Code (SCC): **A252-00-000-00**	3. SCC Units: **1000 Gallon Years Storage Capacity**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **3,480.4**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Maximum annual rate represents the storage capacity of all 8 tanks combined.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
FL	013	013	NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted:	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor _____ of_____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement: [ ] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:____________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID:________ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [X] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J 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
(All Emissions Units)

Emissions Unit Description and Status

1. 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, a 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.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
North AP Plant (Ammoniated Phosphates Fertilizers Manufacturing)

4. Emissions Unit Identification Number: [ ] No ID
ID: **029** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**28**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **053 Five Venturi/Cyclonic Scrubbers** **038 Ammonia Vaporizer**	
2. Control Device or Method Code(s): **053, 038**	

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:	
2. Generator Nameplate Rating:	MW	
3. Incinerator Information:		
Dwell Temperature:		°F
Dwell Time:		seconds
Incinerator Afterburner Temperature:		°F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:			50	mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:			1,920 TPD (100% P_2O_5)	
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:				
	24	hours/day	7	days/week
	52	weeks/year	8,760	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 63.620(a) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.620(b)(1) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.620(e) NESHAPS for Phosphate Fertilizer Plants
40 CFR 63.622(a) Standards for existing DAP/MAP Plants
40 CFR 63.624 Wet Scrubber operating requirements
40 CFR 63.625(a) Monitoring requirements
40 CFR 63.625(b) Monitoring requirements
40 CFR 63.625(c) Monitoring requirements
40 CFR 63.625(f) Monitoring requirements
40 CFR 63.626(a)(1) Performance tests and compliance
40 CFR 63.626(b) Performance tests and compliance
40 CFR 63.626(c) Performance tests and compliance
40 CFR 63.627(a) Notification, recordkeeping, and reporting
40 CFR 63.627(b) Notification, recordkeeping, and reporting
40 CFR 63.627(c) Notification, recordkeeping, and reporting
40 CFR 63.628 Applicability of general provisions
40 CFR 63.630(a) Compliance dates
40 CFR 63.631 Exemption from NSPS
62-212.400(7)(b) PSD
62-296.320(b) General VE Standard
62-296.403 Phosphate processing
62-297.310 Compliance Testing
62-297.401 Compliance Test Methods

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **AP Plants**		2. Emission Point Type Code: **3**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Main Stack** **R/G Stack**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **128** feet	7. Exit Diameter: **8.0** feet
8. Exit Temperature: **113** °F	9. Actual Volumetric Flow Rate: **153,000** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):		
14. Emission Point Comment (limit to 200 characters): **Stack/vent information represents the main stack while operating in DAP mode. Refer to Table 2-2 in the PSD report for a summary of stack/vent information for the North AP Plant.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Chemical Manufacturing; Ammonium Phosphates; Ammoniator/Granulator.**		
2. Source Classification Code (SCC): **3-01-030-02**	3. SCC Units: **Tons P_2O_5 Produced**	
4. Maximum Hourly Rate: **80**	5. Maximum Annual Rate: **700,800**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Maximum hourly rate based on a maximum daily P_2O_5 input rate of 1,920 TPD.**		

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use; Distillate Oil; Phosphate Fertilizer Dryer.**		
2. Source Classification Code (SCC): **3-90-005-99**	3. SCC Units: **1000 Gallons Burned**	
4. Maximum Hourly Rate: **0.37**	5. Maximum Annual Rate: **3,244**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135**
10. Segment Comment (limit to 200 characters): **Maximum hourly rate based on heat input rate of 50 MMBtu/hr.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use; Natural Gas; Phosphate Fertilizer Dryer.**		
2. Source Classification Code (SCC): **3-90-006-99**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.05**	5. Maximum Annual Rate: **438**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,000**
10. Segment Comment (limit to 200 characters): **Maximum hourly rate based on heat input rate of 50.0 MMBtu/hr.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: *	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	053		EL
PM_{10}	053		NS
FL	053	038	EL
SO_2			EL
NO_x			NS
CO			NS
H107	053	038	NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **13.60** lb/hour **59.57** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.17 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.17 lb/ton P_2O_5 x 80 ton/hr P_2O_5 = 13.60 lb/hr** **13.60 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 59.57 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **PM emissions represents both stacks combined.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.17 lb/ton P_2O_5**	4. Equivalent Allowable Emissions: **13.60** lb/hour **59.57** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Emission Test using EPA Method 5.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **13.60** lb/hour **59.57** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.17 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.17 lb/ton P_2O_5 x 80 ton/hr P_2O_5 = 13.60 lb/hr** **13.60 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 59.57 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **PM_{10} emissions represents both stacks combined.**	

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **FL**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3.20** lb/hour **14.02** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.04 lb/ton P_2O_5** Reference: **Proposed BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.04 lb/ton P_2O_5 x 80 ton/hr P_2O_5 = 3.20 lb/hr** **3.20 lb/hr x 8,760 hr/yr ÷ 2,000 lb/ton = 14.02 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **FL emissions represents both stacks combined.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.04 lb/ton P_2O_5**	4. Equivalent Allowable Emissions: **3.20** lb/hour **14.02** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack emissions test using EPA Method 13A or 13B.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.63 lb/hour 11.52 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: 142 S lb/Mgal Reference: AP-42	7. Emissions Method Code: 0
8. Calculation of Emissions (limit to 600 characters): See Part B, PSD Report.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): S = 0.05%	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 0.05% Sulfur	4. Equivalent Allowable Emissions: 2.63 lb/hour 11.52 tons/year
5. Method of Compliance (limit to 60 characters): Fuel oil analysis and usage.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Based on heat input rate of 50 MMBtu/hr.	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [ ] Rule [X] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE test using EPA Method 9.**	
5. Visible Emissions Comment (limit to 200 characters): **Permit No. 1050053-012-AV.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 12

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across R/G High Mole and Low Mole Venturi/Cyclonic Scrubbers. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 12

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement:	[**X**] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Pressure drop across Cooler Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 3 of 12

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of R/G High Mole and Low Mole Venturi/Cyclonic Scrubbers and ammonia vaporizer. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____ .

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 4 of 12

1. Parameter Code: **TEMP**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Flue gas temperature after ammonia vaporizer. Based on proposed (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 5 of 12

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of R/G Pond Water Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 6 of 12

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **R/G Pond Water Scrubber fan. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 7 of 12

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Dryer Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 8 of 12

1. Parameter Code: FLOW	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Screens and Mills Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 9 of 12

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Scrubbing media flow of Cooler Venturi/Cyclonic Scrubber. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 10 of 12

1. Parameter Code: Fan Amperage	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Dryer Venturi/Cyclonic Scrubber fan. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 11 of 12

1. Parameter Code: **Fan Amperage**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Screens and Mills Venturi/Cyclonic Scrubber fan. Based on proposed MACT (40 CFR 63, Subpart BB) monitoring plan (24-hour average).**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] 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 (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 12 of 12

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Mass flow of phosphorous-bearing feed material to process. Based on 40 CFR 63, Subpart BB.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: **PSD Report** [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: CG-EU4-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: **PSD Report** [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_______ [ ] Previously submitted, Date:_______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: **PSD Report** [ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_______ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:________ [X] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:________ [X] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID: ________ [X] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:________ [X] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:________

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:________

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:________

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:________

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:________

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:________

[X] Not Applicable

ATTACHMENT CG-EU4-J2

FUEL ANALYSIS

ATTACHMENT CG-EU4-J2

NORTH AP PLANT FUEL ANALYSIS

Fuel	Density	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Natural Gas	0.048 lb/scf	<0.01	<0.001	0.62	--	1,000 Btu/scf
No. 2 Fuel Oil	6.83 lb/gal	<0.01	0.05	0.006	<0.01	135,000 Btu/gal

PSD REPORT

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LIST OF ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standards
AQRV	air quality related values
acfm	actual cubic feet per minute
AFI	Animal Feed Ingredient
BACT	Best Available Control Technology
CAA	Clean Air Act
Cargill	Cargill Fertilizer, Inc.
CFR	Code of Federal Regulations
CNWA	Chassahowitzka National Wildlife Area
CO	carbon monoxide
DAP	diammonium phosphate
DCP	dicalcium phosphate
DE	diatomaceous earth
dscfm	dry standard cubic feet per minute
EPA	U.S. Environmental Protection Agency
F	fluoride
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FGD	flue gas desulfurization
ft^2	square foot
ft^3	cubic foot
GEP	Good Engineering Practice
gpm	gallons per minute
gr/dscf	grains per dry standard cubic foot
GTSP	Granular Triple Super Phosphate
GPM	gallons per minute
H_2O	water
H_2S	hydrogen sulfide

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LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

H_2SO_4	sulfuric acid
hr/yr	hours per year
HSH	highest, second-highest
lb	pound
lb/hr	pounds per hour
lb/ton	pounds per ton
MAP	monoammonium phosphate
MCP	monocalcium phosphate
mg/m^3	milligrams per cubic meter
NO_2	nitrogen dioxide
NO_3	nitric oxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
NSR	new source review
NTU	number of transfer unit
P_2O_5	phosphorous pentoxide
PAP	Phosphoric Acid plant
PA	Phosphoric Acid
PFS	phosphatic fertilizer solution
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 micrometers
PSD	prevention of significant deterioration
RACT	Reasonably Available Control Technology
R/G	reactor granulator
R/GCV	reactor-granulator-cooler-equipment vents
SAM	sulfuric acid mist
SiF_4	silicon tetrafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO4	sulfate

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LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

TPD	tons per day
TPH	tons per hour
TPY	tons per year
TSP	triple super phosphate
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound

1.0 INTRODUCTION

Cargill Fertilizer, Inc. (Cargill) operates the Green Bay phosphate fertilizer manufacturing facility located in Bartow, Polk County, Florida. The plant is currently operating under Title V Permit No. 1050053-012-AV. The facility was acquired by Cargill in November 2002 from Farmland Hydro, L.P. The existing Green Bay plant consists of molten sulfur (rail and truck unloading and truck loading) and wet phosphate rock handling systems, phosphoric acid production, sulfuric acid production, fertilizer plants, and a fertilizer shipping and storage plant. Phosphate rock, along with sulfuric acid produced in the Nos. 4, 5, and 6 Sulfuric Acid Plants, are fed to the Phosphoric Acid Plant, where phosphoric acid is manufactured, concentrated, clarified, aged, blended, and stored. The phosphoric acid is fed to the South Diammonium Phosphate (DAP) Fertilizer Plant and the North Monoammonium Phosphate (MAP)/DAP Plant. After the addition of ammonia, MAP and DAP fertilizers are produced and transferred to the storage and shipping buildings, where it is then transported by truck or railcar.

Cargill is proposing to modify its Phosphoric Acid Production System, South DAP Fertilizer Plant, and its North MAP/DAP Plant. The Phosphoric Acid Production System, consisting of the Phosphoric Acid Plant (PAP) No. 1-North, PAP No. 1-South, PAP No. 2, and Phosphoric Acid Storage, Blending, Clarification, Evaporation and Aging Tanks, is being modified to improve process efficiency, plant stability, and evaporation capacity. Due to comingling of the acid between the different phosphoric acid reactors, the modified system should be treated as a single emissions unit.

The South DAP and North MAP/DAP are being modified to improve the product quality, as well as allow the capability of producing both MAP and DAP in the South DAP plant. The proposed quality improvements and expansion of production capabilities will be accomplished by implementing changes to the reactors, granulators, coolers, and screening systems. Enhancements to existing emission control equipment along with new control equipment will accompany these process changes. The plants will be renamed the South Ammoniated Phosphates (AP) Plant and the North AP Plant, respectively.

Based on the potential increase in actual emissions of particulate matter (PM), particulate matter less than or equal to 10 micrometers (PM_{10}), nitrogen oxides (NO_x), and fluorides (F) due to the proposed modifications, the proposed project will constitute a major modification to a major stationary source and thus, trigger new source review (NSR) under the provisions of the federal and state prevention of significant deterioration (PSD) regulations.

For each pollutant subject to PSD review, the following analyses are required:

1. Ambient monitoring analysis, unless the net increase in emissions due to the modification causes impacts that are below specified significant impact levels;
2. Application of best available control technology (BACT) for each new or modified emissions unit;
3. Air quality impact analysis, unless the net increase in emissions due to the modification causes impacts which are below specified significant impact levels; and
4. Additional impact analysis (impact on soils, vegetation, visibility), including impacts on PSD Class I areas.

This PSD permit application addresses these requirements and is organized into six additional sections, followed by the appendices. A description of the project including air emission sources and pollution control equipment is presented in Section 2.0. A regulatory applicability analysis of the proposed project is presented in Section 3.0. An ambient air monitoring analysis is presented in Section 4.0. The BACT analysis is presented in Section 5.0. The air quality impact analysis and additional impact analysis are presented in Sections 6.0 and 7.0, respectively. Supporting documentation is presented in the appendices.

2.0 PROJECT DESCRIPTION

Cargill is proposing modifications to several emission units at its Green Bay phosphate fertilizer manufacturing plant located in Bartow, Florida. These emission units are as follows:

- Phosphoric Acid Production System:
  - Phosphoric Acid Plant No. 1—North Train,
  - Phosphoric Acid Plant No. 1—South Train,
  - Phosphoric Acid Plant No. 2, and
  - Phosphoric Acid Storage, Blending, Clarification and Aging Tanks (8).
- South DAP Fertilizer Plant (to be renamed the South AP Plant), and
- North MAP/DAP Fertilizer Plant (to be renamed the North AP Plant).

The plant is located in Bartow, Florida, on County Road (CR) 640 West in Polk County (refer to Figure 2-1). A plot plan of the facility, showing stack locations, is presented in Figure 2-2. The following sections describe the project modifications to each plant in more detail.

2.1 <u>PHOSPHORIC ACID PRODUCTION SYSTEM</u>

2.1.1 GENERAL

Cargill is proposing to modify the PAPs-Nos. 1-North, 1-South, and 2, and the Phosphoric Acid Reactors, Filtration, Blending, Clarification, and Evaporation. The plant is being modified to improve process efficiency, plant stability, and evaporation capacity. The existing Phosphoric Acid Production System is currently operating under Title V Permit No. 1050053-012-AV, issued December 28, 1999. The PAP No. 1 consists of a North and a South Train. The PAP Nos. 1 and 2 consist of reactors, filtration units, and evaporators.

Emissions from the PAP No. 1-North and No. 1-South are each controlled by two Arco Cyclonic Jet scrubbers operating in series. Emissions from the PAP No. 2 are controlled by a Poly-Con wet scrubber. Refer to the process flow diagram (Figure 2-3). The proposed modifications will include improvements to the piping system, the filtration system, the evaporators to improve capacity, the process flow rates, and emission controls. The existing scrubbing system at the PAP No. 1-North will be replaced with a new packed-bed scrubber to improve control efficiency for the plant. Cargill is not requesting a change in the current permitted production rates for the Phosphoric Acid Production System.

Cargill is also requesting to classify the storage, clarification, aging, and blending tanks as unregulated sources and remove the permit allowable emission rates and testing requirements from the operating permit. These sources emit very small amounts of F and are not regulated by any federal or state regulations. Review of several other phosphate fertilizer production facility Title V permits, such as IMC Phosphates New Wales and South Pierce Plants, CF Industries, and Cargill's Riverview and Bartow facilities, have phosphoric acid tanks that are listed as unregulated sources in their Title V permits. Therefore, Cargill Green Bay is requesting to remove the phosphoric acid tanks (EU014, EU015, and EU037) as regulated sources from the Title V permit and classify them as unregulated sources.

2.1.2 PROCESS DESCRIPTION

Modifications are proposed for the Phosphoric Acid Production System to improve process efficiency, plant stability, and evaporation capacity. The physical modifications will include reconfiguring the process flow piping, upgrading the wash systems, upgrading the filter valves, installing a new cross-flow packed scrubber at the PAP No. 1-North, increasing the evaporation capacity, and making other miscellaneous changes necessary to achieve the proposed performance goals.

Currently, the PAP No. 1 consists of two separate identical trains — the North Train and South Train. Each train consists of a Prayon digester, a filter, and a slurry cooler. The filter systems produce weak phosphoric acid, which is sent to a flow-through tank and then sent to a clarifier. The weak acid is clarified and further processed in an evaporator, where the acid concentration is increased. Modifications will be made to the evaporator to provide improved efficiency and increased capacity. There will be no new emission sources in this area.

The PAP No. 2 currently consists of an isothermal reactor, pre-mix filter tanks, and two filters — the Bird filter and Ucego filter. The filter systems produce weak phosphoric acid, which is sent to a flow-through tank and then sent to a clarifier. The weak acid is clarified and further processed in an evaporator, where the acid concentration is increased. Modifications will be made to the evaporator to provide improved efficiency and increased capacity. There will be no new emission sources in this area.

There are currently eight permitted phosphoric acid tanks at the Green Bay facility. Two phosphoric acid storage tanks that serve the PAP Nos. 1 and 2 are controlled by a single D.R. Technology wet scrubber. A clarification tank and an aging tank that serve the PAP Nos. 1 and 2 are also controlled by a single D.R. Technology wet scrubber. There are currently four phosphoric acid blend tanks at the Green Bay facility. All four tanks are controlled by a single D.R. Technology, Model PT-100 packed-bed pond water scrubber. Unclarified phosphoric acid from the evaporators is blended in these tanks with sludge. The blend acid is used in the production of MAP and DAP. As previously discussed, it is requested that these storage tanks be reclassified as unregulated emission units.

The PAP No. 1-North is currently permitted for a maximum input rate of 27.5 tons per hour (TPH) of phosphorous pentoxide (P_2O_5). The PAP No. 1-South is currently permitted for a maximum input rate of 45.03 TPH P_2O_5. The PAP No. 2 is currently permitted for a maximum input rate of 55 TPH P_2O_5. Cargill is not requesting a change in these permitted rates. However, since the acid from the various reactors is commingled in the production process prior to evaporation, Cargill requests that the production rate be stated as a combined rate of 128 TPH P_2O_5 for the system.

27.5 45.0 55.0 128.0

2.1.3 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

The emissions from the Prayon digester at the PAP No. 1-North are currently controlled by two Arco Cyclonic Jet scrubbers operating in series. Emissions from the filter are currently controlled by the second-stage Arco Cyclonic Jet scrubber. The two scrubbers will be replaced with a packed-bed scrubber. The exhaust gases from the new scrubbing system will vent through the existing PAP No. 1-North stack.

The emissions from the Prayon digester at the PAP No. 1-South are currently controlled by two Arco Cyclonic Jet scrubbers operating in series. Emissions from the filter are currently controlled by the second-stage Arco Cyclonic Jet scrubber. The exhaust gases from the scrubbers vent through the existing PAP No. 1-South stack. Cargill is not modifying any of the control equipment at the PAP No. 1–South.

The emissions from the reactor, Bird and Ucego filters, and the pre-mix filter tanks at the PAP No. 2 are currently controlled by a Poly-Con wet scrubber. The exhaust gases from the scrubber will vent through the existing PAP No. 2 stack. Cargill is not modifying any of the control equipment at the PAP No. 2.

The four phosphoric acid storage, clarification, and aging tanks are currently subject to a F emission limit of 0.04 pound per hour (lb/hr), equivalent to 0.18 ton per year (TPY), as specified in Title V Permit No. 1050053-012-AV. As described earlier, Cargill is requesting removal of the emission limit, as the tanks will be classified as unregulated emissions units.

Due to mixing of product acid within the system, Cargill is requesting that the Phosphoric Acid emission units be grouped together as a single emissions unit, such as the Phosphoric Acid Plant at Cargill Riverview and Cargill Bartow. The emission unit will be renamed the "Phosphoric Acid Plant". The single emissions unit will have one maximum throughput rate, equal to the sum of the current PAP No. 1-North, PAP No. 1-South, and the PAP No. 2 throughput rates. The current operating permit limits the material process input rate at PAP No. 1-North to 27.5 TPH P_2O_5. The current operating permit limits the material process input rate at PAP No. 1-South to 45.03 TPH P_2O_5. The current operating permit limits the material process input rate at PAP No. 2 to 55.0 TPH P_2O_5. Therefore, the combined maximum throughput rate will be 127.53 TPH P_2O_5. Secondly, Cargill is proposing to reduce the allowable F emission rate at the "Phosphoric Acid Plant" emission unit to 0.012 lb/ton P_2O_5, 1.53 lb/hr, and 6.71 TPY.

The pollution control equipment and allowable F emission rates for the Phosphoric Acid Plant are presented in Table 2-1. The table includes information about the existing PAP and proposed modifications to the PAP. Current actual emissions (2001 through 2002) from the PAP are presented in Table 2-2 (also refer to Appendix A).

2.1.4 STACK DATA

Stack and operating data are presented in Table 2-3 for each emission point located at the Phosphoric Acid Production System. These sources include the PAP No. 1-North, No. 1-South, No. 2, and the Phosphoric Acid storage, blending, clarification, and aging tanks.

2.2 SOUTH DAP PLANT

2.2.1 GENERAL

Cargill currently operates a DAP fertilizer plant with a maximum permitted feed rate of 46 TPH P_2O_5. The South DAP Plant currently consists of a reactor, granulator, dryer, screens and mills, coolers, and associated equipment. Cargill is proposing to modify the South Plant to improve product quality of the plant and to enable production of MAP as well as DAP fertilizer. The modified plant will be renamed the "South Ammoniated Phosphates (AP) Plant". DAP + MAP

2.2.2 PROCESS DESCRIPTION

In the existing DAP manufacturing process, phosphoric acid and anhydrous ammonia are reacted in a sealed reaction tank. Ammonia is then further added to the ammoniated acid in a rotary reactor-granulator (R/G). The granulated, unsized DAP is then dried in a rotary dryer. The dryer is fired at a maximum heat input rate of 60 million British thermal units per hour (MMBtu/hr) by natural gas as the primary fuel and No. 2 fuel oil or liquefied petroleum gas (LPG) as the backup fuel.

The dried DAP material is sized and screened, and the oversized and undersized material is recycled back to the granulator. The product is then cooled, screened, and sent to storage in the MAP/DAP Storage Building. Flow diagrams of the existing and proposed future plant are presented in Figures 2-4 and 2-5, respectively.

The proposed project will include the following changes and improvements:

1. Upgrading the scrubbing system including:
    a. R/G venturi/cyclonic scrubber,
    b. R/G tailgas scrubber (vaporizer),
    c. Dryer venturi/cyclonic scrubber,
    d. Screens/mills (S/M) venturi/cyclonic scrubber, and
    e. Cooler venturi/cyclonic scrubber;
2. Upgrading the fans;
3. Installing new R/G and main plant stacks in the same location (with same stack height); and
4. Making other miscellaneous equipment changes necessary to meet production and quality goals.

The proposed product quality improvements will be accomplished primarily by implementing changes to the reactor, the screening operations, and the cooling systems. The addition of the capability to produce MAP as well as DAP will be accomplished primarily by implementing changes to the reactor and granulator. Specific changes will include upgrades to the granulator, improvements to the screening process, and improvements to the cooling capacity.

To accommodate the increase in airflow and to improve the control efficiency of the plant, the proposed modifications also include enhancements to the control equipment at the South AP Plant.

Cargill is requesting an increase in the production rate for the South AP Plant from 46 TPH P_2O_5 to 65 TPH P_2O_5 for production of AP fertilizer.

2.2.3 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

The South AP Plant currently utilizes five scrubbers to control emissions. Evacuated air from the reactor and granulator is vented to the R/G venturi scrubber and then vented through a pond water scrubber. This air stream is then vented through "Stack A". Emissions from the dryer are evacuated through the dryer venturi scrubber. Emissions from the screens and mills are evacuated through the screens and mills venturi scrubber. The air streams exiting the dryer venturi scrubber and the mills and screens venturi scrubber are combined and vented through a cross-flow pond water scrubber. The air stream is then evacuated through "Stack B". The cooler and equipment is vented through the cooler equipment venturi scrubber, and is then evacuated through "Stack B". Refer to Figure 2-4 for the process flow diagram.

The proposed modifications to the South AP Plant will include modifications to the R/G evacuation scrubbing system and the cooler, dryer, and screens and mills evacuation scrubbing system. The proposed modification to the R/G scrubbing system includes the installing a phosphoric acid venturi/cyclonic scrubber, which will primarily remove particulate. Refer to Figure 2-5 for the process flow diagram.

After acid scrubbing, the air stream will pass through the tubes of a shell and tube heat exchanger (R/G ammonia vaporizer). On the shell side, ammonia is vaporized, which cools the air stream and condenses moisture on the tube side. This condensed moisture absorbs the majority of the F in the air stream. A portion of the condensate is continuously recirculated over the tube sheet and through the tubes. This pollution control technology has been successfully utilized in the Green Bay North MAP/DAP Plant.

The increased airflow rate from the dryer will provide proper moisture removal from the granulated fertilizer product. A new dryer venturi/cyclonic scrubber will provide proper PM removal and the scrubber will exhaust to a new dryer fan that will be sized to provide the necessary flow rate. The screens/mills evacuation system inside of the plant will be modified as required to provide proper dust control and will vent through the existing dryer cyclones for removal of the majority of the PM prior to exhausting through a new screens/mills venturi/cyclonic scrubber. The scrubber will exhaust to a new screens/mills evacuation fan that will be sized to provide the proper airflow for effective dust control inside the plant. The present cooler is adequate to operate with a higher production rate, but the airflow is inadequate to provide the proper heat exchange. With an increased airflow, the cooler will discharge a product at the required temperature for storage and shipping. To accommodate the airflow rate, a new cooler venturi/cyclonic scrubber and new fan will be installed.

The cooler, dryer, and the screens/mills evacuation air streams containing PM will be scrubbed using recirculated phosphoric acid (scrubber solution) in three new venturi/cyclonic scrubbers. This recirculated liquor will absorb the dust and provide proper control of PM.

The current maximum allowable PM/PM_{10} emission rates for the South DAP Plant are 46.8 lb/hr and 205.0 TPY of PM/PM_{10}, equivalent to 1.017 lb/ton P_2O_5. Allowable F emissions are 12.03 lb/hr and 52.7 TPY, equivalent to 0.26 lb/ton P_2O_5. The proposed modifications will result in a decrease in these allowable emission rates. The proposed maximum allowable emission rates for the modified South AP Plant are 11.1 lb/hr and 48.4 TPY of PM/PM_{10}, equivalent to 0.17 lb/ton P_2O_5; and 2.6 lb/hr and 11.4 TPY of F, equivalent to 0.04 lb/ton P_2O_5. The proposed emission rates result in a reduction in permitted PM/PM_{10} emissions of 155 TPY and a reduction in permitted F emissions of 41 TPY.

The existing stacks will be replaced with new stacks of the same height and in the current locations.

A summary of allowable emission rates for the South AP Plant is presented in Table 2-4. The table summarizes the existing and proposed allowable emission rates for PM/PM_{10} and F. A summary of the pollution control equipment for the South AP Plant is presented in Table 2-5. The table summarizes the existing and proposed control equipment for the South AP Plant. The current actual emissions for the South DAP Plant for 2002 and 2001, and the average actual emissions for the 2-year period, are presented in Table 2-2.

Maximum future emissions due to fuel combustion in the dryer are presented in Table 2-6. These emissions are based on 60 MMBtu/hr heat input and burning natural gas, No. 2 fuel oil, or LPG. Consumption of the No. 2 fuel oil is limited to a sulfur content of 0.05 percent.

2.2.4 STACK DATA

Stack and operating data for the current and future proposed project sources only are presented in Table 2-3.

2.3 NORTH MAP/DAP PLANT

2.3.1 GENERAL

Cargill currently operates a MAP/DAP phosphate fertilizer plant with a maximum permitted production rate of 200 TPH of MAP, corresponding to 106.1 TPH P_2O_5, and 150 TPH of DAP, corresponding to 70.4 TPH P_2O_5. The North MAP/DAP Plant currently consists of a reactor, granulator, dryer, screens and mills, coolers, and associated equipment. Cargill is proposing to modify the North MAP/DAP Plant to improve product quality of the plant. The modified plant will be renamed the "North Ammoniated Phosphates (AP) Plant".

2.3.2 PROCESS DESCRIPTION

In the existing manufacturing process, phosphoric acid and anhydrous ammonia are combined in a reactor then followed by the introduction to the rotary granulator. Ammonia can be further added to the ammoniated acid in the granulator, depending on the grade of ammoniated phosphate being manufactured. The granulated, unsized ammoniated phosphate is then dried in a rotary dryer. The dryer is fired at a maximum heat input rate of 50 MMBtu/hr by natural gas as the primary fuel and No. 2 fuel oil as the backup fuel.

The dried ammoniated phosphate is then sized and screened, and the oversized and undersized material is recycled back to the granulator. The product is then passed to a product cooler, which uses chilled air from the vaporization of incoming liquid ammonia. Material is screened and sent to storage in the Storage Building. Flow diagrams of the existing and proposed future plant are presented in Figures 2-6 and 2-7, respectively.

The proposed project will include the following changes and improvements:

1. Upgrading the scrubbing system including:
    a. R/G venturi/cyclonic scrubber,
    b. R/G Tailgas scrubber (vaporizer),

   c. Dryer venturi/cyclonic scrubber, and
   d. S/M venturi/cyclonic scrubber;
2. Upgrading the fans;
3. Installing a new main plant stack in the same location and at the same stack height; and
4. Making other miscellaneous equipment changes as necessary to meet production and quality goals.

The proposed product quality improvements will be accomplished primarily by implementing changes to the reactor, the screening operations, and the cooling systems. Modifications to the process equipment, such as screens and an increase in the airflow for cooling improvements, will allow the North AP Plant to produce a better quality product.

To accommodate the increase in airflow and to improve the control efficiency of the plant, the proposed modifications also include enhancements to the control equipment at the North AP Plant.

Cargill is requesting a change in the production rate for the North AP Plant from the current 106.1 TPH P_2O_5 when producing MAP and 70.4 TPH P_2O_5 when producing DAP, to 80 TPH P_2O_5 for producing AP.

Syed Limit will be 80 TPH P_2O_5 for both MAP/DAP

2.3.3 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

The North AP Plant currently utilizes seven scrubbers to control emissions. Evacuated air from the reactor and granulator is vented to the R/G venturi/cyclonic scrubbing system and then vented through an ammonia vaporizer. This air stream is then vented through the R/G stack. Emissions from the dryer are evacuated through the dryer venturi scrubber. Emissions from the screens/mills are evacuated through the screens/mills venturi scrubber. The cooler gases are vented through the cooler venturi scrubber. The air streams exiting the dryer venturi scrubber, the screens/mills venturi scrubber, and the cooler venturi scrubber are vented through a single cross-flow pond water scrubber. The air stream is then evacuated through the main plant stack. The process flow diagram is presented in Figure 2-6.

The proposed modifications to the North AP Plant will include modifications to the R/G evacuation scrubbing system and the cooler, dryer, and screens/mills evacuation scrubbing system The process flow diagram is presented in Figure 2-7.

The proposed modification to the R/G scrubbing system includes installing a phosphoric acid venturi/cyclonic scrubber, which will primarily remove particulate. After acid scrubbing, the air stream will pass through the tubes of a shell and tube heat exchanger (R/G ammonia vaporizer). On the shell side, ammonia is vaporized, which cools the air stream and condenses moisture on the tube side. This condensed moisture absorbs the majority of the F in the air stream. A portion of the condensate is continuously recirculated over the tube sheet and through the tubes. This technology has been successfully utilized in the Green Bay North MAP/DAP Plant.

A new venturi/cyclonic scrubber for the dryer will provide proper particulate removal. The scrubber will utilize a new dryer fan sized to provide the necessary airflow rate. The screens/mills evacuation system inside the plant will be modified as required to provide proper particulate control and will pass through the existing dry cyclones for removal of the majority of the PM prior to passing through a new venturi/cyclonic scrubber. The exhaust of the scrubber will vent to a new screens/mills evacuation fan sized to provide the proper airflow for effective PM control in the plant.

The existing cooler is adequate to accommodate the increased production rate, but the airflow is inadequate to provide proper heat exchange. With an increased airflow, the cooler will discharge a product at the required temperature for storage and shipping. To allow for the higher airflow rate, a new fan will be installed.

The cooler, dryer, and screens/mills evacuation air streams will use recirculated phosphoric acid (scrubber solution) as the scrubbing media in all three venturi/cyclonic scrubbers. This recirculated acid will provide proper control of PM and ammonia emissions. The discharge of all three fans will be combined together and will exit through a new stack (the main stack).

The current maximum allowable F emission rates for the North MAP/DAP Plant are 0.06 lb/ton P_2O_5, 6.4 lb/hr, and 27.9 TPY when producing MAP, and 0.0417 lb/ton P_2O_5, 2.9 lb/hr, and 12.7 TPY when producing DAP. The current maximum allowable PM/PM_{10} emission rates are 31.8 lb/hr and 139.3 TPY, equivalent to 0.3 lb/ton P_2O_5 when producing MAP, and 21.1 lb/hr and 92.5 TPY, equivalent to 0.3 lb/ton P_2O_5, when producing DAP. The proposed modification will result in a decrease in these allowable emission rates. The proposed maximum allowable emission rates for the modified North AP Plant are 13.6 lb/hr and 59.6 TPY of PM/PM_{10}, equivalent to 0.17 lb/ton P_2O_5; and 3.2 lb/hr and 14.0 TPY of F, equivalent to 0.04 lb/ton P_2O_5.

The existing stacks will be replaced with new stacks of the same height and in the current locations.

A summary of allowable emission rates for the North AP Plant is presented in Table 2-7. The table summarizes the existing and proposed allowable emission rates for PM/PM_{10} and F. A summary of the pollution control equipment for the North AP Plant is presented in Table 2-8. The table summarizes the existing and proposed control equipment for the North AP Plant. The current actual emissions for the North DAP Plant for 2002 and 2001 and the average actual emissions for the 2-year period, are presented in Table 2-2.

Maximum future emissions due to fuel combustion in the dryer are presented in Table 2-9. These emissions are based on 50 MMBtu/hr heat input and burning natural gas or No. 2 fuel oil. The maximum sulfur content of the No. 2 fuel oil will be limited to 0.05 percent.

2.3.4 STACK DATA

Stack and operating data for the current and future proposed project sources only are presented in Table 2-3.

2.4 AFFECTS ON OTHER EMISSIONS UNITS

Due to the proposed modifications to the existing Phosphoric Acid Production and Storage System, the South DAP Plant, and the North MAP/DAP Plant, other emissions units at the Green Bay plant may be potentially affected (i.e., increased production rates or actual emission rates). The following section describes the other emissions unit at Cargill Green Bay and the potential affect of the proposed modifications.

2.4.1 MAP/DAP STORAGE AND SHIPPING BUILDINGS

The MAP/DAP Storage and Shipping Buildings are used to store and ship the granulated fertilizer products (MAP and DAP). Process operations in the shipping building include product screening, product transfer by conveyor belts, a product shipping bin, and truck and railcar loading. The increase in production rates at the South and North AP Plants may result in an increase in operation at the MAP/DAP Storage and Shipping Buildings. Since these storage buildings are no longer used for storage and handling of granular triple super phosphate (GTSP), the F emission limits should be removed and the PM emissions applied to the control of the product shipping system. Cargill is not requesting a change in the current permitted loading rates for the Storage Building of 180 TPH P_2O_5 and 98 TPH P_2O_5 for the Shipping Building. The current permitted allowable emission rates of 2.75 lb/hr and 12.05 TPY for F (storage and shipping combined) should be removed while the limits of 4.1 lb/hr and 18 TPY of PM/PM_{10} should remain the same. Current actual emissions (2001 through 2002) are presented in Table 2-2.

2.4.2 NOS. 4, 5, AND 6 SULFURIC ACID PLANTS

The Nos. 4, 5, and 6 Sulfuric Acid Plants will not be modified as part of this project. Although sulfuric acid is used in the phosphoric acid production process, there will not be an increase in the amount of sulfuric acid at Green Bay. Green Bay is currently a net exporter of sulfuric acid. For example, in 2002 the facility exported 140,000 tons of sulfuric acid. In 2001 the facility exported 61,500 tons. Furthermore, Cargill recently acquired a sulfuric acid plant in Mulberry, Florida, that can supply supplemental sulfuric acid to all of the Cargill facilities or ship to a third party. Lastly, the Green Bay facility can also purchase sulfuric acid from third parties. Therefore, even if the actual amount of phosphoric acid production increases as part of this project, the actual amount of sulfuric acid produced will not increase. Decreasing exports and/or increasing import of sulfuric acid will offset any additional amount of sulfuric acid needed.

Table 2-1. Summary of Pollution Control Equipment and Allowable Emission Rates for the Phosphoric Acid Plant, Cargill Green Bay

Source	EU ID	Control Equipment	Design Capacity	Operating Hours	Maximum Process Rate (TPH P_2O_5)	Fluoride Allowable Emission Rate		
						lbs/ton P_2O_5 feed	lb/hr	TPY
Existing Phosphoric Acid Plant								
No. 1--North Train Digester/Filter	016	(2) Cyclonic Jet Scrubbers	29,100 acfm	8,760	27.5	0.055	1.5	6.57
No. 1--South Train Digester/Filter	017	(2) Cyclonic Jet Scrubbers	29,100 acfm	8,760	45.03	0.018	0.83	3.64
No. 2 Reactors, Filters, Pre-mix Filter Tanks	013	Poly-Con Wet Scrubber	24,300 acfm	8,760	55.0	0.02	1.00	4.38
Total--Existing Phosphoric Acid Plant					127.53		3.33	14.59
Modified Phosphoric Acid Plant								
No. 1--North Train Digester/Filter	016	Packed-bed Scrubber (new)	29,100 acfm	8,760	27.5	0.012	0.33	1.45
No. 1--South Train Digester/Filter	017	(2) Cyclonic Jet Scrubbers	29,100 acfm	8,760	45.03	0.012	0.54	2.37
No. 2 Reactors, Filters, Pre-mix Filter Tanks	013	Poly-Con Wet Scrubber	24,300 acfm	8,760	55.0	0.012	0.66	2.89
Total--Modified Phosphoric Acid Plant					127.53		1.53	6.70

Notes: acfm =actual cubic feet per minute

Table 2-2. Actual Annual (2001-2002) Emissions for Sources Affected by the Proposed Project, Cargill Green Bay

Source Description	EU ID	Pollutant Emission Rate [a] (TPY)								
		SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
2002 Actual Emissions										
Phosphoric Acid Plant No. 1-North Train	016	--	--	--	--	--	--	--	--	0.20
Phosphoric Acid Plant No. 1-South Train	017	--	--	--	--	--	--	--	--	1.01
Phosphoric Acid Plant No. 2	013	--	--	--	--	--	--	--	--	0.17
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	014	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	015	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks-4	037	--	--	--	--	--	--	--	--	0.0004
South DAP Fertilizer Plant	007	0.03	5.67	4.77	22.82	22.82	0.31	--	--	5.18
North MAP/DAP Fertilizer Plant	029	0.03	5.27	4.42	40.54	40.54	0.29	--	--	3.09
MAP/DAP Shipping & Storage Buildings	020	--	--	--	8.62	8.62	--	--	--	0.17
2001 Actual Emissions										
Phosphoric Acid Plant No. 1-North Train	016	--	--	--	--	--	--	--	--	0.26
Phosphoric Acid Plant No. 1-South Train	017	--	--	--	--	--	--	--	--	0.09
Phosphoric Acid Plant No. 2	013	--	--	--	--	--	--	--	--	0.42
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	014	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	015	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks-4	037	--	--	--	--	--	--	--	--	0.0004
South DAP Fertilizer Plant	007	0.04	9.07	1.10	25.48	22.00	0.18	--	--	7.31
North MAP/DAP Fertilizer Plant	029	0.03	4.15	0.87	24.43	21.25	6.07	--	--	3.46
MAP/DAP Shipping & Storage Buildings	020	--	--	--	3.47	3.02	--	--	--	0.17
Average 2002 & 2001 Actual Emissions										
Phosphoric Acid Plant No. 1-North Train	016	--	--	--	--	--	--	--	--	0.23
Phosphoric Acid Plant No. 1-South Train	017	--	--	--	--	--	--	--	--	0.55
Phosphoric Acid Plant No. 2	013	--	--	--	--	--	--	--	--	0.30
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	014	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	015	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks-4	037	--	--	--	--	--	--	--	--	0.0004
South DAP Fertilizer Plant	007	0.03	7.37	2.94	24.15	22.41	0.25	--	--	6.25
North MAP/DAP Fertilizer Plant	029	0.03	4.71	2.65	32.49	30.90	3.18	--	--	3.28
MAP/DAP Shipping & Storage Buildings	020	--	--	--	6.05	5.82	--	--	--	0.17

[a] From the 2002 and 2001 Annual Operating Reports, Farmland Industries and Cargill Fertilizer, Inc.

Table 2-3. Stack and Operating Data for the Proposed Project Sources Only--Cargill Green Bay

Source	EU ID	Location [a] X (ft)	Location [a] X (m)	Location [a] Y (ft)	Location [a] Y (m)	Stack/Vent Release Height (ft)	Stack/Vent Release Height (m)	Stack/Vent Diameter (ft)	Stack/Vent Diameter (m)	Exhaust Flow Rate (acfm)	Exhaust Gas Exit Temperature (°F)	Exhaust Gas Exit Temperature (K)	Exhaust Gas Velocity (ft/s)	Exhaust Gas Velocity (m/s)
Current Operations														
Phosphoric Acid Plant No. 1--North	016	397.1	121.0	645.8	196.9	100.5	30.6	3.5	1.07	26,400	110	316	45.7	13.94
Phosphoric Acid Plant No. 1--South	017	405.9	123.7	446.9	136.2	100.5	30.6	3.5	1.07	21,200	108	315	36.7	11.19
Phosphoric Acid Plant No. 2	013	244.9	74.7	848.4	258.6	110.0	33.5	3.0	0.91	21,300	114	319	50.2	15.31
Phosphoric Acid Tanks (2, R-R)	014	443.1	135.1	400.8	122.2	59.3	18.1	0.8	0.25	113	94	308	3.5	1.05
Phosphoric Acid Tanks (2, N-N)	015	457.1	139.3	966.9	294.7	62.8	19.1	1.3	0.41	109	91	306	1.3	0.40
Phosphoric Acid Blend Tanks	037	707.3	215.6	538.1	164.0	22.5	6.9	0.5	0.15	94	77	298	8.0	2.43
South DAP Plant--Stack A	007	417.1	127.1	8.1	2.5	130.0	39.62	6.0	1.83	40,000	191	361	23.58	7.19
South DAP Plant--Stack B	007	522.8	159.3	10.9	3.3	129.5	39.47	7.5	2.29	144,500	107	315	54.51	16.62
North MAP/DAP Plant-Main Stack	029	522.4	159.2	127.8	39.0	128.0	39.01	7.5	2.29	237,800	103	313	89.71	27.34
North MAP/DAP Plant-RG Stack	029	433.1	132.0	130.6	39.8	116.5	35.51	5.5	1.68	89,800	198	365	63.00	19.20
Future Operations														
Phosphoric Acid Plant No. 1--North	016	397.1	121.0	645.8	196.9	100.5	30.6	3.5	1.07	26,400	110	316	45.7	13.94
Phosphoric Acid Plant No. 1--South	017	405.9	123.7	446.9	136.2	100.5	30.6	3.5	1.07	21,200	108	315	36.7	11.19
Phosphoric Acid Plant No. 2	013	244.9	74.7	848.4	258.6	110.0	33.5	3.0	0.91	21,300	114	319	50.2	15.31
Phosphoric Acid Tanks (2, R-R)	014	443.1	135.1	400.8	122.2	59.3	18.1	0.8	0.25	113	94	308	3.5	1.05
Phosphoric Acid Tanks (2, N-N)	015	457.1	139.3	966.9	294.7	62.8	19.1	1.3	0.41	109	91	306	1.3	0.40
Phosphoric Acid Blend Tanks	037	707.3	215.6	538.1	164.0	22.5	6.9	0.5	0.15	94	77	298	8.0	2.43
South DAP Plant--Stack A [b]	007	417.1	127.1	8.1	2.46	130.0	39.62	5.0	1.52	40,000	190	361	33.95	10.35
South DAP Plant--Stack B [b]	007	522.8	159.3	10.9	3.32	129.5	39.47	8.0	2.44	150,000	97	309	49.74	15.16
North AP Plant-Main Stack [b]	029	522.4	159.2	127.8	38.95	128.0	39.01	8.0	2.44	153,000	113	318	50.73	15.46
North AP Plant-RG Stack [b]	029	433.1	132.0	130.6	39.80	116.5	35.51	5.0	1.52	56,000	194	363	47.53	14.49

[a] Relative to the SW corner of the DAP/MAP Storage Building.

Table 2-4. Summary of Allowable Emission Rates for the South AP Plant, Cargill Green Bay

Source	EU ID	Operating Hours	Maximum Process Rate (TPH P_2O_5)	Fluoride Emission Rate: Equivalent lb/ton P_2O_5	Fluoride Emission Rate: lb/hr	Fluoride Emission Rate: TPY	PM/PM_{10} Emission Rate: Equivalent lb/ton P_2O_5	PM/PM_{10} Emission Rate: lb/hr	PM/PM_{10} Emission Rate: TPY
Existing South DAP Fertilizer Plant									
Total--Reactor/Granulator-Stack A and Dryer, Screens & Mills, Cooler-Stack B	007	8,760	46.0 (1,104 TPD)	0.26	12.03	52.7	1.017	46.8 → x4,38	205.0
Modified South AP Plant									
Total--Reactor/Granulator-Stack A and Dryer, Screens & Mills, Cooler-Stack B	007	8,760	65.0 (1,560 TPD)	0.04	2.60	11.39	0.17	11.05 x 4,38	48.40

Notes: DAP = Diammonium Phosphate; MAP = Monoammonium Phosphate

PM/PM_{10} = Particulate Matter/Particulate Matter with aerodynamic diameter less than or equal to 10 micrometers

Table 2-5. Summary of Pollution Control Equipment for the South AP Plant, Cargill Green Bay

Source	EU ID	Primary Control Equipment			Secondary Control Equipment			Tertiary Control Equipment	
		Type	Design Capacity	Design Pressure Drop	Type	Design Capacity	Design Pressure Drop	Type	Design Capacity
Existing South DAP Fertilizer Plant									
Reactor and Granulator (Stack A)	007	Venturi Scrubber	25,000 acfm	19 inches	Pond Water Scrubber	80,000 acfm	19 inches	--	--
Dryer (Stack B)	007	Venturi Scrubber	60,000 acfm		--	--		--	--
Screens and Mills (Stack B)	007	Venturi Scrubber	29,000 acfm		--	--		--	--
Cooler (Stack B)	007	Venturi Scrubber	57,000 acfm		--	--		--	--
Combined Stack B	007	--	--		Cross-Flow Pond Water Scrubber	80,000 acfm		--	--
Modified South AP Plant									
Reactor and Granulator (Stack A)	007	High Mol Spray Cyclonic Scrubber (New)	82,000 acfm		Low Mol Venturi/Cyclonic Scrubber (New)	82,000 acfm	16 inches	Ammonia Vaporizer	86,000 acfm
Dryer (Stack B)	007	Venturi/Cyclonic Scrubber (New)	62,000 acfm	16 inches	--	--		--	--
Screens and Mills (Stack B)	007	Venturi/Cyclonic Scrubber (New)	41,000 acfm	16 inches	--	--		--	--
Cooler (Stack B)	007	Venturi/Cyclonic Scrubber (New)	103,000 acfm	16 inches	--	--		--	--
Combined Stack B	007	--	--		--	--		--	--

Note: NA = not applicable

Table 2-6. Maximum Emission Rates Due to Fuel Combustion for the Dryer at the South AP Plant, Cargill Green Bay

Parameter	Units	No. 2 Fuel Oil	Natural Gas	LPG
Operating Data				
Annual Operating Hours	hr/yr	8760	8,760	8,760
Maximum Heat Input Rate	10^6Btu/hr	60	60	60
Hourly Fuel Oil Usage[a]	10^3gal/hr	0.44	N/A	N/A
Annual Fuel Oil Usage	10^3gal/yr	3,893	N/A	N/A
Maximum Sulfur Content	Weight %	0.05	N/A	N/A
Hourly Natural Gas Usage[b]	10^6scf/hr	N/A	0.060	N/A
Annual Natural Gas Usage	10^6scf/yr	N/A	525.6	N/A
Maximum Sulfur Content	gr/100 ft^3	N/A	N/A	15
Hourly LPG Usage[g]	10^3gal/hr	N/A	N/A	0.663
Annual LPG Usage	10^3gal/yr	N/A	N/A	5,808

Pollutant	AP-42 Emissions Factor[c]	No. 2 Fuel Oil Hourly Emisson Rate (lb/hr)	No. 2 Fuel Oil Annual Emission Rate (TPY)	Natural gas Hourly Emisson Rate (lb/hr)	Natural gas Annual Emission Rate (TPY)	LPG Hourly Emisson Rate (lb/hr)	LPG Annual Emission Rate (TPY)	Maximum Emission Rate Hourly Emisson Rate (lb/hr)	Maximum Emission Rate Annual Emission Rate (TPY)
Sulfur Dioxide									
Fuel oil	142 *(S) lb/10^3gal[d]	3.16	13.82	--	--	--	--	--	--
Natural gas	0.6 lb/10^6ft^3	--	--	0.04	0.16	--	--	--	--
LPG	0.1 *(S)lb/10^3gal[h]	--	--	--	--	0.994	4.36	--	--
Worse-Case Combination of Fuels		--	--	--	--	--	--	3.16	13.82
Sulfuric Acid Mist									
Fuel oil	2.4 *(S) lb/10^3gal[d,e]	0.05	0.23	--	--	--	--	0.053	0.234
Nitrogen Oxides									
Fuel oil	20 lb/10^3gal	8.89	38.93	--	--	--	--	--	--
Natural gas	100 lb/10^6ft^3	--	--	6.00	26.28	--	--	--	--
LPG	19 lb/10^3gal	--	--	--	--	12.60	55.17	--	--
Worse-Case Combination of Fuels		--	--	--	--	--	--	12.60	55.17
Carbon Monoxide									
Fuel oil	5 lb/10^3gal	2.22	9.73	--	--	--	--	--	--
Natural gas	84 lb/10^6ft^3	--	--	5.04	22.08	--	--	--	--
LPG	3.2 lb/10^3gal	--	--	--	--	2.12	9.29	--	--
Worse-Case Combination of Fuels		--	--	--	--	--	--	5.04	22.08
Volatile Organic Compounds									
Fuel oil	0.2 lb/10^3gal	0.09	0.39	--	--	--	--	--	--
Natural gas	5.5 lb/10^6ft^3[f]	--	--	0.33	1.45	--	--	--	--
LPG	0.2 lb/10^3gal	--	--	--	--	0.133	0.58	--	--
Worse-Case Combination of Fuels		--	--	--	--	--	--	0.33	1.45

Footnotes:

Particulate matter emissions rates through the common plant stack are included in Table 2-?.

