Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

November 5, 2003

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris, Vice President
Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, Florida 33569

Re: DEP File No. 0570008-044-AC (PSD-FL-336)
Riverview Facility – Major Revamping of EPP Plant (renamed No. 6 Granulation Plant)

Dear Mr. Morris:

The Department received the referenced application on October 17, 2003 describing proposed major modifications for expansion of the Riverview EPP Plant in Hillsborough County. The initial review concluded that supplemental information is required. To save processing time, the Department is requesting information in advance of the expiration of the 30-day completeness review period. Further requests may be made by the 30th day including any related to modeling or review by other agencies. Please submit the information requested below:

1. Please provide sufficiently detailed drawings of the scrubber systems being relocated and the proposed new scrubbers to allow a proper engineering evaluation of their expected performance. Also provide sufficiently detailed engineering descriptions of the new and existing scrubbers including calculations of their design efficiencies for PM/PM_{10} and fluoride removal. [Rule 62-4.070(3), F.A.C., Standards for Issuance or Denial of Permits. Rule 62-212.400, F.A.C., Prevention of Significant Deterioration/Best Available Control Technology]

2. Since the new scrubbing configuration involves removing the reactor/granulator tail gas scrubber, please provide sufficiently detailed engineering calculations of the relative PM/PM_{10} and fluoride removal efficiencies for two cases: (a) the ammonia vaporizer without a tail gas scrubber as proposed; and (b) the ammonia vaporizer exhaust being directed to the dryer tail gas scrubber. Also, please quantify the gaseous fluoride that will be stripped from the RGV Venturi Scrubber solution and the total fluoride removal effected by the recirculated condensate in the ammonia vaporizer. [Rule 62-4.070(3), F.A.C., Standards for Issuance or Denial of Permits. Rule 62-212.400, F.A.C., Prevention of Significant Deterioration/Best Available Control Technology]

Rule 62-4.050(3), F.A.C. requires that all responses to requests for further information of an engineering nature be certified by a professional engineer registered in the State of Florida. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days.

If there are any questions, please contact John Reynolds at 850/921-9530.

Sincerely,

A. A. Linero, P.E., Administrator
Bureau of Air Regulation

AAL/jr

cc: Jerry Kissel, DEP-SWD
Jeaneanne Gettle, EPA
John Bunyak, NPS

"More Protection, Less Process"

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. E. O. Morris
Vice President
Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, FL 33569

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* ROY BURNETT B. Date of Delivery 11/10

C. Signature X Roy Burnett ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. 7001 0320 0001 3692 5757

PS Form 3811, July 1999 Domestic Return Receipt 102595-00-M-0952

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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Postage	$
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Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

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Sent To Mr. E. O. Morris
Street, Apt. No.; or PO Box No. 8813 Highway 41 South
City, State, ZIP+4 Riverview, FL 33569

PS Form 3800, January 2001 See Reverse for Instructions

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

set up file

Mr. Gregg Worley, Chief
Air, Radiation Technology Branch
Preconstruction/HAP Section
U.S. EPA, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

RE: Cargill Fertilizer, Inc.
No. 6 Granulation Plant
DEP File No. 0570008-044-AC, PSD-FL-336

Dear Mr. Worley:

Enclosed for your review and comment is a PSD application submitted by Cargill Fertilizer, Inc. for proposed modifications at their facility in Hillsborough 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 Teresa Heron, review engineer, at 850/921-9529.

Sincerely,

Patty Adams

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

AL/pa
Enclosure
cc: Teresa Heron

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

October 24, 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.
No. 6 Granulation Plant
DEP File No. 0570008-044-AC, PSD-FL-336

Dear Mr. Bunyak:

Enclosed for your review and comment is a PSD application submitted by Cargill Fertilizer, Inc. for proposed modifications at their facility in Hillsborough 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 Teresa Heron, review engineer, at 850/921-9529.

Sincerely,

Patty Adams

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

AL/pa
Enclosure
cc: Teresa Heron

Golder Associates Inc.

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

Golder Associates

CERTIFIED MAIL: 7002 0860 0006 3730 0802

October 7, 2003 | 0237575

RECEIVED
OCT 17 2003
BUREAU OF AIR REGULATION

Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. Al Linero, P.E.

RE: CARGILL FERTILIZER, INC., FACILITY ID NO. 0570008
PSD APPLICATION TO MODIFY THE EPP PLANT (NO. 6 GRANULATION PLANT)

Dear Mr. Linero:

Enclosed please find six (6) copies of a PSD application to modify the No. 6 Granulation Plant [formerly the Enhanced Phosphates Production (EPP) Plant] at Cargill Fertilizer, Inc.'s (Cargill) Riverview facility, and a check to cover the application processing fee of $7,500.

Cargill has updated the site-specific testing plan for the GTSP Storage Buildings Nos. 2 and 4 pursuant to 40 CFR 63.630(c). The updated site-specific testing plan is included in the PSD report in Appendix E.

If you have any questions, please feel free to call me at (352) 336-5600 or Dean Ahrens, Cargill, at (813) 671-6369.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E., Q.E.P.
Principal Engineer

DAB/FWB/jkw

Enclosures

cc: D. Ahrens, Cargill
F. Bergen, Golder

Y:\Projects\2002\0237575 Cargill Riverview\4\4 1\100703\CoverLetter.doc

O. Morris
D. Jellerson
J. Dominic
F. Matthews
File: P-30-32- 4
P-05-01

J. Kahn
C. Holladay
G. Kissel, SWD
A. Herman, EPC
G. Worley, EPA
D. Bunyak, NPS

RECEIVED

OCT 17 2003

BUREAU OF AIR REGULATION

PSD APPLICATION FOR THE NO. 6 GRANULATION PLANT
CARGILL FERTILIZER, INC.
RIVERVIEW, FLORIDA

Prepared For:
Cargill Fertilizer, Inc.
8813 U.S. Highway 41 South
Riverview, FL 33569

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

October 2003
0237575

DISTRIBUTION:
6 Copies - FDEP
1 Copy - Cargill Fertilizer, Inc.
2 Copies - Golder Associates Inc.

AIR PERMIT APPLICATION FORM

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: **Tampa Plant**	
3. Facility Identification Number: **0570008** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **8813 U.S. Highway 41 South** City: **Riverview** County: **Hillsborough** Zip Code: **33569**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **Dean Ahrens, Environmental Superintendent**
2. Application Contact Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **8813 Highway 41 South** City: **Riverview** State: **FL** Zip Code: **33569**
3. Application Contact Telephone Numbers: Telephone: (**813**) **671 - 6369** Fax: (**813**) **671 - 6149**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	10-17-2003
2. Permit Number:	0570008-044-AC
3. PSD Number (if applicable):	PSD-FL-336
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) 10/10/03
   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

10/7/03 — Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
007	No. 6 Granulation Plant (Formerly EPP Plant)	AC1A	$7,500

Application Processing Fee

Check one: [X] Attached - Amount: $: 7,500 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **This application is for the proposed modification and increased ammoniated phosphates (AP) production rate of the No. 6 Granulation Plant (formerly EPP Plant).**	
2. Projected or Actual Date of Commencement of Construction:	**1 Dec 2003**
3. Projected Date of Completion of Construction:	**1 Dec 2006**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: 17 East (km): 362.9 North (km): 3082.5			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): 27 / 51 / 28 Longitude (DD/MM/SS): 82 / 23 / 15			
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 28	6. Facility SIC(s): 2874
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: Dean Ahrens, Environmental Superintendent
2. Facility Contact Mailing Address: Organization/Firm: Cargill Fertilizer, Inc. Street Address: 8813 U.S. Highway 41 South City: Riverview State: FL Zip Code: 33569
3. Facility Contact Telephone Numbers: Telephone: (813) 671 - 6369 Fax: (813) 671 - 6149

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [ ] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] 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
SAM	A				Sulfuric Acid Mist

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

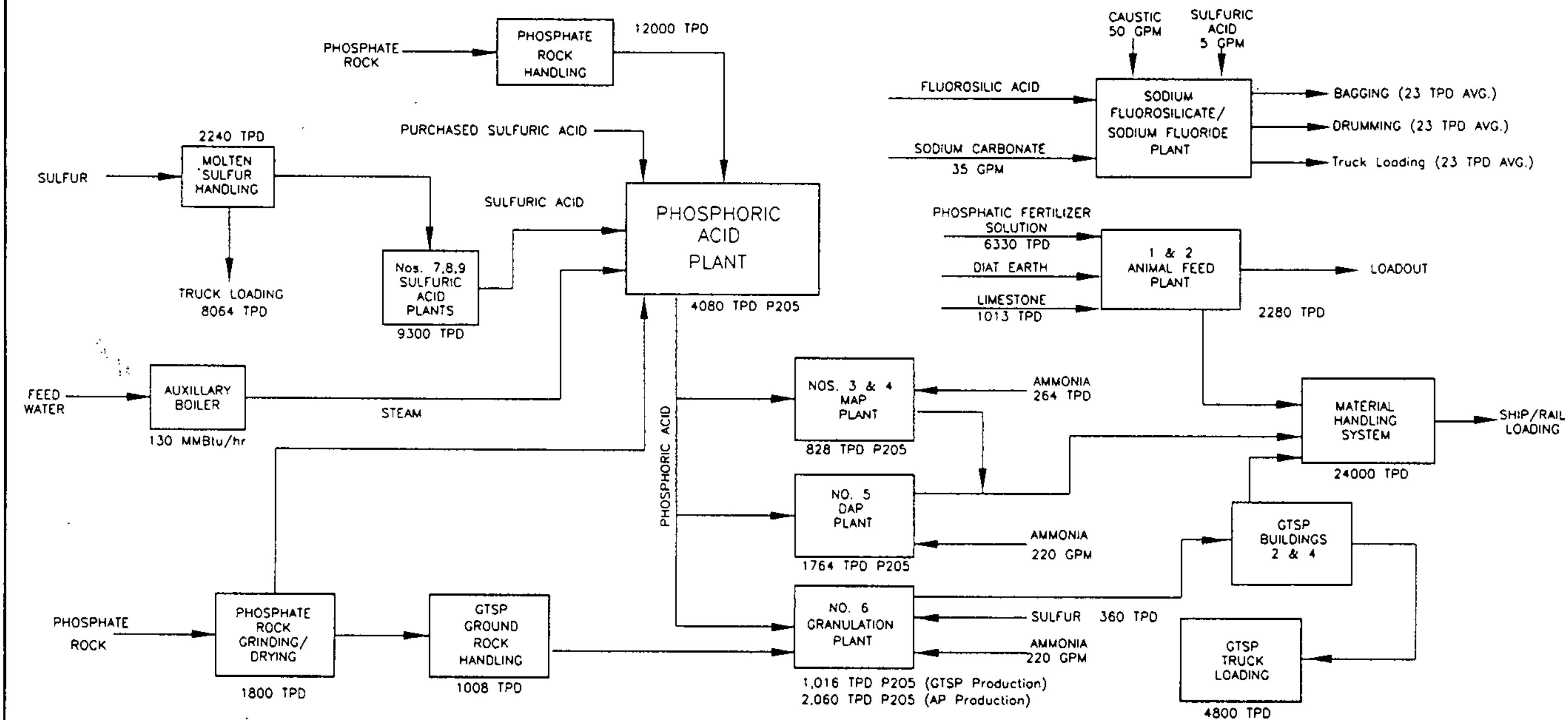
1. Area Map Showing Facility Location: [X] Attached, Document ID: See PSD Report [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: See PSD Report [ ] Not Applicable [ ] Waiver Requested
3. Process Flow Diagram(s): [X] Attached, Document ID: CR-FI-C3 [ ] Not Applicable [ ] 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: See PSD Report [ ] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: See 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 CR-FI-C3

PROCESS FLOW DIAGRAM



Golder Associates, GAINESVILLE, FLORIDA	SCALE N/A	TITLE	ATTACHMENT CR-FI-C3 Future Facility Process Flow Diagram Cargill Riverview
	DATE 08/12/03		
	DESIGN N/A		
	CADD N/A		
FILE Name. CR-FI-C3.dwg	LAST REVISED JEJ	PATH	Y:\\0237575\4\4.4\4.4.1\CR-FI-C3.dwg
PROJECT No. 0237575-0100 REV.	REVIEW N/A		

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):

No. 6 Granulation Plant (formerly EPP Plant)

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)

There exists a potential for fugitive emissions of $PM/PM_{10}/FL$ to occur from this emission unit. It is our understanding, based on past FDEP interpretations and permitting history, that these emissions are not regulated under federal/state/local emission standards.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Venturi Scrubbers (3)** **Packed-Bed Tailgas Scrubbers (2)** **Ammonia Vaporizer (1)**	
2. Control Device or Method Code(s):	**053, 050, 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:			80	mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:			2,060	TPD P_2O_5 input
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):

Maximum process rate represents P_2O_5 input rate during AP production.

There are two methods of operation: GTSP mode and ammoniated phosphates (AP) mode. Maximum process rate for GTSP production is 1,016 TPD P_2O_5 input. Ammoniated phosphate products with added nutrients can also be produced. Maximum heat input represents a monthly average.

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

Note: the following MACT rules will apply if the Riverview facility is deemed a major source of HAPS	40 CFR 63.627(a) Notification, Recordkeeping, and Reporting
40 CFR 63, Subpart A NESHAPs General Provisions	40 CFR 63.627(b) Notification, Recordkeeping, and Reporting
40 CFR 63.620(a) NESHAPs for Phosphate Fertilizer Plants	40 CFR 63.627(c) Notification, Recordkeeping, and Reporting
40 CFR 63.620(b)1 NESHAPs for Phosphate Fertilizer Plants	40 CFR 63.628 Applicability of General Provisions
40 CFR 63.620(e) NESHAPs for Phosphate Fertilizer Plants	40 CFR 63.629 Miscellaneous Requirements
40 CFR 63.622(a) Standards for Existing DAP/MAP Plants	40 CFR 63.630(a) Compliance Dates
40 CFR 63.622(b) GTSP	40 CFR 63.630(c)
40 CFR 63.622(c) GTSP stg.	40 CFR 63.631 Exemption from NSPS
40 CFR 63.624 Wet Scrubber Operating Requirements	62-212.400 Preconstruction Review
40 CFR 63.625(a) Monitoring Requirements	62-296.403(2) Phosphate Processing
40 CFR 63.625(b) Monitoring Requirements	62-296.403(3) Phosphate Processing – Test Methods
40 CFR 63.625(c) Monitoring Requirements	62-296.320(4)(b) General VE Limitation
40 CFR 63.625(d) GTSP stg.	62-297.310 Compliance Testing
40 CFR 63.625(e) Monitoring Requirements	62-297.401 Compliance Test Methods
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 63.626(d) Performance Tests and Compliance	

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? **No. 6 Granulation 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):

Cooler Stack (South Stack)

Reactor, Granulator, Dryer, and Equipment Vents Stack (North Stack)

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

5. Discharge Type Code: **V**	6. Stack Height: **162** feet	7. Exit Diameter: **8.5** feet
8. Exit Temperature: **164** °F	9. Actual Volumetric Flow Rate: **200,000** 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):

Parameters listed are design parameters for the RG, Dryer, and Vents Stack. Parameters for the Cooler Stack are included in the PSD Report.

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; Triple Superphosphate; Ammoniator/Granulator**		
2. Source Classification Code (SCC): **3-01-029-23**	3. SCC Units: **Tons of Fertilizer Produced**	
4. Maximum Hourly Rate: **92**	5. Maximum Annual Rate: **805,920**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **GTSP Process Rate of 1,016 TPD P_2O_5 input, equivalent to 92 TPH of GTSP. Production rate for GTSP with sulfur and nitrogen added is also 1,016 TPD P_2O_5 input, equivalent to 92 TPH (2,208 TPD).**		

Segment Description and Rate: Segment 2 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Chemical Manufacturing; Ammonium Phosphates; Ammoniator/Granulator**		
2. Source Classification Code (SCC): **3-01-030-23**	3. SCC Units: **Tons of Fertilizer Produced**	
4. Maximum Hourly Rate: **186.6**	5. Maximum Annual Rate: **1,634,616**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **AP process rate of 2,060 TPD P_2O_5, equivalent to 186.6 TPH.**		

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; Ammonium Phosphate Dryer; Natural Gas.**		
2. Source Classification Code (SCC): **3-90-006-99**	3. SCC Units: **Millions of Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.08**	5. Maximum Annual Rate: **700.8**	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 maximum monthly average heat input rate of 80.0 MMBtu/hr.**		

Segment Description and Rate: Segment 4 of 4

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Oil; Distillate Oil; Ammonium Phosphate Dryer.**		
2. Source Classification Code (SCC): **3-90-005-99**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.571**	5. Maximum Annual Rate: **228.4**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.5**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **140**
10. Segment Comment (limit to 200 characters): **Fuel oil burning limited to 400 hours per year. Maximum hourly rate based on maximum monthly average heat input rate of 80 MMBtu/hr.**		

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	050	EL
FL	053	050	EL
SO_2			EL
NO_X			NS
CO			NS
PM_{10}	053	050	NS
VOC			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: **12.88** lb/hour **56.39** tons/year

4. Synthetically Limited? [ ]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor: **0.15 lb/ton P_2O_5 input**

   Reference: **Proposed limit**

7. Emissions Method Code: **0**

8. Calculation of Emissions (limit to 600 characters):

   0.15 lb/ton P_2O_5 x 85.83 ton P_2O_5/hr = 12.875 lb/hr
   12.88 lb/hr x 8,760 hr/yr x 1 ton/2000 lb = 56.39 TPY

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   PM is emitted through two modes of operation, this is AP mode. PM Emissions Limits for GTSP mode are 6.35 lb/hr and 27.81 TPY.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **0.15 lb/ton P_2O_5 input**

4. Equivalent Allowable Emissions: **12.88** lb/hour **56.39** tons/year

5. Method of Compliance (limit to 60 characters):

   Annual Stack Test using EPA Method 5.

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Proposed limit for AP mode.

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: 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 2 of 2

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.15 lb/ton P_2O_5 input**	4. Equivalent Allowable Emissions: **6.35** lb/hour **27.81** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Test using EPA Method 5.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Applies to operation in GTSP mode. Based on proposed BACT.**	

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: **3.43** lb/hour **15.04** 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 input** Reference: **Proposed limit**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.04 lb/ton P_2O_5 input x 85.83 TPH P_2O_5 = 3.433 lb/hr** **3.433 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 15.04 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Estimated emissions based on operating in AP mode. Emission Limits for GTSP mode are 1.69 lb/hr and 7.42 TPY.**	

Allowable Emissions Allowable Emissions 1 of 2

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 input**	4. Equivalent Allowable Emissions: **3.43** lb/hour **15.04** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Test Using EPA Method 13A or 13B.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Applies to operation in AP mode. Based on proposed limit.**	

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: 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 2 of 2

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 input**	4. Equivalent Allowable Emissions: **1.69** lb/hour **7.42** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Test using EPA Method 13A or 13B.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Applies to operation in GTSP mode. Based on proposed BACT limit.**	

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: **40.5** lb/hour **8.3** 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 PSD Report, Table 2-3.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.5 % S fuel oil**	4. Equivalent Allowable Emissions: **40.5** lb/hour **8.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel analysis and usage records.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Limited by Permit No. 0570008-014-AV and Permit No. 0570008-036-AC. Maximum 400 hr/yr on fuel oil.**	

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: [X] Rule [ ] 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) and Permit No. 0570008-036-AC.**	

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

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: **FoxBoro Magnetic Flow Transmitter** Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Represents flow of phosphate bearing material. Based on Permit No. 0570008-014-AV during AP mode.**	

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 2

1. Parameter Code: PRS	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Taylor Differential Pressure Transmitter Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): Pressure drop across scrubbing system. Based on Permit No. 0570008-014-AV for operation during AP mode.	

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

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: See PSD Report [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: CR-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: See 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: See 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 CR-EU1-J2

FUEL ANALYSIS

ATTACHMENT CR-EU1-J2

NO. 6 GRANULATION 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	0.5	0.006	<0.01	140,000 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
H_2SO_4	sulfuric acid
hr/yr	hours per year
HSH	highest, second-highest

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LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

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 units
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
RGCV	reactor-granulator-cooler-equipment vents
SAM	sulfuric acid mist
SiF_4	silicon tetrafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_4	sulfate
TPD	tons per day
TPH	tons per hour
TPY	tons per year
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound

1.0 INTRODUCTION

Cargill Fertilizer, Inc. is proposing to modify the Enhanced Phosphates Production (EPP) Plant at its phosphate fertilizer manufacturing facility located in Riverview, Florida. The proposed changes will include an increase in the ammoniated phosphates (AP) production rate, replacement of the reactor, dryer, and cooler, modifications to the control equipment configuration, and the addition of one new stack that will be used along with the existing common plant stack.

Cargill is proposing to increase the AP process rate of the EPP Plant from 1,104 tons per day (TPD) to 2,060 TPD P_2O_5 input, equivalent to approximately 4,000 TPD AP. The granular triple super phosphate (GTSP) production rate will not change from the current permitted rate of 1,016 TPD P_2O_5 input, equivalent to approximately 2,208 TPD GTSP. Cargill is proposing to add a pipe reactor in parallel with a new reactor and to replace the existing rotary cooler with a new fluidized bed cooler. The capability to add sulfuric acid to the reactor/granulator along with micronutrients and macronutrients will also be implemented. Cargill is also proposing to modify the control equipment configuration by adding four new scrubbers and an ammonia vaporizer. One new stack will be added and the existing common plant stack will be utilized. The EPP Plant will be renamed the No. 6 Granulation (DAP) Plant.

Based on the potential increase in actual emissions of fluoride (F) and particulate matter less than or equal to 10 micrometers (PM_{10}) 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 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 to modify its existing EPP Plant at Riverview and to increase the AP process rate. The facility is currently operating under Permit No. 0570008-014-AV, issued April 28, 1999, and Permit No. 0570008-036-AC;PSD-FL-315, issued November 21, 2001. The plant is located south of Tampa on Hillsborough Bay (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 the EPP Plant in more detail.

2.1 GENERAL

Cargill currently operates an Enhanced Phosphates Production (EPP) plant at its Riverview facility under Operating Permit No. 0570008-014-AV and Construction Permit No. 0570008-036-AC. The existing EPP plant consists of reactors, a granulator, a dryer, a cooler, and associated screening and material handling systems. This plant is permitted for the production of GTSP and AP.

Cargill received approval for changes to the EPP plant in November 2001 (Permit No. 0570008-036-AC;PSD-FL-315) to allow for the production of EPP fertilizers including GTSP, AP, and phosphate fertilizers with added nitrogen, sulfur and micronutrients, and to provide proper product granulation and improved overall plant evacuation and pollution control.

Cargill is proposing the following modifications to the existing EPP Plant:

- Increase in AP process rate from 1,104 TPD to 2,060 TPD P_2O_5 input.
- Replacement of Nos. 1 and 2 reactors with a new larger reactor.
- Replacement of the existing rotary cooler with a modified cooler.
- Convert the existing reactor/granulator, cooler, and equipment vents (RGCV) tailgas scrubber into a dryer tailgas scrubber.
- A new ammonia vaporizer will scrub the RGV exit gases in lieu of a tailgas scrubber.
- Addition of a new dryer venturi scrubber.
- Addition of a new cooler venturi scrubber.
- Convert the existing dryer tailgas scrubber into a cooler tailgas scrubber.
- Add one new stack, in addition to the existing stack.
- Addition of sulfuric acid to the reactor and granulator.
- Addition of a sulfur feed tank inside the EPP Plant building, evacuated to the RGV scrubber system. Cargill applied for, and was approved for installation of this sulfur feed tank in

Permit No. 0570008-036-AC. It was planned to install the sulfur feed tank outside of the EPP Building. Cargill is now planning to install it inside instead and vent it through the RGV scrubber.

- The EPP Plant will be renamed the No. 6 Granulation Plant.

2.1.1 PROCESS DESCRIPTION

Cargill is proposing to modify the existing EPP Plant by making changes to the reactor and cooler systems. A pipe reactor will be installed to operate in parallel with the new reactor. Sulfuric acid will be added to the reactor and granulator for the production of AP fertilizers with sulfur. The existing rotary dryer will be converted to a rotary cooler. A molten sulfur feed tank (5,000 gallon) is also being added inside of the No. 6 Granulation Plant building that will evacuate to the RGV scrubber system. Molten sulfur will be fed at a maximum rate of 15 TPH.

Cargill is proposing to modify the existing control equipment and stack configuration. The existing common plant stack will be operated in conjunction with a new stack.

Cargill is also proposing to increase the AP process rate from 1,104 tons per day (TPD) to 2,060 TPD P_2O_5 input, equivalent to production rates of 2,400 and 4,478 TPD AP, respectively. The maximum GTSP process rate of 1,016 TPD P_2O_5 input, equivalent to a GTSP production rate of 2,208 TPD, will not change.

The EPP plant is currently permitted for a maximum annual average heat input rate for the rotary dryer of 80.0 million British thermal units per hour (MMBtu/hr) (monthly average). The rotary dryer will continue to be fired primarily with natural gas with No. 2 fuel oil as a back-up. No. 2 fuel oil will be used for no more than 400 hours per year (hr/yr).

A flow diagram of the existing EPP plant is presented in Figure 2-3. The flow diagram of the modified No. 6 Granulation Plant is shown in Figure 2-4.