[a] Based on the heat content of fuel oil of 135,000 Btu/gallon.

[b] Based on the heat content of natural gas of 1,000 Btu/scf.

[c] Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998

[d] S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.05%.

[e] Sulfuric acid mist emission factor based on emission factor for SO_3 (AP-42, Section 1.3) converted to H_2SO_4 using molecular weight.

[f] Based on methane comprised 52% of total VOC.

[g] Based on the heat content of propane of 90,500 Btu/gallon.

[h] S denotes the amount of sulfur in propane; maximum sulfur content = 15 grains/100 ft^3.

Table 2-7. Summary of Allowable Emission Rates for the North AP Plant, Cargill Green Bay

Source	EU ID	Operating Hours	Maximum Process Rate (TPH P_2O_5)	Fluoride Emission Rate lb/ton P_2O_5	Fluoride Emission Rate lb/hr	Fluoride Emission Rate TPY	PM/PM_{10} Emission Rate Equivalent lb/ton P_2O_5	PM/PM_{10} Emission Rate lb/hr	PM/PM_{10} Emission Rate TPY
Existing North MAP/DAP Fertilizer Plant									
Total--MAP Production Mode--Dryer, Screens & Mills, Cooler-Main Stack and Reactor/Granulator-R/G Stack	029	8,760	106.1 (2,546 TPD)	0.06	6.4	27.9	0.30	31.8	139.3
Total--DAP Production Mode--Dryer, Screens & Mills, Cooler-Main Stack and Reactor/Granulator-R/G Stack	029	8,760	70.4 (1,690 TPD)	0.0417	2.9	12.7	0.30	21.1	92.5
Modified North AP Plant									
Total--Dryer, Screens & Mills, Cooler-Main Stack and Reactor/Granulator-R/G Stack Ammoniated Phosphate	029	8,760	80 (1,920 TPD)	0.04	3.20	14.02	0.17	13.60	59.57 Ok

Notes: DAP = Diammonium Phosphate; MAP = Monoammonium Phosphate
PM/PM_{10} = Particulate Matter/Particulate Matter with aerodynamic diameter less than or equal to 10 micrometers

Reduce 0.06 to 0.04 lb/ton P_2O_5 F

Table 2-8. Summary of Pollution Control Equipment for the North AP Plant, Cargill Green Bay

		Primary Control Equipment			Secondary Control Equipment			Tertiary Control Equipment	
Source	EU ID	Type	Design Capacity	Design Pressure Drop	Type	Design Capacity	Design Pressure Drop	Type	Design Capacity
Existing North MAP/DAP Fertilizer Plant									
Reactor and Granulator (R/G Stack)	029	Venturi/Cyclonic Scrubber	59,400 acfm	2.1 inches	Venturi/Cyclonic Scrubber	59,400 acfm	8.4 inches	Ammonia Vaporizer	52,900 acfm
Dryer (Main Stack)	029	Venturi Scrubber	45,600 acfm	15.5 inches	--	--		--	--
Screens and Mills (Main Stack)	029	Venturi Scrubber	34,700 acfm	3.5 inches	--	--		--	--
Cooler (Main Stack)	029	Venturi Scrubber	74,800 acfm	14.2 inches	--	--		--	--
Combined Main Stack	029	--	--		Cross-Flow Scrubber	73,200 acfm	1.8 inches	--	--
Modified North AP Plant									
Reactor and Granulator (R/G Stack)	029	Venturi/Cyclonic Scrubber	76,700 acfm		Venturi/Cyclonic Scrubber	82,000 acfm		Ammonia Vaporizer	77,500 acfm
Dryer (Main Stack)	029	Venturi Scrubber (New)	54,000 acfm	16 inches	--	--		--	--
Screens and Mills (Main Stack)	029	Venturi Scrubber (New)	41,000 acfm	16 inches	--	--		--	--
Cooler (Main Stack)	029	Venturi Scrubber (New)	102,000 acfm	16 inches	--	--		--	--
Combined Main Stack	029	--	--					--	--

Table 2-9. Maximum Emission Rates Due to Fuel Combustion for the Dryer at the North AP Plant, Cargill Green Bay

Parameter	Units	No. 2 Fuel Oil	Natural Gas
Operating Data			
Annual Operating Hours	hr/yr	8,760	8,760
Maximum Heat Input Rate	10^6Btu/hr	50	50
Hourly Fuel Oil Usage [a]	10^3gal/hr	0.370	N/A
Annual Fuel Oil Usage	10^3gal/yr	3,244	N/A
Maximum Sulfur Content	Weight %	0.05	N/A
Hourly Natural Gas Usage [b]	10^6scf/hr	N/A	0.050
Annual Natural Gas Usage	10^6scf/yr	N/A	438
Hourly LPG Usage	10^3gal/hr	N/A	N/A
Annual LPG Usage	10^3gal/yr	N/A	N/A

Pollutant	AP-42 Emissions Factor[c]	No. 2 Fuel Oil Hourly Emisson Rate (lb/hr)	No. 2 Fuel Oil Annual Emission Rate (TPY)	Natural gas Hourly Emisson Rate (lb/hr)	Natural gas Annual Emission Rate (TPY)	Maximum Emission Rate Hourly Emisson Rate (lb/hr)	Maximum Emission Rate Annual Emission Rate (TPY)
Sulfur Dioxide							
Fuel oil	142 *(S) lb/10^3gal[d]	2.630	11.518	--	--	--	--
Natural gas	0.6 lb/10^6ft^3	--	--	0.030	0.131	--	--
Worse-Case Combination of Fuels		--	--	--	--	2.63	11.52
Sulfuric Acid Mist							
Fuel oil	2.4 *(S) lb/10^3gal[d,e]	0.044	0.195	--	--	0.044	0.195
Nitrogen Oxides							
Fuel oil	20 lb/10^3gal	7.407	32.444	--	--	--	--
Natural gas	100 lb/10^6ft^3	--	--	5.000	21.900	--	--
Worse-Case Combination of Fuels		--	--	--	--	7.41	32.44
Carbon Monoxide							
Fuel oil	5 lb/10^3gal	1.852	8.111	--	--	--	--
Natural gas	84 lb/10^6ft^3	--	--	4.200	18.396	--	--
Worse-Case Combination of Fuels		--	--	--	--	4.20	18.40
Volatile Organic Compounds							
Fuel oil	0.2 lb/10^3gal	0.074	0.324	--	--	--	--
Natural gas	5.5 lb/10^6ft^3 [f]	--	--	0.275	1.205	--	--
Worse-Case Combination of Fuels		--	--	--	--	0.28	1.20

Footnotes:

Particulate matter emissions rates through the common plant stack are included in Table 2-?.

[a] Based on the heat content of fuel oil of 135,000 Btu/gallon.

[b] Based on the heat content of natural gas of 1,000 Btu/scf.

[c] Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998.

[d] S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.5%.

[e] Sulfuric acid mist emission factor based on emission factor for SO_3 (AP-42, Section 1.3) converted to H_2SO_4 using molecular weight.

[f] Based on methane comprised of 52% total VOC.

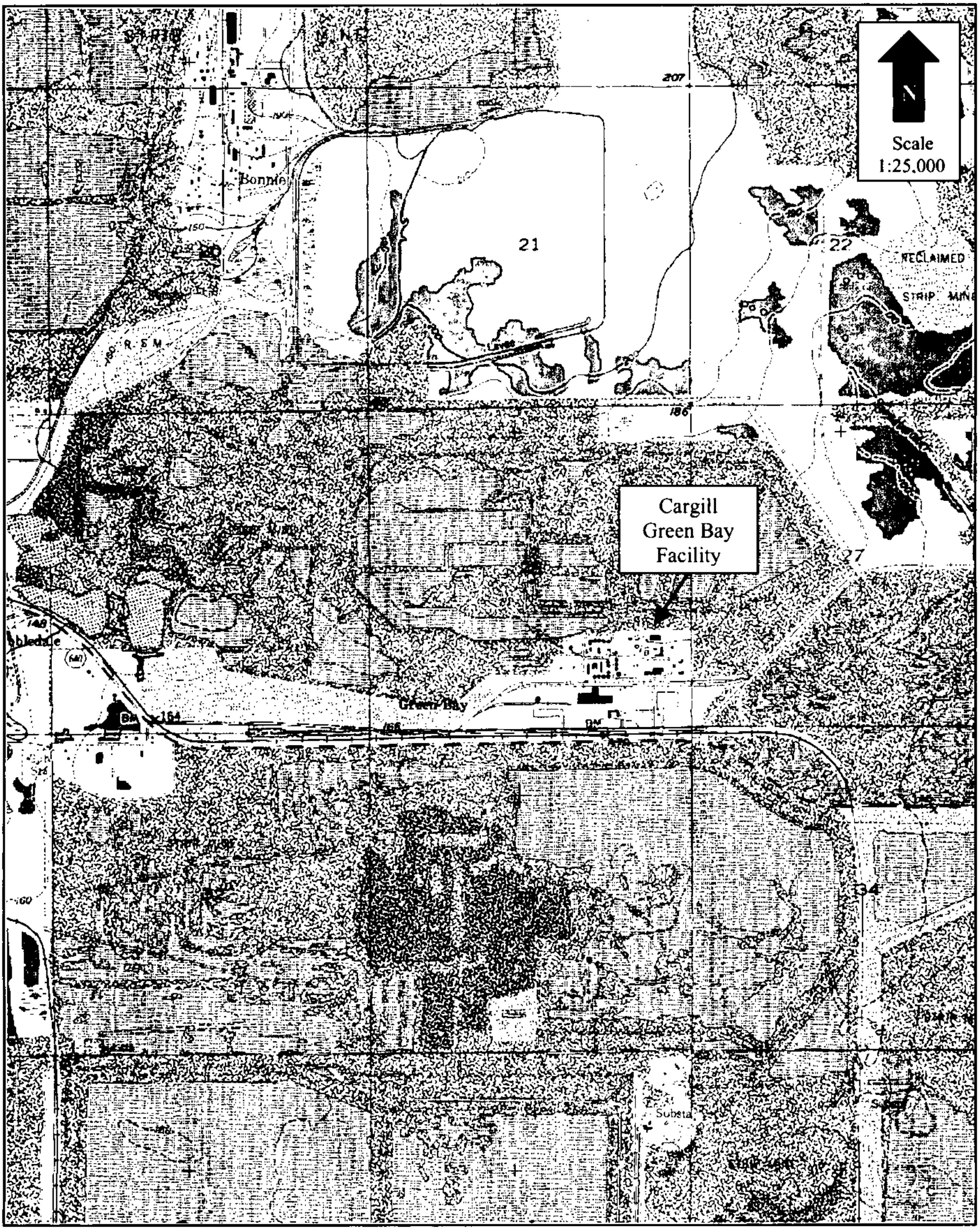

Figure 2-1
Area Map

Source: DeLorme, 1999.

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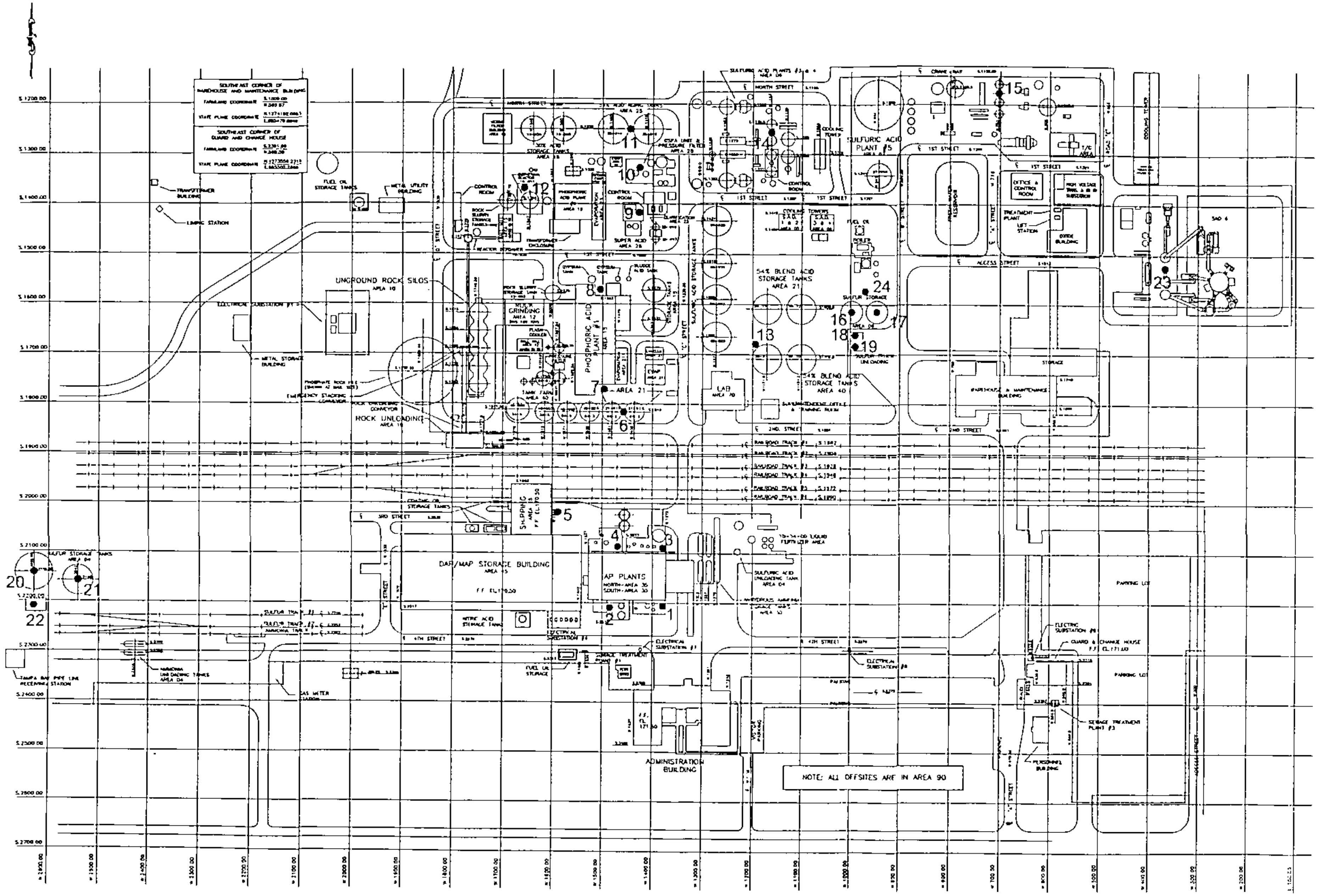
910-G-06



1. SOUTH DRY PRODUCTS-DRYER SCRUBBER STACK (STACK B)
2. SOUTH DRY PRODUCTS-REACTOR/GRANULATOR SCRUBBER STACK (STACK A)
3. NORTH DRY PRODUCTS-DRYER SCRUBBER STACK
4. NORTH DRY PRODUCTS-REACTOR/GRANULATOR SCRUBBER STACK
5. STORAGE AND SHIPPING SCRUBBER STACK
6. PHOSPHORIC ACID STORAGE TANK VENT
7. NO.1 PHOSPHORIC ACID PLANT-SOUTH SCRUBBER STACK
8. NO.1 PHOSPHORIC ACID PLANT-NORTH SCRUBBER STACK
9. SUPER PHOSPHORIC ACID PLANT-THERMINOL HEATER STACK
10. GREEN SUPER ACID PLANT-SCRUBBER STACK (NOT IN USE)
11. PHOSPHORIC ACID TANK VENT
12. NO 2 PHOSPHORIC ACID PLANT-SCRUBBER STACK
13. BLEND ACID TANK SCRUBBER
14. SULFURIC ACID PLANT NO.4 STACK
15. SULFURIC ACID PLANT NO.5 STACK
16. WEST SULFUR STORAGE TANK VENT
17. EAST SULFUR STORAGE TANK VENT
18. SULFUR UNLOADING PIT VENT
19. SULFUR UNLOADING PIT VENT
20. WEST SULFUR TANK VENT
21. EAST SULFUR TANK VENT
22. SULFUR PIT VENT
23. SULFURIC ACID PLANT NO 6 STACK
24. SULFUR PIT VENT

PRESENT CONFIGURATION

FIGURE 2-2. FACILITY PLOT PLAN

CARGILL FERTILIZER, Inc.

GREEN BAY
FACILITY PLOT PLAN

REFERENCE DRAWINGS | NO. | DATE | REVISION | BY | CK | APP

90 G-016 0

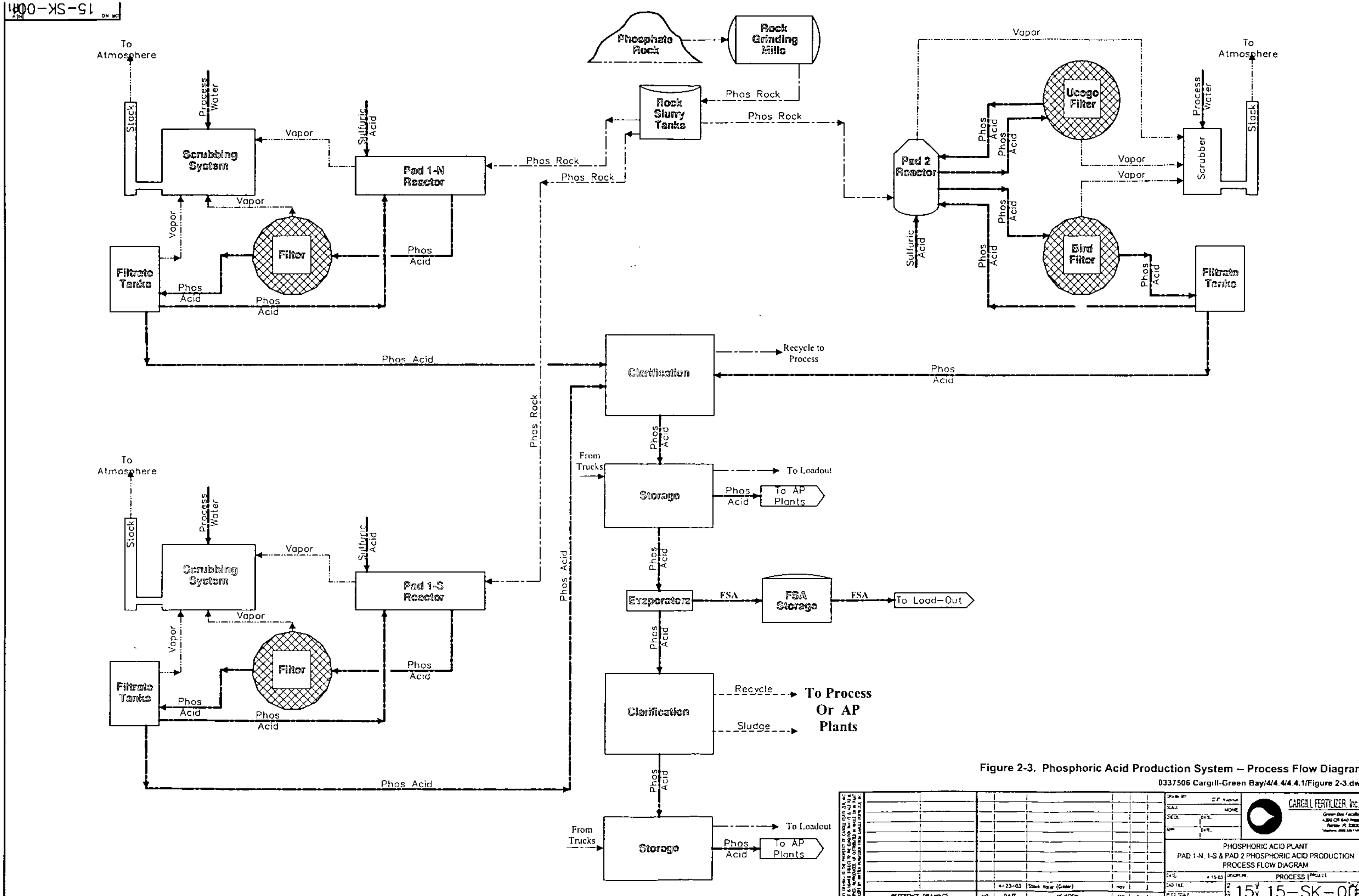


Figure 2-3. Phosphoric Acid Production System – Process Flow Diagram

0337506 Cargill-Green Bay/4/4.4/4.4.1/Figure 2-3.dwg

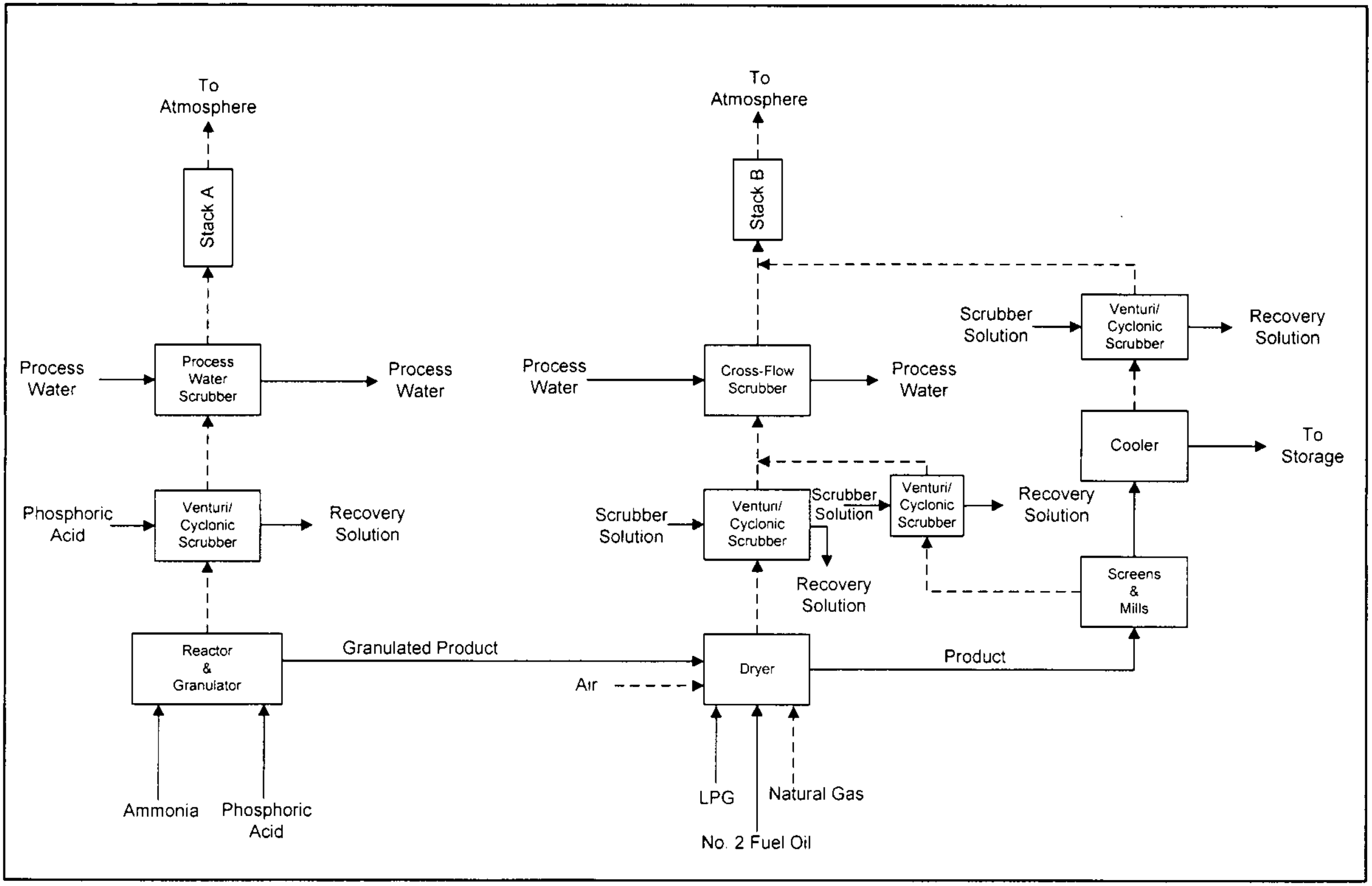


Figure 2-4
South DAP Fertilizer Plant
Current Process Flow Diagram
Cargill - Green Bay

Process Flow Legend

Material Flow →
Gas Flow - - →

Filename: 0337506/4/4.4/4.4.2/FIGURE 2-4.VSD
Date: 04/24/03

Golder Associates

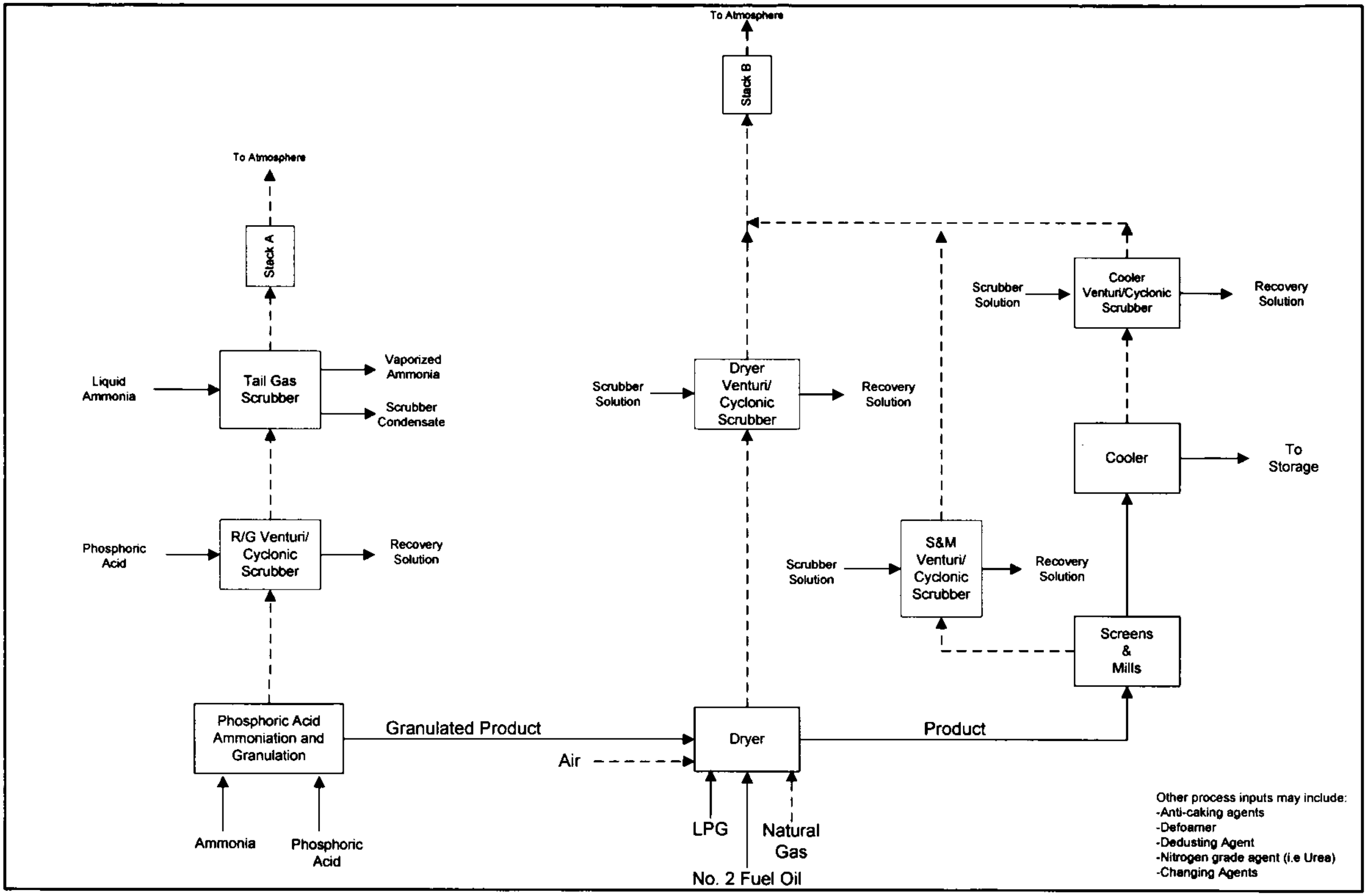


Figure 2-5
Future South AP Fertilizer Plant
Process Flow Diagram
Cargill - Green Bay

Process Flow Legend

Material Flow ————▶
Gas Flow - - - - -▶
New or Modified Equipment

Filename: 0337506/4/4.4/4.4.1/FIGURE 2-5.VSD

Date: 04/29/03

Golder Associates

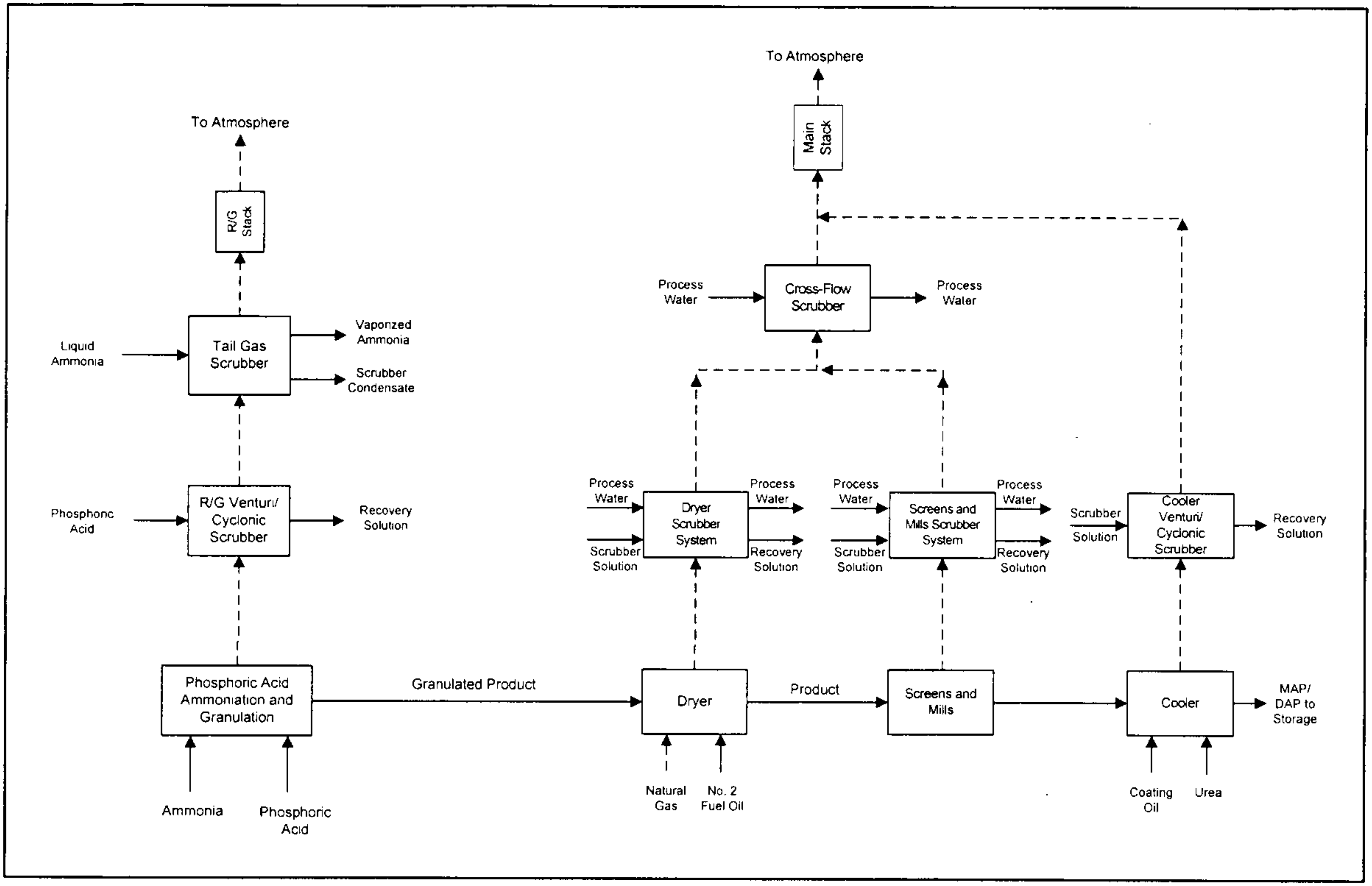


Figure 2-6
Current North MAP/DAP Plant
Process Flow Diagram
Cargill Fertilizer, Inc. - Green Bay Facility

Process Flow Legend

Material Flow ⟶

Gas Flow - - - ->

Filename: 0337506\4\4.2\4.2.2\Figure 2-6.vsd

Date: 04/24/03

Golder Associates

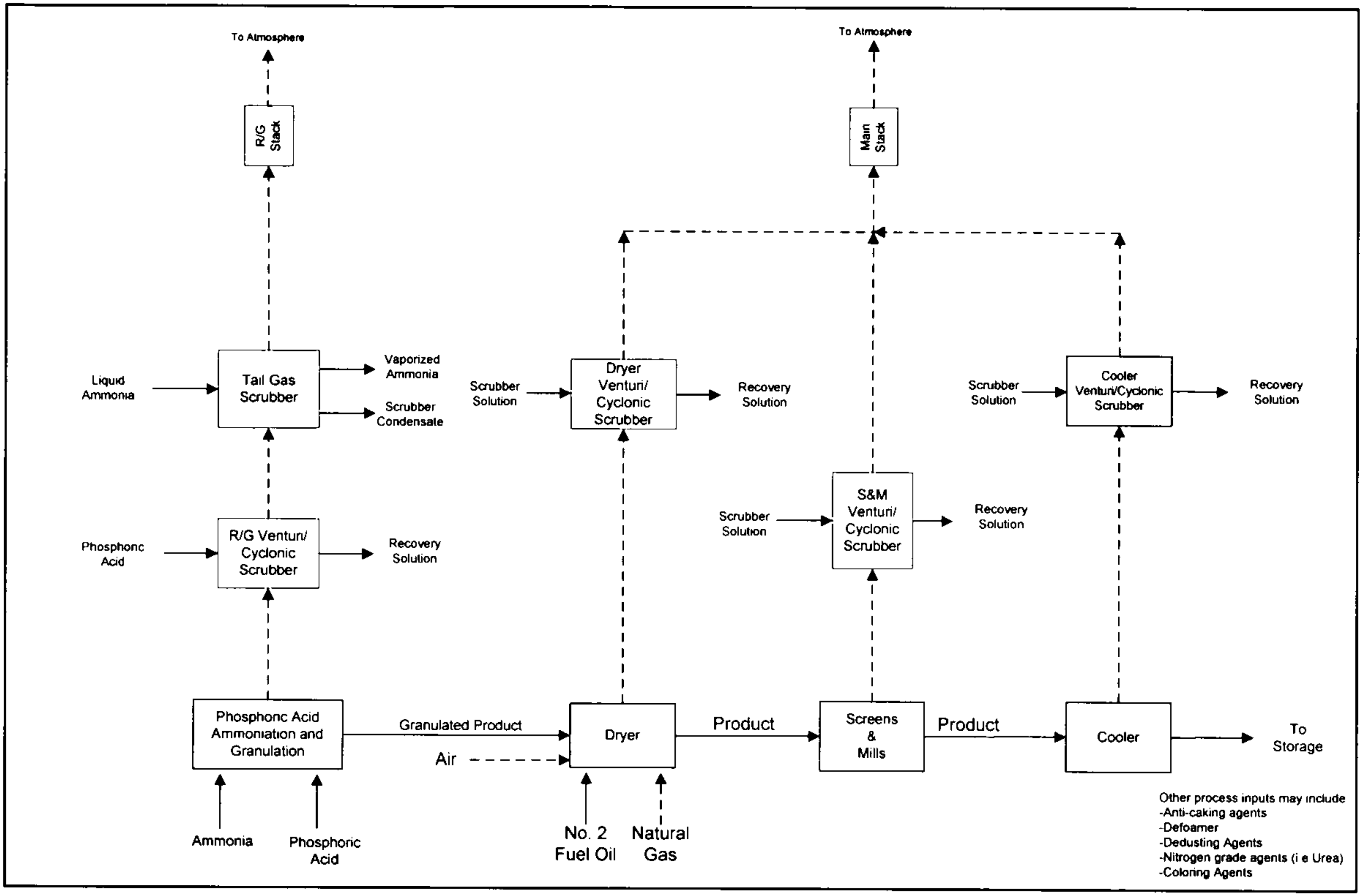


Figure 2-7
Future North AP Fertilizer Plant
Process Flow Diagram
Cargill - Green Bay

Process Flow Legend

Material Flow →
Gas Flow - - →
New or Modified Equipment

Filename: 0337506/4/4.4/4.4.1/FIGURE 2-7.VSD

Date: 04/29/03

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3.0 AIR QUALITY REVIEW REQUIREMENTS

Federal and state air regulatory requirements for a major new or modified source of air pollution are discussed in Sections 3.1 through 3.4. The applicability of these regulations to the proposed Cargill modification is presented in Section 3.5. These regulations must be satisfied before the proposed project can be approved.

3.1 NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS (AAQS)

The existing applicable national and Florida Ambient Air Quality Standards (AAQS) are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health, and secondary national 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 nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

Florida has adopted state AAQS in Rule 62-204.240, Florida Administrative Code (F.A.C.). These standards are the same as the national AAQS, except in the case of SO_2. For SO_2, Florida has adopted the former 24-hour secondary standard of 260 micrograms per cubic meter ($\mu g/m^3$) and former annual average secondary standard of 60 $\mu g/m^3$.

3.2 PSD REQUIREMENTS

3.2.1 GENERAL REQUIREMENTS

Under Federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by the U.S. Environmental Protection Agency (EPA); therefore, PSD approval authority has been granted to the Florida Department of Environmental Protection (FDEP).

A "major facility" is defined as any one of 28 named source categories that have the potential to emit 100 TPY or more or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment. Once a new source is determined to be a "major facility" for a particular pollutant, any pollutant emitted in amounts greater than the PSD significant emission rates is subject to PSD review. For an existing source for which a modification is proposed, the modification is subject to PSD review if the net increase in emissions due to the modification is greater than the PSD significant emission rates. The PSD significant emission rates are shown in Table 3-2.

The EPA class designation and allowable PSD increments are presented in Table 3-1. The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications are designated based on criteria established in the 1990 CAA Amendments. Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. The State of Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2 increments.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 Code of Federal Regulations (CFR) 52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations that are equivalent to the federal PSD regulations (Rule 62-212.400, F.A.C.). Major facilities and major modifications are required to undergo the following analyses related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility must also be reviewed with respect to Good Engineering Practice (GEP) stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 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 Best Available Control Technology (BACT) be applied to control emissions from the source. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility exceeds the significant emission rate (see Table 3-2).

BACT is defined in 40 CFR 52.21(b)(12), as:

> *An emissions limitation (including a visible emission standard) based on the maximum degree of reduction of each pollutant subject to regulation under the Act which would be emitted by any proposed major stationary source of major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determination 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. In no event shall application of best available control technology result in emissions of any pollutant, which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator 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 and shall provide for compliance by means, which achieve equivalent results.*

BACT was promulgated within the framework of the PSD requirements 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 judgement, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

3.2.3 SOURCE IMPACT ANALYSIS

A source impact analysis must be performed for a proposed major source or major modification subject to PSD review and for each pollutant for which the increase in emissions exceeds the PSD significant emission rate (Table 3-2). 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, 1980).

To address compliance with AAQS and PSD Class II increments, a source impact analysis must be performed for the criteria pollutants. However, this analysis is not required for a specific pollutant if the net increase in impacts as a result of the new source or modification is below significant impact levels, as presented in Table 3-1. The significant impact levels are threshold levels that are used to determine the level of air impact analyses needed for the project. If the new or modified source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse affect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with AAQS and PSD increments.

EPA has proposed significant impact levels for Class I areas as follows:

SO_2	3-hour	1 µg/m^3
	24-hour	0.2 µg/m^3
	Annual	0.1 µg/m^3
PM_{10}	24-hour	0.3 µg/m^3
	Annual	0.2 µg/m^3
NO_2	Annual	0.1 µg/m^3

Although these levels have not been officially promulgated as part of the PSD review process and may not be binding for states in performing PSD review, the proposed levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing the NSR provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the proposed rules concerning the significant impact levels is appropriate to assist states in implementing the PSD permit process.

Various lengths of record for meteorological data can be used for impact analysis. A 5-year period is normally used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The meteorological data are selected based on an evaluation of measured weather data from a nearby weather station that represents weather conditions at the project site. The criteria used in this evaluation include determining the distance of the project site to the weather station; comparing topographical and land use features between the locations; and determining availability of necessary weather parameters.

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 important because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, 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 baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM_{10} concentrations, or February 8, 1988, for NO_2 concentrations, but that 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 from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM_{10} concentrations, and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM_{10}, and February 8, 1988, in the case of NO_2;
2. The minor facility 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_2 and PM_{10}, and February 8, 1988, for NO_2.

3.2.4 AIR QUALITY MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m), 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 generally is 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).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that 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.

3.2.5 SOURCE INFORMATION/GEP STACK HEIGHT

Source information must be provided to adequately describe the proposed project. The general type of information required for this project is presented in Section 2.0.

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 Good Engineering Practice (GEP) or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). The FDEP has adopted identical regulations (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:

$$Hg = H + 1.5L$$

where: Hg = 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 above 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.

3.2.6 ADDITIONAL IMPACT ANALYSIS

In addition to air quality impact analyses, federal and State of Florida regulations require analyses 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(o) and Rule 62-212.400, F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.3 <u>NONATTAINMENT RULES</u>

Based on the current nonattainment provisions, all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review. A new major facility is required to undergo this review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant.

3.4 <u>EMISSION STANDARDS</u>

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

Federal NSPS exist for facilities producing phosphoric acid and phosphate fertilizer products (40 CFR 60, Subparts T through X). Specifically, Subpart T applies to wet-process PAPs and Subpart V applies to DAP plants. The NSPS apply to all facilities constructed or modified after October 22, 1974. Subparts T and V regulate F emissions from the plants.

3.4.2 NESHAPS FOR SOURCE CATEGORIES

Maximum Achievable Control Technologies (MACT) standards applicable to the Cargill Green Bay facility are codified in Subparts AA and BB of 40 CFR Part 63. Subpart AA is applicable to Phosphoric Acid Manufacturing Plants, and Subpart BB is applicable to Phosphate Fertilizer Production Plants. The MACT standards require certain monitoring requirements for existing sources subject to the rule.

3.4.3 FLORIDA RULES

The PAPs and North and South AP Plants are subject to the emission limitations of Rule 62-296.403(1) F.A.C., pertaining to F emissions from phosphate processing plants. The provisions of Rule 62-296.403(1)(a) apply to the PAP, and the provisions of Rule 62-296.403(1)(f) apply to the AP plant for DAP production.

3.5 SOURCE APPLICABILITY

3.5.1 AREA CLASSIFICATION

The project site is located in Polk County, which has been designated by EPA and FDEP as an attainment area for all criteria pollutants. Polk County and surrounding counties are designated as PSD Class II areas for all criteria pollutants. The site is located about 110 km from a PSD Class I area (Chassahowitzka National Wilderness Area).

3.5.2 PSD REVIEW

3.5.2.1 Pollutant Applicability

The Cargill Green Bay facility is considered to be an existing major stationary facility because potential emissions of certain regulated pollutants exceed 100 TPY (for example, potential SO_2 emissions currently exceeds 100 TPY). Therefore, PSD review is required for any pollutant for which the increase in emissions due to the modification is greater than the PSD significant emission rates (see Table 3-2).

The net increase in emissions due to the proposed modification at the facility is shown in Table 3-3. The future potential emissions are based on information from Section 2.0. The current actual emissions for all affected sources are presented in Table 2-2. Also included in Table 3-3 are contemporaneous emission increases and decreases that have occurred at Green Bay in the last 5 years. As shown, the net increase in emissions exceeds the PSD significant emission rates for PM, PM_{10}, NO_x, and F. As a result, PSD review applies for these pollutants.

3.5.2.2 Source Impact Analysis

A source impact analysis was performed for PM_{10}, NO_x, and F emissions resulting from the proposed modification. This analysis is presented in Section 6.0.

3.5.2.3 Ambient Monitoring

Based on the increase in emissions from the proposed modification (see Table 3-3), a pre-construction ambient monitoring analysis is required for PM_{10}, NO_x, and F and monitoring data is required to be submitted as part of the application. However, if the net increase in impacts of a pollutant is less than the applicable *de minimis* monitoring concentration, then an exemption from submittal of pre-construction ambient monitoring data may be obtained [40 CFR 52.21(i)(8)]. In addition, if EPA has not established an acceptable ambient monitoring method for the pollutant, monitoring is not required.

Pre-construction monitoring data for NO_x may be exempted for this project because, as shown in Table 3-4 and Section 6.0, the proposed modification's impacts are predicted to be below the applicable *de minimis* monitoring concentration for NO_x. In addition, no air monitoring data is presented for F since AAQS have not been established for these pollutants. A pre-construction ambient monitoring analysis is required for PM_{10}. This analysis is presented in Section 4.0.

3.5.2.4 GEP Stack Height Impact Analysis

No existing stacks at the Cargill facility currently exceed the *de minimis* GEP stack height of 213 feet. In addition, none of the proposed new stacks will exceed this height. Therefore, the proposed modification will comply with the GEP stack height regulations.

3.5.3 EMISSION STANDARDS

3.5.3.1 New Source Performance Standards

The PAPs and the North and South MAP/DAP Plants are not currently subject to NSPS requirements. Subpart T of 40 CFR 60 applies to all PAPs, and Subpart V applies to all DAP plants, constructed or modified after October 22, 1974. These plants are not being modified as defined in 40 CFR 60.14, since Cargill will not be increasing emissions on a kilogram-per-hour basis (refer to Section 3.4.2). The National Emission Standards for Hazardous Air Pollutants (NESHAP) exempts sources from complying with the NSPS.

3.5.3.2 NESHAPs for Source Categories

MACT standards applicable to the Cargill Green Bay facility are codified in Subparts AA and BB of 40 CFR Part 63. Subpart AA is applicable to Phosphoric Acid Manufacturing Plants, and Subpart BB is applicable to Phosphate Fertilizer Production Plants. The specific emissions units at Green Bay covered under the MACT regulations are identified below:

1. Subpart AA
   a. Phosphoric Acid Plant No. 1 (EU 016 and 017)
   b. Phosphoric Acid Plant No. 2 (EU 013)
2. Subpart BB
   a. South DAP Fertilizer Plant (EU 007)
   b. North MAP/DAP Granulation Plant (EU 029)

Cargill is currently discussing Green Bay facility's status as a major source of HAPs with the State of Florida. If the Green Bay facility is deemed to be a minor source of HAPs, the MACT standards will not apply to the above emission units. Given that these discussions are presently ongoing, Cargill is nevertheless meeting provisions of the MACT standards. These provisions are briefly summarized below.

The MACT standards limit emissions of total F from the specified plant types. The emission standards for existing sources are as follows:

- Subpart AA
  - Phosphoric Acid Plant No. 1 (EU 016 and 017): 0.020 lb/ton P_2O_5 input
  - Phosphoric Acid Plant No. 2 (EU 013): 0.020 lb/ton P_2O_5 input

- Subpart BB
  - South DAP Fertilizer Plant (EU 007): 0.060 lb/ton P_2O_5 input
  - North MAP/DAP Granulation Plant (EU 029): 0.060 lb/ton P_2O_5 input

The MACT standards require monitoring for wet scrubber emission control systems for existing sources subject to the rule. The scrubber monitoring requirements under Subparts AA and BB are identical. Provided below is a summary of these requirements.

Plants using a wet scrubbing emission control system shall install, calibrate, maintain, and operate the following monitoring systems:

1. A monitoring system that continuously measures and permanently records the **pressure drop across each scrubber** in the process scrubbing system in 15-minute block averages. The monitoring system shall be certified by the manufacturer to have an accuracy of ±5 percent over its operating range.
2. A monitoring system that continuously measures and permanently records the **flow rate of the scrubbing liquid to each scrubber** in the process scrubbing system in 15-minute block averages. The monitoring system shall be certified by the manufacturer to have an accuracy of ±5 percent over its operating range.

For each source using a wet scrubbing emission control system and subject to emissions limitations for total F or PM contained in this subpart, the source must establish allowable ranges for operating parameters for each scrubber in the process scrubbing system, using either of the following methodologies:

1. The allowable range for the daily averages is ±20 percent of the baseline average value determined from performance testing. The allowable range could be adjusted downward to ±10 percent based on test results. The baseline average value can be readjusted based on subsequent performance testing.
2. The source can establish, and provide to the Administrator for approval, allowable ranges for the daily averages based on performance testing. The source shall certify that the control devices and processes have not been modified subsequent to the testing upon which the data used to establish the allowable ranges were obtained. The owner or operator must request and obtain approval of the Administrator for changes to the allowable ranges. When a source using the methodology of this paragraph is retested, the owner or operator shall

determine new allowable ranges of baseline average values unless the retest indicates no change in the operating parameters outside the previously established ranges.

However, the General Provisions of the MACT standards (40 CFR 63, Subpart A) provide for approval of an alternative monitoring method. Section 63.8(f) sets forth the requirements. Section 63.8(f)(2) states, "After receipt and consideration of written application, the Administrator may approve alternatives to any monitoring methods or procedures of this part...". The application may be submitted at any time provided the monitoring procedure is not the performance test method used to demonstrate compliance.

Cargill has previously submitted a request for alternative MACT monitoring plan for the Green Bay facility. This request is currently being processed by FDEP.

Additional requirements of the MACT standards include performance test and compliance provisions (40 CFR 63.606 and 63.626) and notification, recordkeeping, and reporting requirements (40 CFR 63.607 and 63. 627). Cargill will comply with these requirements for the subject plants.

3.5.3.3 State of Florida Standards

The applicable State of Florida F emissions limits for new phosphate processing plants or plant sections [Rule 62-296.403(1)] are 0.02 lb/ton P_2O_5 for wet process phosphoric acid production and 0.06 lb/ton P_2O_5 for DAP production. The applicable State of Florida F emissions limit for existing phosphate processing plants or plant sections [Rule 62-296.403(2)] is 0.4 lb/ton P_2O_5. According to Permit No. 1050053-012-AV, the PAP No. 1-North, PAP No. 1-South, and South AP Plant are considered "existing" sources and are subject to Rule 62-296.403(2), while the PAP No. 2 is considered a "new" source and is subject to Rule 62-296.403(1). The subject sources at Cargill Green Bay will comply with the Florida standards contained in Rules 62-296.403(1) and 62-296.403(2).

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significant Impact Levels ($\mu g/m^3$)

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

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

PM_{10} = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

[a] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, $PM_{2.5}$ standards were introduced with a 24-hour standard of 65 $\mu g/m^3$ (3-year average of 98th percentile) and an annual standard of 15 $\mu g/m^3$ (3-year average at community monitors). Implementation of these standards are many years away. The ozone standard was modified to be 0.08 ppm for 8-hour average; achieved when 3-year average of 99th percentile is 0.08 ppm or less. FDEP has not yet adopted these standards.

[b] Short-term maximum concentrations are not to be exceeded more than once per year except for the PM_{10} AAQS (these do not apply to significant impact levels). The PM_{10} 24-hour AAQS is attained when the expected number of days per year with a 24-hour concentration above 150 $\mu g/m^3$ is equal to or less than 1. For modeling purposes, compliance is based on the sixth highest 24-hour average value over a 5-year period.

[c] Achieved when the expected number of days per year with concentrations above the standard is fewer than 1.

[d] Maximum concentrations.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978. 40 CFR 50. 40 CFR 52.21. Rule 62-204, F.A.C.

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

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Monitoring Concentration[a] ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	NA
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Asbestos	NESHAP	0.007	NM
Vinyl Chloride	NESHAP	1	15, 24-hour
MWC Organics	NSPS	$3.5x10^{-6}$	NM
MWC Metals	NSPS	15	NM
MWC Acid Gases	NSPS	40	NM
MSW Landfill Gases	NSPS	50	NM

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

NA = Not applicable.
NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
$\mu g/m^3$ = micrograms per cubic meter.
MWC = Municipal waste combustor
MSW = Municipal solid waste

[a] Short-term concentrations are not to be exceeded.

[b] No de minimis concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.

Sources: 40 CFR 52.21.
Rule 62-212.400

Table 3-3. Contemporaneous and Debottlenecking Emissions Analysis and PSD Applicability

Source Description	Pollutant Emission Rate (TPY)								
	SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
Potential Emissions From Modified/New/Affected Sources[a]									
South AP Fertilizer Plant	13.82	55.17	22.08	48.40	48.40	1.45	--	0.23	11.39
North AP Fertilizer Plant	11.52	32.44	18.40	59.57	59.57	1.20	--	0.20	14.02
MAP/DAP Storage and Shipping Building [b]	--	--	--	18.00	18.00	--	--	--	12.05
Phosphoric Acid Plant No. 1-North Train	--	--	--	--	--	--	--	--	1.45
Phosphoric Acid Plant No. 1-South Train	--	--	--	--	--	--	--	--	2.37
Phosphoric Acid Plant No. 2	--	--	--	--	--	--	--	--	2.89
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	--	--	--	--	--	--	--	--	0.09
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	--	--	--	--	--	--	--	--	0.09
Phosphoric Acid Blend Tanks-4	--	--	--	--	--	--	--	--	0.44
Total Potential Emission Rates	**25.34**	**87.61**	**40.48**	**125.97**	**125.97**	**2.65**	**0.00**	**0.43**	**44.17**
Actual Emissions from Current Operations[c]									
South DAP Fertilizer Plant	0.03	7.37	2.94	24.15	22.41	0.25	--	--	6.25
North MAP/DAP Fertilizer Plant	0.03	4.71	2.65	32.49	30.90	3.18	--	--	3.28
MAP/DAP Storage and Shipping Building	--	--	--	6.05	5.82	--	--	--	0.17
Phosphoric Acid Plant No. 1-North Train	--	--	--	--	--	--	--	--	0.23
Phosphoric Acid Plant No. 1-South Train	--	--	--	--	--	--	--	--	0.55
Phosphoric Acid Plant No. 2	--	--	--	--	--	--	--	--	0.30
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks-4	--	--	--	--	--	--	--	--	0.0004
Total Actual Emission Rates	**0.06**	**12.08**	**5.58**	**62.68**	**59.13**	**3.43**	**0.00**	**0.00**	**10.77**
TOTAL CHANGE DUE TO PROPOSED PROJECT	**25.28**	**75.53**	**34.90**	**63.29**	**66.85**	**-0.78**	**0.00**	**0.43**	**33.41**
Contemporaneous Emission Changes									
No. 6 Sulfuric Acid Plant Construction (July 1998) [e]	[d]	[d]	--	--	--	5.50	3.60	[d]	--
North MAP/DAP Plant Modification (September 1998) [e]	11.10	21.70	5.40	[d]	[d]	--	--	--	[d]
Shutdown of Green Phosphoric Acid Plant (November 2002) [f]	--	-4.10	--	-0.14	-0.12	--	--	--	-0.01
Shutdown of Therminol Heater (November 2002) [f]	-0.003	-0.77	-0.19	-0.08	-0.08	-0.02	--	--	--
Total Contemporaneous Emission Changes	**11.10**	**17.60**	**5.40**	**-0.14**	**-0.12**	**5.50**	**3.60**	**0.00**	**-0.01**
TOTAL NET CHANGE	**36.38**	**93.13**	**40.30**	**63.16**	**66.73**	**4.72**	**3.60**	**0.43**	**33.40**
PSD SIGNIFICANT EMISSION RATE	40	40	100	25	15	40	10	7	3
PSD REVIEW TRIGGERED?	No	Yes	No	Yes	Yes	No	No	No	Yes

Footnotes:

[a] Total future potential emissions from Tables 2-1, 2-4, 2-6, 2-7, and 2-9.

[b] Debottlenecking analysis revealed that emissions from these sources could potentially increase as part of this project.

[c] Based on actual emissions for 2002 and 2001 from Table 2-2 (see also Appendix A).

[d] Denotes that PSD review was triggered for this pollutant; therefore any previous contemporaneous increases/decreases are wiped clean.

[e] Emissions from the PSD permit application.

[f] Emissions are based on the average of 2001 and 2002 actual emissions as reported in the AORs.

Table 3-4. Predicted Impacts Due to the Proposed Project Compared to Class II Significant Impact Levels and Ambient Monitoring *De Minimis* Levels

Pollutant	Averaging Time	Maximum Concentration[a] (µg/m^3)	EPA Class II Significant Impact Levels (µg/m^3)	*De Minimis* Monitoring Concentration (µg/m^3)	Ambient Monitoring Review Applies?
Particulate (PM_{10})	Annual	2.7	1	NA	NA
	24-hour	20.4	5	10	Yes
Nitrogen Oxides (NO_x)	Annual	2.4	1	14	No
Fluorides	24-hour	5.9	NA	0.25	Yes

[a] Highest concentration from significant impact analysis (see Section 6.0).

Note: NA = Not Applicable

4.0 AMBIENT MONITORING ANALYSIS

4.1 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 3-1). As discussed in Section 3.1, PM/PM_{10}, NO_x, and F require an air quality analysis to meet PSD pre-construction monitoring requirements for the proposed Cargill expansion.

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* (1987).

An exemption from the pre-construction ambient monitoring requirements is also available if certain criteria are met. If the predicted increase in ambient concentrations, due to the proposed modification, is less than specified *de minimis* concentrations, then the modification can be exempted from the pre-construction air monitoring requirements for that pollutant.

The PSD *de minimis* monitoring concentration for PM_{10} is 10 $\mu g/m^3$, 24-hour average; for NO_x is 14 $\mu g/m^3$, annual average; and for F is 0.25 $\mu g/m^3$, 24-hour average. The predicted increase in PM_{10}, NO_x, and F concentrations due to the proposed modification only are presented in Section 6.0 and in Table 3-4. Since the predicted increases of PM_{10} and F impacts due to the proposed modification are greater than the *de minimis* monitoring concentration levels, a pre-construction air monitoring analysis must be conducted for these pollutants. A pre-construction air monitoring analysis is not required for NO_x. However, background concentrations for NO_x are presented in Section 4.4 to support the air dispersion modeling analysis.

4.2 PM_{10} AMBIENT MONITORING ANALYSIS

The PSD ambient monitoring guidelines allow the use of existing data to satisfy pre-construction review requirements. Presented in Table 4-1 is a summary of existing ambient PM_{10} data for monitors located in the vicinity of Cargill's Green Bay facility. Data are presented for 2001 and 2002. As shown, two PM_{10} monitors were operational in the vicinity of Cargill's Green Bay facility during this period. Both of these stations are located in the town of Mulberry.

The monitors show that most of the ambient PM_{10} concentrations were below the AAQS of 150 $\mu g/m^3$, maximum 24-hour average, and 50 $\mu g/m^3$, annual average. For purposes of an ambient PM_{10} background concentration for use in the modeling analysis, the lowest annual average concentration and sixth-highest 24-hour average concentration occurring over the 4-year period at the NW 4th Circle site were selected. This site was selected since it appears from the data that the Anderson and Pine Crest Road site is heavily impacted by a local source and would not be representative of background. These concentrations are 21 and 50 $\mu g/m^3$, respectively, measured in Mulberry. These monitors are likely impacted by several existing point sources that are already included explicitly in the modeling dispersion analysis. As a result, these background concentrations are conservatively high.

4.3 FLUORIDE AMBIENT MONITORING ANALYSIS

There are no known existing F monitors in the vicinity of Cargill's Green Bay facility. No AAQS for F emissions have been promulgated. Typically, pre-construction monitoring has not been required for pollutants for which no AAQS exist. However, potential effects of F impacts are addressed in Section 7.0.

4.4 NO_X AMBIENT MONITORING ANALYSIS

A background NO_x concentrations must be estimated to account for NO_x sources, which are not explicitly included in the atmospheric dispersion modeling analysis. To estimate reasonable background NO_x concentrations, a review of recent, available NO_x monitoring data in the area of Cargill was performed. Presented in Table 4-2 is a summary of ambient NO_x data available for 2002 and 2001, for the two closest monitors to the Green Bay site. The two stations are located in Tampa.

The monitors show that ambient NO_x annual average concentrations were well below the AAQS of 100 $\mu g/m^3$. For purposes of an ambient NO_x background concentration modeling analysis, the highest annual average concentration occurring over the 2-year period was selected. This concentration is 21 μg/m^3, measured in Tampa (Gandy Boulevard). This background is conservatively high, since it is likely impacted by several existing point sources, such as Cargill Riverview and Tampa Electric's Big Bend power station, which are already included explicitly in the dispersion modeling analysis. These monitors are also impacted significantly by vehicular traffic in the Tampa area.

Table 4-1. Summary of PM_{10} Monitoring Data Collected Near Cargill's Green Bay Facility

County	Station ID	Monitor Location	Year	Number of Observations	Reported Concentration (ug/m^3) Highest 24-Hour	Second-Highest 24-Hour	Third-Highest 24-Hour	Annual
Polk	12-105-0010	Anderson & Pine Crest Road, Mulberry	1999	53	45	42	39	22
			2000	45	127	121	91	27
			2001	354	165	121	104	23
			2002	357	43	38	38	18
Polk	12-105-2006	NW 4th Circle, Mulberry	1999	326	50 (6)	50	47	22
			2000	277	46	45	44	23
			2001	314	74 (3)	59 (5)	50	21
			2002	362	165 (1)	78 (2)	64 (4)	21

Source: FDEP Quick Look Report, 1999 through 2002.

63?
62?
need to go farther

Table 4-2. Summary of NO_2 Monitoring Data Collected Near Cargill's Green Bay Facility

County	Station ID	Monitor Location	Year	Number of Observations	Annual Concentration (ug/m^3)
Hillsborough	12-057-0081	E.G. Simmons County Road	2001	8654	14 (0.0074 ppm)
			2002	8692	13 (0.0070 ppm)
Hillsborough	12-057-1065	5121 Gandy Blvd.	2001	8619	21 (0.0111 ppm)
			2002	8000	20 (0.0106 ppm)

Source: FDEP Quick Look Report, 2001 through 2002.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

5.1 REQUIREMENTS

The 1977 CAA Amendments established requirements for the approval of pre-construction permit applications under the PSD program. As discussed in Section 3.2.2, one of these requirements is that BACT be installed for applicable pollutants. BACT determinations must be made on a case-by-case basis considering technical, economic, energy, and environmental impacts for various BACT alternatives. To bring consistency to the BACT process, the EPA developed the "top-down" approach to BACT determinations.

The first step in a top-down BACT analysis is to determine, for each applicable pollutant, the most stringent control alternative available for a similar source or source category. If it can be shown that this level of control is not feasible on the basis of technical, economic, energy, or environmental impacts for the source in question, then the next most stringent level of control is identified and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any technical, economic, energy, or environmental consideration.

In the case of the proposed project, PM/PM_{10}, NO_x, and F emissions require a BACT analysis. The BACT analysis is presented in the following sections.

5.2 PHOSPHORIC ACID PLANT

5.2.1 PROPOSED CONTROL TECHNOLOGY

Emissions of F from the PAP will occur. The proposed BACT for F is based on the following control techniques:

- One existing Poly-Con spray scrubber with packing using process water;
- Two existing Arco Cyclonic Jet scrubbers using process water; and
- One new Packed-Bed process water scrubber.

Please refer to Section 2.0 for a complete description of the existing and proposed control equipment at the PAP.

The proposed maximum F emissions for the PAP are 0.012 lb/ton P_2O_5, 1.53 lb/hr, or 6.70 TPY. These represent the combined F emissions for the PAP No. 1—North and No. 1—South trains and the PAP No. 2 train.

5.2.2 BACT ANALYSIS

5.2.2.1 Previous BACT Determinations

As part of the BACT analysis, a review was performed of previous F BACT determinations for phosphoric acid production plants listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. A summary of BACT determinations for phosphoric acid plants from this review are presented in Table 5-1. Determinations issued during the last 10 years are shown in the table.

From review of the previous BACT determinations, it is evident that F BACT determinations for phosphoric acid plants have been based on wet scrubber technology. Previous BACT determinations have been in the range of 0.012 to 0.04 lb/ton P_2O_5. The most recent determinations are in the range of 0.012 to 0.0135 lb/ton P_2O_5.

5.2.2.2 Control Technology Feasibility

The control technology feasibility analysis for F emissions controls for the Green Bay PAP are listed in Table 5-2. As shown, there is one type of F abatement method, with four different techniques. Each available technique was listed with its associated efficiency estimate, identified as feasible or infeasible, and ranked based on control efficiency.

5.2.2.3 Potential Control Method Descriptions

Wet scrubbers that are based on absorption principles include:

- Packed towers,
- Plate or tray towers,
- Wet cyclonic,
- Spray chambers, and
- Venturi.

Absorption is a mass transfer operation in which one or more soluble components of a gas mixture are dissolved in a liquid that has low volatility under the process conditions. The pollutant diffuses from the gas into the liquid when the liquid contains less than the equilibrium concentration of the gaseous component. The difference between the actual and the equilibrium concentration provides the driving force for absorption.

Packed towers are the most commonly used gas absorbers for pollution control. Packed towers are columns filled with packing materials that provide a large surface area to facilitate contact between the liquid and gas. Packed tower absorbers can achieve higher removal efficiencies, handle higher liquid rates, and have relatively lower water consumption requirements compared to other types of gas absorbers. However, packed towers may also have high system pressure drops, high clogging and fouling potential, and extensive maintenance costs due to the presence of packing materials.

Plate or tray towers are vertical cylinders in which the liquid and gas are contacted in step-wise fashion on trays (plates). Liquid enters at the top of the column and flows across each plate and through a downspout (downcomer) to the plates below. Gas moves upwards through openings in the plates, bubbles into the liquid, and passes to the plate above. Plate towers are easier to clean and tend to handle large temperature fluctuations better than packed towers. However, at high gas flow rates, plate towers exhibit larger pressure drops and have larger liquid holdups. There is no known application of a plate or tray tower on a phosphoric acid plant, and therefore the technology is unproven for Cargill's PAP.

Wet cyclonic scrubbers are wet cyclones usually with the inlet gas flow through a tangential entry similar to the classic cyclone configuration. The scrubbing liquid can be injected at a number of locations, including through a center axial spray manifold, from sprays located on outer walls of a cylindrical spray chamber, and from sprays evenly spaced throughout the tower chamber. The circular rotating gases with the entrained droplets and the resulting centrifugal force on the droplets cause them to migrate toward the outer scrubber walls. The droplet velocities relative to the gas stream are higher compared to gravity spray towers, and this increases the inertial impaction particle collection mechanism (which increases the single drop particle collection efficiency) but may reduce the distance the droplet travels with respect to the gas (which reduces the fraction of gas swept).

Spray chambers operate by delivering liquid droplets through a spray dilution system. The droplets fall through a countercurrent gas stream under the influence of gravity and contact the pollutant(s) in the gas. Spray towers are simple to operate and maintain, and have relatively low energy requirements. However, they have the least effective mass transfer capability of the absorbers discussed and are usually restricted to particulate removal and control of highly soluble gases such as SO_2 and ammonia. They also require higher water recirculation rates and are inefficient at removing very small particles.

Venturi scrubbers are generally used for controlling particulate matter and sulfur dioxide emissions. Although venturi scrubbers are a feasible control technique for controlling F emissions, they are much more energy intensive and do not have very high control efficiencies as compared to other wet scrubbers, such as wet cyclonic or packed-bed scrubbers.

5.2.3 BACT SELECTION

Packed towers and wet cyclonic scrubbers are technically feasible for application at the PAP. The abatement methods with the highest control efficiency listed in Table 5-2 are packed towers and tray towers. Packed towers are a proven technology, as they are the most common control technique listed in previous BACT determinations for the previous ten years (refer to Table 5-1). Tray towers are not a proven technique for phosphoric acid plants. The abatement methods with the second highest control efficiencies listed in Table 5-2 are wet cyclonic and spray chamber scrubbers. Both are proven techniques, but spray chambers are more effective at controlling large particulates and highly soluble gases. Therefore, Cargill will utilize a combination of packed tower and wet cyclonic scrubbers to control F emissions at the Green Bay PAP.

Currently, the existing scrubber system of the single Poly-Con spray scrubber with packing and the two sets of spray cyclonic scrubbers in series are achieving lower F emission rates than required by the operation permit (0.05, 0.02, and 0.02 lb/ton P_2O_5 for the PAP No. 1—North, No. 1—South, and the PAP No. 2, respectively). The results of the last 3 years of compliance tests for the PAP are summarized in Table 5-3. As shown in Table 5-3, actual F emission rates for the existing PAP measured during the compliance tests ranged from 0.0046 lb/ton P_2O_5 to 0.0287 lb/P_2O_5.

In conclusion, Cargill Green Bay's proposed F control technology and emission limit (based on the Poly-Con spray scrubber with packing, one set of spray cyclonic scrubbers in series, and packed bed scrubber) is reasonable based on previous BACT determinations for similar facilities. Any additional or different F control equipment is not appropriate for the PAP. Such control equipment would result in significant capital costs and may prove unworkable. Therefore, the proposed F BACT limit of

0.012 lb/ton P_2O_5 is based on the proposed combination of the packed bed scrubber, wet cyclonic scrubbers, and the Poly-Con wet spray scrubber with packing.

5.3 SOUTH AND NORTH AP PLANTS—PARTICULATE MATTER (PM/PM_{10})

5.3.1 PROPOSED CONTROL TECHNOLOGY

Emissions of PM/PM_{10} from the South and North AP Plants will occur. The proposed BACT for PM/PM_{10} is based on the following:

South AP Plant

- One new medium-energy venturi/cyclonic scrubber using phosphoric acid operating in combination with a new tailgas scrubber using an ammonia vaporizer system, and
- Three new medium-energy venturi/cyclonic scrubbers using scrubber solution (weak phosphoric acid);

North AP Plant

- One new medium-energy venturi/cyclonic scrubber using phosphoric acid operating in combination with the existing tailgas scrubber using an ammonia vaporizer system,
- Two new medium-energy venturi/cyclonic scrubbers using scrubber solution (weak phosphoric acid), and
- One existing venturi/cyclonic scrubber using scrubber solution (weak phosphoric acid).

Refer to Section 2.0 for a full description of the existing and proposed control equipment for the North and South AP Plants. The proposed maximum PM/PM_{10} emission rate for the South and North AP Plants is 0.17 lb/ton P_2O_5, equivalent to 11.05 lb/hr and 13.60 lb/hr, respectively.

5.3.2 BACT ANALYSIS

5.3.2.1 Previous BACT Determinations

As part of the BACT analysis, a review was performed of previous PM/PM_{10} BACT determinations for GTSP, MAP, and DAP manufacturing facilities listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. A summary of BACT determinations for GTSP, MAP, and DAP manufacturing facilities from this review are presented in Table 5-4. Determinations issued during the last 10 years are shown in the table.

From the review of previous BACT determinations, it is evident that PM/PM_{10} BACT determinations for GTSP, MAP, and DAP manufacturing facilities have been based on wet scrubber technology.

BACT determinations have been in the range of 0.15 to 0.41 lb/ton P_2O_5 for PM/PM_{10} emissions. The most recent determinations are in the range of 0.15 to 0.18 lb/ton P_2O_5.

5.3.2.2 Control Technology Feasibility

The control technology feasibility analysis for PM/PM_{10} controls for the South and North AP Plants are listed in Table 5-5. As shown, there are five types of PM/PM_{10} abatement methods with various techniques within each method. Each available technique was listed with its associated efficiency estimate, identified as feasible or infeasible, and ranked based on control efficiency.

5.3.2.3 Potential Control Method Descriptions

Fuel Techniques

Fuel Substitution, or fuel switching, is a common means of reducing emissions from combustion sources, such as electric utilities and industrial boilers. It involves replacing the current fuel with a fuel, which emits less of a given pollutant when burned. Since the PM/PM_{10} emissions from the AP Plants are mainly due to the manufacturing and handling of the ammoniated phosphates fertilizer, not fuel combustion, this is not a feasible means of particulate control. Therefore, this method is not considered further.

Pretreatment Devices

The performance of particulate control devices can often be improved through pretreatment of the gas stream. For PM control, pretreatment consists of the following techniques:

- Settling Chambers;
- Elutriators;
- Momentum Separators;
- Mechanically-Aided Separators; and
- Cyclones.

Of these five techniques, cyclones offer the most control efficiency, typically in the range of 60 to 90 percent. All of the other techniques have control efficiencies less than 30 percent.

Cyclones use inertia to remove particles from a spinning gas stream. Within a cyclone, the gas stream is forced to spin within a usually conical-shaped chamber. The gas spirals down the cyclone near the inner surface of the cyclone tube. At the bottom of the cyclone, the gas turns and spirals up through the center of the tube and out the top of the cyclone.

Particles in the gas stream are forced toward the cyclone walls by centrifugal forces. For particles that are large, typically greater than 10 microns, inertial momentum overcomes the fluid drag forces so that the particles reach the cyclone walls and are collected. For smaller particles, the fluid drag forces are greater than the momentum forces and the particles follow the gas out of the cyclone. Inside the cyclone gravity forces the large particles down the sidewalls of the cyclone to a hopper where they are collected.

Pretreatment devices are technically feasible for application to the AP Fertilizer Plants. Cargill Green Bay currently utilizes cyclones at its North and South Fertilizer Plants. The cyclones are used primarily for product recovery, and achieve some particle control prior to the air streams entering the scrubbers.

Electrostatic Precipitators (ESPs)

Collection of PM by electrostatic precipitators involves the ionization of the gas stream passing through the ESP, the charging, migration, and collection of particles on oppositely charged surfaces, and the removal of particles from the collection surfaces. There are two basic types of ESPs, dry and wet. In dry ESPs, the particulate is removed by rappers, which vibrate the collection surface, dislodging the material and allowing it to fall into the collection hoppers. Wet ESPs use water to rinse the particulates off of the collection surfaces.

Electrostatic precipitators have several advantages when compared with other control devices. They are very efficient collectors, even for small particles, with greater than 97 percent control efficiency. ESPs can also treat large volumes of gas with a low-pressure drop. ESPs can operate over a wide range of temperatures and generally have low operating cost. The disadvantages of ESPs are large capital cost, large space requirements and difficulty in controlling particles with high resistivity.

While ESPs may be a feasible method of controlling PM, there are no known applications of ESPs at MAP, DAP, or GTSP plants. Since wet scrubbers are necessary to remove F and ammonia emissions, using wet scrubbers to control PM as well is logical. Furthermore, the "stickiness" of the particles after the ammonia has been scrubbed out of the air stream could potentially cause problems with the

ESP. This may be part of the reason ESPs have never been used for this type of application. Therefore, ESPs were not further considered.

Fabric Filters

Baghouses, or fabric filters, utilize porous fabric to clean an airstream. They include types such as reverse-air, shaker, and pulse-jet baghouses. The dust that accumulates on the surface of the filter aids in the filtering of fine dust particles. PM/PM_{10} control efficiencies for fabric filters are typically greater than 99 percent.

During fabric filtration, dusty gas is sent through the fabric by forced-draft fans. The fabric is responsible for some filtration, but more significantly it acts as support for the dust layer that accumulates. The layer of dust, also known as the filter cake, is a highly efficient filter, even for submicron particles. Woven fabrics rely on the filtration of the dust cake much more than felted fabrics.

Fabric filters offer high efficiencies, are flexible to treat many types of dusts and a wide range of volumetric gas flow rates. In addition, fabric filters can be operated with low pressure drop. Some potential disadvantages are:

- High moisture gas streams and sticky particles can plug the fabric and blind the filter, requiring bag replacement;
- High temperatures can damage fabric bags; and
- Fabric filters have a potential for fire or explosion.

Fabric filters are considered technically infeasible for application to the AP Fertilizer Plants. There is no known application of a baghouse to a MAP, DAP, or GTSP fertilizer plant, and therefore the technology is unproven. Serious concerns exist over the ability of a baghouse to operate with a flue gas containing significant moisture. As a result, fabric filter technology was not further considered.

Wet Scrubbers

Wet scrubbers are devices that achieve particle collection by contacting the particles to a liquid, usually water. The aerosol particles are transferred from the gaseous airstream to the surface of the liquid by several different mechanisms. Wet scrubbers create a liquid waste that must be treated prior to disposal. PM/PM_{10} control efficiencies for wet scrubbing systems range from about 50 to 95 percent, depending on the type of scrubbing system used. Typical wet scrubbers are as follows:

- Venturi;
- Spray Chamber;
- Impingement Plate;
- Mechanically-Aided;
- Orifice;
- Condensation; and
- Packed bed.

The advantages of wet scrubbers compared to other PM collection devices are that they can collect flammable and explosive dusts safely, absorb gaseous pollutants, collect "sticky particles", and collect mists. Scrubbers can also cool hot gas streams. The disadvantages are the potential for corrosion and freezing, the potential of water and solid waste pollution problems, and high energy costs.

A venturi scrubber accelerates the gas stream to atomize the scrubbing liquid and to improve gas-liquid contact. In a venturi scrubber, a "throat" section is built into the duct that forces the gas stream to accelerate as the duct narrows and then expands. As the gas enters the venturi throat, both gas velocity and turbulence increase. The scrubbing liquid is introduced at this point and is atomized into small droplets by the turbulence in the throat, and droplet-particle interaction is increased. Typically, after the throat section in a venturi scrubber, the wetted PM and excess liquid droplets are separated from the gas stream by cyclonic motion and/or a mist eliminator. Venturi scrubbers have the advantage of being simple in design, easy to install, and with low-maintenance requirements. To increase the control efficiency of a venturi scrubber, the pressure drop must be increased, which in turn increases the energy consumption. Medium-energy venturi scrubbers have pressure drops up to 15 inches, and high-energy venturi scrubbers have pressure drops from 15 to 30 inches.

Spray chambers are very simple, low-energy wet scrubbers. In these scrubbers, the particulate-laden gas stream is introduced into a chamber where it comes into contact with liquid droplets generated by spray nozzles. These scrubbers are also known as pre-formed spray scrubbers, since the liquid is formed into droplets prior to contact with the gas stream. The size of the droplets generated by the spray nozzles is controlled to maximize liquid-particle contact, and consequently, scrubber collection efficiency.

The two common types of spray chambers are spray towers and cyclonic chambers. Spray towers are cylindrical or rectangular chambers that can be installed vertically or horizontally. The scrubber liquid is sprayed into the chamber. A de-mister at the top of the spray tower removes liquid droplets and wetted PM from the exiting gas stream. A cyclonic spray chamber is similar to a spray tower with one major difference. The gas stream is introduced to produce cyclonic motion inside the chamber. This motion contributes to higher gas velocities, more effective particle and droplet separation, and higher collection efficiency.

An impingement plate scrubber is a vertical chamber with plates mounted horizontally inside a hollow shell. Impingement plate scrubbers operate as countercurrent PM collection devices. The scrubbing liquid flows down the tower while the gas stream flows upward. Contact between the liquid and the particle-laden gas occurs on the plates. The plates are equipped with openings that allow the gas to pass through. The scrubbing liquid flows across each plate and down the inside of the tower onto the plate below. After the bottom plate, the liquid and collected PM flow out of the bottom of the tower. Impingement plate scrubbers are usually designed to provide operator access to each tray, making them relatively easy to clean and maintain. Consequently, impingement plates scrubbers are more suitable for PM collection than packed-bed scrubbers. Particles greater than 1 μm in diameter can be collected effectively by impingement plate scrubbers, but many particles <1 μm will penetrate these devices.

Mechanically-aided scrubbers (MAS) employ a motor driven fan or impeller to enhance gas-liquid contact. Generally in MAS, the scrubbing liquid is sprayed onto the fan or impeller blades. Fans and impellers are capable of producing very fine liquid droplets with high velocities. These droplets are effective in contacting fine PM. Once PM has impacted on the droplets, it is normally removed by cyclonic motion. MAS are capable of high collection efficiencies, but only with a commensurate high-energy consumption. Because many moving parts are exposed to gas and scrubbing liquid in a MAS, these scrubbers have high maintenance requirements. Mechanical parts are susceptible to corrosion, PM buildup, and wear. Consequently, mechanical scrubbers have limited applications for PM control.

Orifice scrubbers, also known as entrainment or self-induced spray scrubbers, force the particle-laden gas stream to pass over the surface of a pool of scrubbing liquid as it enters an orifice. With the high gas velocities typical of this type of scrubber, the liquid from the pool becomes entrained in the gas stream as droplets. As the gas velocity and turbulence increases with the passing of the gas through the narrow orifice, the interaction between the PM and liquid droplets also increases. PM and droplets are then removed from the gas stream by impingement on a series of baffles that the gas encounters after the orifice. The collected liquid and PM drain from the baffles back into the liquid pool below the orifice. Orifice scrubbers usually have low liquid demands, have relatively simple designs, and have few moving parts. The major maintenance concern is the removal of the sludge, which collects at the bottom of the scrubber. Orifice scrubbers are only effective at collecting particles larger than 2 micrometers (μm) in diameter.

Condensation scrubbing is a relatively recent development in wet scrubber technology. Most conventional scrubbers rely on the mechanisms of impaction and diffusion to achieve contact between the PM and liquid droplets. In a condensation scrubber, the PM act as condensation nuclei for the formation of droplets. Generally, condensation scrubbing depends on first establishing saturation conditions in the gas stream. Once saturation is achieved, steam is injected into the gas stream. The steam creates a condition of supersaturation and leads to condensation of water on the fine PM in the gas stream. The large condensed droplets can be removed by several conventional devices. Typically, a high efficiency mist eliminator is used for this purpose.

Packed-bed scrubbers consist of a chamber containing layers of variously shaped packing material, such as raschig rings, spiral rings, and berl saddles that provide a large surface area for liquid-particle contact. The packing is held in place by wire mesh retainers and supported by a plate near the bottom of the scrubber. Scrubbing liquid is evenly introduced above the packing and flows down through the bed. The liquid coats the packing and establishes a thin film. In a packed-bed scrubber, high PM concentrations can clog the bed, hence, the limitation of these devices to streams with relatively low dust loadings. Plugging is a serious problem for packed-bed scrubbers because the packing is more difficult to access and clean than other scrubber designs. In general, packed-bed scrubbers are more suitable for gas scrubbing than particulate scrubbing because of the high maintenance requirements for control of PM.

The PM abatement method most commonly utilized at existing MAP, DAP, and GTSP plants is medium-energy venturi scrubbers (refer to Table 5-4). Cross-flow and packed bed scrubbers are also utilized at a few facilities. Of the technically feasible control technologies, venturi scrubbers are considered to have the highest control efficiencies for controlling PM/PM_{10}. Spray chambers, impingement plate, mechanically aided, orifice, and condensation scrubbers also have fairly high control efficiencies and are considered technically feasible. Of these types of scrubbers only spray chambers have been applied to MAP, DAP, or GTSP plants. Therefore, the other control techniques are considered unproven for this type of application. Packed-bed scrubbers have the lowest control efficiencies of any of the wet scrubbers for PM control.

5.3.2.4 <u>Economic Analysis</u>

A previous BACT determination for a DAP plant (IMC-Agrico-New Wales; PSD-FL-241) addressed alternatives for PM/PM_{10} control. The alternatives addressed consisted of a high-energy (>30 in w.c.) venturi scrubber and a medium energy (15 to 30 in w.c.) venturi scrubber. The IMC Plant employs an existing medium-energy venturi scrubbing system. The high costs of adding a high-energy venturi scrubbing system was deemed economically infeasible with incremental costs effectiveness ranging from $50,000 to $75,000 per incremental ton of PM/PM_{10} removed. As a result, the high-energy venturi scrubber option was found to be infeasible, and the existing medium-energy venturi scrubbers were selected as BACT. This cost impact would also exist for high-energy venturi scrubbers employed at the North and South AP Plants, and is considered economically infeasible. As a result, high-energy venturis for PM/PM_{10} control were not considered further.

5.3.2.5 <u>Environmental Impacts</u>

As shown in Table 6-15 through 6-18, the maximum predicted PM_{10} impacts for the proposed project are well below the AAQS and PSD Class I and Class II increment levels. Additional PM/PM_{10} controls would result in an insignificant reduction of ambient impacts that are already below the AAQS and PSD Class I and Class II increment levels.

5.3.3 BACT SELECTION

Cargill will utilize venturi/cyclonic scrubbers since they will yield the greatest control efficiencies with a proven technology. Cargill Green Bay's proposed PM/PM_{10} technology and emission limit is reasonable based on previous BACT determinations for similar facilities. Although Cargill's proposed PM/PM_{10} emission limit of 0.17 lb/ton P_2O_5 is not consistent with the lowest previous

BACT determination of 0.15 lb/ton P_2O_5 from Cargill Bartow, it is consistent with the all of the other recent BACT determinations. The Cargill Bartow Fertilizer plant that is achieving the 0.15 lb/ton P_2O_5 is a more modern plant than the AP Plants at Cargill Green Bay. Although Green Bay is replacing most of the control equipment at the AP Plants, most of the process equipment will not change as part of this project. A factor affecting the actual emissions from the plants will be the particulate loading to the scrubbers, which will be higher from an older plant than a newer, more modern plant. The upgrade of the pollution control equipment at the AP Plants will help the plants achieve a much lower emission rate of 0.17 lb/ton P_2O_5, which is a significant (over 80 percent) decrease from the current permitted limit of 1.017 lb/ton P_2O_5.

Summaries of recent PM and F emissions tests for the South DAP and North MAP/DAP Plants are presented in Tables 5-6 and 5-7, respectively. The historic PM emissions test results for the South DAP Plant ranged from 0.098 to 0.187 lb/ton P_2O_5. The PM emissions test results for the North MAP/DAP Plant have ranged from 0.067 to 0.222 lb/ton P_2O_5. To be able to meet the lower PM limit of 0.17 lb/ton P_2O_5, Cargill is installing new pollution control equipment as part of the proposed project. Therefore, the proposed limit is justified to provide certainty that the proposed emission level will be achievable on a continuous basis.

5.4 <u>SOUTH AND NORTH AP PLANTS—FLUORIDES</u>

5.4.1 PROPOSED CONTROL TECHNOLOGY

The proposed BACT for F emissions from the South and North AP Plants is based on the following:

<u>South AP Plant</u>

- One new medium-energy venturi/cyclonic scrubber using phosphoric acid operating in combination with a new tailgas scrubber using an ammonia vaporizer system, and
- Three new medium-energy venturi/cyclonic scrubbers using scrubber solution (weak phosphoric acid);

<u>North AP Plant</u>

- One new medium-energy venturi/cyclonic scrubber using phosphoric acid operating in combination with a new tailgas scrubber using an ammonia vaporizer system,
- Two new medium-energy venturi/cyclonic scrubbers using scrubber solution (weak phosphoric acid), and
- One existing medium-energy venturi/cyclonic scrubber using scrubber solution (weak phosphoric acid).

Refer to Section 2.0 for a full description of the existing and proposed control equipment for the North and South AP Plants. The proposed maximum F emissions for the South and North AP Plants are 0.04 lb/ton P_2O_5, equivalent to 2.60 lb/hr and 3.20 lb/hr, respectively.

5.4.2 BACT ANALYSIS

5.4.2.1 <u>Previous BACT Determinations</u>

As part of the BACT analysis, a review was performed of previous BACT determinations for F emissions from GTSP, MAP, and DAP manufacturing facilities listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. A summary of BACT determinations for GTSP, MAP, and DAP manufacturing facilities from this review are presented in Table 5-8. Determinations issued during the last 10 years are shown in the table.

From the review of previous BACT determinations, it is evident that F BACT determinations for GTSP, MAP, and DAP manufacturing facilities have all been based on wet scrubber technology. With one exception, BACT determinations have been in the range of 0.037 to 0.06 lb/ton P_2O_5 of F emissions. The most recent determinations are in the range of 0.037 to 0.041 lb/ton P_2O_5. The lowest emission limit of 0.019 lb/ton P_2O_5 was for a prilled MAP plant, which is a different process compared to Cargill's granular MAP/DAP plants. The next lowest emission limit from previous BACT determinations was 0.037 lb/ton P_2O_5.

5.4.2.2 <u>Control Technology Feasibility</u>

The control technology feasibility analysis for F emission controls for the South and North AP Plants are listed in Table 5-9. As shown, there are 6 types of F abatement methods, all of which are wet scrubber techniques. Each available technique was listed with its associated efficiency estimate, identified as feasible or infeasible, and ranked based on control efficiency.

5.4.2.3 <u>Potential Control Method Descriptions</u>

The technically feasible wet scrubbers for the AP Fertilizer Plants at Cargill Green Bay are as follows:

- Packed Tower;
- Wet Cyclonic;
- Orifice/Impingement Tray;
- Spray Chamber;

- Venturi; and
- Ammonia Vaporizer.

Packed towers, wet cyclonic, orifice/impingement trays, spray chambers, and venturi scrubbers were described in Section 5.2.2.

In an ammonia vaporizer, an air stream passes through the tubes of a shell and tube heat exchanger. On the shell side, ammonia is vaporized while moisture condenses from the air stream on the tube side. In Green Bay's existing ammonia vaporizer system, the air stream consists of gases from the reactor and granulator of the North AP Plant. The condensed moisture on the tube side absorbs the majority of the F present in the gas stream. In order to properly wet all surfaces and promote improved operation, a portion of the condensate is continuously recirculated over the tube sheet and through the tubes.

5.4.2.4 Economic Analysis

A previous BACT determination for a DAP plant (IMC-Agrico-New Wales) addressed alternatives for F control. The alternatives included a packed scrubber using either once-through fresh water, neutralized water from a dedicated pond (fresh water makeup), or process cooling pond water. The first option was dismissed due to concern over fresh water usage and plant water balance problems. The second option was dismissed based on economics, with the cost effectiveness estimated at $14,000 per ton of F removed. In Cargill's case, the first two options can be dismissed based on similar considerations. This leaves the third option, using process (cooling pond) water, as BACT.

5.4.3 BACT SELECTION

In conclusion, Cargill Green Bay's proposed F technology and emission limit is reasonable based on previous BACT determinations for similar facilities. Cargill's proposed F emission limit of 0.04 lb/ton P_2O_5 is consistent (within round-off error) with the lowest previous BACT determination of 0.037 lb/ton P_2O_5 from U.S. Agri-Chemicals, and consistent with the all of the other recent BACT determinations. U.S. Agri-Chemicals based the F limit of 0.037 lb/ton P_2O_5 on stack test data that concluded that the plant was meeting a lower limit than what it had been currently permitted for. Therefore, U.S. Agri-Chemicals agreed to a lower F limit of 0.037 lb/ton P_2O_5, becoming the most stringent BACT for this type of facility.

Recent stack test data for the South DAP and North MAP/DAP Plants are presented in Tables 5-6 and 5-7. The F emissions test data for the South DAP Plant have ranged from 0.0346 lb/ton P_2O_5 to 0.1352 lb/ton P_2O_5. The F emissions test data for the North MAP/DAP Plant ranged from 0.0067 to 0.0211 lb/ton P_2O_5. Although the current emissions for the North MAP/DAP Plant are below the requested F limit of 0.04 lb/ton P_2O_5, the South DAP test results were well above the requested limit. Cargill is also proposing to increase the process rate at the South AP Plant as part of this project. To meet the requested F limit, Cargill is proposing to upgrade the pollution control system for the South DAP Plant. Therefore, the proposed limit is justified to provide certainty that the proposed emission level will be achievable on a continuous basis.

The upgrade of the pollution control equipment at the AP Plants will help the plants achieve a much lower emission rate of 0.04 lb/ton P_2O_5, which is a significant (over 80 percent) decrease from the current permitted limit of 0.26 lb/ton P_2O_5.

5.5 SOUTH AND NORTH AP PLANTS—NITROGEN OXIDES

5.5.1 PROPOSED CONTROL TECHNOLOGY

Emissions of NO_x from the South and North AP Plants will occur from the dryers due to fuel combustion. The proposed BACT for NO_x is based on good combustion practices and low nitrogen fuel. The proposed maximum NO_x emissions for the South and North AP Plants are 12.60 lb/hr or 55.17 TPY; and 7.41 lb/hr or 32.44 TPY, respectively. These are equivalent to 0.21 lb/MMBtu and 0.15 lb/MMBtu for the South and North AP Plants, respectively.

A condition of Title Permit No. 1050053-012-AV for the North MAP/DAP Plant was a requirement for an initial compliance test for NO_x. The test data, which was performed in 2000, is presented in Table 5-10. The NO_x test results for the North MAP/DAP Plant were 0.41 lb/hr and 0.00 lb/hr for MAP and DAP mode, respectively.

5.5.2 BACT ANALYSIS

5.5.2.1 Previous BACT Determinations

As part of the BACT analysis, a review was performed of previous NO_x BACT determinations for GTSP, MAP, and DAP manufacturing facilities listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. There have only been two BACT determinations made for NO_x from GTSP, MAP, and DAP manufacturing facilities in the past 10 years. These determinations, for Cargill Riverview and IMC-Agrico, are presented in Table 5-11.

From the review of the previous BACT determinations, it is evident that NO_x BACT determinations for GTSP, MAP, and DAP manufacturing facilities have relied on good combustion practices without any control equipment. The BACT determination for IMC-Agrico from 1998 was based on 12.6 lb/hr of NO_x. The BACT determination for Cargill Riverview from 2001 did not include an emission limit.

5.5.2.2 <u>Control Technology Feasibility</u>

The control technology feasibility analysis for NO_x controls for the AP Plant dryers are shown in Table 5-12. As shown in the table, there are five types of NO_x abatement methods with various techniques of each method. Each available technique was listed with its associated efficiency estimate, identified as feasible or infeasible, and ranked based on control efficiency.

5.5.2.3 <u>Potential Control Method Descriptions</u>

Removal of Nitrogen

Ultra-Low Nitrogen Fuel -- The fuels combusted in the dryers at the South and North AP Plants will be No. 2 fuel oil and natural gas. Liquefied petroleum gas (LPG) may also be combusted in the South AP Plant. Combustion of these fuels results in emissions of NO_x that are lower than conventional fuels due to the characteristically low levels of nitrogen associated with these fuels. Cargill Green Bay will control NO_x emissions from the dryers through the use of low nitrogen content fuels.

Oxidation of NO_x with Subsequent Absorbtion

Inject Oxidant -- The oxidation of nitrogen to its higher valence states makes NO_x soluble in water. When this is done a gas absorber can be effective. Oxidants that have been injected into the gas stream are ozone, ionized oxygen, or hydrogen peroxide. This NO_x reduction technique has not been demonstrated on this type of process, and as such is not considered to be a proven technique for the AP Plant dryers.

Non-Thermal Plasma Reactor (NTPR) -- This technique generates electron energies in the gas stream that generate gas-phased radicals, such as hydroxyl (OH) and atomic oxygen (O) through collision of electrons with water and oxygen molecules present in the flue gas stream. In the flue gas stream, these radicals oxidize NO_x to form nitric acid (HNO_3), which can then be condensed out through a wet condensing precipitator. NTPR has not been demonstrated on this type of application, and as such is not considered to be a proven technique for the AP Plant dryers.

Chemical Reduction of NO_x

Selective Catalytic Reduction (SCR) -- SCR uses a catalyst to react injected ammonia to chemically reduce NO_x. The catalyst has a finite life in flue gas and some ammonia slips through without being reacted. SCR has historically used precious metal catalysts, but can now also use base metal and zeolite catalyst materials. High moisture content flue gases can cause problems with catalyst operation. An SCR requires a flue gas temperature of 600 to 1,000°F. The flue gases exiting the AP Plant dryers contain high moisture levels, particulate, ammonium compounds, and fluorides. The gas temperature is about 200°F leaving the dryer. The high moisture content of the air stream and the high flue gas temperature requirement excludes SCR as an option for NO_x control for the South and North AP Plant dryers.

Selective Non-Catalytic Reduction (SNCR) -- In SNCR, ammonia or urea is injected within the boiler or in ducts in a region where the temperature is between 1,650 and 2,010°F. This technology is based on temperature ionizing the ammonia or urea instead of using a catalyst or non-thermal plasma. The temperature window for SNCR is very important because outside of it either more ammonia slips through the system or more NO_x is generated than is being chemically reduced. SNCR has been demonstrated as a feasible technology for natural gas and fuel oil combustion and can achieve NO_x reductions up to 50 percent. The high flue gas temperature requirement also excludes SNCR as an option for NO_x control for the South and North AP Plant dryers.

Catalytic Absorption ($SCONO_x$) – $SCONO_x$, unlike SCR, also removes other pollutants such as CO and VOC, while simultaneously absorbing NO_x on a propriety catalyst sorber. This sorber is periodically regenerated using a superheated steam/dilute hydrogen gas mixture which is produced on site and in an automated "on demand" basis, using the same fuel utilized by the turbine. The regeneration process results in the chemical reduction of NO_x compounds which remain on the catalyst and are essential to its chemistry. The $SCONO_x$ system is applicable to natural gas-fired combined cycle turbines using water injection. The performance of the system is sensitive to sulfur in the flue gas and requires periodic regeneration with dilute hydrogen. $SCONO_x$ requires a flue gas temperature between 450 and 700°F. Operation at temperatures as low as 300°F are possible with additional equipment and process changes. Since this technology has only been applied to gas turbines, it is considered an unproven technology for the AP Plant dryers. Another issue is the temperature requirement flue gas. Therefore, $SCONO_x$ is excluded as an option for the AP Plant dryers.