2.1.2 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

Several changes to the control equipment at the EPP Plant were approved in Permit No. 0570008-036-AC;PSD-FL-315, including new RGCV and primary dryer venturi scrubbers. Each new venturi scrubber was to be followed by an existing tailgas scrubber.

Cargill is now proposing to modify the control equipment configuration that was approved in Permit No. 0570008-036-AC. In the proposed configuration, the RGCV venturi scrubber will control emissions from only the reactor, granulator, and equipment vents (RGV), followed by a new ammonia vaporizer. Emissions from the dryer will be controlled by a new dryer venturi scrubber, followed by the converted RGCV tailgas scrubber (now dryer tailgas scrubber). The exhaust gases from the ammonia vaporizer will be combined with the exhaust gases from the dryer tailgas scrubber and will vent through a new stack.

Emissions from the cooler will be controlled by a new cooler venturi scrubber, followed by the converted dryer tailgas scrubber. Exhaust gases from the cooler tailgas scrubber will be vented through the existing stack.

The proposed emission limits for the No. 6 Granulation Plant in AP production mode are 0.15 lb/ton P_2O_5, 12.88 lb/hr, 56.39 tons per year (TPY) for PM/PM_{10}, and 0.04 lb/ton P_2O_5, 3.43 lb/hr, 15.04 TPY for F. The proposed emission limits for the No. 6 Granulation Plant in GTSP production mode are 0.15 lb/ton P_2O_5, 6.35 lb/hr, 27.81 TPY for PM/PM_{10}, and 0.04 lb/ton P_2O_5, 1.69 lb/hr, and 7.42 TPY for F.

A summary of current and proposed allowable emission rates for the No. 6 Granulation Plant are presented in Table 2-1. The table details the existing and proposed allowable emission rates for PM, PM_{10}, and F. A summary of current and proposed control equipment for the No. 6 Granulation Plant is presented in Table 2-2. Maximum future emissions due to fuel combustion in the dryer are presented in Table 2-3. Maximum estimated emissions from the molten sulfur storage tank are presented in Appendix B. The actual emissions from the EPP plant for calendar years 2001-2002 are presented in Table 2-4 (refer to Appendix A).

2.1.3 STACK DATA

Stack geometry and operating data are presented in Table 2-5 for each emission source located at the existing and modified No. 6 Granulation Plant.

2.2 AFFECTS ON OTHER EMISSION UNITS

Due to the proposed modifications to the existing EPP Plant, several other emission units will potentially be affected (i.e., increased production rates or actual emission rates). The following sections describe the other emission units at Cargill Riverview and the potential to be affected by the proposed modifications.

2.2.1 NOS. 7, 8, AND 9 SULFURIC ACID PLANTS

Cargill is proposing to feed sulfuric acid to the reactor at the No. 6 Granulation Plant. Sulfuric acid is also used as a raw material in the Phosphoric Acid Plant (PAP). Although there may be an increase in the actual amount of sulfuric acid required for the No. 6 Granulation Plant and the PAP to meet the increased production needs of the No. 6 Granulation Plant, Cargill will not produce any additional sulfuric acid. Cargill currently exports a portion of the sulfuric acid that is produced in their Sulfuric Acid Plants (SAPs). Cargill will export less sulfuric acid to offset any additional sulfuric acid needed for the No. 6 Granulation Plant and the PAP. Furthermore, Cargill recently acquired a sulfuric acid plant located in Mulberry (formerly Mulberry Phosphates). All sulfuric acid produced at Cargill's Mulberry Plant is exported. Consequently, the current export demand from Cargill Riverview is less than in previous years. Therefore, the SAPs will not be affected by the proposed project.

2.2.2 PHOSPHORIC ACID PLANT

Phosphoric acid is used for the production of GTSP and AP fertilizers. Although the maximum production rate of phosphoric acid is not increasing as part of this project, the actual phosphoric acid production may increase as part of this project. Since the PAP is still under a construction permit (No. 0570008-036-AC; PSD-FL-315), and construction under this permit has not yet been completed, the actual emissions are equivalent to the permit allowable emission rates for PSD review purposes. The permitted allowable emissions are 0.12 lb/ton P_2O_5 and 8.9 TPY of F. This also represents the future potential emissions for the PAP.

2.2.3 NOS. 5, 7, AND 9 ROCK MILLS AND GTSP GROUND ROCK HANDLING

The Nos. 5, 7, and 9 Rock Mills receive wet or dry phosphate rock, and dry and grind the rock for use in the EPP plant for GTSP production. Since the maximum permitted GTSP production rate is not changing as part of this project, the rock mills and ground rock handling will not be affected by the proposed project.

2.2.4 MATERIAL HANDLING SYSTEM

The Material Handling System is used to convey DAP from the DAP storage building, MAP from the MAP storage building, and GTSP from the GTSP storage buildings to the ship loader at the dock.

Since the proposed modifications may result in increased AP production (through the No. 6 Granulation Plant), potential throughput and subsequent PM/PM_{10} emissions for the Material Handling System may increase. Current actual emissions (2001-2002) from the Material Handling System are presented in Table 2-4 (also refer to Appendix A). Future potential emissions from the Material Handling System baghouses are 0.8 lb/hr and 19.5 TPY for PM/PM_{10}. This is based on the current Title V permit and a reduction in allowable emissions requested in the PSD permit application submitted in February 2001 (Permit No. 0570008-036-AC).

Only the annual throughput and emission rates will be affected by the proposed project. The short-term operating rates will remain the same after the proposed project. Although the Material Handling System annual throughput and emissions will be potentially affected, the AFI Railcar Unloading system will not be affected by this process, since AFI production is not affected by the project. Therefore, only the Material Handling System conveyors and baghouses were included in the annual PM_{10} significant impact modeling analysis.

2.2.5 GTSP STORAGE BUILDINGS

The products from the No. 6 Granulation Plant (GTSP, GTSP with sulfur and nitrogen, AP, etc.) will be transferred to the GTSP storage buildings. From there, the products will be transferred to the Material Handling System for ship or railcar loadout, or can be loaded out into trucks. F emissions for the Nos. 2 and 4 Storage Buildings are regulated for the production of GTSP. Since the production rate of GTSP is not increasing as part of this project, the F emissions will not increase as part of this project. Therefore, the GTSP Storage Buildings will not be affected by the proposed project.

2.2.6 GTSP TRUCK LOADING STATION

Following storage in the GTSP storage buildings, the GTSP and AP products may be loaded into trucks at the GTSP truck loading station. Although the AP production rate may increase as part of this project, only the amount of AP sent through the Material Handling System will increase. There will not be any increase in the amount of AP loaded into trucks at the Truck Loading Station. Therefore, the Truck Loading Station will not be affected by the proposed project.

2.2.7 TRUCK TRAFFIC

Trucks are used to transport animal feed ingredient (AFI), limestone, GTSP, MAP, DAP, fuel oil, coating oil, sodium silicofluoride (SSF), fluorosilic acid/phosphatic fertilizer solution (FSA/PFS), sulfur, sulfuric acid, and molten sulfur at Riverview. Although the AP production rate at the No. 6 Granulation Plant may increase as part of this project, only the amount of AP sent through the Material Handling System and to the dock will increase. There will not be an increase in the amount of AP loaded into trucks, and therefore there will not be an increase in the amount of MAP or DAP truck traffic as part of this project. The SAPs are not affected by the proposed project; therefore, the magnitude of the sulfur, sulfuric acid, and molten sulfur truck traffic will not increase as part of this project. GTSP production is not affected; therefore the magnitude of truck traffic onsite will not be affected by the proposed project. Since there will not be an increase in the amount of AFI, limestone, fuel oil, coating oil, SSF, and FSA/PFS production/usage as part of this project, the magnitude of truck traffic onsite will not increase as part of this project.

Table 2-1. Summary of Allowable Emission Rates for the No. 6 Granulation Plant, Cargill Riverview

Source		EU ID	Operating Hours	Maximum Process Rate: P_2O_5 Input (TPD)	PM/PM_{10} Allowable Emission Rate			Fluoride Allowable Emission Rate		
					lb/ton P_2O_5 input	lb/hr	TPY	lb/ton P_2O_5 input	lb/hr	TPY
Existing EPP Plant[a]										
Common Stack	--GTSP Mode	007	8,760	1,016	0.28	12.00	52.6	0.058	2.45	10.75
	--MAP/DAP Mode	007	8,760	1,104	0.174	8.00	35.04	0.041	1.89 [b]	8.28 [b]
Modified No. 6 Granulation Plant (formerly EPP Plant)										
Combined Plant	--GTSP Mode	007	8,760	1,016	0.15	6.35	27.81	0.04	1.69	7.42
	--AP Mode	007	8,760	2,060	0.15	12.88	56.39	0.04	3.43	15.04

[a] Based on Permit No. 0570008-036-AC/PSD-FL-315.

[b] Hourly and annual emission limits are actually higher, but are limited by the more stringent lb/ton limit.

Table 2-2. Summary of Pollution Control Equipment for the No. 6 Granulation Plant, Cargill Riverview

Source	EU ID	Primary Control Equipment			Secondary Control Equipment			Design Stack Exit Flow Rate
		Type	Design Capacity	Design Pressure Drop	Type	Design Capacity	Design Pressure Drop	
Existing EPP Plant								
Reactor, Granulator, Cooler, and Equipment Vents	007	RGCV Venturi Scrubber	110,000 acfm	11 inches w.c	RGCV Packed-Bed Tailgas Scrubber	60,000 acfm	0.5 inches w.c	-- --
Dryer	007	Dryer Venturi Scrubber	115,000 acfm	11 inches w.c	Dryer Packed-Bed Tailgas Scrubber	100,000 acfm	2 - 11 inches w.c	-- --
Common Stack	007	--	-- --	--	--	-- --	--	225,000 acfm
Modified No. 6 Granulation Plant (formerly EPP Plant)								
Reactor, Granulator, and Equipment Vents	007	RGV Venturi Scrubber (previously RGCV Venturi Scrubber)	154,000 acfm	11 inches w.c	Ammonia Vaporizer (new)	143,000 acfm	2 inches w.c.	-- --
Dryer	007	Dryer Venturi Scrubber (new)	95,000 acfm	11 inches w.c	Dryer Packed-Bed Tailgas Scrubber (previously RGCV Tailgas Scrubber)	87,000 acfm	2 - 11 inches w.c	-- --
Reactor, Granulator, Dryer, and Equipment Vents Stack	007	--	-- --	--	--	-- --	--	200,000 acfm
Cooler Stack	007	Cooler Venturi Scrubber (new)	102,000 acfm	10 inches w.c.	Cooler Packed-Bed Tailgas Scrubber (previously Dryer Tailgas Scrubber)	104,000 acfm	2 - 10 inches w.c.	94,000 acfm

Note: w.c. = water column

Table 2-3. Maximum Emission Rates Due to Fuel Combustion for the Dryer at the No. 6 Granulation Plant

Parameter	Units	No. 2 Fuel Oil	Natural Gas
Operating Data			
Annual Operating Hours	hr/yr	400	8,760
Maximum Heat Input Rate	10^6Btu/hr	80	80
Hourly Fuel Oil Usage[a]	10^3gal/hr	0.571	N/A
Annual Fuel Oil Usage	10^3gal/yr	228.4	N/A
Maximum Sulfur Content	Weight %	0.5	N/A
Hourly Natural Gas Usage[b]	scf/hr	N/A	80,000
Annual Natural Gas Usage	10^6scf/yr	N/A	701

Pollutant	AP-42 Emissions Factor[c]	No. 2 Fuel Oil Hourly Emission Rate (lb/hr)	No. 2 Fuel Oil Annual Emission Rate (TPY)	Natural gas Hourly Emission Rate (lb/hr)	Natural gas Annual Emission Rate (TPY)	Maximum Total Emission Rate Hourly Emission Rate (lb/hr)	Maximum Total Emission Rate Annual Emission Rate (TPY)
Sulfur Dioxide							
Fuel oil	142 *(S)lb/10^3gal[d]	40.54	8.11	--	--	--	--
Natural gas	0.6 lb/10^6ft^3	--	--	0.048	0.21	--	--
Worse-Case Combination of Fuels		--	--	--	--	40.54	8.31
Sulfuric Acid Mist							
Fuel Oil	2.4 *(S)lb/10^3gal[d,e]	0.69	0.14	--	--	0.69	0.14
Nitrogen Oxides							
Fuel oil	20 lb/10^3gal	11.42	2.28	--	--	--	--
Natural gas	100 lb/10^6ft^3	--	--	8.000	35.04	--	--
Worse-Case Combination of Fuels		--	--	--	--	11.42	35.72
Carbon Monoxide							
Fuel oil	5 lb/10^3gal	2.855	0.571	--	--	--	--
Natural gas	84 lb/10^6ft^3	--	--	6.720	29.43	--	--
Worse-Case Combination of Fuels		--	--	--	--	6.72	29.43
Volatile Organic Compounds							
Fuel oil	0.2 lb/10^3gal	0.11	0.023	--	--	--	--
Natural gas	5.5 lb/10^6ft^3[f]	--	--	0.440	1.927	--	--
Worse-Case Combination of Fuels		--	--	--	--	0.44	1.93

Footnotes:

Particulate matter emissions through the common plant stack are included in Table 2-1.

[a] Based on the heat content of fuel oil of 140,000 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.

Table 2-4. Average Actual Emissions From Affected Sources for 2002 and 2001--Cargill Riverview

Source Description	EU ID	Hours (hr/yr)	Pollutant Emission Rate (TPY)								
			SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
Phosphoric Acid Plant [a]	073	--	--	--	--	--	--	--	--	--	8.90
EPP Plant [a]	007	--	8.11	35.04	29.43	52.60	52.60	1.93	--	0.14	10.80
Molten Sulfur Tank [a]	--	--	0.66	--	--	0.85	0.85	0.47	0.32	--	--
Material Handling System [b]											
West Baghouse Filter	051	3,132	--	--	--	1.18	1.18	--	--	--	--
South Baghouse	052	3,018	--	--	--	1.16	1.16	--	--	--	--
Vessel Ldng. System--Twr. Baghouse Exhaust	053	2,889	--	--	--	2.56	2.56	--	--	--	--
Building No. 6 Belt to Conveyor No. 7	058	1,606	--	--	--	0.40	0.40	--	--	--	--
Conveyor No.7 to Conveyor No. 8	059	3,132	--	--	--	0.83	0.83	--	--	--	--
Conveyor No.8 to Conveyor No. 9	060	3,132	--	--	--	1.27	1.27	--	--	--	--
Railcar Unloading of AFI Product			--	--	--	0.29	0.06	--	--	--	--
E. Vessel Ldg. Facility-Shiphold/Chokefeed	061	2,889	--	--	--	0.14	0.14	--	--	--	--
Total -- Material Handling System			0.00	0.00	0.00	7.83	7.60	0.00	0.00	0.00	0.00

[a] Construction permit was issued in 2001. Construction not yet complete on the plant, therefore current emission rates equivalent to allowable emi
or maximum potential (Permit No. 0570008-036-AC).

[b] Emissions from the Annual Operating Report (average of 2001-2002). Refer to Appendix A for derivation of actual emissions.

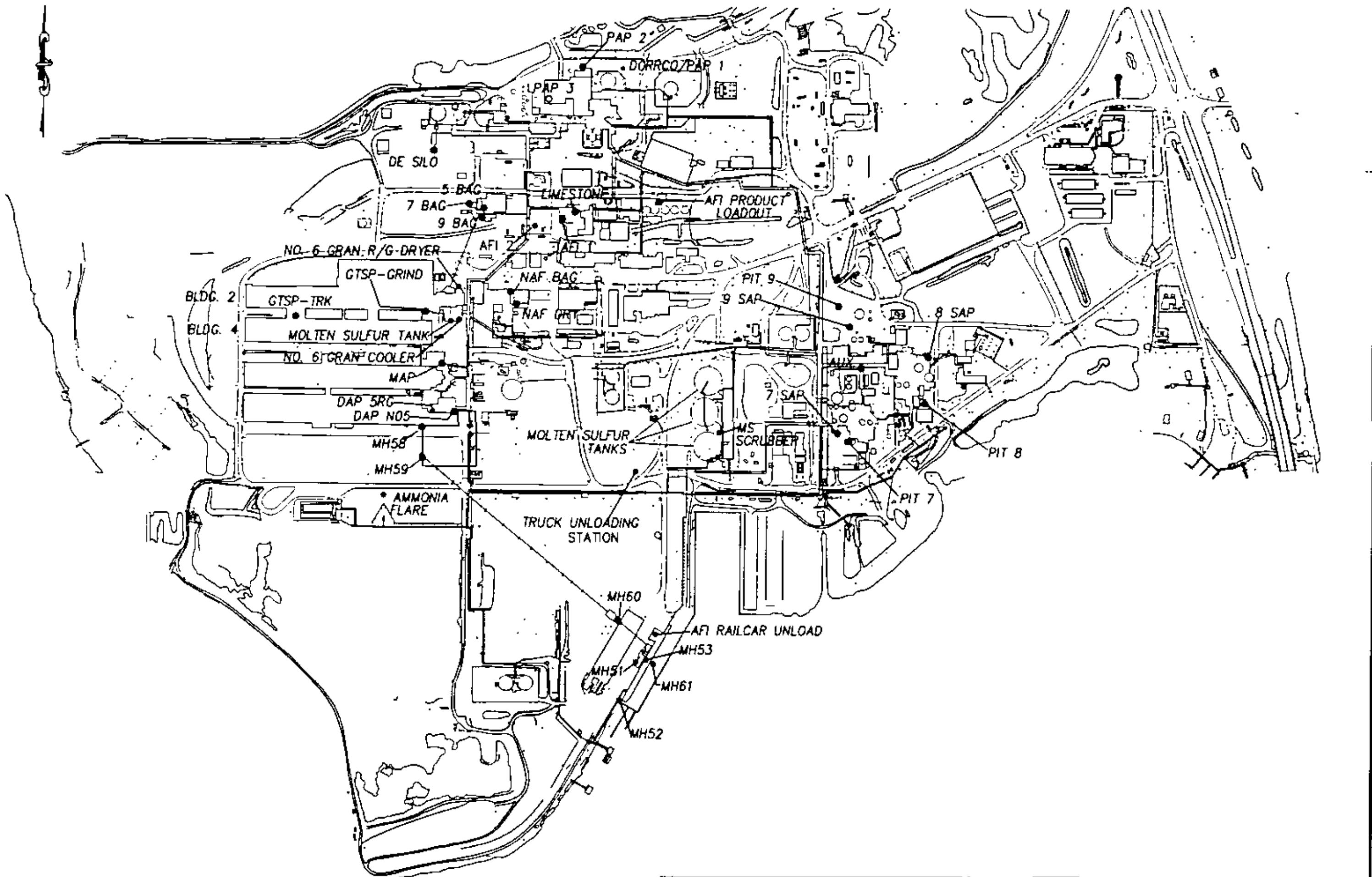
Table 2-5. Stack and Vent Geometry and Operating Data for the Modified Emissions Units – Cargill Riverview

Source	EU ID	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 Gas Flow Rate (acfm)	Exhaust Gas Exit Temperature (°F)	Exhaust Gas Exit Temperature (K)	Exhaust Gas Velocity (ft/s)	Exhaust Gas Velocity (m/s)
EXISTING OPERATIONS														
EPP Plant–Common Stack	007	-1727	-526.4	25.5	7.8	126	38.4	8.0	2.44	237,000	132	329	25.0	7.6
MODIFIED OPERATIONS														
No. 6 Granulation Plant (formerly EPP Plant)--Cooler Stack	007	-1727	-526.4	25.5	7.8	126	38.4	8.0	2.44	104,000	104	313	34.5	10.5
No. 6 Granulation Plant (formerly EPP Plant)--Dryer, R/G, Vents Stack	007	-1732	-527.9	178	54.2	162	49.4	8.5	2.59	200,000	164	346	58.7	17.9

Figure 2-1
Site Location
Cargill Fertilizer, Inc. - Riverview Facility

Source: Golder, 2000.

Golder Associates



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GAINESVILLE, FLORIDA

SCALE	N/A	TITLE	Figure 2-2. Facility Plot Plan Cargill Riverview
DATE	08/13/03		
DESIGN	N/A		
CADD	N/A		
FILE Name: Figure 2-2.dwg	LAST REVISED JEJ	PATH	0237575\4.4.4\4.4.1\Figure 2-2.dwg
PROJECT No. 023-7575 REV. 1	REVIEW N/A		