Reducing Residence Time at Peak Temperature

Air Staging of Combustion -- Combustion air is divided into two streams. The first stream is mixed with fuel in a ratio that produces a reducing flame. The second stream is injected downstream of the flame and creates an oxygen-rich zone. This NO_x reduction technique is already utilized by the AP Plant dryers.

Fuel Staging of Combustion -- This is staging of combustion using fuel instead of air. Fuel is divided into two streams. The first stream feeds primary combustion that operates in a reducing fuel-to-air ratio. The second stream is injected downstream of primary combustion, causing the net fuel to air ratio to be slightly oxidizing. Excess fuel in the primary combustion zone dilutes heat to reduce temperature. The second stream oxidizes the fuel while reducing the NO_x to N_2. This NO_x reduction technique may not be possible with an existing dryer. This would alter the temperature profile and affect the drying of the product. Therefore, this technique is not considered technically feasible for the AP Plant dryers.

Inject Steam -- Injection of steam causes the stoichiometry of the mixture to be changed and dilutes calories generated by combustion. These actions cause combustion temperature to be lower, and in-turn reduces the amount of thermal NO_x formed. This technique would not be possible with this type of dryer. Injecting steam would affect the product. Therefore, this NO_x reduction technique is not considered technically feasible for the AP Plant dryers.

Reducing Peak Temperature

Flue Gas Recirculation (FGR) -- Recirculation of cooled flue gas reduces combustion temperature by diluting the oxygen content of the combustion air and by causing heat to be diluted in a greater mass of flue gas. Heat in the flue gas can be recovered by a heat exchanger. This reduction of temperature lowers the thermal NO_x concentration that is generated. Although technically feasible, this NO_x reduction technique would affect the dryer operation. Therefore, FGR is excluded as a NO_x control technique for the AP Plant dryers.

Reburn -- In a boiler outfitted with reburn technology, a set of natural gas burners are installed above the primary combustion zone. Natural gas is injected to form a fuel-rich, oxygen-deficient combustion zone above the main firing zone. Nitrogen oxides, created by the combustion process in the main portion of the boiler, drift upward into the reburn zone and are converted to molecular nitrogen. The technology requires no catalysts, chemical reagents, or changes to any existing burners. Typical reburn systems also incorporate redesign of the combustion air system to provide less excess air (LEA). Although technically feasible, this NO_x reduction technique would affect the dryer operation. Therefore, reburn is excluded as a NO_x control technique for the AP Plant dryers.

Over-Fire Air (OFA) -- When primary combustion uses a fuel-rich mixture, use of OFA completes the combustion. Because the mixture is always off-stoichiometric when combustion is occurring, the temperature is reduced. After all other stages of combustion, the remainder of the fuel is oxidized in the OFA. Although technically feasible, this NO_x reduction technique would affect the dryer operation. Therefore, OFA is excluded as a NO_x control technique for the AP Plant dryers.

Less Excess Air (LEA) -- Excess airflow combustion has been correlated to the amount of NO_x generated. Limiting the net excess airflow can limit NO_x content of the flue gas. Although technically feasible, this NO_x reduction technique would affect the dryer operation. Therefore, LEA is excluded as a NO_x control technique for the AP Plant dryers.

Combustion Optimization -- Combustion optimization refers to the active control of combustion. The active combustion control measures seek to find optimum combustion efficiency and to control combustion at that efficiency. The AP Plant dryers at Cargill Green Bay will be optimized for maximum combustion efficiency.

Low NO_x Burners (LNB) -- A LNB provides a stable flame that has several different zones. For example, the first zone can be primary combustion. The second zone can be Fuel Reburning (FR) with fuel added to chemically reduce NO_x. The third zone can be the final combustion in low excess air to limit the temperature.

5.5.2.4 <u>Environmental Impacts</u>

As shown in Tables 6-15 through 6-18, the maximum predicted NO_2 impacts are below the AAQS and PSD Class I and Class II increment levels. Additional NO_x controls would result in insignificant reduction of ambient impacts that are already below the AAQS and PSD Class I and Class II increment levels.

5.5.3 BACT SELECTION

The only demonstrated control techniques for controlling NO_x emissions from this type of process are good combustion practices. Cargill is proposing to use good combustion practices along with low nitrogen fuel to achieve NO_x reductions. Any different control equipment would significantly alter the existing dryer operation at Cargill Green Bay. From the test data that was presented in Table 5-10 and the actual emission data presented in Section 2.0 from the AORs, it is evident that Cargill is achieving extremely low NO_x emission levels with the use of good combustion practices. Therefore, no further controls are justified. In conclusion, the use of good combustion practices and low nitrogen fuel constitutes BACT for the AP Plant dryers.

Table 5-1. Summary of BACT Determinations for Fluoride Emissions from Phosphoric Acid Plants

Company	State	Permit No.	Permit Issue Date	Throughput	Emission Limits	Control Equipment
CARGILL FERTILIZER INC.--RIVERVIEW	FL	PSD-FL-315	11/21/2001	170 TPH	0.012 LB/TON P_2O_5	CROSS-FLOW PACKED SCRUBBER
WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	FL	PSD-FL-297	11/27/2000	110 TPH	0.012 LB/TON P_2O_5	CROSS-FLOW PACKED SCRUBBERS
CARGILL FERTILIZER--BARTOW	FL	PSD-FL-295	10/13/2000	170 TONS P_2O_5/HR	0.0135 LB/TON P_2O_5	Packed Scrubber Using Pond Water
SF PHOSPHATES LIMITED CO.-FERTILIZER COMPLEX	MD	MD-384	12/22/1998		0.0135 LB/TON P_2O_5	Filter Vacuum Pump Scrubber. Fume Scrubber
CARGILL FERTILIZER--RIVERVIEW	FL	0570008-013-AC	6/12/1997	300,000 TPY	0.04 LB/TON P_2O_5	Cross-flow Scrubber
CARGILL FERTILIZER--RIVERVIEW	FL	0570008-004-AC	8/27/1996	170 TONS P_2O_5/HR	0.0135 LB F/TON P_2O_5 (Conbined New & Existing Plant)	PACKED SCRUBBER USING POND WATER
					0.016 LB F/TON P_2O_5 (Existing Plant)	PACKED SCRUBBER USING POND WATER
					0.012 LB F/TON P_2O_5 (New Plant)	PACKED SCRUBBER USING POND WATER
CARGILL FERTILIZER--BARTOW	FL	AC53-262532 / PSD-FL/224	8/24/1995	170 TONS P_2O_5	0.0135 LB F/TON P_2O_5 (Conbined New & Existing Plant)	PACKED SCRUBBER
					0.016 LB F/TON P_2O_5 (Existing Plant)	PACKED SCRUBBER
					0.012 LB F/TON P_2O_5 (New Plant)	PACKED SCRUBBER
IMC FERTILIZER, INC.	FL	PSD-FL-201	8/2/1993	2500 TPD	0.02 LB/TON P_2O_5	CROSSFLOW SCRUBBER

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2003.

Table 5-2. Fluoride Control Technolgy Feasibility Analysis for the Phosphoric Acid Plant at Cargill Green Bay

F Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the PAP? (Y/N)
Wet Scrubbers	Packed Tower	95-99%	Y	1	N
	Plate or Tray Towers	95-99%	N	NA	N
	Wet Cyclonic	90-95%	Y	2	Y
	Spray Chamber	90-95%	Y	2	N
	Venturi	80-90%	Y	3	N

Note: NTF = Not Technically Feasible
NA = Not Applicable

Table 5-3. Summary of Recent Phosphoric Acid Plant Emission Tests at Cargill Green Bay

Date	Unit	Average Process Rate (TPH P_2O_5)	Fluoride	
			avg lb/hr	avg lb/ton P_2O_5 [a]
2002				
3/15/2002	PAP No. 1-North	22.3	0.1100	--
4/4/2002	PAP No. 1-North	24.8	0.0900	--
5/9/2002	PAP No. 1-South	45.0	0.0651	--
5/13/2002	PAP No. 2	51.0	0.0624	--
	Total		0.3275	0.0092
2001				
4/27/2001	PAP No. 1-North	27	0.0676	--
5/4/2001	PAP No. 1-South	45.0	0.0225	--
4/19/2001	PAP No. 2	53.0	0.1034	--
	Total		0.1935	0.0046
2000				
5/31/2000	PAP No. 1-North	25	0.6782	--
5/16/2000	PAP No. 1-South	42.5	0.2437	--
8/10/2000	PAP No. 2	50.0	0.2035	--
	Total		1.1254	0.0287

[a] As calculated.

Table 5-4. Summary of BACT Determinations for Particulate Emissions from GTSP, MAP, and DAP Manufacturing Facilities

Company Name	State	Permit Number	Permit Issue Date	Throughput	Emissions Limits	Control Equipment
CARGILL FERTILIZER--BARTOW	FL	PSD-FL-322	3/20/2002	261 TPH	0.15 LB/TON P_2O_5	SCRUBBERS--2 VENTURI & 1 CROSS-FLOW
US AGRI-CHEMICALS-FT. MEADE	FL	PSD-FL-321	3/15/2002	60 TPH	0.17 LB/TON P_2O_5	VENTURI SCRUBBER
CARGILL FERTILIZER--RIVERVIEW	FL	PSD-FL-315	11/21/2001	73.5 TPH P_2O_5	0.17 LB/TON P_2O_5	3 VENTURI SCRUBBERS
CARGILL FERTILIZER--BARTOW	FL	PSD-FL-255	4/21/1999	125 TPH	0.18 LB/TON P_2O_5	VENTURI SCRUBBER W/CYCLONE
US AGRI-CHEMICALS	FL	PSD-FL-222	10/16/1998	60 TPH MAP	0.40 LB/TON P_2O_5	MED ENERGY VENTURI SCRUBBER USING NEUTRALIZED SCRUBBING WATER
FARMLAND HYDRO L.P.	FL	PSD-FL-246	9/11/1998	200 TPH MAP	0.30 LB/TON P_2O_5	2-STAGE SCRUBBERS USING ACID PONDWATER
(NOW CARGILL GREEN BAY)				150 TPH DAP	0.30 LB/TON P_2O_5	2-STAGE SCRUBBERS USING ACID PONDWATER
IMC-AGRICO	FL	PSD-FL-241	1/21/1998	80 TPH	0.156 LB/TON P_2O_5	VENTURI/PACKED BED SCRUBBER
IMC-AGRO COMPANY	FL	AC53-230355, AC53-232681,FL204	4/18/1994	100 TPH DAP	0.41 LB/TON 100% P_2O_5	VENTURI ACID SCRUBBER
CARGILL FERTILIZER--BARTOW	FL	AC53-246403 / PSD-FL-211	11/28/1994	120 TPH 100% P_2O_5	0.19 LB/TON P_2O_5	VENTURI PRIMARY SCRUBBER/PACKED TOWER SECONDARY

Notes GTSP = Granular Triple Super Phosphate.
MAP= Monoammonium Phosphate.
DAP= Diammonium Phosphate.

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2003.

Table 5-5. PM/PM_{10} Control Technolgy Feasibility Analysis for the South and North AP Plants, Cargill Green Bay

PM Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the AP Plants? (Y/N)
Fuel Techniques	Fuel Substitution	NA	NTF	NTF	N
Pretreatment	Settling Chambers	< 10%	NTF	NTF	N
	Elutriators	< 10%	NTF	NTF	N
	Momentum Separators	10 - 20%	NTF	NTF	N
	Mechanically-Aided Separators	20 - 30%	NTF	NTF	N
	Cyclones	60 - 90%	Y	3	Y
Electrostatic Precipitators (ESP)	Dry ESP	>99%	N	NA	N
	Wet ESP	>99%	N	NA	N
	Wire-Plate ESP	>99%	N	NA	N
	Wire-Pipe ESP	>99%	N	NA	N
Fabric Filters	Shaker-Cleaned	>99%	NTF	NTF	N
	Reverse-Air	>99%	NTF	NTF	N
	Pulse-Jet	>99%	NTF	NTF	N
Wet Scrubbers	Venturi	50 - 99 %	Y	1	Y
	Spray Chambers	50 - 95 %	Y	2	N
	Impingement Plate	50 - 95 %	N	NA	N
	Mechanically-Aided	50 - 95 %	N	NA	N
	Orifice	50 - 95 %	N	NA	N
	Condensation	50 - 95 %	N	NA	N
	Packed-Bed	50 - 90 %	Y	4	N

Note: NTF = Not Technically Feasible

Table 5-6. Summary of Recent South DAP Fertilizer Plant Emission Tests at Cargill Green Bay

Date	Average Production Rate[a] (tons/hr)	Average Process Rate[b] (tons/hr)	PM[c]		Fluoride[c]	
			avg lb/hr	avg lb/ton[b]	avg lb/hr	avg lb/ton[b]
5/20/01-5/21/01	90.0	41.5	7.0	0.169	2.01	0.0484
3/8/00-3/9/00	88.0	41.0	4.0	0.098	1.42	0.0346
3/24/99-3/25/99	87.0	40.1	7.5	0.187	5.42	0.1352

[a] As DAP.

[b] As P_2O_5.

[c] Represents both stacks combined.

Table 5-7. Summary of Recent North MAP/DAP Fertilizer Plant Emission Tests at Cargill Green Bay

Date	Average Production Rate[a] (tons/hr)	Average Process Rate[b] (tons/hr)	PM[c]		Fluoride[c]	
			avg lb/hr	avg lb/ton[b]	avg lb/hr	avg lb/ton[b]
8/1/02-8/2/02	164 (MAP)	81.8	10.2	0.125	0.81	0.0099
2/13/01-2/14/01	106 (DAP)	48.8	7.3	0.150	1.02	0.0209
3/27/01-3/28/01	171 (MAP)	85.3	8.5	0.100	0.9	0.0106
4/6/00-4/7/00	98 (DAP)	45.0	3.0	0.067	0.3	0.0067
3/16/00-3/17/00	147 (MAP)	76.6	17.0	0.222	1.21	0.0158
3/16/00-3/20/00	149 (DAP)	75.8	11.8	0.156	1.6	0.0211

[a] As MAP or DAP.

[b] As P_2O_5.

[c] Represents both stacks combined.

Table 5-8. Summary of BACT Determinations for Fluoride Emissions from GTSP, MAP, and DAP Manufacturing Facilities

Company Name	State	Permit Number	Permit Issue Date	Throughput	Emission Limits	Control Equipment
CARGILL FERTILIZER--BARTOW	FL	PSD-FL-322	3/20/2002	261 TPH	0.04 LB/TON P_2O_5	CROSS-FLOW PACKED TOWER SCRUBBER
US AGRI-CHEMICALS	FL	PSD-FL-321	3/15/2002	60 TPH	0.037 LB/TON P_2O_5	VENTURI SCRUBBER
CARGILL FERTILIZER--RIVERVIEW	FL	PSD-FL-315	11/21/2001	73.5 TPH P_2O_5	0.04 LB/TON P_2O_5	2 TAILGAS SCRUBBERS
CARGILL FERTILIZER--BARTOW	FL	PSD-FL-255	4/21/1999	125 TPH	0.041 LB/TON P_2O_5	PACKED SCRUBBER USING POND WATER
US AGRI-CHEMICALS	FL	PSD-FL-222	10/16/1998	49 TPH MAP	0.019 LB/TON P_2O_5 *	MED. ENERGY VENTURI USING NEUTR. SCRUBBING WATER
FARMLAND HYDRO L.P.	FL	PSD-FL-246	9/11/1998	200 TPH MAP	0.06 LB/TON P_2O_5	2-STAGE SCRUBBERS USING ACID/POND WATER
(NOW CARGILL GREEN BAY)				150 TPH DAP	0.0417 LB/TON P_2O_5	2-STAGE SCRUBBERS USING ACID/POND WATER
IMC-AGRICO	FL	PSD-FL-241	1/21/1998	80 TPH	0.0417 LB/TON P_2O_5	VENTURI SCRUBBER AND PACKED BED SCRUBBER
IMC-AGRO COMPANY	FL	AC53-230355, AC53-232681,FL204	4/18/1994	100 TPH DAP	0.0417 LB/TON 100% P_2O_5	VENTURI ACID SCRUBBER

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2003.

* For a prilled MAP plant, not granular MAP.

Table 5-9. Fluoride Control Technolgy Feasibility Analysis for the Ammoniated Phosphate Fertilizer Plants at Cargill Green Bay

F Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the AP Plants? (Y/N)
Wet Scrubbers	Packed Tower	95-99%	Y	1	N
	Wet Cyclonic	90-95%	Y	2	Y
	Orifice (impingement) Tray	95-99%	N	NA	N
	Spray Chamber	90-95%	Y	2	Y
	Venturi	90-95%	Y	2	Y
	Ammonia Vaporizer	95-99%	Y	1	Y

Note: NTF = Not Technically Feasible
NA = Not Applicable

Table 5-10. Summary of Recent North MAP/DAP Fertilizer Plant Emission Tests at Cargill Green Bay

Date	Average Production Rate (tons/hr)	Average Process Rate[a] (tons/hr)	NO_x (avg lb/hr)
3/17/2000	147 (MAP)	76.6	0.408
4/7/2000	98 (DAP)	45.0	0.000

[a] As P_2O_5.

Table 5-11. Summary of BACT Determinations for Nitrogen Oxide Emissions from GTSP, MAP, and DAP Manufacturing Facilities

Company Name	State	Permit Number	Permit Issue Date	Throughput	Emission Limits	Control Equipment
CARGILL FERTILIZER INC.--RIVERVIEW	FL	PSD-FL-315	11/21/2001	170 TPH	N/A	Good combustion practices.
IMC-AGRICO	FL	PSD-FL-241	1/21/1998	80 TPH	12.6 lb/hr	None

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2003.

Table 5-12. NO_x Control Technolgy Feasibility Analysis for the South and North AP Plant Dryers, Cargill Green Bay

NO_x Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by Cargill Green Bay? (Y/N)
1. Removal of nitrogen	Ultra-Low Nitrogen Fuel	< 70%	Y	1	N
2. Oxidation of NO_x with subsequent absorption.	Inject Oxidant	60 - 80%	NTF	NTF	N
	Non-Thermal Plasma Reactor (NTPR)	60 - 80%	NTF	NTF	N
3. Chemical reduction of NO_x	Selective Catalytic Reduction (SCR)	35 - 80%	NTF	NTF	N
	Selective Non-Catalytic Reduction (SNCR)	35 - 80%	NTF	NTF	N
	$SCONO_X$™	35 - 80%	NTF	NTF	N
4. Reducing residence time at peak temperature	Air Staging of Combustion	50 - 65%	Y	2	Y
	Fuel Staging of Combustion	50 - 65%	N	NA	N
	Inject Steam	50 - 65%	N	NA	N
5. Reducing peak temperature	Flue Gas Recirculation (FGR)	15 -25%	N	NA	N
	Natural Gas Reburning (NGR)	15 -25%	N	NA	N
	Over Fire Air (OFA)	15 -25%	N	NA	N
	Less Excess Air (LEA)	15 -25%	N	NA	N
	Combustion Optimization	15 -25%	Y	3	Y
	Reduce Air Preheat	15 -25%	N	NA	N
	Low NO_x Burners (LNB)	15 -25%	Y	3	N

Note: NTF = Not Technically Feasible

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 GENERAL APPROACH

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For all criteria pollutants that will be 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 and/or stack configuration changes due to the project alone will result in predicted impacts that are in excess of the EPA significant impact levels at any location beyond the plant's restricted boundaries.

Generally, if the facility undergoing the modification is within 200 kilometers of a PSD Class I area, then a significant impact analysis is also performed to evaluate the impact due to the project alone at the PSD Class I area. Because the Chassahowitzka National Wilderness Area (CNWA) is a PSD Class I area that is located within 200 km of the proposed project, the maximum predicted impacts at the CNWA are compared to EPA's proposed significant impact levels for PSD Class I areas. These recommended levels have never been promulgated as rules but are the currently accepted criteria for determine whether a proposed project will incur a significant impact on a PSD Class I area.

If the project-only impacts are above the significant impact levels in the vicinity of the facility, then two additional and more detailed air modeling analyses are required. The first analysis demonstrates compliance with federal and Florida ambient air quality standards (AAQS), and the second analysis demonstrates compliance with allowable PSD Class II increments.

If the project-only impacts at the PSD Class I area are above the proposed EPA PSD Class I significant impact levels, then an analysis is performed to demonstrate compliance with allowable PSD Class I impacts at the PSD Class I area. The proposed project's maximum emission increases are evaluated at the PSD Class I area to support the air quality related values (AQRV) analysis, that includes an evaluation of regional haze degradation.

Generally, when using 5-years of meteorological data for the analysis, the highest annual and the highest, second-highest (HSH) short-term concentrations are compared to the applicable AAQS and allowable PSD increments. [Note that for determining compliance with the 24-hour AAQS for particulate matter only, the sixth highest predicted concentration in 5 years (i.e., H6H), instead of the HSH, is used to compare to the applicable 24-hour AAQS.]

The HSH concentration 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.

The HSH 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 modeling 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, if 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.

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 concentrations from other years in the screening analysis are within 10 percent of the overall maximum concentration, then those other concentrations are refined as well. Typically, if the highest and HSH concentrations are in different locations, concentrations in both areas are refined.

A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids, is presented in the following sections.

6.2 SIGNIFICANT IMPACT ANALYSIS

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 both in the vicinity of the project and at the PSD Class I area. Based on the screening modeling analysis results in the vicinity of the project, additional modeling refinements are performed, if necessary, to obtain the maximum concentration with a receptor grid spacing of 100 meters (m) or less.

6.3 AAQS AND PSD CLASS II ANALYSES

For each pollutant for which a significant impact is predicted in the vicinity of the project, AAQS and PSD Class II analyses are required. The AAQS analysis is a cumulative source analysis that evaluates whether the post-project concentrations from all sources will comply with the AAQS. All sources include the post-project source configuration at the project site, the impacts from other nearby facility sources, plus a background concentration to account for sources not included in the modeling analysis.

The PSD Class II analysis is a cumulative source analysis that evaluates whether the post-project PSD increment for all increment-affecting sources will comply with the allowable PSD Class II increments. All sources include the post-project PSD increment-affecting sources at the project site, plus the impacts from all nearby PSD increment- affecting sources at other facilities.

6.4 PSD CLASS I ANALYSIS

For each pollutant for which a significant impact is predicted at the PSD Class I area, a PSD Class I analysis is required. The PSD Class I analysis is a cumulative source analysis that evaluates whether the post-project PSD increment for all increment-affecting sources within the impact distance of the PSD Class I area will comply with the allowable PSD Class I increments. All sources include the post-project PSD increment-affecting sources at the project site, plus the impacts from all PSD increment-affecting sources at other facilities that are within impact distances of the PSD Class I area.

6.5 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 02035) dispersion model (EPA, 2002) was used to evaluate the pollutant impacts due to the proposed project in areas within 50-km of the proposed facility. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network

(TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can be executed in the rural or urban land use mode that affects stability dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent land use within a 3-km radius around a project is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land-use within a 3-km radius of the Cargill plant site (see Figure 2-1), the rural dispersion coefficients were used in the modeling analysis. Also, since the terrain around the facility is flat to gently rolling, the simple terrain feature of the model was selected.

The ISCST3 model was used to provide maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times.

For predicting maximum impacts at the CNWA PSD Class I area, the California Puff (CALPUFF) modeling system was used. CALPUFF, Version 5.5 (EPA, 2002), is a Lagrangian puff model that is the recommended by the FDEP, in coordination with the Federal Land Manager (FLM) for the CNWA, for predicting pollutant impacts at PSD Class I areas that are beyond 50 km from a project site. A listing of CALPUFF model features is presented in Table 6-2.

During preliminary telephone discussions with the FLM, it was indicated that the use of only 1 year of CALMET meteorological data would no longer be acceptable for a refined CALPUFF modeling analysis, and that multiple years of CALMET data should be used. If the CALMET meteorological data are created using only National Weather Service (NWS) data, then a minimum of 5 years of meteorological data are required. If the NWS data are merged with mesoscale meteorological data (i.e., either MM4 or MM5), the analysis should include a minimum of 3 years of meteorological data. For this project, a refined CALPUFF analysis was performed with mesoscale meteorological data for the following 3 years: 1990 with 80-km MM4 data, 1992 with 80-km MM5 data, and 1996 with 36-km MM5 data.

A more detailed discussion of the CALMET wind fields used for the CALPUFF modeling analysis is provided in Appendix C.

6.6 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 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 the Tampa International Airport in Tampa, Florida, and at Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1991 through 1995. The NWS stations at Tampa and Ruskin are located approximately 62 and 50 km, respectively, to the west-northwest and southwest, respectively, of the Cargill Green Bay plant site. The surface meteorological data from Tampa are assumed to be representative of the project site because both the project site and the weather station are located in similar climatological areas in west central Florida. They are, therefore, expected to experience similar weather conditions, such as frontal passages and sea-breeze fronts.

Meteorological data used with the CALPUFF model consisted of 3 years of CALMET-developed meteorological data. A detailed description of the meteorological data is provided in Appendix C.

6.7 EMISSION INVENTORY

6.7.1 SIGNIFICANT IMPACT ANALYSIS

The PM_{10}, NO_x, and F emission rates and the physical and operational stack parameters for all project-affected sources are summarized in Tables 6-3 to 6-4. These tables are based on emissions and stack parameters presented in Section 2.0. The current actual and future potential PM_{10}, NO_x, and F emissions for all Cargill sources affected by the project are presented in Table 6-2. The basis of the emissions are also provided in Table 6-3. The current and future stack and operating parameters for all Cargill sources are included in Table 6-4.

A summary of the future potential PM_{10} and NO_x emission rates for all Cargill sources that were used in the AAQS and PSD Class II increment analyses is presented in Table 6-5. The basis of the emissions is also provided in Table 6-5.

All sources were modeled at locations that are relative to the location of the southwest corner of the MAP/DAP storage building.

6.7.2 AAQS AND PSD CLASS II ANALYSES

A listing of background PM_{10} and NO_x sources and their locations relative to the Cargill Green Bay facility is provided in Tables 6-6 and 6-7, respectively. All facilities were evaluated using the North Carolina screening technique. Based on this technique, facilities whose annual (i.e., ton per year) emissions are less than the threshold quantity, Q, are eliminated from the modeling analysis. Q is equal to 20 x (D-SIA), where D is the distance in km from the facility to Cargill-Green Bay and SIA is the distance of the proposed project's PM_{10} or NO_x significant impact area (1.5 km and 1.0 km, respectively). The PM_{10} and NO_x facilities that were not eliminated in the screening analysis are included in the AAQS and/or PSD Class II analyses.

Summaries of the PM_{10} and NO_x background source data that were used for the AAQS and/or PSD Class II analyses are presented in Appendix B.

Non-Cargill PM_{10} and NO_x PSD sources were obtained from FDEP and were supplemented with current and historical information obtained from Golder. Non-Cargill PM_{10} PSD sources were obtained from the Big Bend Transfer Company PSD analysis.

6.7.3 CARGILL GREEN BAY PSD BASELINE INVENTORY (1974)

A summary of Cargill's PM_{10} sources for the PSD baseline year (1974) is provided in Table 6-8. These sources were used with Cargill's future PM_{10} sources from Tables 6-4 and 6-5 to determine the PSD increment consumption after completion of the proposed project.

6.7.4 CARGILL GREEN BAY PSD BASELINE INVENTORY (1988)

A summary of Cargill's NO_x sources for the PSD baseline year (1988) is provided in Table 6-9. These sources were used with Cargill's future NO_x sources from Tables 6-4 and 6-5, to determine the PSD increment consumption after completion of the proposed project.

6.7.5 PSD CLASS I ANALYSIS

The proposed project's PM_{10} and NO_2 impacts were predicted to not exceed any significant impact level at the CNWA PSD Class I area. Therefore, a PSD Class I increment consumption analysis was not required for either pollutant. However, the proposed project's emissions of PM_{10} and F were evaluated at the Class I area to support the air quality related values (AQRV) analysis, and emissions of SO_2, PM_{10}, SAM, and NO_x were evaluated at the Class I area in support of the regional haze analysis. The increase in SO_2 and SAM emissions due to the proposed project, for use in the regional haze analysis, is presented in Table 6-10. The AQRV and regional haze analysis are presented in Section 7.0.

6.8 RECEPTOR LOCATIONS

6.8.1 SITE VICINITY

A screening receptor grid comprised of Cartesian receptors was developed that consisted of the following:

- Property boundary receptors, spaced at 100-m intervals;
- Receptors from the property boundary to 2 km, spaced at 100-m intervals;
- Receptors from 2 to 5 km, spaced at 250-m intervals; and
- Receptors from 5 to 10 km, spaced at 500 m intervals.

The modeling origin of the receptor grid was the southwestern corner of the MAP/DAP Storage Building and all source and receptor locations are relative to this location. A summary of the property boundary receptors is presented in Table 6-11.

The receptor locations in the vicinity of the plant, as well as the current sources and building locations are shown in Figures 6-1 and 6-2. Based on the results of the significant impact analyses, a maximum receptor distance of 1.5 km was used for the PM_{10} and NO_x AAQS and PSD Class II analyses.

6.8.2 CLASS I AREA

Maximum PM_{10}, NO_x, and F concentrations were predicted at the CNWA with the CALPUFF model using 13 discrete receptors located along the border of the CNWA PSD Class I area. Impacts for the proposed project only were compared to both the proposed EPA PSD Class I significance levels for PM_{10} and NO_x, the regional haze degradation criteria of 5 percent, and the nitrogen and sulfur deposition analysis thresholds of 0.01 kilogram per hectare per year. The

F impacts were used to assess the proposed project's impacts on the CNWA AQRVs. A listing of Class I receptors is provided in Table 6-12.

6.9 BACKGROUND CONCENTRATIONS

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

The derivation of the background concentration for the modeling analysis was presented in Section 4.0. Based on this analysis, the annual NO_2 background concentration was determined to be 21 $\mu g/m^3$ for the annual averaging period. The PM_{10} background concentrations were determined to be 21 and 50 $\mu g/m^3$ for the annual and 24-hour averaging periods, respectively. These background levels were added to model-predicted concentrations to estimate total air quality levels for comparison to AAQS.

6.10 BUILDING DOWNWASH EFFECTS

All significant building structures within Cargill's existing plant area were determined by a site plot plan. The plot plan of the proposed project was presented in Section 2.0 (Figure 2-2). A total of 14 current and 9 baseline year (1974) structures were evaluated. Several of the future structures were storage tanks that are in the immediate vicinity of stack vents. All structures were processed in the EPA Building Input Profile (BPIP, Version 95086) program to determine direction-specific building heights and projected widths for each 10-degree azimuth direction for each source that was included in the modeling analysis. A listing of dimensions for each structure is presented in Table 6-13.

6.11 MODEL RESULTS

6.11.1 SIGNIFICANT IMPACT ANALYSIS

A summary of the predicted maximum PM_{10} and NO_2 concentrations due to the proposed project only from the screening analysis are presented in Table 6-14. The modeling results indicate that the maximum predicted concentrations are above the significant impact levels for both pollutants. It was further determined that the significant impact areas for PM_{10} and NO_2 are approximately 1.5 and 1.0 km, respectively. As a result, detailed modeling analyses were performed for PM_{10} and NO_x to address compliance with AAQS and PSD Class II increments.

6.11.2 AAQS ANALYSIS

A summary of the maximum annual and H6H 24-hour average PM_{10} and maximum annual NO_2 concentrations predicted for all sources for the screening analysis is presented in Table 6-15. Based on the screening analysis results, additional modeling refinements were not required. The final results of the modeling analysis are presented in Table 6-16.

The predicted total annual and H6H 24-hour PM_{10} concentrations of 31.1 and 86.5 µg/m^3, respectively, are less than the AAQS of 50 and 150 µg/m^3, respectively. The predicted total annual NO_2 concentration of 30.95 µg/m^3 is well below the AAQS concentration of 100 µg/m^3. These maximum concentrations include the appropriate background concentrations.

6.11.3 PSD CLASS II ANALYSIS

Summaries of the maximum PM_{10} and NO_x PSD increment consumption predicted for all sources for the screening analysis is presented in Table 6-17. Based on the screening analysis results, further modeling refinements were not required. The final modeling results are presented in Table 6-18.

The maximum predicted HSH 24-hour PM_{10} increment consumption concentration of 13.02 µg/m^3, is below the allowable PSD Class II increment of 30 µg/m^3. The annual average PM_{10} increment consumption was predicted to be less than zero at all receptors for all years.

The maximum predicted annual NO_2 increment consumption concentration of 2.08 µg/m^3 is below the allowable PSD Class II increments of 25 µg/m^3.

6.11.4 PSD CLASS I ANALYSIS

The maximum PM_{10} and NO_2 concentrations, predicted for the proposed project only at the CNWA PSD Class I area, are compared with the EPA's proposed PSD Class I significance levels in Table 6-19. All maximum predicted impacts were below the significant impact levels. Therefore, a full PSD Class I incremental analysis was not performed for these pollutants.

6.11.5 FLUORIDE IMPACTS

Maximum F concentrations due to the proposed project in the site vicinity and the CNWA PSD Class I area are presented in Tables 6-20 and 6-21, respectively, for the annual, 24-, 8-, 3-, and 1-hour averaging times. There are no AAQS or PSD increments for F. However, F impacts are required for the additional impact analysis and AQRV analysis for the Class I area, presented in Section 7.0.

At the site vicinity, the maximum predicted annual and 24-, 8-, and 1-hour fluoride concentrations are 1.0, 5.9, 9.7, and 15.4 $\mu g/m^3$, respectively. The maximum predicted annual and 24-, 8-, 3-, and 1-hour fluoride concentrations at the CNWA are 0.0005, 0.010, 0.022, 0.031, and 0.036 $\mu g/m^3$, respectively.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features[a]
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1 hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 m/s to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.

References:

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Pasquill, F. 1976. Atmospheric Dispersion Parameters in Gaussian Plume Modeling - Part II. Possible Requirements for Change in the Turner Workbook Values. EPA-600/4-76-030b, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

Schulman, L.L. and J.S. Scire. 1980. Buoyant Line and Point Source (BLP) Dispersion Model User's Guide. Document P-7304B, Environmental Research and Technology, Inc., Concord, MA.

Table 6-2. Major Features of the CALPUFF Model, Version 5.5

CALPUFF Model Features
• Source types: Point, line (including buoyancy effects), volume, area (buoyant, non-buoyant)
• Non-steady-state emissions and meteorological conditions (time-dependent source and emission data; gridded 3-dimensional wind and temperature fields; spatially-variable fields of mixing heights, friction velocity, precipitation, Monin-Obukhov length; vertically and horizontally-varying turbulence and dispersion rates; time-dependent source and emission data for point, area, and volume sources; temporal or wind-dependent scaling factors for emission rates)
• Efficient sampling function (integrated puff formulation; elongated puff (slug) formation)
• Dispersion coefficient options (Pasquill-Gifford (PG) values for rural areas; McElroy-Pooler values (MP) for urban areas; CTDM values for neutral/stable; direct measurements or estimated values)
• Vertical wind shear (puff splitting; differential advection and dispersion)
• Plume rise (buoyant and momentum rise; stack-tip effects; building downwash effects; partial plume penetration above mixing layer)
• Building downwash effects (Huber-Snyder method; Schulman-Scire method)
• Complex terrain effects (steering effects in CALMET wind field; puff height adjustments using ISC model method or plume path coefficient; enhanced vertical dispersion used in CTDMPLUS)
• Subgrid scale complex terrain (CTSG option) (CTDM flow module; dividing streamline as in CTDMPLUS)
• Dry deposition (gases and particles; options for diurnal cycle per pollutant, space and time variations with a resistance model, or none)
• Overwater and coastal interaction effects (overwater boundary layer parameters; abrupt change in meteorological conditions, plume dispersion at coastal boundary; fumigation; option to use Thermal Internal Boundary Layers (TIBL) into coastal grid cells)
• Chemical transformation options (Pseudo-first-order chemical mechanisms for SO_2, SO_4, HNO_3, and NO_3; Pseudo-first-order chemical mechanisms for SO_2, SO_4, NO, NO_2, HNO_3, and NO_3 (RIVAD/ARM3 method); user-specified diurnal cycles of transformation rates; no chemical conversions)
• Wet removal (scavenging coefficient approach; removal rate as a function of precipitation intensity and type)
• Graphical user interface
• Interface utilities (scan ISCST3 and AUSPLUME meteorological data files for problems; translate ISCST3 and AUSPLUME input files to CALPUFF input files

Note: CALPUFF = California Puff Model

Source: EPA, 2001.

Table 6-3. Summary of PM_{10}, F, and NO_x Current Actual and Future Potential Emission Rates for the Proposed Project--Cargill Green Bay

		Average Actual	PM_{10} Emissions				F Emissions				NO_x Emissions	
	EU	Operating Hours [d]	Hourly		Annual		Hourly		Annual		Annual	
Source	ID	(hr/yr)	lb/hr	g/s	TPY	g/s	lb/hr	g/s	TPY	g/s	TPY	g/s
Current Actual Emissions [a]												
Phosphoric Acid Plant No. 1-North Train	016	7,745	--	--	--	--	0.06	0.007	0.23	0.007	--	--
Phosphoric Acid Plant No. 1-South Train	017	7,667	--	--	--	--	0.14	0.018	0.55	0.018	--	--
Phosphoric Acid Plant No. 2	013	8,133	--	--	--	--	0.07	0.009	0.30	0.009	--	--
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	014	8,760	--	--	--	--	0.0023	0.00029	0.010	0.00029	--	--
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	015	8,760	--	--	--	--	0.01	0.001	0.05	0.001	--	--
Phosphoric Acid Blend Tanks-4	037	8,760	--	--	--	--	0.00009	0.000012	0.00040	0.000012	--	--
South DAP Plant--Stack A (R/G) [b]	007	7,862	2.85	0.359	11.21	0.359	0.79	0.100	3.12	0.100	--	--
South DAP Plant--Stack B (Dryer) [b]	007	7,862	2.85	0.359	11.21	0.359	0.79	0.100	3.12	0.100	7.37	0.236
North MAP/DAP Plant-Main Stack [b]	029	7,593	4.07	0.513	15.45	0.513	0.43	0.054	1.64	0.054	4.71	0.156
North MAP/DAP Plant-RG Stack [b]	029	7,593	4.07	0.513	15.45	0.513	0.43	0.054	1.64	0.054	--	--
Future Potential Emissions [c]												
Phosphoric Acid Plant No. 1-North Train	016	--	--	--	--	--	0.33	0.042	1.45	0.042	--	--
Phosphoric Acid Plant No. 1-South Train	017	--	--	--	--	--	0.54	0.068	2.37	0.068	--	--
Phosphoric Acid Plant No. 2	013	--	--	--	--	--	0.66	0.083	2.89	0.083	--	--
Phosphoric Acid Storage Tanks-2 (PAP 1, R-R)	014	--	--	--	--	--	0.02	0.003	0.088	0.0025	--	--
Phosphoric Acid Storage Tanks-2 (PAP 2, N-N)	015	--	--	--	--	--	0.02	0.003	0.088	0.0025	--	--
Phosphoric Acid Blend Tanks-4	037	--	--	--	--	--	0.10	0.013	0.44	0.013	--	--
South DAP Plant--Stack A (R/G) [b]	007	--	5.53	0.696	24.20	0.696	1.30	0.164	5.70	0.164	--	--
South DAP Plant--Stack B (Dryer) [b]	007	--	5.53	0.696	24.20	0.696	1.30	0.164	5.70	0.164	55.17	1.587
North MAP/DAP Plant-Main Stack [b]	029	--	6.8	0.857	29.79	0.857	1.60	0.202	7.01	0.202	32.44	0.933
North MAP/DAP Plant-RG Stack [b]	029	--	6.8	0.857	29.79	0.857	1.60	0.202	7.01	0.202	--	--

[a] Emissions from Table 2-?. Hourly emissions were calculated based on the actual annual numbers and the average actual operating hours.

[b] Plant emissions for PM_{10} and F were split between both plant stacks.

[c] Emissions from Tables 2-? through 2-? and Title V Permit No. 1050053-012-AV.

[d] From the 2002 and 2001 AORs.

Table 6-4. Stack and Operating Data for Current and Future Operations for the All Sources--Cargill Green Bay

Source	EU ID	ISCST3 ID Name	Location X (ft)	Location X (m)	Location Y (ft)	Location Y (m)	Stack/Vent Release Height (ft)	Stack/Vent Release Height (m)	Stack/Vent Diameter (ft)	Stack/Vent Diameter (m)	Actual Exhaust Flow Rate (acfm)	Exhaust Gas Exit Temperature (°F)	Exhaust Gas Exit Temperature (K)	Exhaust Gas Velocity (ft/s)	Exhaust Gas Velocity (m/s)
Current Operations															
No. 4 Sulfuric Acid Plant	004	SAP4	738.5	225.11	960.9	292.88	100.0	30.48	7.5	2.29	151,100	180	355	57.00	17.37
No. 5 Sulfuric Acid Plant	005	SAP5	1199.0	365.44	1040.6	317.16	150.0	45.72	8.0	2.44	148,000	169	350	49.07	14.96
No. 6 Sulfuric Acid Plant	038	SAP6	1534.8	467.82	691.9	210.88	150.0	45.72	9.0	2.74	144,500	174	352	37.86	11.54
Phosphoric Acid Plant No. 1--North	016	NPHOS1	397.1	121.03	645.8	196.85	100.5	30.63	3.5	1.07	26,400	110	316	45.73	13.94
Phosphoric Acid Plant No. 1--South	017	SPHOS1	405.9	123.71	446.9	136.20	100.5	30.63	3.5	1.07	21,200	108	315	36.72	11.19
Phosphoric Acid Plant No. 2	013	PHOS2	244.9	74.66	848.4	258.59	110.0	33.53	3.0	0.91	21,300	114	319	50.22	15.31
Phosphoric Acid Tanks (2, R-R)	014	STORPAD1	443.1	135.06	400.8	122.17	59.3	18.08	0.8	0.25	113	94	308	3.45	1.05
Phosphoric Acid Tanks (2, N-N)	015	STORPAD2	457.1	139.33	966.9	294.71	62.8	19.13	1.3	0.41	109	91	306	1.31	0.40
Phosphoric Acid Blend Tanks	037	BLENDTNK	707.3	215.60	538.1	164.02	22.5	6.86	0.5	0.15	94	77	298	7.98	2.43
South DAP Plant--Stack A	007	SDAPGRAN	417.1	127.13	8.1	2.46	130.0	39.62	6.0	1.83	40,000	191	361	23.58	7.19
South DAP Plant--Stack B	007	SDAPMAIN	522.8	159.34	10.9	3.32	129.5	39.47	7.5	2.29	144,500	107	315	54.51	16.62
North MAP/DAP Plant-Main Stack	029	NDAPMAIN	522.4	159.22	127.8	38.95	128.0	39.01	7.5	2.29	237,800	103	313	89.71	27.34
North MAP/DAP Plant-RG Stack	029	NDAPGRAN	433.1	132.01	130.6	39.80	116.5	35.51	5.5	1.68	89,800	198	365	63.00	19.20
MAP/DAP Shipping & Storage Buildings	020	DAPSHIP	313.0	95.4	199.0	60.67	131.5	40.08	8.0	2.44	137,100	92	306	45.46	13.86
Molten Sulfur Railcar/Backup Truck Pit	034	RAILPIT	-722.1	-220.10	7.4	2.26	11.0	3.35	0.8	0.24	16,000	68	293	530 52	161.70

Area Sources	EU ID	ISCST3 ID Name	Location X (ft)	Location X (m)	Location Y (ft)	Location Y (m)	Release Height (ft)	Release Height (m)	X-Init (ft)	X-Init (m)	Y-Init (ft)	Y-Init (m)	Angle (deg)
Molten Sulfur Tank No. 1 (9 Vents)	030	MOLTTNK1	-670.1	-204.26	29.2	8.90	33.0	10.06	60.0	18.29	60.0	18.29	0
Molten Sulfur Tank No. 2 (10 Vents)	031	MOLTTNK2	881.2	268.58	580.7	177.00	33.0	10.06	45.0	13.72	45.0	13.72	0
Molten Sulfur Tank No. 3 (10 Vents)	032	MOLTTNK3	933.5	284.54	580.7	177.00	33.0	10.06	45.0	13.72	45.0	13 72	0
Molten Sulfur Tank No. 4 (1 Vent)	039	MOLTTNK4	-756.2	-230.49	45.2	13.79	37.0	11.28	59.1	18.00	59.1	18 00	0
Molten Sulfur Pit No. 4	036	SULFPIT4	926.9	282.53	640.0	195.07	9.5	2.90	10.0	3.05	10.0	3.05	0
Molten Sulfur Pit No. 5	035	SULFPIT5	884.0	269.44	552.6	168.42	11.3	3.45	9.1	2.76	9.1	2.76	0
Molten Sulfur Pit No. 6	039	SULFPIT6	885.1	269.78	640.0	195.07	8.0	2.44	10.0	3.05	10.0	3.05	0
Molten Sulfur Truck Pit	033	TRUCKUNL	902.4	275.06	525.3	160.11	11.3	3.45	24.7	7.53	37.6	11.47	0

Table 6-4. Stack and Operating Data for Current and Future Operations for the All Sources--Cargill Green Bay

Source	EU ID	ISCST3 ID Name	Location X (ft)	Location X (m)	Location Y (ft)	Location Y (m)	Stack/Vent Release Height (ft)	Stack/Vent Release Height (m)	Stack/Vent Diameter (ft)	Stack/Vent Diameter (m)	Actual Exhaust Flow Rate (acfm)	Exhaust Gas Exit Temperature (°F)	Exhaust Gas Exit Temperature (K)	Exhaust Gas Velocity (ft/s)	Exhaust Gas Velocity (m/s)
Future Operations															
No. 4 Sulfuric Acid Plant	004	SAP4	738.5	225.11	960.9	292.88	100.0	30.48	7.5	2.29	151,100	180	355	57.00	17.37
No. 5 Sulfuric Acid Plant	005	SAP5	1199.0	365.44	1040.6	317.16	150.0	45.72	8.0	2.44	148,000	169	350	49.07	14.96
No. 6 Sulfuric Acid Plant	038	SAP6	1534.8	467.82	691.9	210.88	150.0	45.72	9.0	2.74	144,500	174	352	37.86	11.54
Phosphoric Acid Plant No. 1--North	016	NPHOS1	397.1	121.0	645.8	196.85	100.5	30.63	3.5	1.07	26,400	110	316	45.73	13.94
Phosphoric Acid Plant No. 1--South	017	SPHOS1	405.9	123.7	446.9	136.20	100.5	30.63	3.5	1.07	21,200	108	315	36.72	11.19
Phosphoric Acid Plant No. 2	013	PHOS2	244.9	74.7	848.4	258.59	110.0	33.53	3.0	0.91	21,300	114	319	50.22	15.31
Phosphoric Acid Tanks (2, R-R)	014	STORPAD1	443.1	135.1	400.8	122.17	59.3	18.08	0.8	0.25	113	94	308	3.45	1.05
Phosphoric Acid Tanks (2, N-N)	015	STORPAD2	457.1	139.3	966.9	294.71	62.8	19.13	1.3	0.41	109	91	306	1.31	0.40
Phosphoric Acid Blend Tanks	037	BLENDTNK	707.3	215.6	538.1	164.02	22.5	6.86	0.5	0.15	94	77	298	7.98	2.43
South DAP Plant--Stack A [a]	007	SDAPGRAN	417.1	127.1	8.1	2.46	130.0	39.62	5.0	1.52	40,000	190	361	33.95	10.35
South DAP Plant--Stack B [a]	007	SDAPMAIN	522.8	159.3	10.9	3.32	129.5	39.47	8.0	2.44	150,000	97	309	49.74	15.16
North AP Plant-Main Stack [a]	029	NDAPMAIN	522.4	159.2	127.8	38.95	128.0	39.01	8.0	2.44	153,000	113	318	50.73	15.46
North AP Plant-RG Stack [a]	029	NDAPGRAN	433.1	132.0	130.6	39.80	116.5	35.51	5.0	1.52	56,000	194	363	47.53	14.49
MAP/DAP Shipping & Storage Buildings	020	DAPSHIP	313.0	95.4	199.0	60.67	131.5	40.08	8.0	2.44	137,100	92	306	45.46	13.86
Molten Sulfur Railcar/Backup Truck Pit	034	RAILPIT	-722.1	-220.10	7.4	2.26	11.0	3.35	0.8	0.24	16,000	68	293	530.52	161.70

Area Sources	EU ID	ISCST3 ID Name	Location X (ft)	Location X (m)	Location Y (ft)	Location Y (m)	Release Height (ft)	Release Height (m)	X-Init (ft)	X-Init (m)	Y-Init (ft)	Y-Init (m)	Angle (deg)
Molten Sulfur Tank No. 1 (9 Vents)	030	MOLTTNK1	-670.1	-204.26	29.2	8.90	33.0	10.06	60.0	18.29	60.0	18.29	0
Molten Sulfur Tank No. 2 (10 Vents)	031	MOLTTNK2	881.2	268.58	580.7	177.00	33.0	10.06	45.0	13.72	45.0	13.72	0
Molten Sulfur Tank No. 3 (10 Vents)	032	MOLTTNK3	933.5	284.54	580.7	177.00	33.0	10.06	45.0	13.72	45.0	13.72	0
Molten Sulfur Tank No. 4 (1 Vent)	039	MOLTTNK4	-756.2	-230.49	45.2	13.79	37.0	11.28	59.1	18.00	59.1	18.00	0
Molten Sulfur Pit No. 4	036	SULFPIT4	926.9	282.53	640.0	195.07	9.5	2.90	10.0	3.05	10.0	3.05	0
Molten Sulfur Pit No. 5	035	SULFPIT5	884.0	269.44	552.6	168.42	11.3	3.45	9.1	2.76	9.1	2.76	0
Molten Sulfur Pit No. 6	039	SULFPIT6	885.1	269.78	640.0	195.07	8.0	2.44	10.0	3.05	10.0	3.05	0
Molten Sulfur Truck Pit	033	TRUCKUNL	902.4	275.06	525.3	160.11	11.3	3.45	24.7	7.53	37.6	11.47	0

[a] Operating parameters represent the worst-case for either MAP or DAP mode.

Table 6-5. Summary of Future Potential PM/PM_{10} and NO_x Emission Rates for all Sources--Cargill Green Bay

Source	EU ID	PM_{10} Emissions Hourly lb/hr	PM_{10} Emissions Hourly g/s	PM_{10} Emissions Annual TPY	PM_{10} Emissions Annual g/s	NO_x Emissions Annual TPY	NO_x Emissions Annual g/s	Ref.
Molten Sulfur Handling System								
Molten Sulfur Tank No. 1 (9 Vents)	030	0.320	0.040	1.40	0.040	--	--	(1)
Molten Sulfur Tank No. 2 (10 Vents)	031	0.326	0.041	1.43	0.041	--	--	(1)
Molten Sulfur Tank No. 3 (10 Vents)	032	0.326	0.041	1.43	0.041	--	--	(1)
Molten Sulfur Tank No. 4 (1 Vent)	039	0.176	0.022	0.77	0.022	--	--	(1)
Molten Sulfur Pit No. 4	036	0.011	0.0014	0.05	0.0014	--	--	(1)
Molten Sulfur Pit No. 5	035	0.011	0.0014	0.05	0.0014	--	--	(1)
Molten Sulfur Pit No. 6	039	0.011	0.0014	0.05	0.0014	--	--	(1)
Molten Sulfur Truck Pit	033	0.011	0.0014	0.05	0.0014	--	--	(1)
Molten Sulfur Railcar/Backup Truck Pit	034	0.320	0.040	1.40	0.040	--	--	(1)
Sulfuric Acid Plants								
No. 4 Sulfuric Acid Plant	004	--	--	--	--	45.99	1.323	(4)
No. 5 Sulfuric Acid Plant	005	--	--	--	--	61.32	1.764	(4)
No. 6 Sulfuric Acid Plant	038	--	--	--	--	60.0	1.726	(2)
South DAP Plant--Stack A (R/G) [a]	007	5.53	0.696	24.20	0.696	--	--	(3)
South DAP Plant--Stack B (Dryer) [a]	007	5.53	0.696	24.20	0.696	55.17	1.587	(3)
MAP/DAP Shipping & Storage Buildings	020	4.1	0.517	18.0	0.517	--	--	(2)
North MAP/DAP Plant-Main Stack [a]	029	6.8	0.857	29.79	0.857	32.44	0.933	(3)
North MAP/DAP Plant-RG Stack [a]	029	6.8	0.857	29.79	0.857	--	--	(3)

[a] Plant emissions for PM/PM_{10} were split between both plant stacks.

References:
1. Based on actual emissions from the 2001 and 2002 AORs (refer to Appendix A).
2. Emission rates from Title V Permit No. 1050053-012-AV.
3. Based on the proposed future potential emission rates. Refer to Tables 2-4 through 2-9 for derivation.
4. Calculated based on the emission limit for the No. 6 SAP (0.12 lb/ton H_2SO_4).

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold [c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
	Bartow Phosphate Cnt. (IMC Uranium Rec.)	408.4	3,082.2	-1.1	2.1	332	2.4	-828	17	No	Yes
1050052	C.F. Industries, Bartow	408.3	3,082.5	-1.2	2.4	333	2.7	64	24	Yes	Yes
1050217	Polk Power Partners, L.P. Mulberry	413.6	3,080.6	4.1	0.5	83	4.1	35	53	No	No
1050229	Parallel Products Of Florida	413.9	3,080.7	4.4	0.6	82	4.4	31	58	No	No
1050097	Custom Chemicals Corporation	408.0	3,085.5	-1.5	5.4	344	5.6	2	82	No	No
1050048	Cargill Mulberry (formerly Mulberry Phosphates, Inc.)	406.8	3,085.1	-2.7	5.0	332	5.7	3	84	No	No
1050021	Ashland Specialty Chemical Co.	411.1	3,085.9	1.6	5.8	15	6.0	1	90	No	No
1050148	Grand Eagle Service, Inc.	404.9	3,084.1	-4.6	4.0	311	6.1	1	92	No	No
1050046	Cargill Fertilizer - Bartow	409.8	3,086.6	0.3	6.5	3	6.5	257	100	Yes	Yes
1050146	Pavex Corporation	413.0	3,086.2	3.5	6.1	30	7.0	14	111	No	No
1050050	U S Agri-Chemicals - Bartow	413.2	3,086.3	3.7	6.2	31	7.2	268	114	Yes	Yes
1050312	Master Containers, Inc.	404.3	3,085.6	-5.3	5.5	316	7.6	2	122	No	No
1050234	Hines Energy Complex (Progress Energy)	414.3	3,073.9	4.8	-6.2	142	7.9	200	127	Yes	Yes
	Organic Matters Inc.	417.9	3,083.0	8.4	2.9	71	8.9	21	148	No	No
1050055	IMC Phosphates (South Pierce)	407.5	3,071.4	-2.0	-8.7	193	8.9	770	149	Yes	Yes
1050064	Florida Rock Ind. - Bartow	416.8	3,085.8	7.3	5.7	52	9.3	57	155	No	No
1050145	Bartow Ethanol, Inc.	418.8	3,078.8	9.3	-1.3	98	9.3	281	157	Yes	Yes
1050056	CD Global Prairie Mine (IMC Agrico)	402.9	3,087.0	-6.6	6.9	316	9.5	607	161	Yes	Yes
1050182	Geologic Recovery Systems	401.8	3,085.8	-7.7	5.7	307	9.6	20	162	No	No
1050231	Orange Cogeneration Facility	418.7	3,083.0	9.2	2.9	73	9.6	48	163	No	No
1050198	Palex - Homeland	419.1	3,078.1	9.6	-2.0	102	9.8	97	166	No	No
1050045	Peace River Citrus Products, Inc.	418.7	3,083.6	9.2	3.5	69	9.8	95	167	No	No
1050128	Ridge - Bartow	418.6	3,084.1	9.1	4.0	66	9.9	47	169	No	No
1050157	Purina Mills, Inc.	402.0	3,087.0	-7.5	6.9	313	10.2	22	174	No	No
1050066	K.C. Industries, L.L.C.	401.5	3,086.5	-8.0	6.4	309	10.2	16	175	No	No
1050319	Clark Environmental Inc	401.2	3,086.6	-8.3	6.5	308	10.5	13	181	No	No
1050057	IMC Phosphates (Nichols)	398.4	3,084.2	-11.1	4.1	290	11.8	1,337	207	Yes	Yes
1050199	Vigiron	420.4	3,075.2	10.9	-4.9	114	12.0	88	209	No	No
1050047	Agrifos Mining, L.L.C. - Nichols	398.7	3,085.3	-10.8	5.2	296	12.0	557	210	Yes	Yes
1050034	IMC Phosphates (CFMO)	398.2	3,075.7	-11.3	-4.4	249	12.1	1,781	213	Yes	Yes
1050223	Florida Power Corp.-Tiger Bay Cogeneration Facility	416.3	3,069.3	6.8	-10.8	148	12.8	46	225	No	No
1050059	IMC Phosphates (New Wales)	396.7	3,079.4	-12.8	-0.7	267	12.8	1,521	226	Yes	Yes
1050051	U.S. Agri-Chemicals - Ft. Meade	416.0	3,069.0	6.5	-11.1	150	12.9	119	227	No	No
1050026	Alcoa , L.L.C.	416.8	3,069.5	7.3	-10.6	145	12.9	69	227	No	No
0570448	North Star Recycling--Port Sutton	398.3	3,086.7	-11.2	6.59	300	13.0	2	230	No	No
1050314	Supermag Processing Facility	405.1	3,067.8	-4.4	-12.3	200	13.0	0.1	231	No	No
1050200	Phosphate Rock Dryer	399.1	3,070.6	-10.4	-9.5	228	14.1	5	252	No	No
1050211	General Plastics Division Of PMC, Inc.	413.5	3,093.8	4.0	13.7	16	14.3	4	255	No	No

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location[a] X (km)	Relative Location[a] Y (km)	Relative Location[a] Direction (deg.)	Relative Location[a] Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold[c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
1050233	Polk Power Station-TECO	402.5	3,067.4	-7.1	-12.8	209	14.6	149	261	No	No
1050228	Sadler Drum Company	396.2	3,089.3	-13.3	9.2	305	16.2	0	293	No	No
1050244	Sunbelt Forest Products Corp.	422.1	3,092.1	12.6	12.0	46	17.4	4	317	No	No
1050151	Central Florida Hot-Mix, Inc.	412.5	3,097.7	3.0	17.6	10	17.9	45	327	No	No
1050106	Citrus World, Inc.--Florida's Natural Growers-Bartow	422.7	3,092.6	13.2	12.5	47	18.2	89	334	No	No
1050196	O. K. West & Son	411.5	3,098.2	2.0	18.1	6	18.2	1	334	No	No
1050100	Shell Epoxy Resins LLC	410.7	3,098.9	1.2	18.8	4	18.8	25	347	No	No
1050073	Rinker Materials Corporation	412.5	3,099.0	3.0	18.9	9	19.1	38	353	No	No
1050316	McGee Tire Stores, Inc.	413.7	3,098.8	4.2	18.7	13	19.2	18	353	No	No
1050081	Quikrete Of Florida, Inc.	412.8	3,099.0	3.3	18.9	10	19.2	1	354	No	No
1050127	Juice Bowl Products	409.4	3,099.9	-0.1	19.8	360	19.8	1	366	No	No
1050226	Pops Painting, Inc.	399.3	3,097.2	-10.2	17.1	329	19.9	0	368	No	No
1050297	Polk Co. Animal Services	418.4	3,098.4	8.9	18.3	26	20.3	2	376	No	No
1050240	International Beverage Systems, Inc.	398.0	3,097.0	-11.5	16.9	326	20.4	0.3	379	No	No
1050298	Polk Co. No. Central Landfill	418.9	3,098.5	9.4	18.4	27	20.7	3	384	No	No
1050134	Heath Funeral Chapel	407.1	3,101.9	-2.4	21.8	354	21.9	1	409	No	No
1050003	Lakeland Electric, Larsen Power Plant	408.9	3,102.5	-0.6	22.4	358	22.4	488	418	Yes	Yes
1050213	Florida Favorite Fertilizer Company	403.5	3,101.7	-6.0	21.6	344	22.4	3	418	No	No
1050120	Cement Products & Supply Co., Inc.	405.5	3,102.2	-4.0	22.1	350	22.5	1	419	No	No
0570075	Coronet Industries, Inc.	393.8	3,096.3	-15.7	16.2	316	22.6	9	421	No	No
1050009	Florida Tile Industries, Inc.	405.4	3,102.4	-4.1	22.3	350	22.7	14	423	No	No
1050137	Monier, Inc.	414.0	3,102.5	4.5	22.4	11	22.8	44	427	No	No
1050177	Publix Super Markets-Lakeland Danish Bakery	400.8	3,101.5	-8.7	21.4	338	23.1	5	432	No	No
1050139	Maxpak Corporation	402.0	3,102.0	-7.5	21.9	341	23.1	16	433	No	No
0490015	Hardee Power Station	404.8	3,057.4	-4.7	-22.7	192	23.2	247	434	No	No
1050272	Lakeland Crematory	419.9	3,101.0	10.4	20.9	26	23.3	4	436	No	No
0570220	Southern Culvert	391.5	3,095.0	-18.0	14.9	310	23.4	14	437	No	No
1050034	IMC-Agrico Co. (CFMO), Ft. Lonesome	389.5	3,068.0	-20.0	-12.1	239	23.4	-443	438	No	No
1050114	Ewell Industries - Lakeland	398.9	3,101.2	-10.6	21.1	333	23.6	0.4	442	No	No
1050236	Weyerhaeuser Company	396.0	3,100.1	-13.5	20.0	326	24.1	0.002	452	No	No
7770037	Apac - Florida, Inc., Tampa Div.	392.6	3,097.3	-16.9	17.2	316	24.1	22	452	No	No
1050015	US Beverage Packing Lakeland Plant	399.0	3,101.8	-10.5	21.7	334	24.1	140	452	No	No
1050230	Breed Technologies Inc.	396.3	3,100.3	-13.2	20.2	327	24.1	1	453	No	No
0570460	Hardie Building Products Inc,	387.1	3,089.5	-22.4	9.4	293	24.3	5	457	No	No
1050095	Lakeland Regional Medical Center	406.4	3,104.3	-3.1	24.2	353	24.4	2	458	No	No
1050158	High Performance Systems, Inc.	428.1	3,096.1	18.6	16.0	49	24.5	1	460	No	No
1050252	Cargill Fertilizer, Inc.	425.2	3,061.2	15.7	-18.9	140	24.6	0.2	461	No	No
0570474	T-R Drum & Freight Co.	389.0	3,094.0	-20.5	13.9	304	24.8	1	465	No	No

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold [c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
1050208	Lakeland Drum Service, Inc.	418.8	3,103.6	9.3	23.5	22	25.3	50	475	No	No
1050017	Pursell Industries, Inc.	428.0	3,097.4	18.5	17.3	47	25.3	6	477	No	No
1050174	Pepperidge Farm, Inc	403.3	3,104.8	-6.2	24.7	346	25.5	1	479	No	No
1050096	Florida Distillers - Auburndale	421.4	3,102.9	11.9	22.8	28	25.7	1	484	No	No
1050221	Auburndale Power Partners	420.8	3,103.3	11.3	23.2	26	25.8	553	486	Yes	Yes
1050334	Auburndale Power Osprey	420.8	3,103.3	11.3	23.2	26	25.8	204	486	No	No
1050143	City Of Lakeland	403.7	3,105.3	-5.8	25.2	347	25.9	3	487	No	No
1050175	Ennis Drum Service, Inc./Ennis Container, Inc.	422.5	3,102.5	13.0	22.4	30	25.9	2	488	No	No
1050082	APAC-Florida, Inc., Macasphalt Div.	423.7	3,101.9	14.2	21.8	33	26.0	81	489	No	No
1050004	Lakeland Electric, McIntosh Power Plant	409.0	3,106.2	-0.5	26.1	359	26.1	2,308	492	Yes	Yes
0570388	Hardee Manufacturing Co.	392.2	3,099.7	-17.3	19.6	319	26.1	7	493	No	No
0570417	International Paper	391.7	3,099.3	-17.8	19.2	317	26.2	0.01	494	No	No
0571016	Consolidated Fabricating, Inc.	392.4	3,100.1	-17.1	20.0	319	26.3	6	496	No	No
0570124	Rinker Materials Corporation	392.2	3,100.0	-17.3	19.9	319	26.4	2	497	No	No
1050203	Fleetwood Homes Of Florida Inc.	422.4	3,103.2	12.9	23.1	29	26.5	0.1	499	No	No
1050023	Cutrale Citrus Juices USA,Inc	421.6	3,103.7	12.1	23.6	27	26.5	673	500	Yes	Yes
0570318	Southdown, Inc.	390.2	3,098.3	-19.3	18.2	313	26.5	6	501	No	No
1050007	Owens-Brockway Glass Container Inc.	423.4	3,102.8	13.9	22.7	31	26.6	123	502	No	No
1050022	Tenneco Packaging, Inc.	423.4	3,102.8	13.9	22.7	31	26.6	0.3	502	No	No
1050216	Ridge Generating Station, L.P. [d]	427.0	3,100.3	17.5	20.2	41	26.8	61	505	No	No
1050227	Central Florida Crematory Of Polk Co.	405.0	3,106.5	-4.5	26.4	350	26.8	2	506	No	No
1050037	All-Temp Storage LLC	421.7	3,104.2	12.2	24.1	27	27.0	87	510	No	No
1050076	International Paper - Auburndale	421.7	3,104.3	12.2	24.2	27	27.1	4	512	No	No
0571289	North Star Recycling--Dover Street	362.3	3,086.5	-47.2	6.4	278	47.7	20	924	No	No
1050072	Winterhaven Hospital	428.7	3,100.4	19.2	20.3	43	27.9	1	529	No	No
0490017	Singletary Concrete Prod Inc	418.5	3,053.5	9.0	-26.6	161	28.1	8	533	No	No
1050122	Auburndale Facility	423.5	3,104.6	14.0	24.5	30	28.2	5	534	No	No
0570370	Paradise, Inc.	388.5	3,099.0	-21.0	18.9	312	28.3	2	535	No	No
0571115	Redman Homes, Inc.	387.0	3,097.4	-22.5	17.3	308	28.3	15	536	No	No
0570468	Gatsby Spas Inc.	387.1	3,097.6	-22.4	17.5	308	28.4	15	539	No	No
0490041	CF Industries, Inc.	406.8	3,051.5	-2.7	-28.6	185	28.7	1	545	No	No
1050067	Florida Mining & Materials Corp.	428.1	3,102.0	18.6	21.9	40	28.7	6	545	No	No
0570249	Alcoa Extrusions	385.6	3,097.0	-23.9	16.9	305	29.3	200	555	No	No
	IMC - Agrico Co. (Pierce)	404.1	3,079.0	-16.7	-24.3	214	29.5	-311	560	No	No
1050099	AOC, L.L.C.	401.0	3,108.5	-8.5	28.4	343	29.6	36	563	No	No
0571021	Dunco Rock & Gravel Inc	386.2	3,098.7	-23.3	18.6	309	29.8	5	566	No	No
0570230	Florida Brick & Clay Co	384.9	3,097.1	-24.6	17.0	305	29.9	3	568	No	No

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

		Source Location		Relative Location [a]				PM_{10} Emissions	Q Emissions	Included in Modeling Analysis?	
Plant ID	Facility Name	East (km)	North (km)	X (km)	Y (km)	Direction (deg.)	Distance (km)	Rate[b] (TPY)	Threshold [c] [(Dist. - SIA) X 20]	AAQS	PSD Class II
0570374	Southern Grouts & Mortars	386.0	3,098.7	-23.5	18.6	308	30.0	5	569	No	No
0570320	Dart Container Corp.Of FL	384.9	3,098.2	-24.6	18.1	306	30.5	1	581	No	No
1050333	Human Crematory	433.6	3,099.7	24.1	19.6	51	31.0	1	591	No	No
1050091	Florida Rock Ind. - Winter Haven	428.0	3,105.2	18.5	25.1	36	31.2	55	594	No	No
0570438	Florida Gas Transmission Co.	391.9	3,106.6	-17.6	26.5	326	31.8	0.3	606	No	No
0570091	Terra Asgrow	388.6	3,104.6	-20.9	24.5	320	32.2	5	614	No	No
1050002	Citrus World, Inc.	441.1	3,087.3	31.6	7.2	77	32.4	40	618	No	No
1050090	Florida Distillers - Lake Alfred	428.0	3,108.1	18.5	28.0	33	33.6	0.4	641	No	No
0490043	IPS Vandolah Power Project	408.8	3,044.5	-0.8	-35.6	181	35.6	164	682	No	No
1050209	Florida Treatt, Inc.	434.8	3,109.2	25.3	29.1	41	38.6	0.1	741	No	No
1050019	Cargill Citro-America, Inc.	447.9	3,068.3	38.4	-11.8	107	40.2	248	773	No	No
1050276	Ytong Florida, Ltd.	440.3	3,106.2	30.8	26.1	50	40.4	1	777	No	No
1050263	FL Dept Of Corrections	423.0	3,118.2	13.5	38.1	20	40.4	1	778	No	No
1050166	Scanamerican Holdings Corporation	430.1	3,115.4	20.6	35.3	30	40.9	3	787	No	No
1050113	Lake Wales Mine	450.2	3,085.4	40.7	5.3	83	41.0	96	791	No	No
0490003	The Mancini Packing Company	421.4	3,040.8	11.9	-39.3	163	41.1	25	791	No	No
0570005	CF Industries--Plant City	388.0	3,116.0	-21.5	35.9	329	41.8	705	807	No	No
0570180	FECP/CAST Crete Division	371.9	3,099.2	-37.6	19.1	297	42.2	11	813	No	No
1050001	Citrosuco North America, Inc.	451.6	3,085.5	42.1	5.4	83	42.4	67	819	No	No
0570259	Ewell Industries, Inc.	368.6	3,092.1	-40.9	12.0	286	42.6	5	822	No	No
0570261	Hillsborough Cty. RRF	368.2	3,092.7	-41.3	12.6	287	43.2	92	834	No	No
7770380	Kearney Development Company	368.7	3,094.8	-40.8	14.7	290	43.4	1	837	No	No
0570069	Industrial Galvanizers America, Inc	368.5	3,094.5	-41.0	14.4	289	43.5	11	839	No	No
0571196	Havatampa, Inc.	368.7	3,095.4	-40.8	15.3	291	43.6	0.0007	842	No	No
0570090	Southeastern Wire	368.2	3,094.6	-41.3	14.5	289	43.8	14	845	No	No
0570279	Florida Rock Industries, Inc.	365.8	3,085.0	-43.7	4.9	276	44.0	22	849	No	No
0570025	Trademark Nitrogen Corp	367.3	3,092.6	-42.2	12.5	286	44.0	1,463	850	Yes	Yes
0570280	Ewell Industries, Inc.	367.1	3,092.7	-42.4	12.6	287	44.2	24	855	No	No
0570240	Ewell Industries	367.0	3,092.8	-42.5	12.7	287	44.4	4	857	No	No
0570241	Rinker Materials Corporation	364.9	3,084.4	-44.6	4.3	276	44.8	3	866	No	No
0550035	Sunpure, Limited	448.3	3,057.6	38.8	-22.5	120	44.9	1	868	No	No
0570260	Gaylord Container Corporation	366.3	3,092.3	-43.2	12.2	286	44.9	5	868	No	No
0571242	National Gypsum	364.7	3,075.6	-44.8	-4.5	264	45.0	14	870	No	No
0570405	Goodyear Tire & Rubber Company	366.4	3,093.2	-43.1	13.1	287	45.0	10	871	No	No
0570076	Delta Asphalt	372.1	3,105.4	-37.4	25.3	304	45.2	62	873	No	No
1010076	Plaza Materials Corporation	388.4	3,120.1	-21.1	40.0	332	45.2	1	874	No	No
0570061	Tampa Armature Works	365.6	3,091.7	-43.9	11.6	285	45.4	0.3	878	No	No
0570121	Ewell Industries, Inc.	364.0	3,075.0	-45.5	-5.1	264	45.8	12	886	No	No

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Direction (deg.)	Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold [c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
0570373	Howard F. Curren AWT Plant	364.0	3,089.5	-45.5	9.4	282	46.5	53	899	No	No
0570321	Mantua Manufacturing Co.	364.7	3,092.5	-44.8	12.4	285	46.5	1	900	No	No
0570364	Manna Pro Corporation	364.7	3,092.6	-44.8	12.5	286	46.5	11	900	No	No
0570008	Cargill Riverview Facility	362.9	3,082.5	-46.6	2.4	273	46.7	329	903	No	No
0570317	Janet & Charlies Wood Recycling Fac.	363.1	3,085.3	-46.4	5.2	276	46.7	100	904	No	No
0570119	Gulf Coast Metals	364.7	3,093.6	-44.8	13.5	287	46.8	1	906	No	No
0570150	Dravo Lime,Inc.	362.9	3,084.7	-46.6	4.6	276	46.8	42	907	No	No
0570401	Florida Mega-Mix, Inc.	364.5	3,093.4	-45.0	13.3	286	46.9	8	908	No	No
7771101	Woodruff And Sons Inc	364.3	3,093.2	-45.2	13.1	286	47.0	5	911	No	No
0570409	Coniglio Construction & Demolition	368.9	3,104.2	-40.6	24.1	301	47.2	24	914	No	No
1050061	Holly Hill Fruit Products	441.0	3,115.4	31.5	35.3	42	47.3	114	916	No	No
0570344	Pops Painting, Inc. Tampa Tank	362.8	3,087.9	-46.7	7.8	279	47.3	38	917	No	No
0570057	Gulf Coast Recycling, Inc.	364.0	3,093.5	-45.5	13.4	286	47.4	17	919	No	No
7775052	Woodruff & Sons, Inc.	363.6	3,092.3	-45.9	12.2	285	47.4	5	919	No	No
7775053	Woodruff & Sons, Inc.	363.6	3,092.3	-45.9	12.2	285	47.4	5	919	No	No
7775054	Woodruff & Sons, Inc.	363.6	3,092.3	-45.9	12.2	285	47.4	7	919	No	No
0570094	IMC-Phosphates Co. (Big Bend)	362.1	3,076.1	-47.4	-4.0	265	47.6	76	921	No	No
0570224	Reed Minerals Division	362.2	3,085.5	-47.3	5.4	277	47.6	32	922	No	No
1010075	Matt Stone Inc.	385.3	3,121.1	-24.2	41.0	329	47.6	0.3	922	No	No
0570092	Kinder Morgan Port Sutton Terminal LLC	362.4	3,087.1	-47.1	7.0	278	47.6	141	923	No	No
0570022	Marathon Tampa Asphalt	362.2	3,087.2	-47.3	7.1	279	47.8	0.1	927	No	No
0570056	Building Materials Manf. Corp.	362.2	3,087.2	-47.3	7.1	279	47.8	45	927	No	No
0570029	Nitram, Inc.	362.5	3,089.0	-47.0	8.9	281	47.8	291	927	No	No
0570039	TECO, Big Bend Station	361.9	3,075.0	-47.6	-5.1	264	47.9	5,942	927	Yes	Yes
0570033	CSX Transportation, Inc.	362.4	3,089.0	-47.1	8.9	281	47.9	369	929	No	No
0550022	Fountain Funeral Home	449.0	3,052.8	39.5	-27.3	125	48.0	0	930	No	No
0550016	Jahna Concrete, Inc.	450.1	3,054.3	40.6	-25.8	122	48.1	28	932	No	No
0570238	Keys Concrete Industries, Inc.	363.2	3,093.3	-46.3	13.2	286	48.1	7	933	No	No
0570163	Griffin Industries	364.1	3,096.4	-45.4	16.3	290	48.2	4	935	No	No
0570281	Metro Redi-Mix Company	363.1	3,066.0	-46.4	-14.1	253	48.5	9	941	No	No
0570024	IMC-Phosphates Co.(Port Sutton Terminal)	361.5	3,087.5	-48.0	7.4	279	48.6	391	942	No	No
1050249	Ewell Industries, Inc.	441.1	3,117.1	31.6	37.0	41	48.6	4	942	No	No
0570299	Premdor Inc	362.1	3,092.5	-47.4	12.4	285	49.0	13	950	No	No
0550007	Jahna Concrete	450.0	3,052.2	40.5	-27.9	125	49.2	39	954	No	No
0570255	Lehigh Portland Cement Company	360.7	3,086.8	-48.8	6.7	278	49.3	11	955	No	No
0570097	W R Bonsal Co	363.6	3,098.1	-45.9	18.0	291	49.3	2	956	No	No
0570436	Bay City Sand, Inc.	362.8	3,096.1	-46.7	16.0	289	49.4	9	957	No	No
0550024	Highlands Crematory, Inc.	450.7	3,052.8	41.2	-27.3	124	49.4	3	958	No	No

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold [c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
0810010	FPL - Manatee Power Plant	367.3	3,054.2	-42.3	-25.9	238	49.6	9,472	962	Yes	Yes
0570185	Rinker Materials Corporation	363.2	3,098.1	-46.3	18.0	291	49.7	15	964	No	No
1050014	Davenport Mine-Standard Sand & Silica Co.	441.5	3,118.2	32.0	38.1	40	49.8	301	965	No	No
0570087	Coreslab Structures (Tampa), Inc.	363.2	3,098.4	-46.3	18.3	292	49.8	2	966	No	No
0570136	Verlite Co	363.0	3,098.1	-46.5	18.0	291	49.9	30	967	No	No
0571217	Sea 3 Of FL, Inc. (Tampa LPG Terminal)	360.1	3,087.1	-49.4	7.0	278	49.9	1	968	No	No
0570040	TECO, Gannon	360.1	3,087.5	-49.4	7.4	279	50.0	5,267	969	Yes	Yes
0570014	Eastern Association Terminal Rock Port	360.2	3,088.9	-49.3	8.8	280	50.1	249	972	No	No
0571151	Weyerhaeuser Company	362.8	3,098.3	-46.7	18.2	291	50.1	9	972	No	No
0570003	CF Industries, Inc.	362.8	3,098.4	-46.7	18.3	291	50.2	8	973	No	No
0570079	Ewell Industries, Inc.	362.8	3,098.4	-46.7	18.3	291	50.2	1	973	No	No
0570459	Bausch &Lomb Pharmaceuticals	366.4	3,105.7	-43.1	25.6	301	50.2	1	973	No	No
0571209	Apac-Florida, Inc.	359.9	3,088.1	-49.6	8.0	279	50.3	38	976	No	No
0570052	Florida Rock Industries	362.3	3,097.5	-47.2	17.4	290	50.3	21	976	No	No
0570031	Holnam Inc.	359.5	3,087.3	-50.0	7.2	278	50.5	29	980	No	No
7770473	Conrad Yelvington Distributors	361.8	3,096.9	-47.7	16.8	289	50.6	27	982	No	No
0570442	Gulf Marine Repair	360.3	3,091.9	-49.2	11.8	283	50.6	9	982	No	No
0570252	Southdown, Inc.	359.3	3,087.1	-50.2	7.0	278	50.7	53	984	No	No
0570127	Mckay Bay Refuse-To-Energy Facility	360.2	3,092.2	-49.3	12.1	284	50.8	172	985	No	No
0570413	Kimmins Recycling Corporation	360.4	3,093.1	-49.1	13.0	285	50.8	15	986	No	No
0570032	Southdown Inc.	360.1	3,092.2	-49.4	12.1	284	50.9	18	987	No	No
0570226	Industrial Chemical & Supply Co	360.2	3,092.9	-49.3	12.8	285	50.9	0	989	No	No
0570077	Verlite Company	360.2	3,093.0	-49.3	12.9	285	51.0	11	989	No	No
0570229	General Chemical Corp	359.9	3,092.3	-49.6	12.2	284	51.1	5	992	No	No
0570466	Bulk Intermodal Services	360.1	3,093.2	-49.4	13.1	285	51.1	15	993	No	No
0570103	Cargill,Inc.-Tampa	359.6	3,091.7	-49.9	11.6	283	51.2	8	995	No	No
0570051	CF Industries	359.1	3,089.8	-50.4	9.7	281	51.3	15	996	No	No
Large facilities (> 1,000 TPY) outside the modeling area, but included in modeling analysis:											
0570038	TECO, Hookers Point	358.0	3,091.0	-51.5	10.9	282	52.6	1,536	1023	Yes	Yes
0970014	FPC - Intercession City Plant	446.3	3,126.0	36.8	45.9	39	58.8	1,229	1147	Yes	Yes
1030012	FPC - Higgins Plant	336.5	3,098.4	-73.0	18.3	284	75.3	1,260	1475	Yes	Yes
1030244	A-American Rent All	324.1	3,079.2	-85.4	-0.9	269	85.4	2,190	1678	Yes	Yes
1010017	Anclote Power Plant	324.4	3,118.7	-85.1	38.6	294	93.4	3,761	1839	Yes	Yes
1270028	FPC-DEBARY FACILITY	467.5	3,197.2	58.0	117.1	26	130.7	1,067	2584	Yes	Yes
0170004	FPC-Crystal River Power Plant	334.3	3,204.5	-75.2	124.4	329	145.4	13,012	2877	Yes	Yes

[a] The Cargill Green Bay facility is located at UTM Coordinates: East 409.5 km, North 3,080.1 km

Table 6-6: Summary of all PM_{10} Emitting Facilities in the Vicinity of Cargill, Green Bay Plant

Plant ID	Facility Name	Source Location East (km)	Source Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	PM_{10} Emissions Rate[b] (TPY)	Q Emissions Threshold [c] [(Dist. - SIA) X 20]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II

[b] Emission rates taken from PM_{10} inventory where available, otherwise taken from PM inventory.

[c] The significant impact area (SIA) determined by modeling equals: 1.5 km

[d] Emissions obtained from Ridge Generating Station, L.P. Title V Operating Permit (2/2000).

Table 6-7. Summary of Facilities with NO_x Emission Sources in the Vicinity of Cargill Green Bay

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	NO_x Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
1050217	POLK POWER PARTNERS, L.P.-MULBERRY	413.6	3,080.6	4.1	0.5	83	4.1	311	63	Yes	Yes
1050097	CUSTOM CHEMICALS CORP.	408 0	3,085.5	-1.5	5.4	344	5.6	2	92	No	No
1050048	CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)	406 8	3,085 1	-2.7	5.0	332	5.7	78	94	No	No
1050021	ASHLAND SPECIALTY CHEMICAL CO.	411.1	3,085 9	1.6	5.8	15	6.0	7	100	No	No
1050148	GRAND EAGLE SERVICE, INC.	404.9	3,084.1	-4 6	4.0	311	6.1	2	102	No	No
1050046	CARGILL FERTILIZER, INC.--BARTOW	409.8	3,086 6	0.3	6.5	3	6.5	246	110	Yes	Yes
1050146	PAVEX CORP.	413.0	3,086 2	3.5	6.1	30	7.0	24	121	No	No
1050234	FPC, HINES ENERGY COMPLEX (PROGRESS ENERGY)	414 3	3,073 9	4.8	-6.2	142	7.9	917	137	Yes	Yes
1050055	IMC PHOSPHATES CO. (S. PIERCE)	407.5	3,071 4	-2.0	-8.7	193	8.9	209	159	Yes	Yes
1050056	IMC PHOSPHATES CO. (PRAIRIE)	402.9	3,087 0	-6 6	6.9	316	9.5	61	171	No	No
1050182	GEOLOGIC RECOVERY SYSTEMS	401.8	3,085 8	-7 7	5 7	307	9.6	70	172	No	No
1050231	ORANGE COGENERATION LIMITED PARTNERSHIP	418.7	3,083.0	9.2	2.9	73	9.6	381	173	Yes	Yes
1050319	CLARK ENVIRONMENTAL INC	401.2	3,086.6	-8.3	6 5	308	10.5	15	191	No	No
1050057	IMC PHOSPHATES CO. (NICHOLS)	398.4	3,084.2	-11.1	4.1	290	11.8	55	217	No	No
1050047	AGRIFOS, L.L.C. (NICHOLS)	398.7	3,085.3	-10.8	5.2	296	12.0	311	220	Yes	Yes
1050223	FLORIDA POWER CORPORATION--TIGER BAY	416.3	3,069.3	6.8	-10.8	148	12.8	802	235	Yes	Yes
1050059	IMC PHOSPHATES (NEW WALES)	396.7	3,079.4	-12.8	-0.7	267	12.8	640	236	Yes	Yes
1050051	U.S. AGRI-CHEMICALS - FT. MEADE	416.0	3,069.0	6.5	-11.1	150	12.9	345	237	Yes	Yes
1050026	ALCOA ALUMINA AND CHEMICALS, L.L.C.	416.8	3,069.5	7.3	-10.6	145	12 9	100	237	No	No
1050233	TECO - POLK POWER STATION	402.5	3,067.4	-7.1	-12.8	209	14.6	2,507	271	Yes	Yes
1050228	SADLER DRUM CO	396.2	3,089.3	-13.3	9.2	305	16 2	0	303	No	No
1050106	CITRUS WORLD, INC	422.7	3,092.6	13.2	12.5	47	18.2	46	344	No	No
1050100	SHELL EPOXY RESINS LLC	410.7	3,098.9	1.2	18.8	4	18 8	495	357	Yes	Yes
1050127	JUICE BOWL PRODUCTS	409 4	3,099.9	-0.1	19.8	360	19.8	109	376	No	No
1050297	POLK CO ANIMAL SERVICES	418.4	3,098.4	8.9	18.3	26	20.3	0	386	No	No
1050298	POLK COUNTY NO. CENTRAL LANDFILL	418 9	3,098.5	9.4	18.4	27	20.7	58	394	No	No
1050134	HEATH FUNERAL CHAPEL	407.1	3,101.9	-2.4	21.8	354	21.9	1	419	No	No
1050003	LAKELAND ELECTRIC - LARSON	408 9	3,102.5	-0.6	22.4	358	22.4	3,825	428	Yes	Yes
1050352	WINSTON PEAKING STATION	400 2	3,100.6	-9.3	20.5	336	22.5	240	430	No	No
0570075	CORONET INDUSTRIES, INC.	393 8	3,096.3	-15.7	16.2	316	22.6	228	431	No	No
1050009	FLORIDA TILE INDUSTRIES, INC.	405 4	3,102 4	-4.1	22.3	350	22.7	17	433	No	No
0490015	HARDEE POWER PARTNERS,LTD	404.8	3,057.4	-4 7	-22.7	192	23.2	5,183	444	Yes	Yes
1050272	LAKEVIEW CREMATORY	419 9	3,101.0	10.4	20.9	26	23.3	2	446	No	No
1050034	IMC CFMO-FORT LONESOME RD.	389.5	3,068 0	-20 0	-12 1	239	23.4	-576	448	No	No
7770037	APAC - FLORIDA, INC. - TAMPA DIVISION	392 6	3,097 3	-16.9	17.2	316	24.1	0	462	No	No
1050015	METLIFE - LAKELAND PLANT	399.0	3,101 8	-10 5	21.7	334	24.1	54	462	No	No
0570460	JAMES HARDIE BUILDING PRODUCTS INC,	387.1	3,089 5	-22.4	9.4	293	24.3	27	467	No	No
1050095	LAKELAND REGIONAL MEDICAL CENTER	406.4	3,104 3	-3.1	24.2	353	24.4	27	468	No	No
1050158	HIGH PERFORMANCE SYSTEMS, INC.	428.1	3,096.1	18.6	16.0	49	24.5	1	470	No	No
1050208	LAKELAND DRUM SERVICE, INC.	418.8	3,103.6	9.3	23.5	22	25.3	1	485	No	No
1050174	PEPPERIDGE FARM, INC	403.3	3,104.8	-6.2	24.7	346	25 5	29	489	No	No
1050096	FLORIDA DISTILLERS COMPANY	421.4	3,102.9	11.9	22.8	28	25 7	27	494	No	No
1050221	AUBURNDALE POWER PARTNERS, LP	420.8	3,103.3	11.3	23.2	26	25.8	574	496	Yes	Yes
1050334	AUBURNDALE POWER OSPREY	420.8	3,103.3	11.3	23.2	26	25.8	227	496	No	No
1050004	LAKELAND ELECTRIC - MCINTOSH	409.0	3,106.2	-0.5	26.1	359	26.1	14,331	502	Yes	Yes
0570417	INTERNATIONAL PAPER	391.7	3,099.3	-17.8	19.2	317	26.2	1	504	No	No
1050023	CUTRALE CITRUS JUICES USA,INC	421.6	3,103.7	12.1	23.6	27	26.5	333	510	No	No

Table 6-7. Summary of Facilities with NO_x Emission Sources in the Vicinity of Cargill Green Bay

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	NO_x Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
1050007	OWENS-BROCKWAY GLASS CONTAINER INC.	423.4	3,102.8	13.9	22.7	31	26.6	300	512	No	No
1050022	TENNECO PACKAGING (PCA)	423.4	3,102.8	13.9	22.7	31	26.6	4	512	No	No
1050216	RIDGE GENERATING STATION, L.P	427.0	3,100.3	17.5	20.2	41	26.8	394	515	No	No
1050037	ALL TEMP STORAGE LLC	421.7	3,104.2	12.2	24.1	27	27.0	91	520	No	No
1050076	INTERNATIONAL PAPER COMPANY-AUBURNDALE	421.7	3,104.3	12.2	24.2	27	27.1	6	522	No	No
1050072	WINTERHAVEN HOSPITAL	428.7	3,100.4	19.2	20.3	43	27.9	11	539	No	No
0570370	PARADISE, INC.	388.5	3,099.0	-21.0	18.9	312	28.3	3	545	No	No
0570249	ALCOA EXTRUSIONS	385.6	3,097.0	-23.9	16.9	305	29.3	34	565	No	No
1050099	AOC, L.L.C. (WAS ALPHA OWENS CORN'G)	401.0	3,108.5	-8.5	28.4	343	29.6	46	573	No	No
0570320	DART CONTAINER CORP. OF FLORIDA	384.9	3,098.2	-24.6	18.1	306	30.5	15	591	No	No
1050333	STEELE'S FAMILY FUNERAL SERVICES	433.6	3,099.7	24.1	19.6	51	31.0	1	601	No	No
0570438	FLORIDA GAS TRANSMISSION CO.	391.9	3,106.6	-17.6	26.5	326	31.8	46	616	No	No
0570091	TERRA ASGROW	388.6	3,104.6	-20.9	24.5	320	32.2	2	624	No	No
1050002	CITRUS WORLD, INC.	441.0	3,087.3	31.5	7.2	77	32.3	1,086	626	Yes	Yes
1050090	FLORIDA DISTILLERS	428.0	3,108.1	18.5	28.0	33	33.6	26	651	No	No
0490043	VANDOLAH POWER COMPANY, LLC	408.8	3,044.5	-0.8	-35.6	181	35.6	1,008	692	Yes	Yes
1050019	CARGILL CITRO-AMERICA, INC.	447.9	3,068.3	38.4	-11.8	107	40.2	412	783	No	No
1050263	POLK CORRECTIONAL INSTITUTION	423.0	3,118.2	13.5	38.1	20	40.4	0	788	No	No
0490003	THE MANCINI PACKING COMPANY	421.4	3,040.8	11.9	-39.3	163	41.1	3	801	No	No
0570005	CF INDUSTRIES, INC., PLANT CITY PHOS	388.0	3,116.0	-21.5	35.9	329	41.8	694	817	No	No
1050001	CITROSUCO NORTH AMERICA, INC	451.6	3,085.5	42.1	5.4	83	42.4	86	829	No	No
0570261	HILLSBOROUGH CO. R.R.F.	368.2	3,092.7	-41.3	12.6	287	43.2	1,542	844	Yes	Yes
7770380	KEARNEY DEVELOPMENT CO.	368.7	3,094.8	-40.8	14.7	290	43.4	12	847	No	No
0550035	SUNPURE, LIMITED	448.3	3,057.6	38.8	-22.5	120	44.9	48	878	No	No
0571242	NATIONAL GYPSUM	364.7	3,075.6	-44.8	-4.5	264	45.0	10	880	No	No
0570076	DELTA ASPHALT	372.1	3,105.4	-37.4	25.3	304	45.2	192	883	No	No
0570061	TAMPA ARMATURE WORKS	365.6	3,091.7	-43.9	11.6	285	45.4	15	888	No	No
0570321	MANTUA MANUFACTURING CO.	364.7	3,092.5	-44.8	12.4	285	46.5	13	910	No	No
0570343	HOWARD F. CURREN AWT PLANT	364.0	3,089.5	-45.5	9.4	282	46.5	91	909	No	No
0570008	CARGILL FERTILIZER, INC.--RIVERVIEW	362.9	3,082.5	-46.6	2.4	273	46.7	332	913	No	No
0570317	JANET & CHARLIES WOOD RECYCLING FAC.	363.1	3,085.3	-46.4	5.2	276	46.7	200	914	No	No
0570119	GULF COAST METALS	364.7	3,093.6	-44.8	13.5	287	46.8	13	916	No	No
7771101	WOODRUFF AND SONS INC	364.3	3,093.2	-45.2	13.1	286	47.0	6	921	No	No
0570409	CONIGLIO C&D DEB	368.9	3,104.2	-40.6	24.1	301	47.2	49	924	No	No
0570057	GULF COAST RECYCLING, INC.	364.0	3,093.5	-45.5	13.4	286	47.4	7	929	No	No
7775052 [c]	WOODRUFF & SONS, INC	363.6	3,092.3	-45.9	12.2	285	47.4	15	929	No	No
0570022	MARATHON ASHLAND PETROLEUM LLC	362.2	3,087.2	-47.3	7.1	279	47.8	3	937	No	No
0570029	NITRAM, INC.	362.5	3,089.0	-47.0	8.9	281	47.8	302	937	No	No
0570039	TECO - BIG BEND	361.9	3,075.0	-47.6	-5.1	264	47.9	82,624	937	Yes	Yes
0550022	FOUNTAIN FUNERAL HOME	449.0	3,052.8	39.5	-27.3	125	48.0	0	940	No	No
0570163	GRIFFIN INDUSTRIES	364.1	3,096.4	-45.4	16.3	290	48.2	60	945	No	No
0810010	FP & L - MANATEE PLANT	367.3	3,054.2	-42.3	-25.9	238	49.6	22,732	972	Yes	Yes
1050014	STANDARD SAND & SILICA--DAVENPORT MINE	441.5	3,118.2	32.0	38.1	40	49.8	91	975	No	No
0571217	SEA 3 OF FLORIDA, INC.	360.1	3,087.1	-49.4	7.0	278	49.9	21	978	No	No
0570040	BAYSIDE POWER STATION (TECO - GANNON)	360.1	3,087.5	-49.4	7.4	279	50.0	51,088	979	Yes	Yes
Large facilities (> 1,000 TPY) outside the modeling area, but included in modeling analysis:											
0570038	TECO - HOOKERS POINT	358.0	3,091.0	-51.5	10.9	282	52.6	4,558	1,033	Yes	Yes

Table 6-7. Summary of Facilities with NO_x Emission Sources in the Vicinity of Cargill Green Bay

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	NO_x Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
0970014	FPC-INTERCESSION CITY	446.3	3,126.0	36.8	45.9	39	58.8	15,035	1,157	Yes	Yes
1030011	FPC - BARTOW PLANT	342.4	3,082.6	-67.1	2.5	272	67.1	15,374	1,323	Yes	Yes
0270016	IPS AVON PARK CORPORATION (DESOTO COUNTY)	419.8	3.011.5	10.3	-68.6	172	69.4	4,612	1,367	Yes	Yes
1030013	FPC -BAYBORO PLANT	338.8	3,071.3	-70.7	-8.8	263	71.2	3,838	1,405	Yes	Yes
0810007	TROPICANA PRODUCTS, INC.-BRADENTON	346.8	3,040.9	-62.7	-39.2	238	73.9	1,220	1,459	Yes	Yes
1030012	FPC -HIGGINS PLANT	336.5	3,098.4	-73.0	18.3	284	75.3	10,027	1,485	Yes	Yes
1010056	PASCO COUNTY RESOURCE RECOVERY	348.8	3,138.8	-60.7	58.7	314	84.4	1,184	1,668	Yes	Yes
1010017	FPC-ANCLOTE POWER PLANT	324.4	3,118.7	-85.1	38.6	294	93.4	13,292	1,849	Yes	Yes
0530021	FLORIDA CRUSHED STONE CO., INC.	360.0	3,162.5	-49.5	82.4	329	96.1	6,557	1,902	Yes	Yes
0530032	CENTRAL POWER & LIME, INC.	360.0	3,162.5	-49.5	82.4	329	96.1	13,846	1,902	Yes	Yes
0530010	SOUTHDOWN, INC. (CEMEX)	355.9	3,169.1	-53.6	89.0	329	103.9	2,448	2,058	Yes	Yes
1270009	FPL-SANFORD POWER PLANT	468.3	3,190.3	58.8	110.2	28	124.9	4,500	2,478	Yes	Yes
1270028	FPC-DEBARY FACILITY	467.5	3,197.2	58.0	117.1	26	130.7	1,234	2,594	Yes	Yes
0170004	FPC-CRYSTAL RIVER POWER PLANT	334.3	3,204.5	-75.2	124.4	329	145.4	40,870	2,887	Yes	Yes

[a] The Proposed Project is located at UTM Coordinates: East 409.5 km; North 3,080.1 km

[b] The significant impact area (SIA) determined by modeling equals = 1.0 km

[c] Combined 7775052, 7775053, 7775054 into one facility since all located at same place and have same company name.