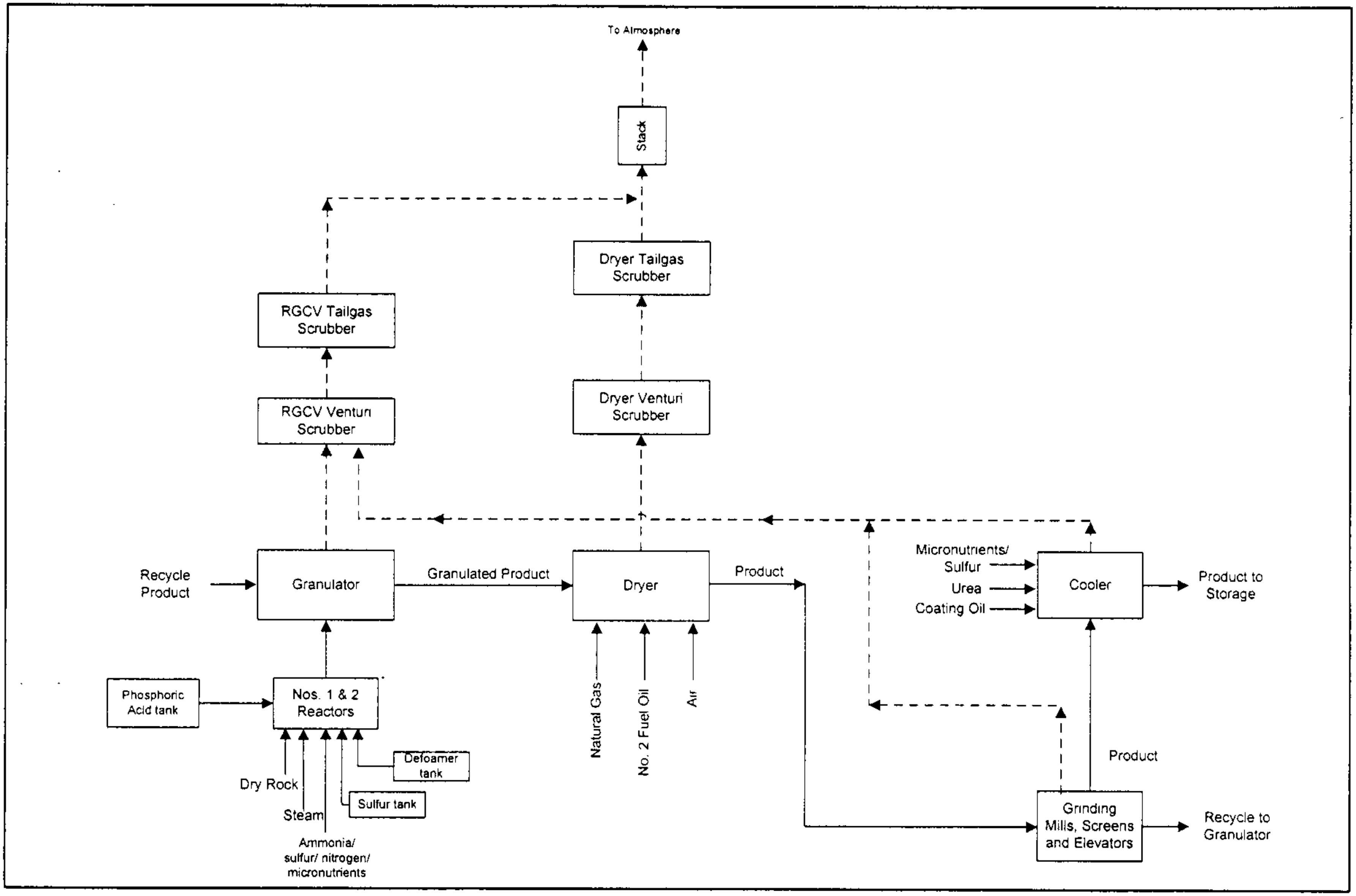

Figure 2-3
Current EPP Plant
Process Flow Diagram
Cargill - Riverview

Process Flow Legend

Material Flow ——→

Evacuation Flow - - - -→

Filename: 0237575/4/4.4/4.4.1/Figure2-3.vsd

Date: 09/15/03

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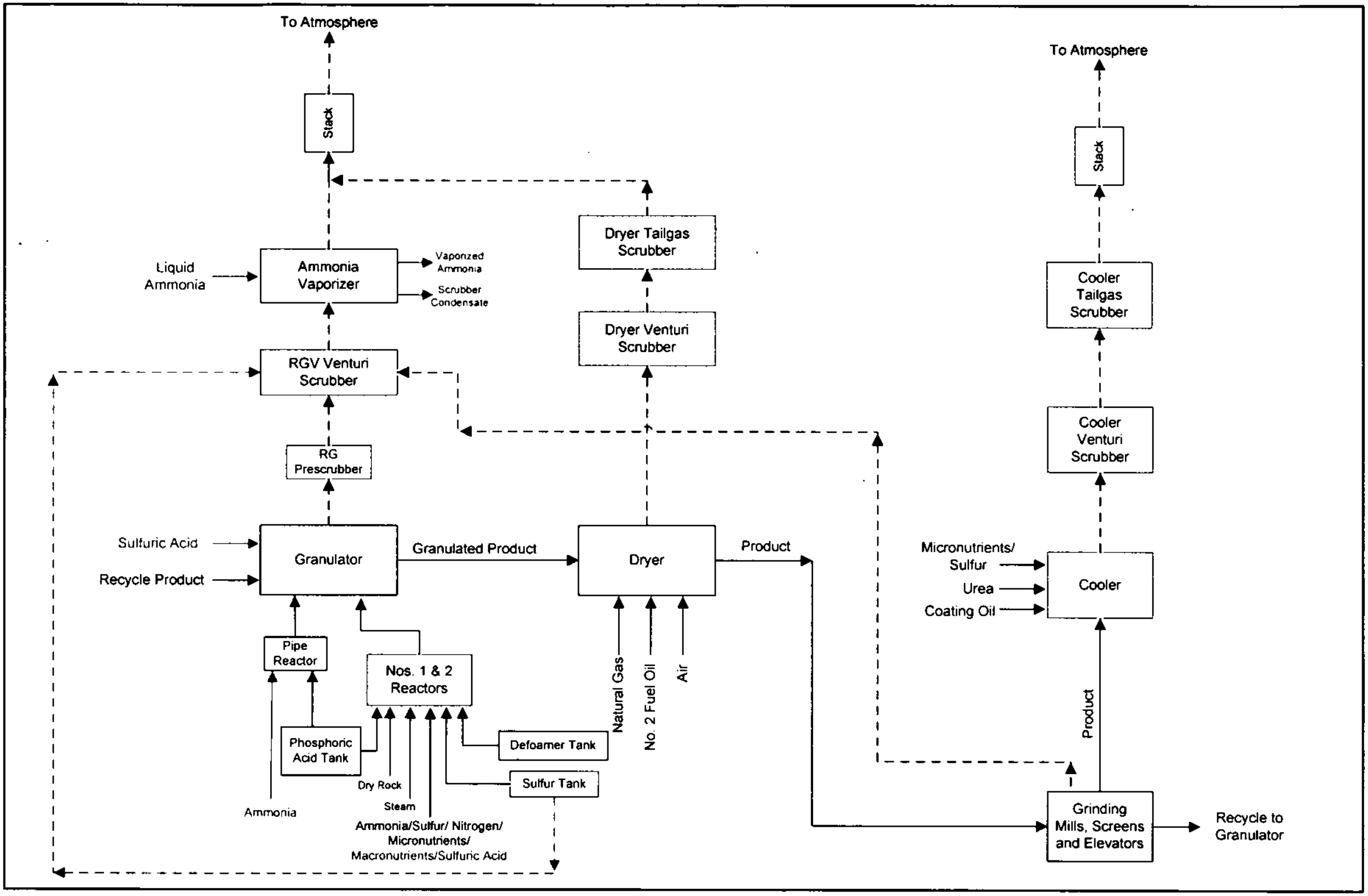

Figure 2-4
Future No. 6 Granulation Plant
Process Flow Diagram
Cargill - Riverview

Process Flow Legend

Material Flow →
Evacuation Flow - - - →
New or Modified Equipment/Process

Filename: 0237575/4/4.4/4.4.1/Figure2-4.vsd
Date: 10/07/03

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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 Riverview 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 $\mu g/m^3$
	24-hour	0.2 $\mu g/m^3$
	Annual	0.1 $\mu g/m^3$
PM_{10}	24-hour	0.3 $\mu g/m^3$
	Annual	0.2 $\mu g/m^3$
NO_2	Annual	0.1 $\mu g/m^3$

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 NONATTAINMENT RULES

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 EMISSION STANDARDS

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 phosphate fertilizer products (40 CFR 60, Subparts V and W). Specifically, Subpart V applies to DAP plants and Subpart W applies to TSP plants. The NSPS apply to all facilities constructed or modified after October 22, 1974. Subpart V regulates F emissions from the plants.

3.4.2 NESHAPS FOR SOURCE CATEGORIES

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

3.4.3 FLORIDA RULES

The No. 6 Granulation Plant is 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)(f) apply to the No. 6 Granulation Plant for DAP production.

3.5 <u>SOURCE APPLICABILITY</u>

3.5.1 AREA CLASSIFICATION

The project site is located in Hillsborough County, which has been designated by EPA and FDEP as an attainment area for all criteria pollutants. Hillsborough County and surrounding counties are designated as PSD Class II areas for all criteria pollutants. The site is located about 85 km from a PSD Class I area (Chassahowitzka National Wilderness Area).

3.5.2 PSD REVIEW

3.5.2.1 <u>Pollutant Applicability</u>

The Cargill Riverview 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 2-4 (see also Appendix A). Also included in Table 3-3 are contemporaneous emission increases and decreases that have occurred at Riverview in the last 5 years. As shown, the net increase in emissions exceeds the PSD significant emission rates for PM_{10} 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} 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} 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 PM_{10} 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 PM_{10}. In addition, no air monitoring data is presented for F since AAQS have not been established for these pollutants. However, a pre-construction ambient monitoring analysis is presented in Section 4.0 for PM_{10} to support the air dispersion modeling analysis.

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

Subpart V applies to DAP plants constructed or modified after October 22, 1974. Since the No. 6 Granulation Plant produces DAP and was modified after October 22, 1974, it is subject to NSPS requirements. Subpart W applies to triple super phosphate plants constructed or modified after October 22, 1974. The No. 6 Granulation Plant produces GTSP, however, the No. 6 Granulation Plant was not constructed or modified after October 22, 1974. Therefore, the No. 6 Granulation Plant is not subject to Subpart W.

The applicable NSPS for GTSP plants (40 CFR 60.232) is 0.20 lb/ton P_2O_5 for F. The applicable NSPS for DAP plants (40 CFR 60.222) is 0.060 lb/ton P_2O_5 input for F.

The proposed F emission limits will comply with the applicable limits for the No. 6 Granulation Plant at Cargill Riverview.

3.5.3.2 NESHAPs for Source Categories

Maximum Achievable Control Technology (MACT) standards potentially applicable to the Cargill Riverview facility are codified in Subparts AA and BB of 40 CFR Part 63. The No. 6 Granulation Plant at Riverview is potentially covered under the MACT regulations.

Cargill is currently discussing Riverview facility's status as a major source of HAPs with the State of Florida. If the Riverview facility is deemed to be a minor source of HAPs, the MACT standards will not apply to the No. 6 Granulation Plant. 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 0.060 lb/ton P_2O_5 input for AP production and 0.150 lb/ton P_2O_5 input for GTSP production at the No. 6 Granulation Plant.

The MACT standards require monitoring for wet scrubber emission control systems for existing sources subject to the rule. 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 Riverview 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 No. 6 Granulation Plant.

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)] is 0.06 lb/ton P_2O_5 for DAP production and 0.15 lb/ton P_2O_5 for GTSP made from phosphoric acid and phosphate rock slurry. The subject sources at Cargill Riverview 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 (µg/m³)

Pollutant	Averaging Time	AAQS: National Primary Standard	AAQS: National Secondary Standard	AAQS: State of Florida	PSD Increments: Class I	PSD Increments: Class II	Significant Impact Levels[d]
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[c]	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 µg/m³ (3-year average of 98th percentile) and an annual standard of 15 µg/m³ (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 µg/m³ 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									
Phosphoric Acid Plant [b]	--	--	--	--	--	--	--	--	8.90
Modified No. 6 Granulation Plant (EPP Plant) [a]	8.11	35.04	29.43	56.39	56.39	1.93	--	0.14	15.04
Material Handling System [b]	--	--	--	19.82	19.58	--	--	--	--
Molten Sulfur Tank [b]	0.66	--	--	0.85	0.85	0.47	0.32	--	--
Total Potential Emission Rates	8.77	35.04	29.43	77.06	76.82	2.40	0.32	0.14	23.94
Actual Emissions from Current Operations[c]									
Phosphoric Acid Plant	--	--	--	--	--	--	--	--	8.90
EPP Plant	8.11	35.04	29.43	52.60	52.60	1.93	--	0.14	10.80
Material Handling System	--	--	--	7.83	7.60	--	--	--	--
Molten Sulfur Tank	0.66	--	--	0.85	0.85	0.47	0.32	--	--
Total Actual Emission Rates	8.77	35.04	29.43	61.28	61.05	2.40	0.32	0.14	19.70
TOTAL CHANGE DUE TO PROPOSED PROJECT	0.00	0.00	0.00	15.78	15.77	0.00	0.00	0.00	4.24

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
Contemporaneous Emission Changes									
A. MAP Plant Expansion (May 1998)	--	--	0.56	--	--	0.04	0.00	--	--
B. DAP Plant Cooler Upgrade (August 1998)[d]	--	--	0.00	--	--	0.00	0.00	--	--
C. Reconstruction of Molten Sulfur Tank No. 1 (February 1999)	--	--	0.00	--	--	2.01	1.35	--	--
D. Molten Sulfur Increase/Truck Loadout (pending)	--	--	0.00	--	--	0.23	0.15	--	--
E. Facility Expansion (November 2001)	[e]	[e]	92.18	[e]	[e]	14.05	5.31	[e]	[e]
Total Contemporaneous Emission Changes	0.00	0.00	92.74	0.00	0.00	16.33	6.81	0.00	0.00
TOTAL NET CHANGE	0.00	0.00	92.74	15.78	15.77	16.33	6.81	0.00	4.24
PSD SIGNIFICANT EMISSION RATE	40	40	100	25	15	40	10	7	3
PSD REVIEW TRIGGERED?	No	No	No	No	Yes	No	No	No	Yes

Footnotes:
[a] Total future potential emissions from Tables 2-1 and 2-3.
[b] Debottlenecking analysis revealed that actual emissions from these sources could potentially increase as part of this project.
[c] Refer to Table 2-4.
[d] Project was determined to not result in an increase in emissions of any pollutant.
[e] Denotes that PSD review was triggered for this pollutant; therefore any previous contemporaneous increases/decreases are wiped clean.

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	4.5	1	NA	NA
	24-hour	4.4	5	10	No
Fluorides	24-hour	1.1	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_{10} and F require an air quality analysis to meet PSD pre-construction monitoring requirements for the proposed Cargill Riverview modification.

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 and for F is 0.25 $\mu g/m^3$, 24-hour average. The predicted increase in PM_{10} and F concentrations due to the proposed modification only are presented in Section 6.0 and in Table 3-4. Since the predicted increase of F impacts due to the proposed modification are greater than *de minimis* monitoring concentration levels, a pre-construction air monitoring analysis must be conducted for these pollutants. Since the predicted increases of PM_{10} impacts due to the proposed modification are below the *de minimis* monitoring concentration levels, a pre-construction air monitoring analysis is not required for PM_{10}. However, background concentrations for PM_{10} are presented in Section 4.2 to support the air dispersion modeling analysis.

4.2 PM_{10} AMBIENT MONITORING ANALYSIS

Background PM_{10} concentrations must be estimated to account for PM_{10} sources, which are not explicitly included in the atmospheric dispersion modeling analysis. To estimate reasonable background PM_{10} concentrations, a review of recent, available PM_{10} monitoring data in the area of Cargill was performed. Presented in Table 4-1 is a summary of ambient PM_{10} data available for 2002 and 2001, for the five closest monitors to the Riverview site. One of these stations, the Gardinier Park station, is located immediately adjacent to the Riverview facility.

The monitors show that ambient PM_{10} concentrations were well 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 third-highest annual average concentration occurring over the 2-year period was selected. The annual concentration of 25 $\mu g/m^3$, measured at the Riverview Station, was selected because this monitor is the closest to the Cargill plant. The monitor is likely impacted by several existing point sources, which are already included explicitly in the dispersion modeling analysis. As a result, this background concentration is conservatively high.

4.3 FLUORIDE AMBIENT MONITORING ANALYSIS

There are no known existing F monitors in the vicinity of Cargill's Riverview 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.

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} and F emissions require a BACT analysis. The BACT analysis is presented in the following sections.

5.2 PARTICULATE MATTER (PM/PM_{10})

5.2.1 PROPOSED CONTROL TECHNOLOGY

Emissions of PM/PM_{10} from the No. 6 Granulation Plant will occur. The proposed BACT for PM/PM_{10} is based on the following:

- One existing medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by a new ammonia vaporizer for the reactor, granulator, and equipment vents (RGV),
- One new medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by an existing packed-bed tailgas scrubber using pond water for the dryer, and
- One new medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by a new packed-bed tailgas scrubber using pond water for the cooler.