Table 6-8. Baseline (1974) PM/PM_{10} and SO_2 Emission Rates and Stack and Operating Data for the All Sources--Cargill Green Bay

Source	ISCST3 ID Name	PM/PM_{10} Emissions Hourly lb/hr	Hourly g/s	Annual TPY	Annual g/s	SO_2 Emissions Hourly lb/hr	Hourly g/s	Annual TPY	Annual g/s	Location X ft	X m	Location Y ft	Y m	Stack/Vent Release Height ft	Height m	Stack/Vent Diameter ft	Diameter m	Actual Exhaust Flow Rate (acfm)	Exhaust Gas Exit Temperature °F	Temperature K	Exhaust Gas Velocity ft/s	Velocity m/s
Sulfuric Acid Plant No. 1	SAP1	--	--	--	--	492.86	62.10	2,158.73	62.10 [b]	739.0	225.24	607.4	185.13	100	30.48	7.00	2.13	43,698	168.8	349	18.92	5.77
Sulfuric Acid Plant No. 2	SAP2	--	--	--	--	532.77	67.13	2,333.53	67.13 [b]	855.4	260.74	608.2	185.38	100	30.48	7.00	2.13	43,488	170.6	350	18.83	5.74
Sulfuric Acid Plant No. 3	SAP3	--	--	--	--	652.64	82,23	2,858.56	82.23 [b]	739.0	225.24	900.0	274.33	100	30.48	7.50	2.29	80,360	161.6	345	30.32	9.24
Sulfuric Acid Plant No. 4	SAP4	--	--	--	--	542.39	68.34	2,375.67	68.34 [b]	738.5	225.11	960.9	292.88	100	30.48	7.50	2.29	60,123	123.8	324	22.68	6.91
Phosphate Rock Unloading and Storage-Scrubber (A-A)	ROCKUNLD	3.87	0.49	16.95	0.49 [a]	--	--	--	--	102.4	31.22	340.4	103.74	90	27.43	3.00	0.91	7,514	98 6	310	17.71	5.40
Unground Rock Storage Silo Filter Pt. 3 (B-B)	UNGNDP3	4.00	0.50	17.52	0.50 [a]	--	--	--	--	164.0	50.00	439.2	133.88	90	27.43	0.50	0.15	420	77.0	298	35.71	10.89
Unground Rock Storage Silo Filter Pt. 4 (C-C)	UNGNDP4	3.43	0.43	15.02	0.43 [a]	--	--	--	--	164.0	50.00	474.1	144.50	90	27.43	0.50	0.15	410	77.0	298	34.86	10.63
Unground Rock Storage Silo Filter Pt. 5 (D-D)	UNGNDP5	4.19	0.53	18.35	0.53 [a]	--	--	--	--	164.0	50.00	509.7	155.36	90	27.43	0.50	0.15	416	75.2	297	35.37	10.78
Unground Rock Storage Silo Filter Pt. 6 (E-E)	UNGNDP6	3.81	0.48	16.69	0.48 [a]	--	--	--	--	164.0	50.00	544.9	166.10	90	27.43	0.50	0.15	406	75.2	297	34.52	10.52
Unground Rock Storage Silo Filter Pt. 7 (F-F)	UNGNDP7	3.60	0.45	15.77	0.45 [a]	--	--	--	--	164.0	50.00	581.0	177.08	90	27.43	0.50	0.15	420	75.2	297	35.71	10.89
Rock Grinding Filter Pt. 8 (G-G)	RGRINDP8	17.95	2.26	78.62	2.26 [a]	--	--	--	--	301.4	91.86	581.0	177.08	100	30.48	1.67	0.51	5,492	77.0	298	41.61	12.68
100-Ton Ball Mill Dust Collector (H-H)	100BALL	18.67	2.35	81.77	2.35 [a]	--	--	--	--	208.1	63.43	751.1	228.94	165	50.29	2.31	0.70	14,886	77.0	298	59.07	18.00
40-Ton Ball Mill Dust Collector (H_1-H_1)	40BALL	25.98	3.27	113.79	3.27 [a]	--	--	--	--	206.5	62.94	779.1	237.48	50	15.24	1.67	0.51	4,070	127.0	326	31.09	9.48
Ground Rock Storage Silos Pt. 10 (I-I)	GRNDP10	9.77	1.23	42.79	1.23 [a]	--	--	--	--	283.8	86.49	580.6	176.96	90	27.43	0.84	0.26	1,298	77.0	298	38.98	11.88
Fluid Bed Calciner Feed Bin Filter Pt. 11 (J-J)	FILTER11	3.53	0.44	15.46	0.44 [a]	--	--	--	--	132.4	40.37	746.3	227.48	40	12.19	1.00	0.30	2,188	77.0	298	46.45	14.16
Rock Storage Silo--No. 2 Phosphoric Acid Plant Feed (L-L)	FILTER13	3.61	0.45	15.81	0.45 [a]	--	--	--	--	209.3	63.80	854.8	260.54	100	30.48	1.50	0.46	5,068	77.0	298	47.80	14.57
DAP Plant-R/G Scrubber (S-S)	DAPRGSCR	1.25	0.16	5.48	0.16 [c]	--	--	--	--	397.9	121.27	10.5	3.20	185	56.39	5.00	1.52	11,476	149.0	338	9.74	2.97
DAP Plant-Dryer Scrubber (U-U)	SDAPMAIN	19.00	2.39	83.22	2.39 [c]	--	--	--	--	522.8	159.34	10.9	3.32	129	39.32	7.50	2.29	59,655	139.0	333	22.51	6.86
DAP Plant-Cooler Scrubber	DAPCOOL	19.00	2.39	83.22	2.39 [c]	--	--	--	--	460.3	140.31	11.3	3.44	120	36.58	5.00	1.52	70,436	139.0	333	59.79	18.22
TSP Plant-Reactor & Blunger Scrubber (W-W)	TSPRBSCR	1.01	0.13	4.43	0.13 [c]	--	--	--	--	394.7	120.29	128.6	39.19	110.5	33.68	2.50	0.76	5,789	130.0	328	19.66	5.99
TSP Plant-Dryer Scrubber (Y_1-Y_1)	NDAPMAIN	11.40	1.44	49.93	1.44 [c]	--	--	--	--	522.4	159.22	127.8	38.95	129	39.32	7.50	2.29	91,324	190.0	361	34.45	10.50
Shipping & Storage-Storage Scrubbers [d] (Z_1-Z_1)	STORSCRB	4.52	0.57	19.80	0.57 [c]	--	--	--	--	325.0	99.06	171.4	52.25	130.5	39.78	8.00	2.44	122,975	69.8	294	40.78	12.43
Shipping & Storage-Shipping Scrubbers (Z_2-Z_2)	SHIPSCRB	3.45	0.43	15.11	0.43 [c]	--	--	--	--	325.4	99.18	186.6	56.89	130.5	39.78	4.00	1.22	24,879	88.0	304	33.00	10.06

[a] From the 1975 AOR submitted by Farmland Industries to the Dept. of Air and Water Pollution Control, West Central Region, March 1, 1976. PM was not reported in the 1974 AOR.

[b] From the 1974 AOR submitted by Farmland Industries to the Dept. of Air and Water Pollution Control, West Central Region, March 24, 1975.

[c] Emissions and stack and operating data based on stack test data from September 1978.

[d] Stack and operating data from the 1974 AOR (see reference [b] above).

Table 6-9. Baseline (1988) NO_x Emission Rates and Stack and Operating Data for the All Sources--Cargill Green Bay

Source	ISCST3 ID Name	NO_x Emissions (TPY)	NO_x Emissions (g/s)	Location X ft	Location X m	Location Y ft	Location Y m	Stack/Vent Release Height ft	Stack/Vent Release Height m	Stack/Vent Diameter ft	Stack/Vent Diameter m	Actual Exhaust Flow Rate (acfm)	Exhaust Gas Exit Temperature °F	Exhaust Gas Exit Temperature K	Exhaust Gas Velocity ft/s	Exhaust Gas Velocity m/s
MAP/DAP/TSP Dryer [b]	NDAPMAIN	6.43 [a]	0.18	522.4	159.22	127.8	38.95	129.0	39.32	7.5	2.29	68,878	630.0	605	25.98	7.92
DAP Plant Dryer [c]	SDAPMAIN	14.93 [a]	0.43	522.8	159.34	10.9	3.32	129.5	39.47	7.5	2.29	92,000	133.7	330	34.71	10.58
Therminol Heater [d]	SATHEAT	338.68 [a]	9.74	473.5	144.33	800.0	243.83	95.0	28.96	5.5	1.68	20,600	117.0	320	14.45	4.40
Sulfuric Acid Plant No. 3 [e]	SAP3	33.91 [f]	0.98	739.0	225.24	900.0	274.33	100	30.48	7.50	2.29	80,360	161.6	345	30.32	9.24
Sulfuric Acid Plant No. 4 [e]	SAP4	32.46 [f]	0.93	738.5	225.11	960.9	292.88	100	30.48	7.50	2.29	60,123	123.8	324	22.68	6.91

Note: The Sulfuric Acid Plants Nos. 1 and 2 existed, but did not operate during the year (based on 1987 AOR).

[a] From the 1987 AOR submitted by Farmland Industries to the Dept. Environmental Regulation, February 29 and May 20, 1988.
[b] Operating parameters from 9/28/88 stack test data.
[c] Stack and operating parameters are from stack test data (10/4/90).
[d] Operating parameters based on design data.
[e] Stack and operating parameters from the 1975 AOR.
[f] Calculated from the annual H_2SO_4 production rate and emission factor of 0.12 lb NO_x/ton H_2SO_4. Annual production rate from the 1987 AOR (see reference [a]).

Table 6-10. Summary of SO_2 and SAM Emission Rates for the Proposed Project--Cargill Green Bay

		Average Actual	SO_2 Emissions				SAM Emissions			
	EU	Operating Hours [c]	Hourly		Annual		Hourly		Annual	
Source	ID	(hr/yr)	lb/hr	g/s	TPY	g/s	lb/hr	g/s	TPY	g/s
Current Actual Emissions [a]										
South DAP Plant--Stack B (Dryer)	007	7,862	0.01	0.0011	0.03	0.0011	0.0	0.0 [d]	0.0	0.0 [d]
North MAP/DAP Plant-Main Stack	029	7,593	0.01	0.0010	0.03	0.0010	0.0	0.0 [d]	0.0	0.0 [d]
Future Potential Emissions [b]										
South DAP Plant--Stack B (Dryer)	007	--	3.16	0.398	13.82	0.398	0.053	0.0067	0.234	0.0067
North MAP/DAP Plant-Main Stack	029	--	2.63	0.331	11.52	0.331	0.044	0.0056	0.195	0.0056

[a] Emissions from Table 2-1. Hourly emissions were calculated based on the actual annual numbers and the average actual operating hours.

[b] Emissions from Tables 2-5 and 2-8.

[c] From the 2002 and 2001 AORs.

[d] No fuel oil was consumed for 2002 and 2001, therefore there were no SAM emissions.

Table 6-11. Cargill Property Boundary Receptors Used in Modeling Analysis

Coordinates [a]				Coordinates [a]				Coordinates [a]			
X		Y		X		Y		X		Y	
ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
-6001	-1829.2	-461	-140.52	-5612	-1710.6	6643	2024.88	6791	2069.78	2523	769.04
-6001	-1,829	901	274	-5326	-1623.4	6721	2048.68	6791	2069.78	2198	669.98
-7901	-2,408	901	274	-4927	-1501.9	7000	2133.48	6791	2069.78	1873	570.92
-9499	-2,895	1770	539	-4815	-1467.6	7200	2194.48	6791	2069.78	1548	471.86
-9801	-2,987	3000	914	-4377	-1334.1	7400	2255.48	6791	2069.78	1223	372.79
-9000	-2,743	3607	1,099	-4052	-1234.9	7400	2255.48	6791	2069.78	898	273.73
-7901	-2,408	6019	1,834	-3726	-1135.8	7400	2255.48	6791	2069.78	573	174.67
-5040	-1,536	6799	2,072	-3401	-1036.6	7400	2255.48	6791	2069.78	248	75.61
-4702	-1,433	7400	2,255	-3076	-937.47	7400	2255.48	6791	2069.78	-77	-23.46
1804	550	7400	2,255	-2750	-838.32	7400	2255.48	6643	2024.78	-635	-193.69
1640	500	4798	1,462	-2425	-739.17	7400	2255.48	6495	1979.78	-869	-264.85
6791	2,070	4798	1,462	-2100	-640.02	7400	2255.48	6348	1934.78	-1102	-336.02
6791	2,070	-402	-123	-1775	-540.87	7400	2255.48	6200	1889.78	-1336	-407.19
5905	1,800	-1803	-550	-1449	-441.72	7400	2255.48	6052	1844.78	-1569	-478.35
4701	1,433	-1803	-550	-1124	-342.57	7400	2255.48	5604	1708.03	-1803	-549.52
3894	1,187	-461	-141	-799	-243.42	7400	2255.48	5303	1616.28	-1803	-549.52
-6001	-1,829	-189	-58	-473	-144.27	7400	2255.48	5002	1524.53	-1803	-549.52
-6001	-1,829	84	25	-148	-45.12	7400	2255.48	4539	1383.58	-1535	-467.72
-6001	-1,829	356	108	177	54.03	7400	2255.48	4378	1334.38	-1266	-385.92
-6001	-1,829	628	191	503	153.18	7400	2255.48	4216	1285.18	-998	-304.12
-6318	-1,926	901	274	828	252.33	7400	2255.48	4055	1235.98	-729	-222.32
-6635	-2,022	901	274	1153	351.48	7400	2255.48	3574	1089.49	-461	-140.52
-6951	-2,119	901	274	1478	450.63	7400	2255.48	3255	992.2	-461	-140.52
-7268	-2,215	901	274	1783	543.53	7075	2156.36	2936	894.91	-461	-140.52
-7584	-2,312	901	274	1763	537.28	6749	2057.23	2617	797.62	-461	-140.52
-8167	-2,489	1045	319	1742	531.03	6424	1958.11	2298	700.33	-461	-140.52
-8434	-2,571	1190	363	1722	524.78	6099	1858.98	1978	603.04	-461	-140.52
-8700	-2,652	1335	407	1701	518.53	5774	1759.86	1659	505.75	-461	-140.52
-8966	-2,733	1480	451	1681	512.28	5449	1660.73	1340	408.46	-461	-140.52
-9232	-2,814	1625	495	1660	506.03	5123	1561.61	1021	311.17	-461	-140.52
-9574	-2918.2	2078	633.23	1962	597.9	4798	1462.48	702	213.88	-461	-140.52
-9650	-2941.2	2385	726.98	2284	696.03	4798	1462.48	383	116.59	-461	-140.52
-9725	-2964.2	2693	820.73	2605	794.15	4798	1462.48	63	19.3	-461	-140.52
-9600	-2926.2	3152	960.73	2927	892.28	4798	1462.48	-256	-77.99	-461	-140.52
-9400	-2865.2	3304	1006.98	3249	990.41	4798	1462.48	-575	-175.28	-461	-140.52
-9200	-2804.2	3455	1053.23	3571	1088.53	4798	1462.48	-894	-272.57	-461	-140.52
-8878	-2706	3875	1181.15	3893	1186.65	4798	1462.48	-1213	-369.87	-461	-140.52
-8756	-2668.8	4143	1262.81	4215	1284.78	4798	1462.48	-1533	-467.16	-461	-140.52
-8634	-2631.6	4411	1344.48	4537	1382.91	4798	1462.48	-1852	-564.45	-461	-140.52
-8512	-2594.3	4679	1426.15	4859	1481.03	4798	1462.48	-2171	-661.74	-461	-140.52
-8389	-2557.1	4947	1507.81	5181	1579.16	4798	1462.48	-2490	-759.03	-461	-140.52
-8267	-2519.9	5215	1589.48	5503	1677.28	4798	1462.48	-2809	-856.32	-461	-140.52
-8145	-2482.7	5483	1671.15	5825	1775.41	4798	1462.48	-3129	-953.61	-461	-140.52
-8023	-2445.4	5751	1752.81	6147	1873.53	4798	1462.48	-3448	-1050.9	-461	-140.52
-7615	-2321	6097	1858.28	6469	1971.66	4798	1462.48	-3767	-1148.2	-461	-140.52
-7329	-2233.8	6175	1882.08	6791	2069.78	4473	1363.42	-4086	-1245.5	-461	-140.52
-7043	-2146.6	6253	1905.88	6791	2069.78	4148	1264.36	-4405	-1342.8	-461	-140.52

Table 6-11. Cargill Property Boundary Receptors Used in Modeling Analysis

Coordinates [a]				Coordinates [a]				Coordinates [a]			
X		Y		X		Y		X		Y	
ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
-6757	-2059.4	6331	1929.68	6791	2069.78	3823	1165.29	-4725	-1440.1	-461	-140.52
-6471	-1972.2	6409	1953.48	6791	2069.78	3498	1066.23	-5044	-1537.4	-461	-140.52
-6184	-1885	6487	1977.28	6791	2069.78	3173	967.17	-5363	-1634.6	-461	-140.52
-5898	-1797.8	6565	2001.08	6791	2069.78	2848	868.11	-5682	-1731.9	-461	-140.52

[a] Relative to the SW corner of the DAP/MAP Storage Building.

Note: m = meter
ft = foot

Table 6-12. Chassahowitzka NWA Receptors Used in the Modeling Analysis

UTM Coordinates, Zone 17	
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

Table 6-13. Building Dimensions Used in the Modeling Analysis, Cargill Green Bay

Structure	Height		Length		Width	
	ft	m	ft	m	ft	m
MAP/DAP Storage	68.0	20.7	360.0	109.7	153.0	46.6
Shipping Building - Lower Level	80.0	24.4	80.0	24.4	45.6	13.9
Shipping Building - Upper Level	112.0	34.1	80.0	24.4	36.4	11.1
MAP/DAP Plant - Upper Level	106.0	32.3	48.0	14.6	97.3	29.7
MAP/DAP Plant - Lower Level	90.0	27.4	107.3	32.7	97.3	29.7
Phosphoric Acid Plant No. 1	75.0	22.9	80.9	24.7	221.4	67.5
Phosphoric Acid Plant No. 2	74.0	22.6	74.1	22.6	71.5	21.8
Unground Rock Tank Column	81.0	24.7	34.8	10.6	175.0	53.3
Ground Rock Tank [a]	30.0	9.1	35.2	10.7	35.2	10.7
Phosphoric Acid No. 2 West Tank [a]	30.0	9.1	60.0	18.3	60.0	18.3
Phosphoric Acid No. 2 East Tank [a]	30.0	9.1	60.0	18.3	60.0	18.3
Phosphoric Acid Blend Tank No 9 [a]	30.0	9.1	60.0	18.3	60.0	18.3
Phosphoric Acid No. 1 East Tank [a]	30.0	9.1	39.8	12.1	39.8	12.1
Phosphoric Acid No. 1 West Tank [a]	30.0	9.1	41.2	12.6	41.2	12.6

[a] Tank is located nearby a stack vent.

Table 6-14. Maximum Predicted Increase in Pollutant Impacts Due to the Proposed Project Only, Cargill Green Bay

Averaging Period	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] Direction (degrees)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)	EPA Significant Impact Level ($\mu g/m^3$)
PM_{10}					
Annual	2.74	-175.3	-140.5	91123124	
	2.45	-175.3	-140.5	92123124	
	2.22	-78	-140.5	93123124	1
	2.43	-78	-140.5	94123124	
	2.15	-175.3	-140.5	95123124	
High 24-Hour	18.8	-175.3	-140.5	91102224	
	20.4	-175.3	-140.5	92022124	
	17.3	-100	-200	93031924	5
	17.9	-100	-200	94120124	
	16.2	-78	-140.5	95061724	
NO_2					
Annual	2.42	-175.3	-140.5	91123124	
	2.12	-78	-140.5	92123124	
	1.86	-100	-200	93123124	1
	2.11	-100	-200	94123124	
	1.69	-175.3	-140.5	95123124	

[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-95.
[b] Relative to the southwest corner of the MAP/DAP storage building.

Note:
YYMMDDHH = Year, Month, Day, Hour Ending.

Table 6-15. Maximum Predicted AAQS Impacts - Screening Analysis, Cargill Green Bay

Averaging Period	Concentration[a] (μg/m³)	Receptor Location[b]		Time Period (YYMMDDHH)
		Direction (degrees)	Distance (m)	
PM_{10}				
Annual	10.10	-78.0	-140.52	92123124
H6H 24-Hour	36.5	311.17	-140.52	92010424
NO_2				
Annual	9.36	-175.3	-140.5	91123124
	9.95	-200	-200	92123124
	9.54	-100	-200	93123124
	9.13	-100	-200	94123124
	9.14	-200	-200	95123124

Footnotes:
[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-1995.
[b] Relative to the southwest corner of the MAP/DAP storage building.

Notes:
YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-16. Maximum Predicted AAQS Impacts - Refined Analysis, Cargill Green Bay

Averaging Period	Concentration[a] ($\mu g/m^3$)			Receptor Location[b]		Time Period (YYMMDDHH)	Florida AAQS ($\mu g/m^3$)
	Total	Modeled Sources	Background	Direction (degrees)	Distance (m)		
PM_{10}							
Annual	31.1	10.1	21	-78.0	-140.52	92123124	50
H6H 24-Hour	86.5	36.5	50	311.17	-140.52	92010424	150
NO_2							
Annual	30.95	9.95	21	-200	-200	92123124	100

Footnotes:

[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-1995.

[b] Relative to the southwest corner of the MAP/DAP storage building.

Notes:

YYMMDDHH = Year, Month, Day, Hour Ending

H6H = 6th-Highest Concentration in 5 Years

Table 6-17. Maximum Predicted PSD Class II Increment Consumption - Screening Analysis, Cargill Green Bay

Averaging Period	Concentration[a] (μg/m³)	Receptor Location[b]		Time Period (YYMMDDHH)
		Direction (degrees)	Distance (m)	
PM_{10}				
Annual	<0	-	-	91123124
	<0	-	-	92123124
	<0	-	-	93123124
	<0	-	-	94123124
	<0	-	-	95123124
H2H 24-Hour	9.30	-1500	-400	91060424
	12.55	-1500	-700	92020824
	7.14	19.3	-140.5	93071624
	13.02	-1500	-1000	94052324
	11.15	-1400	-900	95050324
NO_2				
Annual	2.00	-600	-1500	91123124
	2.08	500	-1500	92123124
	1.98	700	-1500	93123124
	1.93	700	-1500	94123124
	1.84	400	-1500	95123124

[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-95.
[b] Relative to the southwest corner of the MAP/DAP storage building.

Note:
YYMMDDHH = Year, Month, Day, Hour Ending.

Table 6-18. Maximum Predicted PSD Class II Increment Consumption - Refined Analysis, Cargill Green Bay

Averaging Period	Concentration[a] (μg/m³)	Receptor Location[b] Direction (degrees)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)	Class II PSD Increments (μg/m³)
PM_{10}					
Annual	<0	-	-	91123124	17
H2H 24-Hour	13.02	-1500	-1000	94052324	30
NO_2					
Annual	2.08	500	-1500	92123124	25

[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-95.

[b] Relative to the southwest corner of the MAP/DAP storage building.

Note:
YYMMDDHH = Year, Month, Day, Hour Ending.
H2H = Highest, second-highest in 5 years

Table 6-19. Maximum Predicted Impacts for the Proposed Project Only at the Chassahowitzka PSD Class I Area Using the CALPUFF Model

Averaging Period	Year	Concentration[a] (μg/m³)	Proposed EPA PSD Class I Significant Impact Level (μg/m³)
PM10			
Annual	1990	0.0007	0.2
	1992	0.0008	
	1996	0.0008	
24-Hour	1990	0.014	0.3
	1992	0.020	
	1996	0.023	
NO2 Annual	1990	0.0003	0.1
	1992	0.0005	
	1996	0.0004	

[a] Concentrations predicted with the CALPUFF model and CALMET-developed domains for central Florida for 1990, 1992, and 1996.

Table 6-20. Maximum Predicted Increase in Fluoride Impacts Due to the Proposed Project at the Site Vicinity

Averaging Period	Concentration[a] ($\mu g/m^3$)	Receptor Location[b]		Time Period (YYMMDDHH)
		Direction (degree)	Distance (m)	
Annual				
	1.001	-175.3	-140.5	91123124
	0.926	-175.3	-140.5	92123124
	0.866	-78	-140.5	93123124
	0.920	-78	-140.5	94123124
	0.876	-175.3	-140.5	95123124
High 24-Hour				
	5.579	-200	-200	91010424
	5.592	-175.3	-140.5	92022124
	5.901	-100	-200	93111124
	5.829	-100	-200	94120124
	5.154	-78	-140.5	95061724
High 8-Hour				
	8.048	-175.3	-140.5	91011808
	7.345	-78	-140.5	92121308
	7.678	-78	-140.5	93110808
	8.036	-100	-200	94120124
	9.749	505.8	-140.5	95091724
High 1-Hour				
	15.322	311.2	-140.5	91080422
	15.301	311.2	-140.5	92070306
	14.995	311.2	-140.5	93060305
	15.359	311.2	-140.5	94051622
	15.198	311.2	-140.5	95062804

[a] Based on 5-year meteorological record, Tampa/Ruskin, 1991-95.

[b] Relative to southwest corner of MAP/DAP storage building.

Note:
YYMMDDHH = Year, Month, Day, Hour Ending.

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Table 6-21. Maximum Predicted Increase in Fluoride Impacts at the Chassahowitzka PSD Class I Area Due to Proposed Project, Cargill Green Bay

Averaging Period	Year	Concentration[a] (μg/m³)
Annual	1990	0.0004
	1992	0.0005
	1996	0.0004
24-Hour	1990	0.006
	1992	0.009
	1996	0.010
8-Hour	1990	0.014
	1992	0.018
	1996	0.022
3-Hour	1990	0.023
	1992	0.025
	1996	0.031
1-Hour	1990	0.030
	1992	0.033
	1996	0.036

[a] Concentrations predicted with the CALPUFF model and CALMET-developed domains for central Florida for 1990, 1992, and 1996.

Figure 6-1. Property Boundary and Receptor Grid Used for the Air Modeling Analysis, Cargill Green Bay

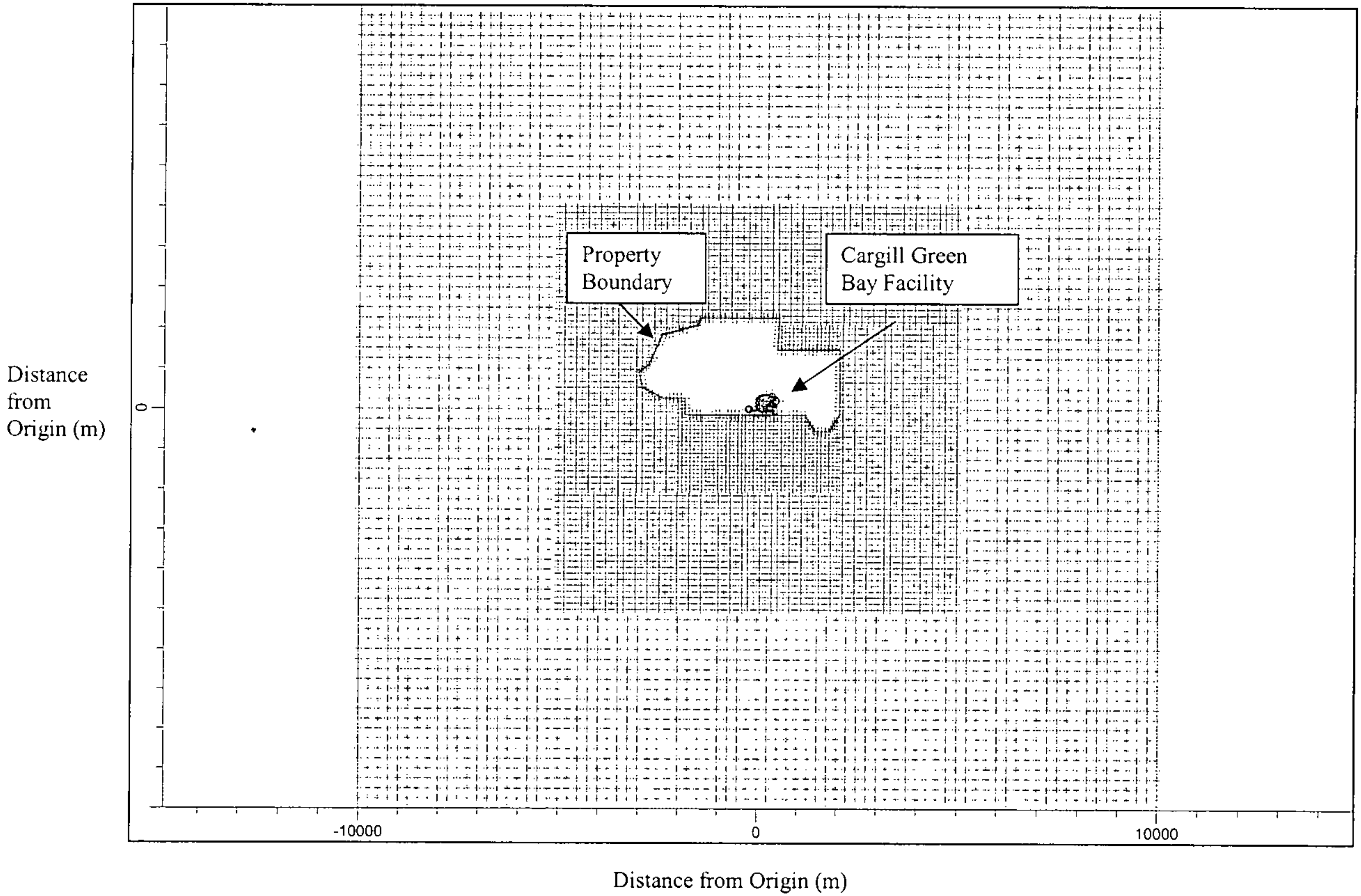
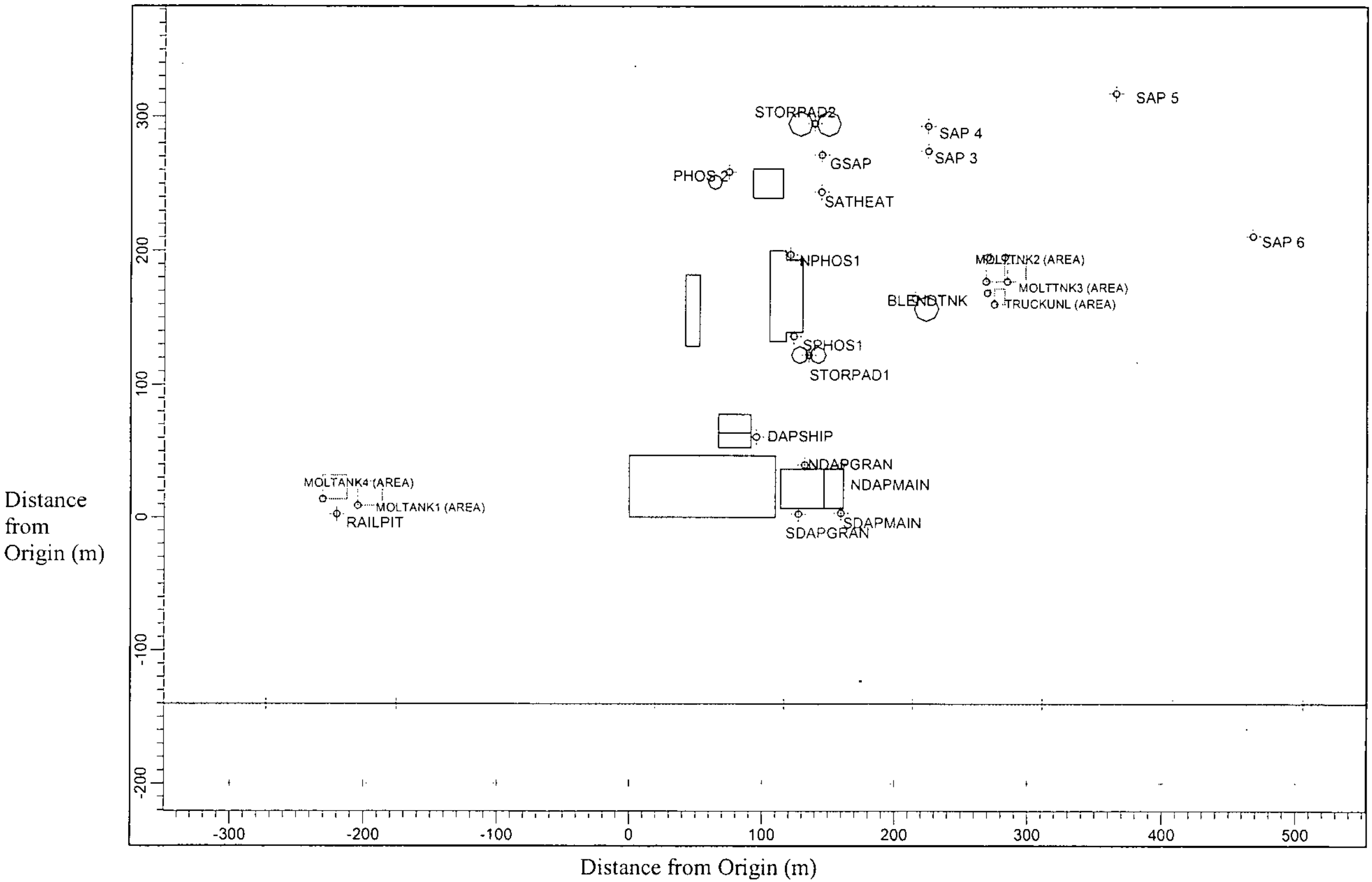


Figure 6-2. Building and Stack Locations and Nearest Receptor Locations Used in the Air Modeling Analysis, Cargill Green Bay



7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

Cargill is proposing to modify its existing facility in Green Bay, Florida. The facility is subject to the PSD new source review requirements for PM_{10}, NO_x, and F. The additional impact analysis and the Class I area analysis addresses these pollutants.

The analysis addresses the potential impacts on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area due to Cargill's proposed modification. The nearest Class I area is the CNWA, located approximately 110 km northwest of the Cargill Green Bay plant. In addition, potential impacts upon visibility resulting from the proposal modification are assessed.

The analysis will demonstrate that the increase in impacts due to the proposed increase in emissions is extremely low. Regardless of the existing conditions in the vicinity of the site or in the Class I areas, the proposed project will not cause any significant adverse effects due to the predicted low impacts upon these areas.

7.2 SOIL, VEGETATION, AND AQRV ANALYSIS METHODOLOGY

In the foregoing analysis, the maximum air quality impacts predicted to occur in the vicinity of Cargill Green Bay and in the Class I area due to the increase in emissions are used. The analysis involved predicting worst-case maximum short- and long-term concentrations of pollutants in the vicinity of the plant and in the Class I areas and comparing the maximum predicted concentrations to lowest observed effect levels for AQRVs or analogous organisms. In conducting the assessment, several assumptions were made as to how pollutants interact with the different matrices, i.e., vegetation, soils, wildlife, and aquatic environment.

A screening approach was used to evaluate potential effects by comparison of the maximum predicted ambient concentrations of air pollutants of concern 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 vicinity of the plant and the Class I area. It was recognized that effects 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.

7.3 IMPACTS TO SOILS AND VEGETATION IN THE VICINITY OF THE CARGILL GREEN BAY PLANT

Land use in the vicinity of the Cargill Green Bay site is primarily phosphate mine lands interspersed with areas of improved pasture and mixed forest. According to the USDA Soil Survey of Polk County, the Cargill site is underlain by the Urban Land soil series, while dominant soil series in the vicinity of the site include Arents-Water Complex, clayey Hydraquents, and Gypsum Land. These are severely disturbed soils resulting from strip mining, clay settling areas, and phosphate processing by-product (gypsum stacks). With the exception of Gypsum Land, these soils are typically neutral to alkaline in nature due to the high limestone and clay content.

Since the majority of the underlying substrate is neutral to alkaline, any acidifying effects of NO_x deposition on soils in the vicinity of the project would be buffered. The PM_{10} emissions are composed primarily of limestone, which is a naturally occurring substance in the area. The additional PM_{10}, NO_x, or fluoride concentrations resulting from the proposed modification will not affect soils in the vicinity of the Project site.

7.3.1 IMPACTS TO SOILS AND VEGETATION

According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Green Bay project are predicted to be below the PSD Class I and Class II increments and the AAQS. Since the AAQS are designed to protect the public welfare, including effects on soils and vegetation, no detrimental effects on soils or vegetation should occur in this area.

7.3.2 IMPACTS ON VISIBILITY

No new emission sources will be created by the proposed project. The proposed projects at the PAP and the North and South AP Plants will include upgrades to pollution control equipment and reductions in maximum permitted emission rates for F and PM/PM_{10}. All of these sources are in compliance with opacity regulations and should remain in compliance after the modification. As a result, no adverse impacts upon visibility are expected.

7.3.3 IMPACTS DUE TO ASSOCIATED POPULATION GROWTH

There will be a small, temporary increase in the number of workers during the construction period. There will be no significant increase in permanent employment at Cargill as a result of the proposed project. Therefore, there will be no anticipated permanent impacts on air quality caused by associated population growth.

The Cargill Green Bay facility is in a remote part of Polk County, primarily phosphate mines and plants for miles in all directions. There has not been any significant commercial, residential, industrial, or other growth in the immediate vicinity of Cargill Green Bay since 1977. Cargill Green Bay will "affect" an area of approximately 1.5 km surrounding the facility, based on the significant impact analysis. At the outer edge of the affected area is the southern part of Bartow. This part of Bartow has not experienced any significant growth since 1977. Based on this discussion, it is concluded that no significant growth has occurred in the area of the Green Bay site that would affect air quality impacts. It is also noted that the conservative background concentrations used in the modeling analysis already account for any such changes.

7.4 CLASS I AREA IMPACT ANALYSIS

7.4.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed modification to the Cargill Green Bay facility. 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 NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

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7.1 INTRODUCTION

Cargill is proposing to modify its existing facility in Green Bay, Florida. The facility is subject to the PSD new source review requirements for PM_{10}, NO_x, and F. The additional impact analysis and the Class I area analysis addresses these pollutants.

The analysis addresses the potential impacts on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area due to Cargill's proposed modification. The nearest Class I area is the CNWA, located approximately 110 km northwest of the Cargill Green Bay plant. In addition, potential impacts upon visibility resulting from the proposal modification are assessed.

The analysis will demonstrate that the increase in impacts due to the proposed increase in emissions is extremely low. Regardless of the existing conditions in the vicinity of the site or in the Class I areas, the proposed project will not cause any significant adverse effects due to the predicted low impacts upon these areas.

7.2 SOIL, VEGETATION, AND AQRV ANALYSIS METHODOLOGY

In the foregoing analysis, the maximum air quality impacts predicted to occur in the vicinity of Cargill Green Bay and in the Class I area due to the increase in emissions are used. The analysis involved predicting worst-case maximum short- and long-term concentrations of pollutants in the vicinity of the plant and in the Class I areas and comparing the maximum predicted concentrations to lowest observed effect levels for AQRVs or analogous organisms. In conducting the assessment, several assumptions were made as to how pollutants interact with the different matrices, i.e., vegetation, soils, wildlife, and aquatic environment.

A screening approach was used to evaluate potential effects by comparison of the maximum predicted ambient concentrations of air pollutants of concern 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 vicinity of the plant and the Class I area. It was recognized that effects 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.

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Land use in the vicinity of the Cargill Green Bay site is primarily phosphate mine lands interspersed with areas of improved pasture and mixed forest. According to the USDA Soil Survey of Polk County, the Cargill site is underlain by the Urban Land soil series, while dominant soil series in the vicinity of the site include Arents-Water Complex, clayey Hydraquents, and Gypsum Land. These are severely disturbed soils resulting from strip mining, clay settling areas, and phosphate processing by-product (gypsum stacks). With the exception of Gypsum Land, these soils are typically neutral to alkaline in nature due to the high limestone and clay content.

Since the majority of the underlying substrate is neutral to alkaline, any acidifying effects of NO_x deposition on soils in the vicinity of the project would be buffered. The PM_{10} emissions are composed primarily of limestone, which is a naturally occurring substance in the area. The additional PM_{10}, NO_x, or fluoride concentrations resulting from the proposed modification will not affect soils in the vicinity of the Project site.

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According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Green Bay project are predicted to be below the PSD Class I and Class II increments and the AAQS. Since the AAQS are designed to protect the public welfare, including effects on soils and vegetation, no detrimental effects on soils or vegetation should occur in this area.

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No new emission sources will be created by the proposed project. The proposed projects at the PAP and the North and South AP Plants will include upgrades to pollution control equipment and reductions in maximum permitted emission rates for F and PM/PM_{10}. All of these sources are in compliance with opacity regulations and should remain in compliance after the modification. As a result, no adverse impacts upon visibility are expected.

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There will be a small, temporary increase in the number of workers during the construction period. There will be no significant increase in permanent employment at Cargill as a result of the proposed project. Therefore, there will be no anticipated permanent impacts on air quality caused by associated population growth.

The Cargill Green Bay facility is in a remote part of Polk County, primarily phosphate mines and plants for miles in all directions. There has not been any significant commercial, residential, industrial, or other growth in the immediate vicinity of Cargill Green Bay since 1977. Cargill Green Bay will "affect" an area of approximately 1.5 km surrounding the facility, based on the significant impact analysis. At the outer edge of the affected area is the southern part of Bartow. This part of Bartow has not experienced any significant growth since 1977. Based on this discussion, it is concluded that no significant growth has occurred in the area of the Green Bay site that would affect air quality impacts. It is also noted that the conservative background concentrations used in the modeling analysis already account for any such changes.

7.4 CLASS I AREA IMPACT ANALYSIS

7.4.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed modification to the Cargill Green Bay facility. 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 NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in 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; and
- 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 that 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 that 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 that can be used as indicators of effects.

The maximum predicted ambient impacts upon the Chassahowitzka Class I area were presented in Section 6.0 and are summarized in Table 7-1.

7.4.2 VEGETATION

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants such as fluoride, chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis.

Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

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 concentrations that 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.

Particulate Matter

Although information pertaining to the effects of particulate matter on plants is scarce, some threshold concentrations are available. Mandoli and Dubey (1998) exposed ten species of native Indian plants to levels of particulate matter ranging from 210 to 366 $\mu g/m^3$ for an 8-hour averaging period. Damage in the form of a higher leaf area/dry weight ratio was observed at varying degrees for most plants tested. Concentrations of particulate matter lower than 163 $\mu g/m^3$ did not appear to be injurious to the tested plants.

By comparison of these published toxicity values for particulate matter exposure (i.e., concentrations for an 8-hour averaging time), the possibility of plant damage in the Chassahowitzka NWA can be determined. The maximum predicted cumulative 8-hour PM_{10} concentration in the Class I area due to the project only is 0.052 $\mu g/m^3$ (Table 7-1). This concentration is only 0.02% of the lower threshold value that reportedly affects plant foliage. Since the predicted 8-hour impact is very low, no measurable effects upon vegetation in the Class I area will occur due to the proposed project.

Nitrogen Dioxide

NO_2 can injure plant tissue with symptoms usually appearing as irregular white to brown collapsed lesions between the leaf veins and near the margins. Conversely, non-injurious levels of NO_2 can be absorbed by plants, enzymatically transformed into ammonia, and incorporated into plant constituents such as amino acids (Matsumaru et al., 1979).

Plant damage can occur through either acute (short-term, high concentration) or chronic (long-term, relatively low concentration) exposure. For plants that have been determined to be more sensitive to NO_2 exposure than others, acute (1, 4, 8 hours) exposure caused 5 percent predicted foliar injury at concentrations ranging from 3,800 to 15,000 $\mu g/m^3$ (Heck and Tingey, 1979). Chronic exposure of selected plants (some considered NO_2-sensitive) to NO_2 concentrations of 2,000 to 4,000 $\mu g/m^3$ for 213 to 1,900 hours caused reductions in yield of up to 37 percent and some chlorosis (Zahn, 1975).

Average and maximum 24-hour average background concentrations of NO_2 reported in the Chassahowitzka NWA are 0.006 and 0.104 $\mu g/m^3$, respectively (NADP, 2000). The increase in maximum 8-hour average NO_2 concentrations due to the Green Bay project in the Class I area is predicted to be 0.046 $\mu g/m^3$ (Table 7-1). This concentration is less than 0.01 percent of the levels that cause foliar injury in acute exposure scenarios. By comparison of published toxicity values for NO_2 exposure to long-term (annual averaging time) modeled concentrations, the possibility of plant damage in the Class I areas can be examined for chronic exposure situations. For a chronic exposure, the maximum increase in annual average NO_2 concentrations due to the Green Bay project in the Class I area is 0.0005 $\mu g/m^3$. When added to the maximum annual average concentration of NO_2 reported in the Chassahowitzka NWA, the resultant value (0.0065 $\mu g/m^3$) is less than 0.001 percent of the levels that caused minimal yield loss and chlorosis in plant tissue.

Fluoride

Fluoride is an inhibitor of plant metabolism. As fluoride accumulates in plants, it causes an inhibition of plant metabolism and chlorosis (a yellowing of the leaf). With further increases in accumulation of fluoride, the cells die and necrosis is observed. Leaf tips and margins accumulate the highest concentrations of fluoride and are the sites of initial visible injury. Gaseous fluoride is taken up primarily through the stomata of transpiring plants. There is negligible contribution to leaf fluoride content by uptake through the roots (Applied Sciences Associates, Inc., 1978).

Plant sensitivities can range from 16 $\mu g/m^3$ of fluoride in sensitive plants to 500 $\mu g/m^3$ of fluoride in tolerant plants for 3-hour exposures. The lowest observed effect levels for sensitive plants are reported to be as follows (Applied Sciences Associates, Inc., 1978):

<50 $\mu g/m^3$ for 1-hour exposures
<16 $\mu g/m^3$ for 3-hour exposures
<1.6 $\mu g/m^3$ for 24-hour exposures

Gladiolus is considered the plant species most sensitive to flouride. Visible symptoms are reported to occur when gladiolus have been exposed to concentrations >0.5 $\mu g/m^3$ for 5 to 10 days. More tolerant fruit tree species and conifers displayed symptoms at around 1 $\mu g/m^3$ at 10-day exposures (Treshow and Anderson, 1989).

The predicted increase in maximum fluoride concentrations in the Chassahowitzka NWA due to the modified Cargill Green Bay plant are 0.036 $\mu g/m^3$ for 1-hour averaging time, 0.010 $\mu g/m^3$ for 24-hour averaging time, and 0.0005 $\mu g/m^3$ for the annual averaging time (refer to Table 7-1). These concentrations are only 0.07 to 0.6 percent of the reported effect levels. As a result, no significant adverse effects are predicted to occur to the vegetative AQRVs of Chassahowitzka NWA.

7.4.3 WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National AAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary ambient air quality standards. Physiological and behavioral effects have been observed in experimental animals at or below these standards. The ingestion of excessive amounts of fluoride can lead to an animal disease called fluorosis. Fluorosis is a skeletal and dental disease resulting in softening of bone and dental tissue that can lead to injury and other health problems. In general, forage plants with over 30 ppm of fluoride which are regularly ingested by animals such as cattle and deer can result in mild fluorosis. A number of states (excluding Florida) have fluoride standards. These range from 25 to 40 parts per million (ppm) of fluoride in vegetation as a maximum annual average.

For impacts on wildlife, the lowest threshold values of NO_2 and PM_{10} which are reported to cause physiological changes are shown in Table 7-2. These values are up to orders of magnitude larger than maximum concentrations predicted from the Cargill Green Bay project in the Class I area. No effects on wildlife AQRVs from NO_2, PM_{10}, or F are expected. The proposed project's contribution to cumulative impacts are negligible.

Since the predicted annual F concentration due to the project is very low, no measurable accumulation of fluoride will occur in vegetation that would be the prime forage of wildlife. Therefore, no significant adverse effects to wildlife AQRVs will occur from vegetation.

7.4.4 SOILS

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification,
- Alteration in cation exchange,
- Loss of base cations, and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

According to the USDA Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the Chassahowitzka NWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacooche, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the NWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the NWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and therefore have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of contaminants projected for the Chassahowitzka NWA from the proposed project's emissions precludes any significant impact on soils.

Particulate Matter

The majority of the soil in the Class I area 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).

Any particulate deposition from the proposed project would be neutral or alkaline in nature. Although ground deposition was not calculated, it is evident that the effect of any dust deposited would be inconsequential in light of the existing soil pH. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity.

Nitrogen Dioxide

The greatest threat to soils from increased NO_x deposition is a decrease in pH or an increase in nitrate to levels considered unnatural or potentially toxic. The results from the Florida Acid Deposition Study (FADS) network for two sampling stations (Site 8 and Site 5) located to the north of the Class I area indicate that the average sulfate deposition ranges from 14.5 to

17.7 kg/ha/yr (Pollman, 1994). The predicted amount of NO_x deposition due to the proposed project is insignificant in light of the sulfate deposition measured in the area and the inherent sulfur content of the soils. In addition, the regular flooding of these soils by the Gulf of Mexico regulates the pH, and any rise in acidity would be buffered by this activity.

7.4.5 IMPACTS UPON VISIBILITY

7.4.5.1 Introduction

The CAA Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in mandatory Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants. Sources of air pollution can cause visible plumes if emissions of PM_{10} and NO_x are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature, such as a mountain). PSD Class I areas, such as national parks and wilderness areas, are afforded special visibility protection designed to prevent plume visual impacts to observers within a Class I area.

Visibility is an AQRV for the Chassahowitzka NWA. Visibility can take the form of plume blight for nearby areas or regional haze for long distances (e.g., distances beyond 50 km). Because the Chassahowitzka NWA is more than 50 km from the Cargill Green Bay facility, the potential change in visibility is analyzed as regional haze.

Currently, there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and FLM of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report; and
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report,* USFS, NPS, USFWS (December, 2000), referred to as the FLAG document.

The methods and assumptions recommended in these documents were used to assess visibility impairment due to the project.

7.4.5.2 Analysis Methodology

Based on the FLAG document, current regional haze guidelines characterize a change in visibility by the change in the light-extinction coefficient (b_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change. An index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient.