Refer to Section 2.0 for a full description of the existing and proposed control equipment for the No. 6 Granulation Plant. The proposed maximum PM/PM_{10} emission rate for the No. 6 Granulation Plant is 0.15 lb/ton P_2O_5, equivalent to 12.88 lb/hr and 56.39 TPY when producing AP and 6.35 lb/hr and 27.81 TPY when producing GTSP.

5.2.2 BACT ANALYSIS

5.2.2.1 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 5-1. 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.

5.2.2.2 Control Technology Feasibility

The control technology feasibility analysis for PM/PM_{10} controls for the No. 6 Granulation Plant are listed in Table 5-2. 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.

5.2.2.3 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 No. 6 Granulation Plant 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 No. 6 Granulation Plant. Cargill Riverview currently utilizes cyclones at its No. 6 Granulation Plant. 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 No. 6 DAP Plant. 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 from 15 to 30 inches, and high-energy venturi scrubbers have pressure drops above 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 plate 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 5-1). 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.

5.2.2.4 Economic Analysis

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 inches w.c.) venturi scrubber and a medium energy (15 to 30 inches 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 No. 6 Granulation Plant as described below, and is considered economically infeasible.

To evaluate the incremental cost effectiveness of high-energy venturi scrubbers applied to the No. 6 Granulation Plant, cost estimates were developed for medium- and high-energy venturi scrubbers. Vendor quotes and Cargill Riverview experience (refer to Appendix F for supportive documentation) were utilized in developing the economic analysis. The capital cost analysis includes the costs associated with complete systems, including the venturi scrubber, mist eliminator, fan and motor, recycle pump, and installation costs. Operational costs include labor for the operator and supervisor, maintenance, and the energy requirement associated with the operation of the scrubber fan. There is a considerable difference in the energy requirements between the medium-energy and high-energy scrubbers due to the operation of the fan and motor. For this analysis, the medium-energy scrubber fans require 199 kW to 299 kW of energy, while the high-energy scrubbers require 543 kW to 815 kW of energy.

Baseline PM emissions were specified as 52.6 TPY, which is based on the proposed maximum emissions. The maximum PM emissions with the use of the high-energy venturi scrubbers were specified as 10 TPY. This is based on uncontrolled emissions that were calculated based on the maximum production rate and an uncontrolled emission factor from AP-42 (refer to Table 5-5) and a control efficiency of 99.5-percent. Capital recovery costs were based on 7-percent interest and a 20-year equipment life.

The annualized cost for the proposed project was estimated and is presented in Table 5-4. Since Cargill is proposing to add two new medium-energy venturi scrubbers, a dryer venturi, and a cooler venturi scrubber, and utilize the existing RGV venturi scrubber, the cost estimate included capital costs for two new medium-energy venturi scrubbers and operating costs for three medium-energy venturi scrubbers. The total annualized cost for the proposed project is $683,900.

The annualized cost of utilizing high-energy venturi scrubbers at the No. 6 Granulation Plant was estimated and is presented in Table 5-5. Since the existing venturi scrubbers are medium-energy, this cost analysis included the installation of three new high-energy venturi scrubbers and all associated operating costs. The incremental annualized cost of high-energy venturi scrubbers applied to the No. 6 Granulation Plant was estimated by taking the difference between the annualized cost of medium-energy venturi scrubbers and the annualized cost of high-energy scrubbers applied to the No. 6 Granulation Plant. The incremental cost effectiveness was estimated from the incremental annualized cost and the incremental reduction in PM emissions that would result from installing high-energy venturi scrubbers. Based on uncontrolled emissions of PM of 2,029 TPY, and assuming 99.5-percent control efficiency with the use of high-energy venturi scrubbers, the maximum PM emissions are 10.1 TPY, and the incremental PM removed is 42.5 TPY. The resulting incremental cost effectiveness is $31,366 per ton of PM removed. This cost is considered to be unreasonable and infeasible for the proposed project. As a result, high-energy venturi scrubbers for PM/PM_{10} control were not considered further.

5.2.2.5 Environmental Impacts

As shown in Tables 6-13 through 6-15, 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.

For PM applications, wet scrubbers generate waste in the form of a slurry. This creates the need for both wastewater treatment and solid waste disposal. Initially, the slurry is treated to separate the solid waste from the water. Once the water is removed, the remaining waste will be in the form of a solid or sludge. The sludge is properly disposed.

To operate a venturi scrubber, particularly the fan motor, a good deal of energy is required. A medium energy venturi scrubber requires approximately 2.2 million kilowatt hours per year (kWh/yr), while a high energy venturi scrubber requires approximately 6.4 million kWh/yr. Cargill will utilize medium energy venturi scrubbers, which will consume considerably less energy than high energy venturi scrubbers.

5.2.3 BACT SELECTION

Cargill will utilize venturi scrubbers followed by tailgas scrubbers since they will yield the greatest control efficiencies with a proven technology. Cargill Riverview's proposed PM/PM_{10} technology and emission limit is reasonable based on previous BACT determinations for similar facilities. The proposed PM/PM_{10} emission limit of 0.15 lb/ton P_2O_5 is consistent with the lowest previous BACT determination.

A summary of recent PM emissions tests for the No. 6 Granulation Plant (EPP Plant) is presented in Table 5-3. The historic PM emissions test results for the No. 6 Granulation Plant ranged from 0.199 to 0.215 lb/ton P_2O_5. To be able to meet the lower PM limit of 0.15 lb/ton P_2O_5, Cargill is installing new pollution control equipment as part of the proposed project. Cargill is also proposing to increase the AP process rate. Therefore, the proposed limit is justified to provide certainty that the proposed emission level will be achievable on a continuous basis.

5.3 FLUORIDES

5.3.1 PROPOSED CONTROL TECHNOLOGY

The proposed BACT for F emissions from the No. 6 Granulation Plant is based on the following:

- One existing medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by a new ammonia vaporizer for the reactor, granulator, and equipment vents (RGV),
- One existing medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by an existing packed-bed tailgas scrubber using pond water for the dryer, and
- One new medium-energy venturi scrubber using scrubber solution (weak phosphoric acid) followed by a new packed-bed tailgas scrubber using pond water for the cooler.

Refer to Section 2.0 for a full description of the existing and proposed control equipment for the No. 6 Granulation Plant. The proposed maximum F emissions rate for the No. 6 Granulation Plant is 0.04 lb/ton P_2O_5, equivalent to 3.43 lb/hr and 15.04 TPY when producing AP and 1.69 lb/hr and 7.42 TPY when producing GTSP.

5.3.2 BACT ANALYSIS

5.3.2.1 Previous BACT Determinations

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 5-6. 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.

5.3.2.2 Control Technology Feasibility

The control technology feasibility analysis for F emission controls for the No. 6 Granulation Plant is listed in Table 5-7. As shown, there are six 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.

5.3.2.3 Potential Control Method Descriptions

The technically feasible wet scrubbers for the No. 6 Granulation Plant at Cargill Riverview 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. For the proposed No. 6 Granulation Plant at Riverview, the air stream will consist of gases from the reactor and granulator. 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.

5.3.2.4 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.

5.3.3 BACT SELECTION

In conclusion, Cargill Riverview'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 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 No. 6 Granulation Plant (GTSP Plant) are presented in Table 5-3. The F emissions test data for the No. 6 Granulation Plant have ranged from 0.014 to 0.041 lb/ton P_2O_5. To meet the requested F limit, Cargill is proposing to add pollution control equipment at the No. 6 Granulation Plant. Cargill is also proposing to increase the AP process rate. Therefore, the proposed limit is justified to provide certainty that the proposed emission level will be achievable on a continuous basis.

Table 5-1. 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	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 5-2. PM/PM_{10} Control Technolgy Feasibility Analysis for the No. 6 Granulation Plant, Cargill Riverview

PM Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the No. 6 Granulation Plant? (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	Y

Note: NTF = Not Technically Feasible

Table 5-3. Summary of Recent No. 6 Granulation (GTSP Plant) Emission Tests at Cargill Riverview

Date	Average Process Rate ($TPH\ P_2O_5$)	Average Production Rate (TPH GTSP)	PM [a]		Fluoride [a]	
			lb/hr	lb/ton P_2O_5	lb/hr	lb/ton P_2O_5
8/1/2002	40.5	88.0	8.1	0.200	0.73	0.018
7/1/2001	38.4	83.5	8.2	0.215	0.54	0.014
6/29/2000	38.2	83.1	7.6	0.199	1.55	0.041

[a] Represents average of three test runs.

Table 5-4. Cost Analysis of Medium-Energy Venturi Scrubbers for PM Control, No. 6 Granulation Plant, Cargill Riverview

Cost Items	Cost Factors[a]	Cost Per Scrubber ($) Dryer Venturi (new)	Cooler Venturi (new)	RGV Venturi (existing)	Total
DIRECT CAPITAL COSTS (DCC):					
Purchased Equipment Cost (PEC)					
Venturi Scrubber/Mist Eliminator	Vendor Quote[b]	300,000	300,000	0	--
ID Fan/Motor	Vendor Quote[b]	150,000	150,000	0	--
Recycle Pump	Vendor Quote[b]	50,000	50,000	0	--
Freight	5%	25,000	25,000	0	--
Taxes	6%	30,000	30,000	0	--
Total PEC:		555,000	555,000	0	1,110,000
Direct Installation Costs					
Foundation and Structure Support	4% of PEC	22,200	22,200	0	--
Handling & Erection	20% of PEC; Engineering Estimate	111,000	111,000	0	--
Electrical	8% of PEC	44,400	44,400	0	--
Piping	1% of PEC	5,550	5,550	0	--
Insulation for ductwork	2% of PEC	11,100	11,100	0	--
Painting	2% of PEC	11,100	11,100	0	--
Total Direct Installation Costs		205,350	205,350	0	410,700
Total DCC:		760,350	760,350	0	1,520,700
INDIRECT CAPITAL COSTS (ICC):					
Contractor Fees	10% of PEC	55,500	55,500	0	--
Performance test	1% of PEC	5,550	5,550	0	--
Contingencies	35% of PEC, OAQPS Retrofit Cost Factor	194,250	194,250	0	--
Total ICC:		255,300	255,300	0	510,600
TOTAL CAPITAL INVESTMENT (TCI):	DCC + ICC	1,015,650	1,015,650	0	2,031,300
DIRECT OPERATING COSTS (DOC):					
(1) Operating Labor					
Operator	16 hours/week, $16/hr, 26 weeks/yr	6,656	6,656	6,656	--
Supervisor	15% of operator cost	998	998	998	--
(2) Maintenance	Engineering estimate, 1% PEC	5,550	5,550	5,550	--
(3) Electricity - Fan	$0.06/kWh, 7,340 hr/yr[c]	87,684	87,684	131,525	--
Total DOC:		100,888	100,888	144,730	346,506
INDIRECT OPERATING COSTS (IOC):					
Overhead	60% of oper. labor & maintenance	7,923	7,923	7,923	--
Property Taxes	1% of total capital investment	10,157	10,157	10,157	--
Insurance	1% of total capital investment	10,157	10,157	10,157	--
Administration	2% of total capital investment	20,313	20,313	20,313	--
Total IOC:		48,549	48,549	48,549	145,646
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.0944 times TCI (20 yrs @ 7%)	95,877	95,877	0	191,755
ANNUALIZED COSTS (AC):	DOC + IOC + CRC	245,314	245,314	193,279	683,907

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 3, Sixth edition.

[b] Cargill Riverview, 2003.

[c] 199 kW for each of the cooler and dryer venturi scrubber fans and 299 kW for the RGV venturi scrubber fan.

Table 5-5. Incremental Cost Effectiveness of High-Energy Venturi Scrubber for PM Control, No. 6 Granulation Plant, Cargill Riverview

Cost Items	Cost Factors[a]	Cost Per Scrubber ($)			Total
		Dryer Venturi (new)	Cooler Venturi (new)	RGV Venturi (new)	
DIRECT CAPITAL COSTS (DCC):					
Purchased Equipment Cost (PEC)					
Venturi Scrubber/Mist Eliminator	Vendor Quote [b]	325,000	325,000	325,000	--
ID Fan/Motor	Vendor Quote [c]	150,000	150,000	150,000	--
Recycle Pump	Vendor Quote [c]	50,000	50,000	50,000	--
Freight	5%	26,250	26,250	26,250	--
Taxes	6%	31,500	31,500	31,500	--
Total PEC:		582,750	582,750	582,750	1,748,250
Direct Installation Costs					
Foundation and Structure Support	4% of PEC	23,310	23,310	23,310	--
Handling & Erection	20% of PEC; Engineering Estimate	116,550	116,550	116,550	--
Electrical	8% of PEC	46,620	46,620	46,620	--
Piping	1% of PEC	5,828	5,828	5,828	--
Insulation for ductwork	2% of PEC	11,655	11,655	11,655	--
Painting	2% of PEC	11,655	11,655	11,655	--
Total Direct Installation Costs		215,618	215,618	215,618	646,853
Total DCC:		798,368	798,368	798,368	2,395,103
INDIRECT CAPITAL COSTS (ICC):					
Contractor Fees	10% of PEC	58,275	58,275	58,275	--
Performance test	1% of PEC	5,828	5,828	5,828	--
Contingencies	35% of PEC, OAQPS Retrofit Cost Factor	203,963	203,963	203,963	--
Total ICC:		268,065	268,065	268,065	804,195
TOTAL CAPITAL INVESTMENT (TCI):	DCC + ICC	1,066,433	1,066,433	1,066,433	3,199,298
DIRECT OPERATING COSTS (DOC):					
(1) Operating Labor					
Operator	16 hours/week, $16/hr, 26 weeks/yr	6,656	6,656	6,656	--
Supervisor	15% of operator cost	998	998	998	--
(2) Maintenance	Engineering estimate, 1% PEC	5,828	5,828	5,828	--
(3) Electricity - Fan	$0.06/kWh, 7,340 hr/yr [d]	239,137	239,137	358,706	--
Total DOC:		252,619	252,619	372,188	877,426
INDIRECT OPERATING COSTS (IOC):					
Overhead	60% of oper. labor & maintenance	8,089	8,089	8,089	--
Property Taxes	1% of total capital investment	10,664	10,664	10,664	--
Insurance	1% of total capital investment	10,664	10,664	10,664	--
Administration	2% of total capital investment	21,329	21,329	21,329	--
Total IOC:		50,746	50,746	50,746	152,239
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.0944 times TCI (20 yrs @ 7%)	100,671	100,671	100,671	302,014
ANNUALIZED COSTS (AC):	DOC + IOC + CRC	404,037	404,037	523,605	1,331,679
ANNUALIZED COSTS FOR THE MEDIUM-ENERGY VENTURI SCRUBBER (see Table 5-4)		245,314	245,314	193,279	683,907
INCREMENTAL ANNUALIZED COSTS: [e]		158,723	158,723	330,327	647,772
BASELINE PM EMISSIONS (TPY):	Based on maximum proposed emissions.	--	--	--	52.6
MAXIMUM PM EMISSIONS (TPY)	Based on uncontrolled emissions [f] and 99.5% control efficiency	--	--	--	10.1
INCREMENTAL REDUCTION IN PM EMISSONS (TPY):		--	--	--	42.5
INCREMENTAL COST EFFECTIVENESS:	$ per ton of PM Removed	--	--	--	31,366

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 3, Sixth edition.

[b] Ceilcote Air Pollution Control, 2003; and Cargill Riverview, 2003; Venturi scrubber with chevron blade mist eliminator.

[c] Cargill Riverview, 2003.

[d] 543 kW for each of the cooler and dryer venturi scrubber fans and 815 kW for the RGV venturi scrubber fan.

[e] Incremental annualized cost (AC) represents the difference between the annualized costs for the high-energy and medium-energy venturi scrubbers.

[f] Emission factor based on AP-42, Table 8.5.3-1 (7/93), for the controlled emissions for production of ammonium phosphates. Uncontrolled emissions calculated by using the controlled emission factor of 0.68 lb/ton product for total plant emissions, and assuming an average control efficiency of 87.4% for PM (AP-42 page 8.5.3-4).

Table 5-6. 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	4/18/1994	100 TPH DAP	0.0417 LB/TON 100% P_2O_5	VENTURI ACID SCRUBBER
		AC53-232681, FL204				

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

* For a prilled MAP plant, not granular MAP.

Table 5-7. Fluoride Control Technolgy Feasibility Analysis for the No. 6 Granulation Plant at Cargill Riverview

F Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the No. 6 Granulation Plant? (Y/N)
Wet Scrubbers	Packed Tower	95-99%	Y	1	N
	Wet Cyclonic	90-95%	Y	2	N
	Orifice (impingement) Tray	95-99%	N	NA	N
	Spray Chamber	90-95%	Y	2	N
	Venturi	90-95%	Y	2	Y
	Ammonia Vaporizer	95-99%	Y	1	N

Note: NTF = Not Technically Feasible.
NA = Not Applicable.

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 determining 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 D.

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 18 and 14 km, respectively, to the northwest and south, respectively, of the Cargill Riverview 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 D.

6.7 EMISSION INVENTORY

6.7.1 SIGNIFICANT IMPACT ANALYSIS

The PM_{10} and F emission rates and the physical and operational stack parameters for all project-affected sources are summarized in Tables 6-3 and 6-4. Table 6-3 is based on emissions presented in Section 2.0. The current actual and future potential PM_{10} and F emissions for all Cargill sources affected by the project are presented 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} emission rates and stack parameters 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. A summary of the future potential F emission rates and stack parameters for all Cargill sources that were used in the F impact analysis is presented in Table 6-6.

All sources were modeled at locations that are relative to the location of the No. 9 SAP.

6.7.2 AAQS AND PSD CLASS II ANALYSES

A listing of background PM_{10} sources and their locations relative to the Cargill Riverview facility is provided in Table 6-7. 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 Riverview and SIA is the distance of the proposed project's PM_{10} significant impact area (1.5 km). The PM_{10} facilities that were not eliminated in the screening analysis are included in the AAQS and/or PSD Class II analyses.

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

Non-Cargill PM_{10} PSD sources were obtained from FDEP and were supplemented with current and historical information obtained from Golder.

6.7.3 CARGILL RIVERVIEW 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 Table 6-4 to determine the PSD increment consumption after completion of the proposed project.

6.7.4 PSD CLASS I ANALYSIS

The proposed project's PM_{10} 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, NO_x, and SAM emissions due to the proposed project, for use in the regional haze analysis, is presented in Table 6-9. The AQRV and regional haze analysis are presented in Section 7.0.

6.8 <u>RECEPTOR LOCATIONS</u>

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 1.5 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 No. 9 SAP and all source and receptor locations are relative to this location.

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} AAQS and PSD Class II analyses.

6.8.2 CLASS I AREA

Maximum PM_{10} 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 the regional haze degradation criteria of 5 percent. 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 6-10.

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. The PM_{10} background concentrations were determined to be 25 $\mu g/m^3$ for the annual averaging period. This background level was 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 18 building structures were evaluated. 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 6-11.

6.11 MODEL RESULTS

6.11.1 SIGNIFICANT IMPACT ANALYSIS

A summary of the predicted maximum PM_{10} concentrations due to the proposed project only from the screening analysis are presented in Table 6-12. The modeling results indicate that the maximum predicted annual average concentrations are above the significant impact levels for PM_{10}. The maximum predicted 24-hour average concentrations are below the significant impact levels for PM_{10}. It was further determined that the significant impact area for annual average PM_{10} extends out to 1.5 km. As a result, detailed modeling analyses were performed for annual average PM_{10} to address compliance with AAQS and PSD Class II increments.

6.11.2 AAQS ANALYSIS

A summary of the maximum annual average PM_{10} concentrations predicted for all sources for the screening analysis is presented in Table 6-13. Based on the screening analysis results, additional modeling refinements were not required. The final results of the modeling analysis are presented in Table 6-14.

The predicted total annual PM_{10} concentration is 45.1 $\mu g/m^3$, which is below the AAQS of 50 $\mu g/m^3$. This maximum concentration includes the appropriate background concentration.

6.11.3 PSD CLASS II ANALYSIS

A summary of the maximum annual average PM_{10} PSD increment consumption predicted for all sources for the screening analysis is presented in Table 6-15. The maximum annual concentrations were predicted to be less than zero at all receptors.

6.11.4 PSD CLASS I ANALYSIS

The maximum PM_{10} concentration, 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 6-16. 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 6-17 and 6-16, 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-, 3-, and 1-hour fluoride concentrations are 0.04, 1.1, 3.0, 5.9, and 17.8 $\mu g/m^3$, respectively. The maximum predicted annual and 24-, 8-, 3-, and 1-hour fluoride concentrations at the CNWA are 0.0, 0.0013, 0.0046, 0.0124, and 0.0159 $\mu g/m^3$, 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:

Bowers, J.F., J.R. Bjorklund and C.S. Cheney. 1979. Industrial Source Complex (ISC) Dispersion Model User's Guide. Volume I, EPA-450/4-79-030; Volume II. EPA-450/4-79-031. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

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Huber, A.H. and W.H. Snyder. 1976. Building Wake Effects on Short Stack Effluents. Preprint Volume for the Third Symposium on Atmospheric Diffusion and Air Quality, American Meteorological Society, Boston, Massachusetts.

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. Current Actual and Future Potential Emission Rates for the Project-Affected Sources Used in the Significant Impact Analysis, Cargill Riverview

Source Name	EU ID	ISCST3 Model ID	PM10 Emission Rate lb/hr	g/s	TPY	g/s	F Emission Rate lb/hr	g/s	TPY	g/s
Current Actual [a]										
Phosphoric Acid Plant [b]										
Prayon Reactor	073	PAPPRAYC	--	--	--	--	0.51	0.064	2.23	0.064
Nos. 1 and 2 Filtration Units	073	PAPF12C	--	--	--	--	0.51	0.064	2.23	0.064
Dorrco Reactor and Digester	073	PAPDORC	--	--	--	--	0.51	0.064	2.23	0.064
No. 3 Filtration Unit	073	PAPF3C	--	--	--	--	0.51	0.064	2.23	0.064
Total Emissions			--	--	--	--	2.04	0.257	8.9	0.256
EPP Plant [b]	007	EPPPLTC	12.0	1.513	52.6	1.513	4.1	0.517	17.96	0.517
Material Handling System										
West Baghouse Filter	051	MHWESTC	--	--	1.18	0.034	--	--	--	--
South Baghouse	052	MHSOUTC	--	--	1.16	0.033	--	--	--	--
Vessel Ldng. System--Twr. Baghouse Exhaust	053	MHTWREC	--	--	2.56	0.074	--	--	--	--
Building No. 6 Belt to Conveyor No. 7	058	MHBLG6C	--	--	0.40	0.012	--	--	--	--
Conveyor No. 7 to Conveyor No. 8	059	BLT78BC	--	--	0.83	0.024	--	--	--	--
Conveyor No. 8 to Conveyor No. 9	060	BLT89BC	--	--	1.27	0.037	--	--	--	--
E. Vessel Ldg. Facility-Shiphold/Chokefeed	061	EVSHIPC	--	--	0.14	0.004	--	--	--	--
Total Emissions [c]			--	--	7.55	0.22				
Molten Sulfur Tank [b]	--	EPPMSTC	0.19	0.024	0.85	0.024	--	--	--	--
Future Potential										
Phosphoric Acid Plant [d]			--	--	--	--	--	--	--	--
Prayon Reactor	073	PAPPRAY	--	--	--	--	0.51	0.064	2.23	0.064
Nos. 1 and 2 Filtration Units	073	PAP12F	--	--	--	--	0.51	0.064	2.23	0.064
Dorrco Reactor and Digester	073	PAPDORR	--	--	--	--	0.51	0.064	2.23	0.064
No. 3 Filtration Unit	073	PAPF3	--	--	--	--	0.51	0.064	2.23	0.064
Total Emissions			--	--	--	--	2.04	0.257	8.9	0.256
No. 6 Granulation (formerly EPP) Plant [e]										
Cooler	007	DAP6COOL	6.44	0.811	28.20	0.811	1.72	0.216	7.52	0.216
Dryer/RG/Equipment Vents	007	DAP6DRY	6.44	0.811	28.20	0.811	1.72	0.216	7.52	0.216
Total Emissions			12.88	1.622	56.39	1.622	3.43	0.433	15.04	0.433
Molten Sulfur Tank [d]	--	--	0.19	0.024 [f]	0.85	0.024 [f]	--	--	--	--
Material Handling System [d]										
West Baghouse Filter	051	MHWEST	--	--	4.60	0.132	--	--	--	--
South Baghouse	052	MHSOUTH	--	--	4.60	0.132	--	--	--	--
Vessel Ldng. System--Twr. Baghouse Exhaust	053	MHTWRE	--	--	3.20	0.092	--	--	--	--
Building No. 6 Belt to Conveyor No. 7	058	MHBLDG6	--	--	1.20	0.035	--	--	--	--
Conveyor No. 7 to Conveyor No. 8	059	MHBLT78	--	--	1.90	0.055	--	--	--	--
Conveyor No. 8 to Conveyor No. 9	060	MHBLT89	--	--	3.60	0.104	--	--	--	--
E. Vessel Ldg. Facility-Shiphold/Chokefeed	061	EVSHIP	--	--	0.42	0.012	--	--	--	--
Total Emissions			--	--	19.52	0.56				

[a] Based on actual emissions for 2002 and 2001 from Tables A-1 and A-2, respectively, except where otherwise noted. Hourly emissions calculated from the annual emissions and the actual operating hours for 2002 and 2001, except where otherwise noted.