The purpose of the visibility analysis is to calculate the extinction at each receptor for each day (24-hour period) of the year due to the proposed project. The criteria to determine if the project's impacts are potentially significant are based on a change in extinction of 5 percent or greater for any day of the year.

Processing of visibility impairment for this study was performed with the CALPUFF model (see Appendix C) and the CALPUFF post-processing programs POSTUTIL and CALPOST. The analysis was conducted in accordance with the most recent guidance from the FLAG report (December 2000). The CALPUFF postprocessor model CALPOST is used to calculate the combined visibility effects from the different pollutants that are emitted from the Project. Daily background extinction coefficients are calculated on an hour-by-hour basis using hourly relative humidity data from CALMET and hygroscopic and non-hygroscopic extinction components specified in the FLAG document. For the Class I area evaluated, the hygroscopic and non-hygroscopic components are 0.9 and 8.5 inverse mega meter (Mm^{-1}). CALPOST then predicts the percent extinction change for each day of the year.

7.4.5.3 Emission Inventory

Based on recommendations of the FLAG Phase I Summary Report (12/00), the regional haze analysis considered only the maximum 24-hour increase in emissions due to the proposed Cargill

Green Bay modification. The emission rates and source parameters for the affected sources are presented in Chapter 6.0.

7.4.5.4 Building Wake Effects

The air modeling analysis included the same building structure dimensions to account for the effects of building-induced downwash as was used in the ISCST3 modeling analysis. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model.

7.4.5.5 Receptor Locations

Receptors for the refined analysis included 13 discrete receptors located at the Chassahowitzka PSD Class I area. Because the area's terrain is flat, all receptors were assumed to be at zero elevation.

7.4.5.6 Background extinction coefficents and relative humidity

The regional haze analysis was performed using the latest regulatory guidance as provided in the Federal Land Manager's Air Quality Related Values Workgroup (FLAG) Phase I report. Using the hourly meteorological and relative humidity data used with the CALPUFF model, the daily change is background extinction is computed. The hygroscopic and dry non-hygroscopic components used for calculating the daily background extinction coefficients for the CNWA were obtained from the FLAG report. For this analysis, the hygroscopic and dry non-hygroscopic values were 0.9 and 8.5 inverse millimeters (Mm^{-1}), respectively.

7.4.5.7 Meteorological Data

Three years of CALMET wind field data was used for a domain that covers all of central Florida. The years of data are 1990, 1992, and 1996. A detailed description of the data used to develop the wind domains is presented in Appendix C.

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7.4.5.8 Chemical Transformation

The air modeling analysis included all chemical transformation processes that occur for the emitted species.

7.4.5.9 Results

The visibility modeling results are presented in Table 7-3. The maximum predicted 24-hour change in background extinction coefficient is 1.43 percent. As this percentage is below the criteria value of 5 percent, it is concluded that the proposed project will not adversely impact the background visibility levels at the CNWA PSD Class I area.

7.4.6 NITROGEN DEPOSITION

As part of the AQRV analyses, total nitrogen (N) deposition rates were predicted at the Chassahowitzka NWA Cass I area. The deposition analysis threshold is based on the annual averaging period. The total nitrogen deposition is estimated in units of kilogram per hectare per year (kg/ha/yr). The CALPUFF model is used to predict wet and dry deposition fluxes of various oxides of these elements.

For N deposition, the species include:

- Particulate ammonium nitrate (from species NO_3), wet and dry deposition;
- Nitric acid (species HNO_3), wet and dry deposition;
- NO_x, dry deposition; and
- Ammonium sulfate (species SO_4), wet and dry deposition.

The CALPUFF model produces results in units of $\mu g/m^2/s$. The modeled deposition rates are then converted to N deposition in kg/ha respectively, by using a multiplier equal to the ratio of the molecular weights of the substances (IWAQM Phase II report Section 3.3).

The deposition analysis threshold (DAT) for nitrogen of 0.01 kg/ha/yr was provided by the U.S. Fish and Wildlife Service (January 2002). A DAT is the additional amount of N deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The maximum N deposition predicted for the proposed Green Bay project is, therefore, compared to these DAT or significant impact levels.

The maximum predicted N deposition predicted for the Project in the PSD Class I area of the Chassahowitzka NWA is summarized in Table 7-4. The maximum N deposition rate for the Project is predicted to be 0.0003 kg/ha/yr, which is below the DAT of 0.01 kg/ha/yr. As a result, the project's emissions are not expected to have a significant adverse effect on N deposition at the Class I area.

Table 7-1. Summary of Maximum PSD Class I Impacts Predicted for the Proposed Project

	Averaging Time	Concentration[a] (ug/m^3) for Year 1990	1992	1996	EPA Class I Significant Impact Levels (ug/m^3)
NO_2	Annual	0.0003	0.0005	0.0004	0.1
	24-Hour	0.013	0.015	0.016	
	8-Hour	0.034	0.041	0.046	
	3-Hour	0.058	0.060	0.070	
	1-Hour	0.067	0.086	0.084	
PM_{10}	Annual	0.0007	0.0008	0.0008	0.2
	24-Hour	0.014	0.020	0.023	0.3
	8-Hour	0.033	0.041	0.052	
	3-Hour	0.056	0.059	0.072	
	1-Hour	0.074	0.078	0.091	
F	Annual	0.0004	0.0005	0.0004	
	24-Hour	0.006	0.009	0.010	
	8-Hour	0.014	0.018	0.022	
	3-Hour	0.023	0.025	0.031	
	1-Hour	0.030	0.033	0.036	

[a] Concentrations predicted with the CALPUFF model and CALMET-developed domains for central Florida for 1990, 1992, and 1996.

Table 7-2. Examples of Reported Effects of Air Pollutants at Concentrations Below National Secondary Ambient Air Quality Standards

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Sulfur Dioxide[1]	Respiratory stress in guinea pigs	427 to 854	1 hour
	Respiratory stress in rats	267	7 hours/day; 5 day/week for 10 weeks
	Decreased abundance in deer mice	13 to 157	continually for 5 months
Nitrogen Dioxide[2,3]	Respiratory stress in mice	1,917	3 hours
	Respiratory stress in guinea pigs	96 to 958	8 hours/day for 122 days
Particulates[1]	Respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	Decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Source: [1]Newman and Schreiber, 1988.
[2]Gardner and Graham, 1976.
[3]Trzeciak et al., 1977.

Table 7-3. Maximum 24-hour Average Visibility Impairment Predicted for Cargill Green Bay at the PSD Class I Area of the Chassahowitzka NWA

Ranking	Visibility Impairment (%) [a]			Visibility Impairment Criteria (%)
	1990	1992	1996	
Highest	0.36	1.43	1.18	5.0

[a] Concentrations are highest predicted using the CALPUFF model and CALMET windfields for central Florida.

Table 7-4. Maximum Nitrogen Annual Deposition Predicted for Cargill Green Bay at the PSD Class I Area of the Chassahowitzka NWA

Species	Total Deposition (Wet & Dry)						Deposition Analysis Threshold [b]
	1990		1992		1996		
	($g/m^2/s$)	(kg/ha/yr)[a]	($g/m^2/s$)	(kg/ha/yr)[a]	($g/m^2/s$)	(kg/ha/yr)[a]	(kg/ha/yr)
Nitrogen (N)	6.70E-13	0.0002	1.08E-12	0.0003	6.10E-13	0.0002	0.01

[a] Conversion factor is used to convert $g/m^2/s$ to kg/hectare (ha)/yr with the following units:

$g/m^2/s$ x 0.001 kg/g
x 10,000 m^2/hectare
x 3,600 sec/hr
x 8,760 hr/yr = kg/ha/yr
or
$g/m^2/s$ x 3.154E+08 = kg/ha/yr

[b] Deposition analysis thresholds (DAT) for nitrogen and sulfur deposition provided by the U.S. Fish and Wildlife Service, January 2002. A DAT is the additional amount of N or S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant.

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APPENDIX A

BASIS OF ACTUAL EMISSIONS

Table A-1. Actual Emissions [a] for 2002--Cargill Green Bay

Source Description	EU ID	Operating Hours	Pollutant Emission Rate (TPY)								
			SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
A. Molten Sulfur Handling System											
Molten Sulfur Storage Tank No. 1	030	8,760	1.23	--	--	1.40	1.40	2.54	1.71	--	--
Molten Sulfur Storage Tank No. 2	031	8,760	3.64	--	--	1.43	1.43	2.58	1.75	--	--
Molten Sulfur Storage Tank No. 3	032	8,760	3.64	--	--	1.43	1.43	2.58	1.75	--	--
Molten Sulfur Storage Tank No 4	039	8,760	2.10	--	--	0.77	0.77	1.61	1.05	--	--
Molten Sulfur Truck Pit	033	8,760	0.13	--	--	0.05	0.05	0.10	0.07	--	--
Molten Sulfur Rail/Back-up Truck Pit	034	8,760	1.23	--	--	1.40	1.40	2.54	1.71	--	--
Molten Sulfur Supply Pit No. 4	036	8,760	0.13	--	--	0.05	0.05	0.10	0.07	--	--
Molten Sulfur Supply Pit No. 5	035	8,760	0.13	--	--	0.05	0.05	0.10	0.07	--	--
Molten Sulfur Supply Pit No 6	041	8,760	--	--	--	0.05	0.05	0.10	0.07	--	--
Total			**12.23**	**0.00**	**0.00**	**6.63**	**6.63**	**12.25**	**8.25**	**0.00**	**0.00**
B. Sulfuric Acid Plant No. 4	004	8,221	896.24	26.36	--	--	--	--	--	10.54	--
C. Sulfuric Acid Plant No. 5	005	8,443	1,255.63	35.37	--	--	--	--	--	17.68	--
D. Sulfuric Acid Plant No. 6	038	8,475	1,416.15	34.33	--	--	--	--	--	17.17	--
E. Phosphoric Acid Production/Handling System											
Phosphoric Acid Plant No. 1--North	016	7,616	--	--	--	--	--	--	--	--	0.20
Phosphoric Acid Plant No. 1--South	017	7,599	--	--	--	--	--	--	--	--	1.01
Phosphoric Acid Plant No. 2	013	7,841	--	--	--	--	--	--	--	--	0.17
Green Superphosphoric Acid Plant	009	1,158	--	1.48	--	0.08	0.12	--	--	--	0.01
Phosphoric Acid Tanks--54% (2)	014	8,760	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Tanks (2)--Clarifying & Aging	015	8,760	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks (4)	037	8,760	--	--	--	--	--	--	--	--	0.0004
Total			**0.00**	**1.48**	**0.00**	**0.08**	**0.12**	**0.00**	**0.00**	**0.00**	**1.45**
F. South DAP Fertilizer Plant	007	7,592	0.03	5.67	4.77	22.82	22.82	0.31	--	--	5.18
G. North MAP/DAP Fertilizer Plant	029	7,160	0.03	5.27	4.42	40.54	40.54	0.29	--	--	3.09
H. DAP, MAP, or TSP Storage & Shipping Buildings	020	8,760	--	--	--	8.62	8.62	--	--	--	0.17
I. Therminol Heater	028	1,140	0.002	0.33	0.28	0.02	0.02	0.02	--	--	--
J. Fugitive and Unregulated Facility-wide Emissions	042	8,760	--	--	--	--	--	--	--	--	1.60
Total Actual Emission Rates--2002			**3,580.31**	**108.81**	**9.47**	**78.71**	**78.75**	**12.87**	**8.25**	**45.39**	**11.49**

[a] Emissions from the 2002 AOR.

Table A-2. Actual Emissions [c] for 2001--Cargill Green Bay

Source Description	EU ID	Operating Hours	Pollutant Emission Rate (TPY)								
			SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
A. Molten Sulfur Handling System											
Molten Sulfur Storage Tank No. 1	030	8,760	1.23	--	--	1.40	--	2.54	1.71	--	--
Molten Sulfur Storage Tank No. 2	031	8,760	3.64	--	--	1.43	--	2.58	1.75	--	--
Molten Sulfur Storage Tank No. 3	032	8,760	3.64	--	--	1.43	--	2.58	1.75	--	--
Molten Sulfur Storage Tank No.4	039	8,760	2.10	--	--	0.77	--	1.61	1.05	--	--
Molten Sulfur Truck Pit	033	8,760	0.13	--	--	0.05	--	0.10	0.07	--	--
Molten Sulfur Rail/Back-up Truck Pit	034	8,760	1.23	--	--	1.40	--	2.54	1.71	--	--
Molten Sulfur Supply Pit No. 4	036	8,760	0.13	--	--	0.05	--	0.10	0.07	--	--
Molten Sulfur Supply Pit No. 5	035	8,760	0.13	--	--	0.50	--	0.10	0.07	--	--
Molten Sulfur Supply Pit No. 6	041	8,760	0.13	--	--	--	--	0.10	0.07	--	--
Total			**12.36**	**0.00**	**0.00**	**7.03**	**0.00**	**12.25**	**8.25**	**0.00**	**0.00**
B. Sulfuric Acid Plant No. 4	004	8,180	473.70	21.78	--	14.36	14.60	--	--	14.60	--
C. Sulfuric Acid Plant No. 5	005	8,548	1,374.18	37.55	--	14.49	14.49	--	--	14.49	--
D. Sulfuric Acid Plant No. 6	038	8,678	1,173.03	30.00	--	27.01	27.01	--	--	27.01	--
E. Phosphoric Acid Production/Handling System											
Phosphoric Acid Plant No. 1--North	016	7,745	--	--	--	--	--	--	--	--	0.26
Phosphoric Acid Plant No. 1--South	017	7,667	--	--	--	--	--	--	--	--	0.09
Phosphoric Acid Plant No. 2	013	8,133	--	--	--	--	--	--	--	--	0.42
Green Superphosphoric Acid Plant	009	2,029	--	6.72	--	0.19	--	--	--	--	0.01
Phosphoric Acid Tanks--54% (2)	014	8,760	--	--	--	--	--	--	--	--	0.01
Phosphoric Acid Tanks (2)--Clarifying & Aging	015	8,760	--	--	--	--	--	--	--	--	0.05
Phosphoric Acid Blend Tanks (4)	037	8,760	--	--	--	--	--	--	--	--	0.0004
Total			**0.00**	**6.72**	**0.00**	**0.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.84**
F. South DAP Fertilizer Plant	007	7,862	0.04	9.07	1.10	25.48	22.00	0.18	--	--	7.31
G. North MAP/DAP Fertilizer Plant	029	7,593	0.03	4.15	0.87	24.43	21.25	6.07	--	--	3.46
H. DAP, MAP, or TSP Storage & Shipping Buildings	020	8,760	--	--	--	3.47	3.02	--	--	--	0.17
I. Therminol Heater	028	2,255	0.003	0.77	0.19	0.08	--	0.02	--	--	--
J. Fugitive and Unregulated Facility-wide Emissions	042	8,760	--	--	--	--	--	--	--	--	1.62
Total Actual Emission Rates--2001			**3,033.34**	**110.03**	**2.16**	**116.54**	**102.37**	**18.52**	**8.25**	**56.10**	**13.40**

[c] Emissions from the 2001 AOR.

APPENDIX B

PM_{10} AND NO_X AAQS AND PSD CLASS II INVENTORIES

Table B-1. Summary of PM_{10} Sources Included in the Air Modeling Analyses, Cargill Green Bay

Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline [a]	Modeled in AAQS	Modeled in Class II
	Bartow Phosphate Center (Formerly IMC Uranium Recovery)																	
			16IMCF	-1,100	2,100	85	25.9	0.7	0.2	75	297	38.1	11.6	-189.7	-23.90	E	No	Yes
1050052	CF Industries, Inc. - Bartow																	
	No. 1 MAP/DAP/GTSP Shipping Unit	2	CFIBR2	-1,200	2,400	140	42.7	2.5	0.76	77	298	71.0	21.6	40.4	5.09	C	Yes	Yes
	Boiler No. 1	21	CFIBR21	-1,200	2,400	36	11.0	2.5	0.76	600	589	44.0	13.4	11.0	1.38	B	Yes	No
	No 2 MAP/DAP Shipping Unit	25	CFIBR25	-1,200	2,400	135	41.1	5.0	1.52	77	298	25.0	7.6	40.4	5.09	C	Yes	Yes
	West Phosphate Rock Unloading System	26	CFIBR26	-1,200	2,400	65	19.8	4.0	1.22	77	298	50.0	15.2	14.0	1.76	B	Yes	No
1050046	Cargill Fertilizer - Bartow																	
	N. 3 Fertilizer Plant	1	CFBAR1	300	6,500	153	43.3	7.5	2.29	160	344	79.4	24.1	30.00	1.46	C	Yes	Yes
	N. 4 Fertilizer Plant	21	CFBAR2	300	6,500	140	42.7	11.0	3.35	146	329	45.6	12.8	18.00	2.27	C	Yes	Yes
	N 3 Fertilizer Shipping Plant	4	CFBAR3	300	6,500	80	24.4	2.3	0.70	77	297	38.2	11.4	12.00	1.51	C	Yes	Yes
	N.4 Fertilizer Shipping Plant	2	CFBAR4	300	6,500	128	39.0	4.9	1.49	91	305	30.9	11.6	10.54	1.33	C	Yes	Yes
	Phosphate Rock Grinding Mill "D" Vent		CFBAR5	300	6,500	83	25.3	1.7	0.51	115	319	26.6	8.1	-1.00	-0.13	E	No	Yes
	Phosphate Rock Storage Bin Stack R-4		CFBAR6	300	6,500	55	16.8	3.1	0.94	95	308	59.9	18.2	-5.10	-0.64	E	No	Yes
	Phosphate Rock Storage Bin Stack R-5		CFBAR7	300	6,500	55	16.8	3.0	0.92	75	297	74.7	22.8	-2.70	-0.34	E	No	Yes
	Phosphate Rock Storage Bin Stack R-6		CFBAR8	300	6,500	55	16.8	3.0	0.92	82	301	65.3	19.9	-9.00	-1.13	E	No	Yes
	Phosphate Rock Storage Bin Stack R-7		CFBAR9	300	6,500	50	15.2	1.1	0.33	113	318	25.5	7.8	-2.10	-0.26	E	No	Yes
	GTSP Fertilizer Plant N. 1, Stack N. 8		CFBAR10	300	6,500	100	30.5	6.7	2.03	135	330	47.9	14.6	-20.00	-2.52	E	No	Yes
	GTSP Shipping East, Stack N. 13		CFBAR11	300	6,500	92	28.0	1.8	0.55	75	297	34.7	10.6	-0.40	-0.05	E	No	Yes
	GTSP Shipping West, Stack N. 14		CFBAR12	300	6,500	95	29.0	2.2	0.67	75	297	14.0	4.3	-0.38	-0.05	E	No	Yes
	GTSP Storgae Building E-1, Stack N. 31		CFBAR13	300	6,500	108	32.9	6.9	2.10	108	315	42.8	13.0	-0.71	-0.09	E	No	Yes
	GTSP Fertilizer Plant N. 1, Stack N. 7		CFBAR14	300	6,500	80	24.4	6.6	2.01	112	318	54.9	16.7	-10.20	-1.29	E	No	Yes
	GTSP Fertilizer Plant N. 2, Granulator Stack N. 12		CFBAR15	300	6,500	46	14.0	2.0	0.61	75	297	53.1	16.2	-0.10	-0.01	E	No	Yes
	Phosphate Rock Grinding Mill "A" Vent		CFBAR16	300	6,500	74	22.6	1.8	0.56	91	306	25.8	7.9	-1.13	-0.14	E	No	Yes
	Phosphate Rock Grinding Mill "B" Vent		CFBAR17	300	6,500	74	22.6	1.8	0.56	106	314	28.9	8.8	-0.90	-0.11	E	No	Yes
	Phosphate Rock Grinding Mill "C" Vent		CFBAR18	300	6,500	74	22.6	1.8	0.56	94	308	24.5	7.5	-0.93	-0.12	E	No	Yes
	Phosphate Rock Transfer Point R-10,R-11,R-12		CFBAR19	300	6,500	46	14.0	1.0	0.30	75	297	32.3	9.8	-0.10	-0.01	E	No	Yes
	Phosphate Rock Cveyor R-8		CFBAR20	300	6,500	53	16.2	0.7	0.22	75	297	21.2	6.4	-1.40	-0.18	E	No	Yes
	Phosphate Rock Cveyor, Stack N. 27		CFBAR21	300	6,500	40	12.2	1.8	0.56	99	310	37.9	11.6	-0.80	-0.10	E	No	Yes
	Phosphate Rock Cveyor, Stack N. 28		CFBAR22	300	6,500	58	17.7	1.8	0.56	91	306	38.0	11.6	-0.50	-0.06	E	No	Yes
	Phosphate Rock Cveyor, Stack N. 29		CFBAR23	300	6,500	71	21.6	1.8	0.56	91	306	38.0	11.6	-0.50	-0.06	E	No	Yes
	Phosphate Dryers R-1 and R-2		CFBAR24	300	6,500	50	15.2	6.7	2.05	140	333	56.6	17.2	-5.00	-0.63	E	No	Yes
1050050	U S Agri-Chemicals - Bartow																	
	150 TPH MAP/DAP Plant	38	USAGBR38	3,700	6,200	131	39.9	7.0	2.13	110	316	56.3	17.2	38.6	4.86	C	Yes	Yes
	DAP/MAP Storage/Loading	39	USAGBR39	3,700	6,200	73	22.3	2.8	0.85	77	298	81.2	24.7	22.7	2.86	C	Yes	Yes
1050234	Hines Energy Complex (Progress Energy)																	
	Power Block 1	1	HINES1	4,840	-6,190	300	91.4	9.0	2.7	312	429	119.2	36.3	44.8	5.64	C	Yes	Yes
	Power Block 2	2	HINES2	4,840	-6,190	125	38.1	19.0	5.8	270	405	69.4	21.2	64.8	8.16	C	Yes	Yes
	Power Block 3	5	HINES3	4,840	-6,190	125	38.1	18.0	5.5	270	405	69.4	21.2	64.8	8.16	C	Yes	Yes
	Auxiliary Boiler	3	HINESAX	4,840	-6,190	60	18.3	2.5	0.8	332	440	106.0	32.3	4.9	0.62	C	Yes	Yes
	EMERGENCY DIESEL GENERATOR	4	HINESEG	4,840	-6,190	25	7.6	1.5	0.5	980	800	143.0	43.6	0.48	0.06	C	Yes	Yes
1050055	IMC - Agrico Co. (South Pierce)																	
	Auxiliary Boiler	1	IMCPIER1	-2,000	-8,700	35	10.7	4.8	1.46	430	494	51.0	15.5	1.76	0.22	C	Yes	Yes
	GTSP Production Plant	23	IMCPIE23	-2,000	-8,700	140	42.7	9.0	2.74	110	316	36.0	11.0	35.0	4.41	C	Yes	Yes

Table B-1. Summary of PM_{10} Sources Included in the Air Modeling Analyses, Cargill Green Bay

Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline[a]	Modeled in AAQS	Modeled in Class II
	GTSP East Storage Nrth	24	IMCPIE24	-2,000	-8,700	80	24.4	11.0	3.35	90	305	25.0	7.6	40.1	5.05	C	Yes	Yes
	GTSP East Storage South	25	IMCPIE25	-2,000	-8,700	80	24.4	11.0	3.35	90	305	25.6	7.8	40.1	5.05	C	Yes	Yes
1050145	Bartow Ethanol, Inc.																	
	BOILER	1	BRTETH1	9,250	-1,260	36	11.0	3.0	0.91	350	450	66.0	20.1	64.24	8.09	C	Yes	Yes
1050056	IMC-Agrico Co.(Prairie)																	
	Limestone Bucket Elevator	1	IMCPR1	-6,600	6,900	90	27.4	1.0	0.30	100	311	42.0	12.8	32.3	4.07	B	Yes	No
	#1, Limerock Grinding	2	IMCPR2	-6,600	6,900	75	22.9	1.1	0.34	130	328	79.0	24.1	15.0	1.89	B	Yes	No
	N. 3, Limerock Grinding	3	IMCPR3	-6,600	6,900	75	22.9	1.1	0.34	130	328	133.0	40.5	19.2	2.42	B	Yes	No
	Limerock Dryer	4	IMCPR4	-6,600	6,900	70	21.3	4.4	1.34	184	358	51.0	15.5	32.4	4.08	B	Yes	No
	#4 Raymond Mill	5	IMCPR5	-6,600	6,900	65	19.8	2.0	0.61	140	333	33.0	10.1	19.2	2.42	B	Yes	No
	Limestone Bin & Truck Loadout	6	IMCPR6	-6,600	6,900	50	15.2	0.5	0.15	78	299	76.0	23.2	0.15	0.02	B	Yes	No
	Feed Bin Area & Assoc. Equip.	7	IMCPR7	-6,600	6,900	75	22.9	1.1	0.34	130	328	175.0	53.3	2.4	0.30	B	Yes	No
1050057	IMC Phosphates (Nichols)																	
	Phosphoric Acid Plant	1	IMCNIC1	-11,100	4,100	42	12.8	4.0	1.2	100	311	34.0	10.4	39.0	4.91	B	Yes	No
	DAP Cooler Venturi Scrubber	2	IMCNIC2	-11,100	4,100	52	15.8	2.5	0.8	120	322	66.0	20.1	11.0	1.39	B	Yes	No
	DAP Plant Dryer	3	IMCNIC3	-11,100	4,100	80	24.4	3.5	1.1	130	328	78.0	23.8	11.0	1.39	B	Yes	No
	DAP Plt Scrubber 4a	4	IMCNIC4	-11,100	4,100	72	21.9	3.2	1.0	190	361	101.0	30.8	11.0	1.39	B	Yes	No
	North Ball Mill	9	IMCNIC9	-11,100	4,100	207	63.1	1.4	0.4	135	330	69.0	21.0	5.0	0.63	B	Yes	No
	South Ball Mill	10	IMCNIC10	-11,100	4,100	207	63.1	1.4	0.4	135	330	69.0	21.0	5.0	0.63	B	Yes	No
	Phosphate Rock Dryer W/ Wet Scrubber	12	IMCNIC12	-11,100	4,100	81	24.7	7.5	2.3	130	328	12.0	3.7	35.24	4.44	B	Yes	No
	Package Boiler (North Standby Boiler)	15	IMCNIC15	-11,100	4,100	27	8.2	2.0	0.6	500	533	45.0	13.7	0.36	0.05	B	Yes	No
	Package Boiler	16	IMCNIC16	-11,100	4,100	39	11.9	3.2	1.0	500	533	29.0	8.8	0.72	0.09	B	Yes	No
	Dry Phosphate Rock Storage Bin	19	IMCNIC19	-11,100	4,100	207	63.1	0.9	0.3	140	333	168.0	51.2	11.0	1.39	B	Yes	No
	Sulfur Storage & Handling Tank	21	IMCNIC21	-11,100	4,100	6	1.8	0.8	0.2	77	298	11.6	3.54	0.40	0.05	B	Yes	No
1050047	Agrifos Mining, L.L.C. - Nichols																	
	Rock Dryer N. 1	1	AGRNIC1	-10,800	5,200	80	24.4	7.5	2.29	160	344	41.0	12.5	38.1	4.80	C	Yes	Yes
	Rock Dryer N. 2	2	AGRNIC2	-10,800	5,200	80	24.4	7.5	2.29	160	344	41.0	12.5	38.1	4.80	C	Yes	Yes
	Dry Rock Storage Building	10	AGRNIC10	-10,800	5,200	85	25.9	5.5	1.68	80	300	47.0	14.3	40.0	5.04	C	Yes	Yes
	Dry Rock Loadout	11	AGRNIC11	-10,800	5,200	85	25.9	5.0	1.52	75	297	63.0	19.2	33.0	4.16	C	Yes	Yes
1050034	IMC-Agrico Co. (CFMO) Noralyn																	
	Dryer No. 1 @ Noralyn Mine (011)	11	IMCFMO11	-11,300	-4,400	76	23.16	6.5	2.0	250	394	56.8	17.3	42.2	5.32	B	Yes	No
	Dryer No. 2 East @ Noralyn Mine (012)	12	IMCFMO12	-11,300	-4,400	55	16.76	9.3	2.8	155	341	29.0	8.8	45.1	5.68	B	Yes	No
	Silos 1, 2, 3, 12 @ Noralyn Mine (013)	13	IMCFMO13	-11,300	-4,400	150	45.72	3.5	1.1	100	311	52.0	15.8	35.0	4.41	B	Yes	No
	Ball Mill Transfers @ Noralyn Mine (014)	14	IMCFMO14	-11,300	-4,400	24	7.32	2	0.6	110	316	26.5	8.1	15.0	1.89	B	Yes	No
	Ball Mill Transfers @ Noralyn Mine (015)	15	IMCFMO15	-11,300	-4,400	24	7.32	2	0.6	110	316	26.5	8.1	10.0	1.26	B	Yes	No
	Ball Mill No. 3 @ Noralyn Mine (016)	16	IMCFMO16	-11,300	-4,400	25	7.62	1.5	0.5	75	297	37.7	11.5	10.0	1.26	B	Yes	No
	Ball Mill No. 4 @ Noralyn Mine (017)	17	IMCFMO17	-11,300	-4,400	27	8.23	2	0.6	75	297	15.9	4.8	10.0	1.26	B	Yes	No
	No. 3 Ball Mill Loadouts @ Noralyn Mine (018)	18	IMCFMO18	-11,300	-4,400	25	7.62	1.5	0.5	77	298	37.7	11.5	10.0	1.26	B	Yes	No
	No. 4 Ball Mill Loadouts @ Noralyn Mine (019)	19	IMCFMO19	-11,300	-4,400	29	8.84	1.8	0.5	77	298	19.7	6.0	10.0	1.26	B	Yes	No
	A Track Railcar Loadout @ Noralyn Mine	20	IMCFMO20	-11,300	-4,400	27	8.23	2	0.6	85	303	53.1	16.2	15.0	1.89	B	Yes	No
	B Track Railcar Loadout @ Noralyn Mine	21	IMCFMO21	-11,300	-4,400	27	8.23	1.9	0.6	81	300	71.8	21.9	15.0	1.89	B	Yes	No
	Transfer Points To Conveyors C31 & C33 @ Noralyn	22	IMCFMO22	-11,300	-4,400	40	12.19	1.5	0.5	100	311	47.2	14.4	10.0	1.26	B	Yes	No
	Material Transfer Sources @ Noralyn	23	IMCFMO23	-11,300	-4,400	43	13.11	2	0.6	86	303	26.5	8.1	15.0	1.89	B	Yes	No
	Dry Phosphate Transfer @ Noralyn Mine (024)	24	IMCFMO24	-11,300	-4,400	135	41.15	2.8	0.9	60	289	55.0	16.8	15.0	1.89	B	Yes	No
1050034	IMC Phosphates (CFMO)																	

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Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline[a]	Modeled in AAQS	Modeled in Class II
	1 And 2 Grinders W/Scrubbers @ Kingsford Mine	2	IMCFMO2	-11,300	-4,400	60	18.3	2.5	0.8	110	316	64.0	19.5	33.5	4.22	B	Yes	No
	No 3 Grinder W/Scrubber @ Kingsford Mine	3	IMCFMO3	-11,300	-4,400	58	17.7	1.9	0.6	100	311	49.0	14.9	30.0	3.78	B	Yes	No
	Phos Rk Dryer W/Scrubber @ Kingsford Mine	4	IMCFMO4	-11,300	-4,400	70	21.3	7.0	2.1	165	347	47.0	14.3	44.2	5.57	B	Yes	No
	Phosphate Transfer/Storage Silos W/Scrubber @ Kingsford	5	IMCFMO5	-11,300	-4,400	106	32.3	2.5	0.8	95	308	67.0	20.4	20.0	2.52	B	Yes	No
	Unground Phosphate Rr Car Load Out @ Kingsford Mine	6	IMCFMO6	-11,300	-4,400	35	10.7	2.5	0.8	75	297	33.0	10.1	20.0	2.52	B	Yes	No
	Boiler @ Four Corners Mine	8	IMCFMO8	-11,300	-4,400	26	7.9	1.0	0.3	400	478	23.5	7.2	0.06	0.01	C	Yes	Yes
	Magnetite Storage Bin @ Four Corners Mine (009)	9	IMCFMO9	-11,300	-4,400	122	37.2	0.6	0.2	77	298	29.5	9.0	0.13	0.02	C	Yes	Yes
	Ferrosilicon Storage Bin @ Four Corners Mine	10	IMCFMO10	-11,300	-4,400	122	37.2	0.6	0.2	77	298	22.4	6.8	1.37	0.17	C	Yes	Yes
	PSD Expanding source		12IMCF	-11,300	-4,400	125	38.1	8.0	2.4	151	339	49.7	15.1	-25.20	-3.18	E	No	Yes
	PSD Expanding source		13IMCF	-11,300	-4,400	125	38.1	8.0	2.4	151	339	55.1	16.8	-24.90	-3.14	E	No	Yes
	PSD Expanding source		14IMCF	-11,300	-4,400	150	45.7	2.7	0.8	110	316	27.7	8.4	-51.20	-6.45	E	No	Yes
1050059	IMC-AGRICO CO (NEW WALES)																	
	PHOSPHATE ROCK RAILCAR UNLOADING (80 TPH MAXIMUM	5	WALES5	-12,800	-700	40	12.2	3.00	0.9144	108	315	58.0	17.6784	6.40	0.806	C	Yes	Yes
	GROUND ROCK SILO W/PNEUMATIC 80 TPH LOAD RATE	6	WALES6	-12,800	-700	110	33.5	1.40	0.4267	110	316	45.0	13.716	1.30	0.164	C	Yes	Yes
	DAP PLANT NO 1 W/3 TELLER VENTURI SCRUBBERS,	9	WALES9	-12,800	-700	133	40.5	7.00	2.1336	105	314	49.0	14.9352	28.60	3.604	B	Yes	No
	GTSP PLANT (65 TPH) W/TELLER PACKED BED SCRUBBER	10	WALES10	-12,800	-700	133	40.5	6.00	1.8288	125	325	83.1	25.32888	33.75	4.253	B	Yes	No
	MAP PRILL TOWER W/VENTURI SCRUBBER AND CYCLONIC D	11	WALES11	-12,800	-700	120	36.6	4.00	1.2192	155	341	57.0	17.3736	15.00	1.890	C	Yes	Yes
	GTSP STORAGE (65 TPH) W/ FUME SCRUBBER	12	WALES12	-12,800	-700	133	40.5	6.00	1.8288	108	315	61.0	18.5928	28.70	3.616	C	Yes	Yes
	ANIMAL FEED SHIPPING/TRUCK LOADOUT (200 TPH), WITH B/	15	WALES15	-12,800	-700	65	19.8	1.00	0.3048	105	314	169.0	51.5112	1.08	0.136	C	Yes	Yes
	GROUND PHOSPHATE ROCK BIN AT GTSP PLANT	21	WALES21	-12,800	-700	82	25.0	1.00	0.3048	105	314	53.0	16.1544	4.80	0.605	C	Yes	Yes
	ANIMAL FEED STORAGE SILOS (3) - "A" SIDE	23	WALES23	-12,800	-700	114	34.7	1.00	0.3048	105	314	33.0	10.0584	4.75	0.599	C	Yes	Yes
	ANIMAL FEED STORAGE/SHIPPING/RAILCAR LOADOUT	24	WALES24	-12,800	-700	103	31.4	1.00	0.3048	105	314	140.0	42.672	3.60	0.454	C	Yes	Yes
	ANIMAL FEED - (2) LIMESTONE SILOS	25	WALES25	-12,800	-700	119	36.3	1.00	0.3048	105	314	127.0	38.7096	3.60	0.454	C	Yes	Yes
	ANIMAL FEED - SILICA STORAGE BIN	26	WALES26	-12,800	-700	18	5.5	1.00	0.3048	105	314	31.0	9.4488	1.60	0.202	C	Yes	Yes
	ANIMAL FEED INGREDIENT GRANULATION PLANT	27	WALES27	-12,800	-700	172	52.4	8.00	2.4384	130	328	66.3	20.20824	36.80	4.637	C	Yes	Yes
	ANIMAL FEED STORAGE SILOS (3) - "B SIDE"	28	WALES28	-12,800	-700	114	34.7	1.00	0.3048	105	314	33.0	10.0584	4.75	0.599	C	Yes	Yes
	#1 FERTILIZER RAIL/TRUCK SHIPPING	29	WALES29	-12,800	-700	133	40.5	3.00	0.9144	90	305	42.4	12.92352	4.70	0.592	C	Yes	Yes
	MULTIFOS SODA ASH CONVEYING SYSTEM W/BAGHOUSE	31	WALES31	-12,800	-700	108	32.9	0.80	0.2438	80	300	31.0	9.4488	3.60	0.454	C	Yes	Yes
	MULTIFOS "A" KILN COOLER W/BAGHOUSE	32	WALES32	-12,800	-700	86	26.2	1.50	0.4572	220	378	258.0	78.6384	7.70	0.970	C	Yes	Yes
	MULTIFOS "B" KILN COOLER W/BAGHOUSE	33	WALES33	-12,800	-700	86	26.2	1.50	0.4572	274	408	225.0	68.58	7.70	0.970	C	Yes	Yes
	MULTIFOS PLANT MILLING & SIZING SYSTEM WEST BAGHOU	34	WALES34	-12,800	-700	71	21.6	1.70	0.5182	125	325	87.0	26.5176	0.93	0.118	C	Yes	Yes
	MULTIFOS MILLING & SIZING SYSTEM EAST BAGHOUSE	35	WALES35	-12,800	-700	71	21.6	1.00	0.3048	100	311	253.0	77.1144	0.93	0.118	C	Yes	Yes
	MULTIFOS PRODUCTION 1 DRYER 2 KILNS (A/B) FOR MULTIF(	36	WALES36	-12,800	-700	172	52.4	4.50	1.3716	105	314	52.0	15.8496	29.83	3.759	C	Yes	Yes
	MAP/DAP #2 TRUCK LOADOUT	37	WALES37	-12,800	-700	10	3.0	1.80	0.5486	100	311	68.0	20.7264	3.60	0.454	C	Yes	Yes
	MULTIFOS MILLING & SIZING SYST SURGE BIN BAGHOUSE	38	WALES38	-12,800	-700	65	19.8	1.10	0.3353	100	311	79.0	24.0792	7.50	0.945	C	Yes	Yes
	GTSP TRUCK LOADOUT FACILITY W/BAGHOUSE	41	WALES41	-12,800	-700	10	3.0	1.50	0.4572	100	311	179.0	54.5592	5.00	0.630	C	Yes	Yes
	MAP/DAP NO. 2 RAIL LOADOUT	43	WALES43	-12,800	-700	10	3.0	1.60	0.4877	105	314	70.0	21.336	3.60	0.454	C	Yes	Yes
	DAP PLANT II - EAST TRAIN	45	WALES45	-12,800	-700	171	52.1	6.00	1.8288	110	316	58.0	17.6784	6.40	0.806	C	Yes	Yes
	DAP PLANT II - WEST TRAIN	46	WALES46	-12,800	-700	171	52.1	6.00	1.8288	110	316	58.0	17.6784	6.40	0.806	C	Yes	Yes
	DAP II WEST PRODUCT COOLER	47	WALES47	-12,800	-700	147	44.8	4.30	1.3106	175	353	68.9	21.00072	4.22	0.532	C	Yes	Yes
	URANIUM RECOVERY ACID CLEANUP SCRUBBER	48	WALES48	-12,800	-700	60	18.3	3.50	1.0668	80	300	31.2	9.50976	1.00	0.126	C	Yes	Yes
	URANIUM REFINERY W/BAGHOUSE	50	WALES50	-12,800	-700	100	30.5	1.80	0.5486	102	312	37.0	11.2776	1.50	0.189	C	Yes	Yes
	URANIUM RECOVERY - CLAY STORAGE BIN	51	WALES51	-12,800	-700	86	26.2	0.70	0.2134	80	300	54.0	16.4592	1.50	0.189	C	Yes	Yes
	ANIMAL FEED - LIMESTONE FEED BIN	52	WALES52	-12,800	-700	114	34.7	1.00	0.3048	105	314	33.0	10.0584	4.75	0.599	C	Yes	Yes
	DAP PLANT #1 PRODUCT COOLER	54	WALES54	-12,800	-700	107	32.6	3.50	1.0668	150	339	77.0	23.4696	7.70	0.970	C	Yes	Yes
	MAP PLANT COOLER	55	WALES55	-12,800	-700	25	7.6	4.30	1.3106	140	333	34.0	10.3632	5.14	0.648	C	Yes	Yes
	DAP II EAST PRODUCT COOLER	56	WALES56	-12,800	-700	170	51.8	5.00	1.524	110	316	64.5	19.6596	6.06	0.764	C	Yes	Yes
	GTSP RAILCAR LOADOUT FACILITY W/ BAGHOUSE	59	WALES59	-12,800	-700	10	3.0	1.50	0.4572	100	311	68.9	21.00072	5.00	0.630	C	Yes	Yes
	LIMESTONE STORAGE SILO WITH BAGHOUSE.	70	WALES70	-12,800	-700	110	33.5	0.75	0.2286	110	316	113.2	34.50336	0.70	0.088	C	Yes	Yes
	KILN C SCRUBBER STACK - MULTIFOS PLANT	74	WALES74	-12,800	-700	172	52.4	4.50	1.3716	105	314	70.2	21.39696	14.30	1.802	C	Yes	Yes

Table B-1. Summary of PM_{10} Sources Included in the Air Modeling Analyses, Cargill Green Bay

Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline [a]	Modeled in AAQS	Modeled in Class II
	MULTIFOS KILN C COOLER BAGHOUSE	75	WALES75	-12,800	-700	86	26.2	3.00	0.9144	250	394	106.1	32.33928	1.90	0.239	C	Yes	Yes
	MULTIFOS KILN C MILLING & SIZING BAGHOUSE	76	WALES76	-12,800	-700	90	27.4	1.50	0.4572	130	328	113.2	34.50336	1.90	0.239	C	Yes	Yes
1050003	Lakeland Electric, Larsen Power Plant																	
	Steam Generator # 6	3	LARPWR3	-600	22,400	165	50.3	10.0	3.05	340	444	21.0	6.4	31.0	3.91	B	Yes	No
	Steam Generator # 7	4	LARPWR4	-600	22,400	165	50.3	10.0	3.05	340	444	22.0	6.7	60.0	7.56	B	Yes	No
	Peaking Gas Turbine # 3	5	LARPWR5	-600	22,400	31	9.4	11.8	3.60	800	700	101.0	30.8	7.94	1.00	B	Yes	No
	Peaking Gas Turbine # 2	6	LARPWR6	-600	22,400	31	9.4	11.8	3.60	800	700	101.0	30.8	7.94	1.00	B	Yes	No
	Peaking Gas Turbine # 3	7	LARPWR7	-600	22,400	31	9.4	11.8	3.60	800	700	101.0	30.8	-7.94	-1.00	E	No	Yes
	Combined Cycle CT	8	LARPWR8	-600	22,400	155	47.2	16.0	4.88	481	523	85.7	26.1	26.0	3.28	C	Yes	Yes
1050221	Auburndale Power Partners, LP																	
	Proposed Peaker Project CT(Phase I)		CALPEAK	11,300	23,200	50	15.2	22.0	6.7	1040	833	68.1	20.8	43.00	5.42	C	Yes	Yes
	Existing CT (100% load/92° F Temp.)	1	CALEXT1	11,300	23,200	160	48.8	18.0	5.5	280	411	58.0	17.7	36.80	4.64	C	Yes	Yes
1050004	Lakeland Electric, C.D. McIntosh, Jr. Power Plant																	
	McIntosh Unit 1	1	MCINT1	-500	26,100	150	45.7	9	2.7	277	409	81.2	24.7	520.0	65.52	B	Yes	No
	Diesel Engine Peaking Unit 2	2	MCINT2	-500	26,100	20	6.1	2.6	0.8	715	653	77.0	23.5	1.75	0.22	B	Yes	No
	Diesel Engine Peaking Unit 3	3	MCINT3	-500	26,100	20	6.1	2.6	0.8	715	653	77.0	23.5	1.75	0.22	B	Yes	No
	Gas Turbine Peaking Unit 1	4	MCINT4	-500	26,100	35	10.7	13.5	4.1	900	755	79.5	24.2	20.24	2.55	B	Yes	No
	McIntosh Unit 2	5	MCINT5	-500	26,100	157	47.9	10.5	3.2	277	409	73.2	22.3	518.8	65.37	B	Yes	No
	McIntosh Unit 3	6	MCINT6	-500	26,100	250	76.2	18	5.5	167	348	82.6	25.2	1196.0	150.70	C	Yes	Yes
	Combustion Turbine Unit 5	28	MCINT28	-500	26,100	85	25.9	28	8.5	1095	864	82.7	25.2	49.0	6.17	C	Yes	Yes
1050023	Cutrale Citrus Juices USA, Inc																	
	Citrus Feed Mill Dryer	1	CCJUSA1	12,100	23,600	93	28.3	3.5	1.07	140	333	55.0	16.8	33	4.15	B	Yes	No
	Peel Dryer	3	CCJUSA3	12,100	23,600	100	30.5	3.2	0.98	161	345	49.0	14.9	33	4.15	C	Yes	Yes
	Cooling Reel Stack N.1n	5	CCJUSA5	12,100	23,600	33	10.1	2.5	0.76	100	311	57.0	17.4	20	2.52	C	Yes	Yes
	Cooling Reel Stack N. 2c	6	CCJUSA6	12,100	23,600	33	10.1	2.5	0.76	100	311	57.0	17.4	20	2.52	C	Yes	Yes
	Cooling Reel Stack N. 3s	7	CCJUSA7	12,100	23,600	34	10.4	2.7	0.82	90	305	49.0	14.9	20	2.52	C	Yes	Yes
0570025	Trademark Nitrogen Corp																	
	Nitric Acid Plant W/ 2 Absorption Towers	1	TRADE1	-42,200	12,500	50	15.2	1.7	0.5	350	450	17.9	5.5	334	42.08	B	Yes	No
0570039	TECO - Big Bend Station																	
	Unit #1 Coal Fired Boiler w/ ESP	1	TECOBB1	-47,600	-5,100	490	149.35	24.0	7.3	300	422	116.0	35.4	404	50.904	B	Yes	No
	Unit #2 Riley-Stoker Coal Boiler w/ Esp	2	TECOBB2	-47,600	-5,100	490	149.35	24.0	7.3	300	422	116.0	35.4	400	50.400	B	Yes	No
	Unit #3 Riley-Stoker Coal Boiler w/ ESP	3	TECOBB3	-47,600	-5,100	499	152.10	24.0	7.3	292	418	51.2	15.6	412	51.912	B	Yes	No
	Unit #4 Coal Boiler W/ Belco ESP Psd-Fl-040	4	TECOBB4	-47,600	-5,100	499	152.10	24.0	7.3	156	342	59.0	18.0	130	16.380	C	Yes	Yes
	Combustion Turbine #2 - No. 2 Fuel Oil	5	TECOBB5	-47,600	-5,100	75	22.86	14.0	4.3	928	771	61.0	18.6	33.0	4.158	B	Yes	No
	Gas Turbine #3 - No. 2 Fuel Oil	6	TECOBB6	-47,600	-5,100	75	22.86	14.0	4.3	928	771	61.0	18.6	33.0	4.158	B	Yes	No
	Gas Turbine #1 No. 2 Fuel Oil	7	TECOBB7	-47,600	-5,100	35	10.67	11.0	3.4	1010	816	91.9	28.0	33.0	4.158	B	Yes	No
	Unit No. 1 & No. 2 Fly Ash Silo w/Baghouse	8	TECOBB8	-47,600	-5,100	102	31.09	2.5	0.8	250	394	52.0	15.8	5.16	0.650	B	Yes	No
	Fly-Ash Silo For Unit #3	9	TECOBB9	-47,600	-5,100	113	34.44	0.9	0.3	250	394	406.0	123.7	3.00	0.378	B	Yes	No
	Limestone Silo A W/ 2 Baghouses	12	TECOBB12	-47,600	-5,100	101	30.78	0.5	0.2	150	339	46.0	14.0	0.05	0.006	B	Yes	No
	Limestone Silo B W/ 2 Baghouses	13	TECOBB13	-47,600	-5,100	101	30.78	0.5	0.2	150	339	46.0	14.0	0.05	0.006	B	Yes	No
	Flyash Silo For Unit #4	14	TECOBB14	-47,600	-5,100	139	42.37	1.6	0.5	140	333	59.0	18.0	0.20	0.025	B	Yes	No
	Unit 1 Coal Bunker W/Roto-Clone	15	TECOBB15	-47,600	-5,100	179	54.56	1.7	0.5	78	299	69.0	21.0	0.48	0.060	B	Yes	No
	Unit 2 Coal Bunker W/Roto-Clone	16	TECOBB16	-47,600	-5,100	179	54.56	1.7	0.5	78	299	69.0	21.0	0.48	0.060	B	Yes	No
	Unit 3 Coal Bunker W/Roto-Clone	17	TECOBB17	-47,600	-5,100	179	54.56	1.7	0.5	78	299	69.0	21.0	0.48	0.060	B	Yes	No

Table B-1. Summary of PM_{10} Sources Included in the Air Modeling Analyses. Cargill Green Bay

Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Stack Height ft	Stack Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline [a]	Modeled in AAQS	Modeled in Class II
0810010	Florida Power & Light - Manatee																	
	Combined Facility		FPLMAN1	-42,250	-25,950	475	144.8	26.2	8.0	307	426	77.5	23.6	1730	217 98	B	Yes	No
0570040	TECO Gannon																	
	Unit #1 Steam Generator	1	TECOGN1	-49,400	7,400	315	96.0	10 0	3.0	277	409	124.4	37.9	126	15.88	B	Yes	No
	Unit #2	2	TECOGN2	-49,400	7,400	315	96.0	10.0	3.0	299	421	126.3	38.5	126	15.88	B	Yes	No
	Unit #3 Coal Fired Boiler	3	TECOGN3	-49,400	7,400	315	96.0	10.6	3.2	271	406	113.5	34.6	160	20.16	B	Yes	No
	Unit#4 Coal Fired Boiler	4	TECOGN4	-49,400	7,400	315	96.0	10.0	3.0	289	416	97.1	29.6	188	23.69	B	Yes	No
	Unit #5 Coal Fired Boiler	5	TECOGN5	-49,400	7,400	315	96.0	14.6	4.5	293	418	166.5	50.7	228	28 73	B	Yes	No
	Unit #6 - Coal Fired Boiler With ESP	6	TECOGN6	-49,400	7,400	315	96 0	17.6	5.4	260	400	109.2	33.3	380	47.88	B	Yes	No
	Gas Fired Turbine	7	TECOGN7	-49,400	7,400	35	10 7	11.0	3.4	1,010	816	92.6	28.2	122	15.37	B	Yes	No
	Economizer Ash Silo	9	TECOGN8	-49,400	7,400	72	21.9	0.7	0.2	350	450	35.0	10.7	0.14	0 02	B	Yes	No
	Flyash Silo No. 1 For Units 5 & 6	10	TECOGN9	-49,400	7,400	107	32.6	1.0	0.3	350	450	99.0	30.2	1.20	0.15	B	Yes	No
	Fly Ash Silo No. 2 Units 1-4	11	TECOGN11	-49,400	7,400	104	31.7	2.0	0 6	350	450	59.0	18.0	2.90	0.37	B	Yes	No
	Unit 1 Coal Bunker W/Roto-Clone	13	TECOGN13	-49,400	7,400	175	53.3	1.7	0 5	78	299	70 0	21.3	0.19	0 02	B	Yes	No
	Unit 2 Coal Bunker W/Roto-Clone	14	TECOGN14	-49,400	7,400	175	53.3	1.7	0.5	78	299	70 0	21.3	0.19	0 02	B	Yes	No
	Unit 3 Coal Bunker W/Roto-Clone	15	TECOGN15	-49,400	7,400	177	53.9	2 0	0.6	78	299	50.0	15 2	0.19	0 02	B	Yes	No
	Unit 4 Coal Bunker W/Roto-Clone	16	TECOGN16	-49,400	7,400	175	53.3	1 7	0.5	78	299	70.0	21.3	0.19	0 02	B	Yes	No
	Unit 5 Coal Bunker W/Roto-Clone	17	TECOGN17	-49,400	7,400	174	53.0	1.2	0.4	78	299	79.0	24.1	0.19	0 02	B	Yes	No
	Unit 6 Coal Bunker W/Roto-Clone	18	TECOGN18	-49,400	7,400	175	53.3	1.7	0.5	78	299	70.0	21.3	0.19	0 02	B	Yes	No
0570038	TECO, Hookers Point																	
	Boiler #1	1	TECOHK1	-51,500	10,900	280	85.3	11.3	3 4	356	453	82.0	25.0	37.3	4 70	B	Yes	No
	Boiler #2	2	TECOHK2	-51,500	10,900	280	85.3	11.3	3 4	356	453	82.0	25.0	37.3	4 70	B	Yes	No
	Boiler #3	3	TECOHK3	-51,500	10,900	280	85.3	12.0	3.7	341	445	62.7	19.1	51.4	6 48	B	Yes	No
	Boiler #4	4	TECOHK4	-51,500	10,900	280	85.3	12.0	3.7	341	445	62.7	19.1	51.4	6.48	B	Yes	No
	Boiler #5	5	TECOHK5	-51,500	10,900	280	85.3	11.3	3 4	356	453	82.0	25.0	76.3	9 61	B	Yes	No
	Boiler #6	6	TECOHK6	-51,500	10,900	280	85.3	9.4	2.9	329	438	75.2	22.9	97.3	12.26	B	Yes	No
0970014	FPC - Intercession City Plant																	
	Combined CTs 1-6	1-6	INTCP16	36,800	45,900	48	14.6	14 6	4 46	760	678	174.9	53.3	250.68	31 62	B	Yes	No
	Combined CTs 7-10	7-10	INTCP710	36,800	45,900	50	15.2	13.8	4 19	1043	835	139.4	42.5	60 0	7.56	C	Yes	Yes
	CT # 11	11	INTCP11	36,800	45,900	75	22.9	19.0	5.79	1034	830	139.4	42.5	17.0	2.14	C	Yes	Yes
1030012	FPC - Higgins Plant																	
	Fffsg-Sg 1	1	FPCHIG1	-73,000	18,300	174	53 04	12.5	3.8	312	429	27.0	8.2	54.80	6.905	B	Yes	No
	Fffsg-Sg 2	2	FPCHIG2	-73,000	18,300	174	53.04	12.5	3.8	310	428	27.0	8.2	52.30	6 590	B	Yes	No
	Fffsg-Sg 3	3	FPCHIG3	-73,000	18,300	174	53.04	12.5	3.8	301	423	24.0	7.3	54.80	6.905	B	Yes	No
	CT Peaking Unit-Ctp 1	4	FPCHIG4	-73,000	18,300	55	16.76	15.1	4.6	850	728	93.1	28.4	20.16	2.540	B	Yes	No
	CT Peaking Unit-Ctp 2	5	FPCHIG5	-73,000	18,300	56	17.07	15.1	4 6	850	728	93.1	28.4	20.16	2.540	B	Yes	No
	CT Peaking Unit-Ctp 3	6	FPCHIG6	-73,000	18,300	55	16.76	15.1	4.6	850	728	93.1	28.4	22.47	2.831	B	Yes	No
	CT Peaking Unit-Ctp 4	7	FPCHIG7	-73,000	18,300	55	16.76	15.1	4.6	850	728	93.1	28.4	22.47	2.831	B	Yes	No
1030244	A-American Rent All																	
	Concrete Batching Plant	1	AAMER1	-85,400	-900	5.0	1.52	2 0	0.6	90	305	10.5	3.2	500	63 000	C	Yes	Yes
1010017	FLORIDA POWER CORP., ANCLOTE POWER PLANT																	
	Steam Turbine Gen. Anclote Unit No.1	1	FPCANC1	-85,100	38,600	499	152.10	24	7.3	320	433	62.0	18.9	621	78.183	B	Yes	No
	525 Mw #6 Oil Fired Steam Generator	2	FPCANC2	-85,100	38,600	499	152.10	24	7.3	320	433	62.0	18.9	606	76.388	B	Yes	No
1270028	FPC-DEBARY FACILITY																	
	Combustion Turbine Peaking Unit # 1	3	DEBPEK1	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3 881	C	Yes	Yes

Table B-1. Summary of PM_{10} Sources Included in the Air Modeling Analyses, Cargill Green Bay

Facility ID	Facility Name / Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location X (m)	Relative Location Y (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	PM_{10} Emission Rate lb/hr	PM_{10} Emission Rate g/s	PSD Consuming Expanding or Baseline[a]	Modeled in AAQS	Modeled in Class II
	Combustion Turbine Peaking Unit # 2	5	DEBPEK2	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3.881	C	Yes	Yes
	Combustion Turbine Peaking Unit # 3	7	DEBPEK3	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3.881	C	Yes	Yes
	Combustion Turbine Peaking Unit # 4	9	DEBPEK4	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3.881	C	Yes	Yes
	Combustion Turbine Peaking Unit # 5	11	DEBPEK5	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3.881	C	Yes	Yes
	Combustion Turbine Peaking Unit # 6	13	DEBPEK6	58,000	117,100	45	13.72	17.7	5.4	1050	839	173.7	52.9	30.8	3.881	C	Yes	Yes
	Combustion Turbine # 7 (Phase II Acid Rain Unit)	15	DEBCT7	58,000	117,100	50	15.24	13.75	4.2	1043	835	174.1	53.1	15.0	1.890	C	Yes	Yes
	Combustion Turbine # 8 (Phase II Acid Rain Unit)	16	DEBCT8	58,000	117,100	50	15.24	13.75	4.2	1043	835	174.1	53.1	15.0	1.890	C	Yes	Yes
	Combustion Turbine # 9 (Phase II Acid Rain Unit)	17	DEBCT9	58,000	117,100	50	15.24	13.75	4.2	1043	835	174.1	53.1	15.0	1.890	C	Yes	Yes
	Combustion Turbine # 10 (Phase II Acid Rain Unit)	18	DEBCT10	58,000	117,100	50	15.24	13.75	4.2	1043	835	174.1	53.1	15.0	1.890	C	Yes	Yes
0170004	FPC - Crystal River Plant																	
	Fossil Fuel Steam Generator Unit 1	1	FPCCR1	-75,200	124,400	499	152.1	15.0	4.57	291	417	132.8	40.5	1125.0	141.75	B	Yes	No
	Fossil Fuel Steam Generator Unit 2	2	FPCCR2	-75,200	124,400	502	153.0	16.0	4.88	300	422	160.1	48.8	1438.5	181.25	B	Yes	No
	Fossil Fuel Steam Generator- 5	3	FPCCR3	-75,200	124,400	585	178.3 [b]	25.5	7.77	253	396	68.9	21.0	667.0	84.04	C	Yes	Yes
	Fossil Fuel Steam Generator- 4	4	FPCCR4	-75,200	124,400	585	178.3 [b]	25.5	7.77	253	396	68.9	21.0	667.0	84.04	C	Yes	Yes
	Fly Ash Transfer From FFSG Unit 1	6	FPCCR6	-75,200	124,400	8	2.4	0.8	0.24	77	298	60.4	18.4	3.5	0.44	C	Yes	Yes
	Fly Ash Storage Silo for FFSG Units 1 & 2	8	FPCCR8	-75,200	124,400	93	28.3	1.5	0.46	77	298	24.0	7.3	0.6	0.07	C	Yes	Yes
	Fly Ash Transfer From (4) FFSG Unit 2	9	FPCCR9	-75,200	124,400	8	2.4	0.8	0.24	77	298	73.0	22.3	2.2	0.28	C	Yes	Yes
	Fly Ash Transfer From (5) FFSG Unit 2	10	FPCCR10	-75,200	124,400	8	2.4	0.8	0.24	77	298	92.8	28.3	2.2	0.28	C	Yes	Yes
	Cooling Towers,FFSG Units 1,2 and Nuclear Unit 3	13	FPCCR13	-75,200	124,400	53	16.2	34.5	10.52	77	298	26.0	7.9	428.0	53.93	C	Yes	Yes
	Bottom Ash Storage Silo for FFSG Units 1 & 2	14	FPCCR14	-75,200	124,400	5	1.5	0.8	0.24	77	298	72.9	22.2	13.0	1.64	C	Yes	Yes
	Cooling Towers for FFSG Units 4 & 5	15	FPCCR15	-75,200	124,400	443	135.0	214.0	65.23	100	311	10.8	3.3	175.0	22.05	C	Yes	Yes

[a] C = PSD increment consuming source
E = PSD increment Expanding source
B = Baseline source

[b] FPC Crystal River Units 3 and 4 are at GEP height

Table B-2 Summary of NO_x Sources Included in the Air Modeling Analyses, Cargill Green Bay

FAC. ID	FAC. Name	Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	Emission Rate TPY	Emission Rate g/s	PSD Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
		Gas Turbine Peaking Unit 1	4	MCINT4	-500	26,100	35	10 67	13.5	4.11	900	755	79.5	24.23	396.78	11.414	B	Yes	No
		McIntosh Unit 2 FFFSG (Phase II Acid Rain Unit)	5	MCINT5	-500	26,100	157	47.85	10.5	3.20	277	409	73.2	22.31	1,556.00	44.762	C	Yes	Yes
		McIntosh Unit 3 FFFSG (Phase II Acid Rain Unit)	6	MCINT6	-500	26,100	250	76 20	18.0	5.49	167	348	82.6	25 18	11,160.00	321.041	C	Yes	Yes
		250 MW Combustion Turbine UNIT 5	28	MCINT28	-500	26,100	85	25.91	28.0	8.53	1095	864	82.7	25.21	321.00	9.234	C	Yes	Yes
1050002	CITRUS WORLD, INC.																		
		CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #2	1	CITRUS1	31,500	7,200	75	22.86	4 7	1.43	195	364	49.0	14.94	245.85	7.072	B	Yes	No
		ERIE CITY KEYSTONE BOILER #3 USING NAT GAS AND #6 OIL	3	CITRUS3	31,500	7,200	40	12.19	3.7	1.11	450	505	59.9	18.26	71 13	2 046	B	Yes	No
		ERIE CITY KEYSTONE BOILER #2 USING NAT GAS AND #6 OIL	4	CITRUS4	31,500	7,200	40	12.19	3.7	1.11	450	505	60.5	18.44	132.14	3.801	B	Yes	No
		CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #1	7	CITRUS7	31,500	7,200	75	22.86	3.2	0.97	150	339	49.7	15.15	126 14	3.629	B	Yes	No
		WASTE HEAT BOILER 91.36 MMBTU/HR NATURAL GAS FIRED	11	CITRUS11	31,500	7,200	40	12.19	3.9	1.20	320	433	66.3	20 21	56.07	1.613	B	Yes	No
		NATURAL GAS TURBINE @ 51.1MMBTU/HR (APPROX. 66 DEG. F)	12	CITRUS12	31,500	7,200	40	12.19	4.0	1 21	320	433	64 7	19.72	96.40	2.773	B	Yes	No
		CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #3	13	CITRUS13	31,500	7,200	75	22.86	4 6	1.40	150	339	33.1	10.09	253.69	7.298	B	Yes	No
		ERIE CITY KEYSTONE BOILER #1 USING NAT GAS AND #6 OIL	17	CITRUS17	31,500	7,200	40	12.19	3.7	1.12	450	505	25.3	7.71	66.09	1.901	B	Yes	No
		GAS TURBINE NO. 2 W/WH BOILER	27	CITRUS27	31,500	7,200	50	15.24	4.5	1.37	319	433	70.7	21.55	39.40	1.133	B	Yes	No
0490043	VANDOLAH POWER COMPANY, LLC																		
		A 170 MW Gas Simple Cycle Combustion Turbine	1	VANDP1	-750	-35,600	60	18.29	22 0	6 71	1113	874	116 0	35.36	252 00	7.249	C	Yes	Yes
		A 170 MW Gas Simple Cycle Combustion Turbine	2	VANDP2	-750	-35,600	60	18.29	22.0	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
		A 170 MW Gas Simple Cycle Combustion Turbine	3	VANDP3	-750	-35,600	60	18.29	22 0	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
		A 170 MW Gas Simple Cycle Combustion Turbine	4	VANDP4	-750	-35,600	60	18.29	22.0	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
0570261	HILLSBOROUGH CO. R.R.F.																		
		Municipal Waste Combustor & Auxiliary burners-Unit #1	1	HILLSRC1	-41,300	12,600	220	67.06	5.1	1.55	290	416	72.5	22.10	513 91	14.784	B	Yes	No
		Municipal Waste Combustor & Auxiliary burners-Unit #2	2	HILLSRC2	-41,300	12,600	220	67 06	5.1	1.55	290	416	72.5	22.10	513.91	14.784	B	Yes	No
		Municipal Waste Combustor & Auxiliary burners-Unit #3	3	HILLSRC3	-41,300	12,600	220	67.06	5.1	1.55	290	416	72 5	22.10	513.91	14.784	B	Yes	No
0570039	TECO - BIG BEND																		
		Fossil Fuel Fired Steam Generator1 (Phase II Acid Rain Unit)	1	TECOBB1	-47,600	-5,100	490	149.35	24	7.32	294	419	115.9	35.33	27,029.0	777.547	B	Yes	No
		Fossil Fuel Fired Steam Generator2 (Phase II Acid Rain Unit)	2	TECOBB2	-47,600	-5,100	490	149.35	24	7.32	125	325	87.6	26.70	27,118.0	780.107	B	Yes	No
		Fossil Fuel Fired Steam Generator3 (Phase II Acid Rain Unit)	3	TECOBB3	-47,600	-5,100	499	152.10	24	7.32	279	410	47	14.33	12,619 0	363.012	B	Yes	No
		UNIT #4 COAL-FIRED BOILER W/ BELCO ESP PSD-FL-040	4	TECOBB4	-47,600	-5,100	499	152 10	24	7.32	156	342	59	17.98	11,379.0	327.341	C	Yes	Yes
		Gas Turbine No. 2: oil fired, 78 MW, w/evap. cooling	5	TECOBB5	-47,600	-5,100	75	22.86	14	4.27	928	771	61	18.59	1,958.0	56.326	B	Yes	No
		Gas Turbine No. 3: oil fired, 78 MW, w/evap. cooling	6	TECOBB6	-47,600	-5,100	75	22.86	14	4.27	928	771	61	18.59	1,958.0	56.326	B	Yes	No
		GAS TURBINE #1 FIRED BY #2 FUEL OIL	7	TECOBB7	-47,600	-5,100	35	10 67	11.04	3.36	1010	816	91.9	28.01	561.0	16 138	B	Yes	No
0810010	FP & L - MANATEE PLANT																		
		Fossil Fuel Steam Generator, Unit 1-Phase II Acid Rain Unit	1	FPLMAN1	-42,250	-25,950	499	152.10	26.2	7.99	325	436	82.5	25.15	11,366.10	326.970	B	Yes	No
		Fossil Fuel Steam Generator, Unit 2-Phase II Acid Rain Unit	2	FPLMAN2	-42,250	-25,950	499	152.10	26 2	7 99	325	436	82.5	25.15	11,366 10	326 970	B	Yes	No
0570040	BAYSIDE POWER STATION (TECO - GANNON)																		
		UNIT #1 STEAM GENERATOR	1	TECOGN1	-49,400	7,400	315	96 01	10	3.05	289	416	94	28.65	8,055 00	231.719	B	Yes	No

Table B-2 Summary of NO_x Sources Included in the Air Modeling Analyses, Cargill Green Bay

FAC. ID	FAC. Name	Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Stack and Operating Parameters: Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	Emission Rate TPY	Emission Rate g/s	PSD Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
		125MW BABCOCK&WILCOX CORP WET BOTTOM CYCLONIC FIRING TYPE BL	2	TECOGN2	-49,400	7,400	315	96.01	10	3.05	298	421	101	30.78	8,314.00	239.170	B	Yes	No
		UNIT #3 - B&W WET BOTTOM COAL FIRED BOILER	3	TECOGN3	-49,400	7,400	315	96.01	10.6	3.23	296	420	126	38.40	10,518.00	302.573	B	Yes	No
		UNIT#4- B&W WET BOT CYCLONIC FIR'G COAL FIR BOLR, EAST STACK	4	TECOGN4	-49,400	7,400	315	96.01	10	3.05	309	427	75	22.86	11,555.00	332.404	B	Yes	No
		UNIT #5 COAL FIRED BOILER	5	TECOGN5	-49,400	7,400	315	96.01	14.6	4.45	303	424	76	23.16	15,128.00	435.189	B	Yes	No
		UNIT #6 - COAL FIRED BOILER WITH ESP	6	TECOGN6	-49,400	7,400	315	96.01	17.6	5.36	320	433	81	24.69	24,957.00	717.941	B	Yes	No
		14 MW GAS FIRED TURBINE	7	TECOGN7	-49,400	7,400	35	10.67	11	3.35	1010	816	92.6	28.22	561.00	16.138	B	Yes	No
0570038	TECO - HOOKERS POINT																		
		Boiler #1 298 MMBtu/hr (Phase II Acid Rain Unit)	1	TECOHK1	-51,500	10,900	280	85.34	11.3	3.44	356	453	82	24.99	530.0	15.247	B	Yes	No
		Boiler #2 298 MMBtu/hr (Phase II Acid Rain Unit)	2	TECOHK2	-51,500	10,900	280	85.34	11.3	3.44	356	453	82	24.99	530.0	15.247	B	Yes	No
		Boiler #3 411 MMBtu/hr (Phase II Acid Rain Unit)	3	TECOHK3	-51,500	10,900	280	85.34	12	3.66	341	445	62.7	19.11	731.0	21.029	B	Yes	No
		Boiler #4 411 MMBtu/hr (Phase II Acid Rain Unit)	4	TECOHK4	-51,500	10,900	280	85.34	12	3.66	341	445	62.7	19.11	731.0	21.029	B	Yes	No
		Boiler #5 610 MMBtu/hr (Phase II Acid Rain Unit)	5	TECOHK5	-51,500	10,900	280	85.34	11.3	3.44	356	453	82	24.99	1,064.0	30.608	B	Yes	No
		Boiler #6 778 MMBtu/hr (Phase II Acid Rain Unit)	6	TECOHK6	-51,500	10,900	280	85.34	9.4	2.87	329	438	75.2	22.92	972.0	27.962	B	Yes	No
0970014	FPC-INTERCESSION CITY																		
		Combustion Turbine (CT) Peaking Unit 1	1	INTCP1	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine (CT) Peaking Unit 2	2	INTCP2	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine (CT) Peaking Unit 3	3	INTCP3	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine (CT) Peaking Unit 4	4	INTCP4	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine (CT) Peaking Unit 5	5	INTCP5	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine (CT) Peaking Unit 6	6	INTCP6	36,800	45,900	20	6.10	14.63	4.46	760	678	174.9	53.31	2,164.00	62.252	B	Yes	No
		Combustion Turbine # 7	7	INTCT7	36,800	45,900	50	15.24	13.75	4.19	1043	835	174.1	53.07	308.49	8.874	C	Yes	Yes
		Combustion Turbine # 8	8	INTCT8	36,800	45,900	50	15.24	13.75	4.19	1043	835	174.1	53.07	308.49	8.874	C	Yes	Yes
		Combustion Turbine # 9	9	INTCT9	36,800	45,900	50	15.24	13.75	4.19	1043	835	174.1	53.07	308.49	8.874	C	Yes	Yes
		Combustion Turbine # 10	10	INTCT10	36,800	45,900	50	15.24	13.75	4.19	1043	835	174.1	53.07	308.49	8.874	C	Yes	Yes
		Combustion Turbine # 11	11	INTCT11	36,800	45,900	75	22.86	19	5.79	1034	830	139.4	42.49	566.13	16.286	C	Yes	Yes
		P-12: Simple cycle combustion turbine 87 MW, GE Frame 7EA	18	INTSC12	36,800	45,900	56	17.07	16.1	4.91	933	774	117.6	35.84	83.50	2.402	C	Yes	Yes
		P-13: Simple cycle combustion turbine 87 MW, GE Frame 7EA	19	INTSC13	36,800	45,900	56	17.07	16.1	4.91	993	807	117.6	35.84	83.50	2.402	C	Yes	Yes
		P-14. Simple cycle combustion turbine 87 MW, GE Frame 7EA	20	INTSC14	36,800	45,900	56	17.07	16.1	4.91	993	807	117.6	35.84	83.50	2.402	C	Yes	Yes
1030011	FPC - BARTOW PLANT																		
		No.1 Unit, FFSG (Phase II Acid Rain Unit)	1	FPCBAR1	-67,100	2,500	300	91.44	9	2.74	312	429	119	36.27	2,305.00	66.308	B	Yes	No
		No.2 Unit, FFSG (Phase II Acid Rain Unit)	2	FPCBAR2	-67,100	2,500	300	91.44	9	2.74	305	425	102	31.09	1,615.00	46.459	B	Yes	No
		No.3 Unit, FFSG (Phase II Acid Rain Unit)	3	FPCBAR3	-67,100	2,500	300	91.44	11	3.35	275	408	113	34.44	2,712.00	78.016	B	Yes	No
		Bartow-Anclote Pipeline Heating Boiler	4	FPCBAR4	-67,100	2,500	30	9.14	3	0.91	515	541	17	5.18	9.64	0.277	B	Yes	No
		Gas Turbine Peaking Unit #P-1	5	FPCBAR5	-67,100	2,500	45	13.72	17.9	5.46	930	772	69.1	21.06	2,183.00	62.799	B	Yes	No
		Gas Turbine Peaking Unit #P-2	6	FPCBAR6	-67,100	2,500	45	13.72	17.9	5.46	930	772	69.1	21.06	2,183.00	62.799	B	Yes	No
		Gas Turbine Peaking Unit #P-3	7	FPCBAR7	-67,100	2,500	45	13.72	17.9	5.46	930	772	69.1	21.06	2,183.00	62.799	B	Yes	No
		Gas Turbine Peaking Unit #P-4	8	FPCBAR8	-67,100	2,500	45	13.72	17.9	5.46	930	772	69.1	21.06	2,183.00	62.799	B	Yes	No

Table B-2 Summary of NO_x Sources Included in the Air Modeling Analyses, Cargill Green Bay

FAC. ID	FAC. Name	Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Stack and Operating Parameters: Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	Emission Rate TPY	Emission Rate g/s	PSD Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0270016	IPS AVON PARK CORPORATION (DESOTO COUNTY)																		
		170 MW Dual Fuel Combustion Turbine Electrical Generator	1	AVONP1	10,250	-68,600	75	22.86	22	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
		170 MW Dual Fuel Combustion Turbine Electrical Generator	2	AVONP2	10,250	-68,600	75	22.86	22	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
		GE Frame 7A Simple Cycle CT	3	AVONP3	10,250	-68,600	75	22.86	22	6.71	1113	874	116.0	35.36	252.00	7.249	C	Yes	Yes
1030013	FPC -BAYBORO PLANT																		
		Combustion Turbine Peaking Unit # 1	1	FPCBAY1	-70,700	-8,800	40	12.19	22.9	6.98	900	755	21	6.40	985.85	28.360	B	Yes	No
		Combustion Turbine Peaking Unit # 2	2	FPCBAY2	-70,700	-8,800	40	12.19	22.9	6.98	900	755	21	6.40	1,013.79	29.164	B	Yes	No
		Combustion Turbine Peaking Unit # 3	3	FPCBAY3	-70,700	-8,800	40	12.19	22.9	6.98	900	755	21	6.40	935.39	26.909	B	Yes	No
		Combustion Turbine Peaking Unit # 4	4	FPCBAY4	-70,700	-8,800	40	12.19	22.9	6.98	900	755	21	6.40	902.76	25.970	B	Yes	No
0810007	TROPICANA PRODUCTS, INC -BRADENTON																		
		CITRUS PEEL DRYER #1 W/WHE	1	TROP1	-62,700	-39,200	95	28.96	3.2	0.98	100	311	35.2	10.73	36.07	1.038	B	Yes	No
		CITRUS PEEL DRYER #2 W/WHE	2	TROP2	-62,700	-39,200	95	28.96	3	0.91	140	333	70	21.34	36.07	1.038	B	Yes	No
		CITRUS PEEL DRYER #3 W/WHE	3	TROP3	-62,700	-39,200	95	28.96	3.2	0.98	140	333	62	18.90	36.07	1.038	B	Yes	No
		GLASS PLANT #2 FIRED WITH NATURAL GAS OR BIO-GAS.	12	TROP12	-62,700	-39,200	71	21.64	6.2	1.89	425	491	43.3	13.20	423.60	12.186	B	Yes	No
		GLASS PLANT FURNACE #3, BURNS NATURAL GAS OR BIO-GAS.	14	TROP14	-62,700	-39,200	103	31.39	6.2	1.89	510	539	57.1	17.40	391.00	11.248	B	Yes	No
		157.4 MMBTU/HR AUXILIARY BOILER FOR COGEN PLANT	15	TROP15	-62,700	-39,200	75	22.86	5	1.52	540	555	48.6	14.81	80.20	2.307	C	Yes	Yes
		GAS TURBINE W/HEAT RECOVERY - FOR COGENERATION PLANT	16	TROP16	-62,700	-39,200	67	20.42	12	3.66	268	404	54	16.46	314.50	9.047	C	Yes	Yes
		STEAM BOILER (10 MMBTU/HR) NAT GAS OR BIO GAS FIRED	21	TROP21	-62,700	-39,200	40	12.19	1.7	0.52	300	422	16	4.88	42.77	1.230	C	Yes	Yes
		400 HP Boiler - 17.0 MMBTU/hr., NSPS Dc, Natural Gas	23	TROP23	-62,700	-39,200	30	9.14	2	0.61	300	422	20.2	6.16	11.00	0.316	C	Yes	Yes
1030012	FPC -HIGGINS PLANT																		
		FFFSG-SG 1 (Phase II, Acid Rain Unit)	1	FPCHIG1	-73,000	18,300	174	53.04	12.5	3.81	312	429	27.0	8.23	1,680.00	48.329	B	Yes	No
		FFFSG-SG 2 (Phase II, Acid Rain Unit)	2	FPCHIG2	-73,000	18,300	174	53.04	12.5	3.81	310	428	27.0	8.23	1,603.20	46.119	B	Yes	No
		FFFSG-SG 3 (Phase II, Acid Rain Unit)	3	FPCHIG3	-73,000	18,300	174	53.04	12.5	3.81	301	423	24.0	7.32	1,680.00	48.329	B	Yes	No
		Combustion Turbine Peaking Unit-CTP 1	4	FPCHIG4	-73,000	18,300	55	16.76	15.1	4.60	850	728	93.1	28.38	1,197.36	34.445	B	Yes	No
		Combustion Turbine Peaking Unit-CTP 2	5	FPCHIG5	-73,000	18,300	56	17.07	15.1	4.60	850	728	93.1	28.38	1,197.36	34.445	B	Yes	No
		Combustion Turbine Peaking Unit-CTP 3	6	FPCHIG6	-73,000	18,300	55	16.76	15.1	4.60	850	728	93.1	28.38	1,334.56	38.391	B	Yes	No
		Combustion Turbine Peaking Unit-CTP 4	7	FPCHIG7	-73,000	18,300	55	16.76	15.1	4.60	850	728	93.1	28.38	1,334.56	38.391	B	Yes	No
1010056	PASCO COUNTY RESOURCE RECOVERY																		
		Municipal Waste Combustion Unit No. 1	1	PASCO1	-60,690	58,670	275	83.82	10.0	3.05	250	394	51.0	15.54	394.20	11.340	C	Yes	Yes
		Municipal Waste Combustion Unit No. 2	2	PASCO2	-60,690	58,670	275	83.82	10.0	3.05	250	394	51.0	15.54	394.20	11.340	C	Yes	Yes
		Municipal Waste Combustion Unit No. 3	3	PASCO3	-60,690	58,670	275	83.82	10.0	3.05	250	394	51.0	15.54	394.20	11.340	C	Yes	Yes
		Leachate Treatment Facility	5	PASCO5	-60,690	58,670	50	15.24	1.3	0.40	330	439	37.0	11.28	1.32	0.038	C	Yes	Yes
1010017	FPC-ANCLOTE POWER PLANT																		
		Steam Turbine Generator Units 1 and 2--Common Stack	1,2	FPCANC12	-85,100	38,600	499	152.10	24.0	7.32	320	433	62.0	18.90	13,292.00	382.373	B	Yes	No
0530021	FLORIDA CRUSHED STONE CO., INC.																		
		POWER PLANT	18	FCRUSH18	-49,500	82,400	320	97.54	16.0	4.88	300	422	69.6	21.21	3,705.48	106.596	C	Yes	Yes

Table B-2 Summary of NO_x Sources Included in the Air Modeling Analyses, Cargill Green Bay

FAC. ID	FAC. Name	Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity m/s	Emission Rate TPY	Emission Rate g/s	PSD Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
		BCP: Kiln, Clinker Cooler, Raw Mill, & Dryer with Baghouse	20	FCRUSH20	-49,500	82,400	300	91.44	16.0	4.88	220	378	47.0	14.33	1,572.00	45.222	C	Yes	Yes
		KILN #2 SYSTEM: preheater/precalciner, cooler,dyer,raw mill	26	FCRUSH26	-49,500	82,400	320	97.54	14.0	4.27	258	399	33.8	10.30	1,280.00	36.822	C	Yes	Yes
0530032	CENTRAL POWER & LIME, INC.																		
		CEMENT KILN, CLINKER COOLER, RAW MILL & DRYER	9	CENTPLP	-49,500	82,400	300	91.44	16.0	4.88	226	381	47.0	14.33	4,863.00	139.895	C	Yes	Yes
		POWER PLANT	14	CENTPL14	-49,500	82,400	320	97.54	16.0	4.88	250	394	69.6	21.21	8,983.38	258.426	C	Yes	Yes
0530010	SOUTHDOWN, INC. (CEMEX)																		
		CEMENT KILN NO. 1 BAGHOUSE(E-55);REVISED OIL CONCENTRATIONS	3	SDOWN3	-53,600	89,000	150	45.72	13.0	3.96	285	414	34.0	10.36	1,318.00	37.915	C	Yes	Yes
		CEMENT KILN NO. 2 BAGHOUSE(E-19); REVISED OIL CONCENTRATIONS	14	SDOWN14	-53,600	89,000	105	32.00	14.0	4.27	250	394	32.0	9.75	1,130.00	32.507	C	Yes	Yes
1270009	FPL-SANFORD POWER PLANT																		
		Fossil Fuel Steam Generator, Unit 3	1	SANF1	58,800	110,200	302	92.05	9.5	2.90	300	422	153.1	46.68	2,386.00	68.638	B	Yes	No
		Fossil Fuel Steam Generator, Unit 4	2	SANF2	58,800	110,200	400	121.92	19.2	5.85	308	426	82.5	25.14	5,850.80	168.311	B	Yes	No
		Fossil Fuel Steam Generator, Unit 5	3	SANF3	58,800	110,200	400	121.92	19.2	5.85	308	426	82.6	25.16	5,850.80	168.311	B	Yes	No
		CC CT Generators 5A through 5D w/HRSG	9-12	SANF912	58,800	110,200	125	38.10	19.0	5.79	220	378	70.3	21.43	372.20	10.707	C	Yes	Yes
1270028	FPC-DEBARY FACILITY																		
		Peaking CT Unit No. 1	3	DEBPEK1	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		Peaking CT Unit No. 2	5	DEBPEK2	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		Peaking CT Unit No. 3	7	DEBPEK3	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		Peaking CT Unit No. 4	9	DEBPEK4	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		Peaking CT Unit No. 5	11	DEBPEK5	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		Peaking CT Unit No. 6	13	DEBPEK6	58,000	117,100	45	13.72	17.7	5.39	1050	839	173.7	52.94	1,008.99	29.026	B	Yes	No
		CT Unit 7	15	DEBCT7	58,000	117,100	50	15.24	13.8	4.19	1043	835	174.1	53.07	308.50	8.875	C	Yes	Yes
		CT Unit 8	16	DEBCT8	58,000	117,100	50	15.24	13.8	4.19	1043	835	174.1	53.07	308.50	8.875	C	Yes	Yes
		CT Unit 9	17	DEBCT9	58,000	117,100	50	15.24	13.8	4.19	1043	835	174.1	53.07	308.50	8.875	C	Yes	Yes
		CT Unit 10	18	DEBCT10	58,000	117,100	50	15.24	13.8	4.19	1043	835	174.1	53.07	308.50	8.875	C	Yes	Yes
0170004	FPC-CRYSTAL RIVER POWER PLANT																		
		Fossil-Fuel Steam Generator, Unit 1	1	FPCCR1	-75,200	124,400	499	152.10	15.0	4.57	291	417	132.8	40.47	9,855.00	283.500	B	Yes	No
		Fossil-Fuel Steam Generator, Unit 2	2	FPCCR2	-75,200	124,400	502	153.01	16.0	4.88	300	422	160.1	48.80	12,601.00	362.495	B	Yes	No
		Fossil-Fuel Steam Generator, Unit 5	3	FPCCR3	-75,200	124,400	585	178.31 [b]	25.5	7.77	253	396	68.9	21.00	20,435.00	587.856	B	Yes	No
		Fossil-Fuel Steam Generator, Unit 4	4	FPCCR4	-75,200	124,400	585	178.31 [b]	25.5	7.77	253	396	68.9	21.00	20,435.00	587.856	B	Yes	No

[a] C= PSD increment consuming source
E= PSD increment expanding source
B= baseline source
[b] Velocity of 1 ft/s assumed.
[c] Information from Table 6-6, CCA - Frostproof PSD application, Golder Associates.
[d] PSD status from Tables D-1& E-1, Cargill Riverview report, Golder Associates.

Table B-2 Summary of NO_x Sources Included in the Air Modeling Analyses, Cargill Green Bay

FAC. ID	FAC. Name	Emission Unit Description	EU ID	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Stack and Operating Parameters Height ft	m	Diameter ft	m	Temperature °F	K	Velocity ft/s	m/s	Emission Rate TPY	g/s	PSD Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Class II

[c] FPC Crystal River Units 3 and 4 are at GEP stack height.

APPENDIX C

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

C.1 INTRODUCTION

As part of the new source review requirements under Prevention of Significant Deterioration (PSD) regulations, new sources are required to address air quality impacts at PSD Class I areas. As part of the PSD analysis report submitted to the Florida Department of Environmental Protection (DEP), the air quality impacts due to the potential emissions of the proposed Cargill Green Bay modification are required to be addressed at the PSD Class I area of the Chassahowitzka National Wildlife Area (NWA). The Chassahowitzka NWA is located approximately 110 km northwest of the facility site and is the only PSD Class I area located within 200 km of the project site.

The evaluation of air quality impacts are not only concerned with determining compliance with PSD Class I increments but also assessing a source's impact on Air Quality Related Values (AQRVs), such as regional haze. Further, compliance with PSD Class I increments can be evaluated by determining if the source's impacts are less than the proposed U.S. Environmental Protection Agency (EPA) Class I significant impact levels. The significant impact levels are threshold levels that are used to determine the type of air impact analyses needed for the facility. If the new source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse affect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with Class I increments.

Currently there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and Federal Land Managers (FLM) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report.
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report,* USFS, NPS, USFWS (12/00), referred to as the FLAG document.

For the proposed project, air quality analyses were performed that assess the facility's impacts in the PSD Class I area of the Chassahowitzka NWA using the refined modeling approach from the IWAQM Phase 2 report for:

- Significant impact analysis,
- Regional haze analysis, and
- Nitrogen deposition.

The refined analysis approach was used instead of the screening analysis approach since the air quality impacts are based on generally more realistic assumptions, include more detailed meteorological data, and are estimated at locations at the Class I area.

C.2 GENERAL AIR MODELING APPROACH

The general modeling approach was based on using the long-range transport model, California Puff model (CALPUFF, Version 5.5). At distances beyond 50 km, the ISCST3 model is considered to overpredict air quality impacts, because it is a steady-state model. At those distances, the CALPUFF model is recommended for use. Recently, the FLM have requested that air quality impacts, such as for regional haze, for a source located more than 50 km from a Class I area be predicted using the CALPUFF model. The Florida DEP has also recommended that the CALPUFF model be used to assess if the source has a significant impact at a Class I area located beyond 50 km from the source. As a result, a significant impact and regional haze analyses were performed using the CALPUFF model to assess the facility's impacts at the Chassahowitzka NWA.

The methods and assumptions used in the CALPUFF model were based on the latest recommendations for a refined analysis as presented in the IWAQM Phase 2 Summary Report and the FLAG documents.

A regional haze analysis was performed to determine the affect that the facility's emissions will have on background regional haze levels at the Chassahowitzka NWA. In the regional haze analysis, the change in visual range, as calculated by a deciview change, was estimated for the facility in accordance with the IWAQM recommendations. Based on those recommendations, the CALPUFF model is used to predict the maximum 24-hour average sulfate (SO_4), nitrate (NO_3), and fine particulate (PM_{10}) concentrations as well as ammonium sulfate [$(NH_4)_2SO_4$] and ammonium nitrate

(NH_4NO_3) concentrations. The change in visibility due to a source, estimated as a percentage, is then calculated based on the change from background data.

The following sections present the methods and assumptions used to assess the refined significant impact and regional haze analyses performed for the proposed project. The results of these analyses are presented in Sections 6.0 and 7.0 of the report.

C.3 MODEL SELECTION AND SETTINGS

The CALPUFF air modeling system was used to model to assess the proposed project's impacts at the PSD Class I area for comparison to the PSD Class I significant impact levels and to the regional haze visibility criteria. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALPUFF meteorological and geophysical data preprocessor (CALMET, Version 5.2), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. CALMET was designed to process raw meteorological, terrain and land-use databases to be used in the air modeling analysis. The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. The processed data produced from CALMET was input to CALPUFF to assess the pollutant specific impact. Both CALMET and CALPUFF were used in a manner that is recommended by the IWAQM Phase 2 and FLAG reports.

C.3.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing a Phase 2 refined modeling analyses that are presented in Table C-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table C-2.

C.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the facility's emission, stack, and operating data as well as building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input

Program (BPIP), Version 95086, and were included in the CALPUFF model input. The PSD report presents a listing of the facility's emissions and structures included in the analysis.

C.4 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted in an array of 13 discrete receptors located at the Chassahowitzka NWA area. These receptors are the same as those used in the PSD Class I analysis performed for the PSD report.

C.5 METEOROLOGICAL DATA

C.5.1 REFINED ANALYSIS

CALMET was used to develop the gridded parameter fields required for the refined modeling analyses. The follow sections discuss the specific data used and processed in the CALMET model.

C.5.2 CALMET SETTINGS

The CALMET settings contained in Table C-3 were used for the refined modeling analysis.

C.5.3 MODELING DOMAIN

A rectangular modeling domain extending 350 km in the east-west (x) direction and 280 km in the north-south (y) direction was used for the refined modeling analysis. The southwest corner of the domain is the origin and is located at 27 degrees north latitude and 83.5 degrees west longitude. This location is in the Gulf of Mexico approximately 110 km west of Venice, Florida. For the processing of meteorological and geophysical data, the domain contains 70 grid cells in the x-direction and 56 grid cells in the y-direction. The domain grid resolution is 5 km. The air modeling analysis was performed in the UTM coordinate system.

C.5.4 MESOSCALE MODEL – GENERATION 4 (MM4) DATA

Pennsylvania State University in conjunction with the NCAR Assessment Laboratory developed the MM4 data set, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create these datasets (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and have been developed for the MM4 data for 1990 and the MM5 data for 1992 and 1996. The analysis used the MM4 and MM5 data to initialize the CALMET wind field. The 1990 MM4 and 1992 MM5 data have horizontal spacing of 80 km while the 1996 MM6 data has a spacing of 36 km. These data are used to simulate atmospheric variables within the modeling domain.

The MM4 subset domain consisted of a 8 x 6- cell rectangle, with 80 km grid resolution, extending from the MM4 grid points (49,10) to (56, 15). These data were processed to create a MM4.DAT file, for input to the CALMET model. The MM5 subset domain was provided by the National Park Service and was processed in a similar manner as the MM4 data.

The MM4 and MM5 data sets used in the CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

C.5.5 SURFACE DATA STATIONS AND PROCESSING

The surface station data processed for the CALPUFF analyses consisted of data from five NWS stations or Federal Aviation Administration (FAA) Flight Service stations for Gainesville, Tampa, Daytona Beach, Vero Beach, Fort Myers and Orlando. A summary of the surface station information and locations are presented in Table C-4. The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions. The surface station data were processed into a SURF.DAT file format for CALMET input.

Because the modeling domain extends largely over water, C-Man station data from Venice was obtained. These data were processed into an over-water surface station format (i.e., SEA*.DAT) for input to CALMET. The over-water station data include wind direction, wind speed and air temperature.

C.5.6 UPPER AIR DATA STATIONS AND PROCESSING

The analysis included three upper air NWS stations located in Ruskin, Apalachicola, and West Palm Beach. Data for each station were obtained from the Florida DEP in a format for CALMET input.

The data and locations for the upper air stations are presented in Table C-4.

C.5.7 PRECIPITATION DATA STATIONS AND PROCESSING

Precipitation data were processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation-recording stations located within the latitude and longitudinal limits of the modeling domain. Data for 14 stations were obtained in NCDC TD-3240 variable format and converted into a fixed-length format. The utility programs PXTRACT and PMERGE were then used to process the data into the format for the PRECIP.DAT file that is used by CALMET. A listing of the precipitation stations used for the modeling analysis is presented in Table C-5.

C.5.8 GEOPHYSICAL DATA PROCESSING

The land-use and terrain information data were developed for the modeling domain and were converted into a GEO.DAT file format for input to CALMET. Terrain elevations for each grid cell of the modeling domain were obtained from Digital Elevation Model (DEM) files obtained from US Geographical Survey (USGS). The DEM data was extracted for the modeling domain grid using the utility extraction program LCELEV. Land-use data were obtained from the USGS GIS.DAT which is based on the ARM3 data. The resolution of the GIS.DAT file is one-eighth of a degree in the east-west direction and one-twelfth of a degree in the north-south direction. Land-use values for the domain grid were obtained with the utility program CAL-LAND. Other parameters processed for the modeling domain by CAL-LAND include surface roughness, surface Albedo, Bowen ratio, soil heat flux, and leaf index field. The land-use parameter values were based on annual averaged values.

Table C-1. Refined Modeling Analyses Recommendations [a]

Model Input/Output	Description
Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition. 3. Define background values for ozone and ammonia for area.
Processing	1. For PSD increments: use highest, second highest 3-hour and 24-hour average SO_2 concentrations; highest, second highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10} and NO_x concentrations. 2. For haze: process, on a 24-hour basis, compute the source extinction from the maximum increase in emissions of SO_2, NO_x and PM_{10}; compute the daily relative humidity factor [f(RH)], provided from an external disk file; and compute the maximum percent change in extinction using the FLM supplied background extinction data in the FLAG document. 3. For significant impact analysis: use highest annual and highest short-term averaging time concentrations for SO_2, PM_{10},NO_x,,and F

[a] IWAQM Phase II report (12/98) and FLAG document (12/00)

Table C-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, and NO_3, PM_{10}, and F
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion.
Meteorological/Land Use Input	CALMET
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3, PM_{10}, SO_2, and NO_x
Model Processing	For haze: highest predicted 24-hour extinction change (%) for the year For significant impact analysis: highest predicted annual and highest short-term averaging time concentrations for SO_2, NO_x, and PM_{10}.
Background Values [a]	Ozone: 50 ppb; Ammonia: 1 ppb

[a] Recommended by the National Park Service.

Table C-3. General CALMET Settings, 1990, 1992, and 1996 Domains

Parameter	Setting
Horizontal Grid Dimensions	350 by 280 km, 4 km grid resolution
Vertical Grid	10 layers
Weather Station Data Inputs	6 surface, 3 upper air, 27 precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	1990: MM4 data, 80-km resolution, 8 x 6 grid, used for wind field initialization 1992: MM5 data, 80-km resolution, 8 x 6 grid, used for wind field initialization 1996: MM5 data, 36-km resolution, 8 x 6 grid, used for wind field initialization
Output	Binary hourly gridded meteorological data file for CALPUFF input

Table C-4. Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates Easting (km)	UTM Coordinates Northing (km)	Zone	Anemometer Height (m)
Surface Stations						
Tampa	TPA	12842	349.20	3094.25	17	6.7
Daytona Beach	DAB	12834	495.14	3228.05	17	9.1
Orlando	ORL	12815	468.96	3146.88	17	10.1
Gainesville	GNV	12816	377.40	3284.12	17	6.7
Vero Beach	VER	12843	557.52	3058.36	17	6.7
Fort Myers	FMY	12835	413.65	2940.38	17	6.1
Upper Air Stations						
Ruskin	TBW	12842	349.20	3094.28	17	NA
West Palm Beach	PBI	12844	587.87	2951.42	17	NA
Apalachicola	AQQ	12832	110.00[a]	3296.00	16	NA

[a] Equivalent coordinate for Zone 17; Zone 16 coordinate is 690.22 km.

Table C-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name	Station Number	UTM Coordinate		
		Easting (km)	Northing (km)	Zone
Belle Glade Hrcn Gt 4	80616	528.190	2953.034	17
Branford	80975	315.606	3315.955	17
Brooksville 7 SSW	81048	358.029	3149.545	17
Canal Point Gate 5	81271	536.428	2971.514	17
Daytona Beach WSO AP	82158	494.165	3227.413	17
Deland 1 SSE	82229	470.780	3209.660	17
Fort Myers FAA/AP	83186	413.992	2940.710	17
Gainesville 11 WNW	83322	355.411	3284.205	17
Inglis 3 E	84273	342.631	3211.652	17
Lakeland	84797	409.871	3099.178	17
Lisbon	85076	423.594	3193.256	17
Lynne	85237	409.255	3230.295	17
Marineland	85391	479.193	3282.030	17
Melbourne WSO	85612	534.381	3109.967	17
Moore Haven Lock 1	85895	491.608	2967.803	17
Orlando Wso Mccoy	86628	468.169	3145.102	17
Ortona Lock 2	86657	470.174	2962.267	17
Parrish	86880	366.986	3054.394	17
Port Mayaca S L Canal	87293	538.044	2984.440	17
Saint Leo	87851	376.483	3135.086	17
St Lucie New Lock 1	87859	571.042	2999.353	17
St Petersburg	87886	339.608	3071.991	17
Tampa Wscmo AP	88788	348.478	3093.670	17
Venice	89176	357.593	2998.178	17
Venus	89184	467.266	3001.224	17
Vero Beach 4 W	89219	554.268	3056.498	17
West Palm Beach Int AP	89525	589.611	2951.627	17