[b] Construction permit was issued in 2001. Construction not yet complete on the plant, therefore current actual emission rates are equal to allowable emission rates or maximum potential (Permit No. 0570008-036-AC)

[c] Refer to Appendix A, Tables A-3 and A-4 for calculations.

[d] Future potential emission rates based on construction permit application and Permit No. 0570008-036-AC.

[e] Refer to Table 2-1 for derivation.

[f] Emissions combined with No. 6 Granulation Plant Dryer/RG/Equipment Vents for modeling purposes since Molten Sulfur tank will be controlled by RGV scrubber and will vent through the Dryer/RG/Equipment Vents Stack.

Table 6-4. Stack and Operating Parameters and Locations for Project-Affected Sources, Cargill Riverview

AIRS Number	Source	ISCST Source ID	Stack/Vent Release Height ft	Stack/Vent Release Height m	Stack/Vent Diameter ft	Stack/Vent Diameter m	Gas Flow Rate acfm	Gas Exit Temperature F	Gas Exit Temperature K	Velocity ft/sec	Velocity m/sec	Discharge Direction[a] (Vert./Horiz.)	Location[b] X Coordinate ft	Location[b] X Coordinate m	Location[b] Y Coordinate ft	Location[b] Y Coordinate m
Existing Operations																
073	Phosphoric Acid Production Facility															
	Prayon Reactor	PAPPRAYC	110	33.53	4.00	1.22	20,900	105	314	27.7	8.45	V	-1,140	-347	940	287
	Nos. 1 and 2 Filtration Units	PAPF12C	110	33.53	4.83	1.47	45,000	115	319	40.9	12.48	V	-1,200	-366	1,120	341
	Dorrco Reactor and Digester	PAPDORC	95	28.96	4.50	1.37	55,000	110	316	57.6	17.57	V	-1,070	-326	1,110	338
	No. 3 Filtration Unit	PAPF3C	115	35.05	4.92	1.50	57,100	90	305	50.1	15.26	V	-1,350	-411	984	300
007	EPP Manufacturing Plant	EPPPLTC	126	38.40	8.00	2.44	171,700	132	329	51.1	15.58	V	-1,727	-526	26	8
	Material Handling Conveyor															
051	West Baghouse	MHWESTC	30	9.14	3.50	1.07	33,000	80	300	57.2	17.42	V	-950	-290	-1,480	-451
052	South Baghouse	MHSOUTC	50	15.24	1.50	0.46	4,500	80	300	42.4	12.94	H	-1,030	-314	-1,650	-503
053	Tower East Baghouse	MHTWREC	30	9.14	2.50	0.76	12,000	80	300	40.7	12.42	H	-910	-277	-1,500	-457
058	Building No 6 Baghouse	MHBLG6C	30	9.14	1.16	0.35	3,630	80	300	57.2	17.45	H	-1,890	-576	-450	-137
059	Belt 7 to 8 Baghouse	BLT78BC	45	13.72	1.16	0.35	3,630	80	300	57.2	17.45	H	-1,890	-576	-580	-177
060	Belt 8 to 9 Baghouse	BLT89BC	75	22.86	1.57	0.48	6,930	80	300	59.5	18.15	H	-1,030	-314	-1,290	-393
061	East Vessel Loading Facility-Shiphold Chokefeed	EVSHIPC	30	9.14 [d]	--	--	--	3.49	1.06 [e]	7.0	2.13 [d]	[d]	-890	-271	-1,520	-463
	Molten Sulfur Tank [e]	EPPMSTC	--	--	--	--	--	--	--	--	--	V	--	--	--	--
Future Operations																
073	Phosphoric Acid Production Facility															
	Prayon Reactor	PAPPRAY	110	33.53	4.00	1.22	20,900.00	105	314	27.72	8.45	V	-1,140	-347	940	287
	Nos. 1 and 2 Filtration Units	PAP12F	110	33.53	4.83	1.47	45,000	115	319	40.93	12.48	V	-1,200	-366	1,120	341
	Dorrco Reactor and Digester	PAPDORR	95	28.96	4.50	1.37	55,000	110	316	57.64	17.57	V	-1,070	-326	1,110	338
	No 3 Filtration Unit	PAPF3	115	35.05	4.92	1.50	57,100	90	305	50.06	15.26	V	-1,350	-411	984	300
007	No 6 Granulation Plant															
	Cooler Stack (South Stack)	DAP6COOL	126	38.40	8.00	2.44	104,000	104	313	34.48	10.51	V	-1,727	-526	26	8
	Dryer/RG/Equipment Vents Stack (North Stack)	DAP6DRY	162	49.38	8.50	2.59	200,000	164	346	58.74	17.90	V	-1,732	-528	178	54
	Material Handling Conveyor															
051	West Baghouse	MHWEST	30	9.14	3.50	1.07	33,000	80	300	57.17	17.42	V	-950	-290	-1,480	-451
052	South Baghouse	MHSOUTH	50	15.24	1.50	0.46	4,500	80	300	42.44	12.94	H	-1,030	-314	-1,650	-503
053	Tower East Baghouse	MHTWRE	30	9.14	2.50	0.76	12,000	80	300	40.74	12.42	H	-910	-277	-1,500	-457
058	Building No 6 Baghouse	MHBLDG6	30	9.14	1.16	0.35	3,630	80	300	57.24	17.45	H	-1,890	-576	-450	-137
059	Belt 7 to 8 Baghouse	MHBLT78	45	13.72	1.16	0.35	3,630	80	300	57.24	17.45	H	-1,890	-576	-580	-177
060	Belt 8 to 9 Baghouse	MHBLT89	75	22.86	1.57	0.48	6,930	80	300	59.54	18.15	H	-1,030	-314	-1,290	-393
061	East Vessel Loading Facility-Shiphold/Chokefeed	EVSHIP	30	9.14 [d]	--	--	--	3.49	1.06 [d]	6.98	2.13 [d]	[d]	-890	-271	-1,520	-463
	Molten Sulfur Tank [e]	EPPMSTK	--	-- [f]	--	-- [f]	-- [f]	--	-- [f]	--	-- [f]	V	--	--	--	--

[a] For modeling purposes, horizontal discharges were modeled with a velocity of 0.01 m/s

[b] Relative to H_2SO_4 Plant No. 9 stack location

[c,d] Volume source dimensions based on methods presented in accordance with ISCST3 User's Manual

Source	Sigma Y (W/4.3)	Sigma Z (H/2.15)
[c] AFI Railcar Unloading	14.0	14.0
[d] East Vessel Loading Facility-Shiphold Chokefeed	3.5	6.98

[e] Assumed velocity, calculated flow rate

[f] Molten sulfur tank emissions combined with No. 6 Granulation Plant Dryer/RG/Equipment Vents Stack, since Molten Sulfur tank emissions will be controlled by the RGV scrubber and will vent through the Dryer/RG/Equipment Vents Stack

Table 6-5. Stack Parameters and Potential PM_{10} Emission Rates for Future Cargill Riverview Sources

AIRS Number	Source	ISCST Source ID	Short-Term PM_{10} Emissions lb/hr	Short-Term PM_{10} Emissions g/sec	Annual Average PM_{10} Emissions TPY	Annual Average PM_{10} Emissions g/sec	Stack/Vent Release Height ft	Stack/Vent Release Height m	Stack/Vent Diameter ft	Stack/Vent Diameter m	Gas Flow Rate acfm	Gas Exit Temperature °F	Gas Exit Temperature K	Velocity ft/sec	Velocity m/sec	Discharge Direction[a] (Vert./Horiz.)	Location[c] X Coordinate ft	Location[c] X Coordinate m	Location[c] Y Coordinate ft	Location[c] Y Coordinate m
[c]	Molten Sulfur Handling																			
	Pits 7, 8, and 9[d]	MSPITS	1.31	0.165	1.10	0.032	8.00	2.44 [e]	–	–	–	48.84	14.89 [e]	3.72	1.13 [e]	[e]	78	24	-238	-73
	Tanks 1, 2, and 3/Truck Loading	MSTKTL	0.28	0.036	1.02	0.029	33	10.06	0.83	0.25	665	110	316	20.48	6.24	V	-630	-192	-460	-140
	Phosphate Rock Grinding/Drying System																			
100	No. 5 Rock Mill Dust Collector	RKMLNO5	1.56	0.197	6.85	0.197	91	27.74	2.50	0.76	36,100	166	348	122.57	37.36	V	-1620	-494	510	155
106	No. 7 Rock Mill Dust Collector	RKMLNO7	1.56	0.197	6.85	0.197	91	27.74	3.00	0.91	20,000	165	347	47.16	14.37	V	-1638	-499	486	148
101	No. 9 Rock Mill Dust Collector	RKMLNO9	1.56	0.197	6.85	0.197	91	27.74	2.50	0.76	31,360	162	345	106.48	32.45	V	-1630	-497	460	140
102	Ground Rock Silo Dust Collector	GRKSILO	0.41	0.052	1.78	0.051	67	20.42	0.80	0.24	1,200	80	300	39.79	12.13	H	-1640	-500	526	160
7	No. 6 Granulation Plant (formerly EPP)																			
	Cooler Stack (South Stack)	DAP6COOL	6.44	0.811	28.20	0.811	126	38.4	8.00	2.44	104,000	104	313	34.48	10.51	V	-1,727	-526	26	8
	Dryer/RG/Equipment Vents Stack (North Stack)	DAP6DRY	6.44	0.811	28.20	0.811	162	49.4	8.50	2.59	200,000	164	346	58.74	17.90	V	-1,732	-528	178	54
	Molten Sulfur Tank[f]	EPPMSTK	0.19	0.024	0.85	0.024	–	–	–	–	–	–	–	–	–	–	–	–	–	–
8	EPP Ground Rock Handling	EPPGRKH	0.95	0.120	4.16	0.120	87	26.52	1.20	0.37	4,400	138	332	64.84	19.76	H	-1880	-573	50	15
72	EPP Truck Loading Station Baghouse	EPPTLST	0.53	0.067	2.30	0.066	38	11.58	2.67	0.81	2,200	77	298	6.55	2.00	H	-2450	-747	30	9
	EPP Truck Loading Station Fugitive	EPPTLSF	0.20	0.025	0.40	0.012	27.50	8.38 [g]	–	–	–	139.53	42.53 [g]	25.58	7.80 [g]	[g]	-2450	-747	30	9
	Animal Feed Ingredient Plant																			
78	Granulation System No. 1	AFIGRAN	8.00	1.008	35.04	1.008	136	41.45	6.00	1.83	109,400	150	339	64.49	19.66	V	-1230	-375	460	140
	Milling, Classification, and Cooling Equipment No. 1	COOLEQB	5.14	0.648	22.53	0.648	85	25.91	5.00	1.52	56,000	120	322	47.53	14.49	V	-1110	-338	446	136
103	Granulation System Milling, Classification, and Cooling Equipment Scrubber No. 2	AFI2	13.14	1.656	57.57	1.008	145	44.20	7.00	2.13	153,200	150	339	66.35	20.22	V	-1414	-431	420	128
79	DE Hopper Baghouse	DEHOPPB	0.05	0.007	0.23	0.007	64	19.51	1.50	0.46	600	90	305	5.66	1.72	–	-1840	-561	760	232
80	Limestone Silo Baghouse	LIMESIB	0.32	0.040	1.40	0.040	85	25.91	1.50	0.46	3,500	90	305	33.01	10.06	–	-1090	-332	540	165
81	AFI Product Loadout Baghouse	AFIPRLB	2.06	0.260	9.01	0.259	30	9.14	3.00	0.91	23,100	90	305	54.47	16.60	V	-860	-262	528	161
	AFI Product Loadout Fugitive	AFIPRLF	0.03	0.003	0.12	0.003	50.00	15.24 [h]	–	–	–	63.72	19.42 [h]	46.51	14.18 [h]	[h]	-860	-262	528	161
55	No. 5 DAP Plant																			
	Dryer/Cooler Equipment Vents Stack	DAPNO5	6.40	0.806	28.05	0.807	133	40.54	7.00	2.13	156,000	110	316	67.56	20.59	V	-1744	-532	-380	-116
	Reactor/Granulator Stack	DAP5RG	6.40	0.806	28.05	0.807	134	40.84	5.50	1.68	83,000	166	348	58.23	17.75	V	-1841	-561	-309	-94
22,23,24	Nos. 3 and 4 MAP Plants and South Cooler	MAPNO34	10.00	1.260	42.50	1.223	133	40.54	7.00	2.13	165,000	142	334	71.46	21.78	V	-1800	-549	-170	-52
	Material Handling Conveyor																			
51	West Baghouse	MHWESTB	1.16	0.146	4.60	0.132	30	9.14	3.50	1.07	33,000	80	300	57.17	17.42	V	-950	-290	-1480	-451
52	South Baghouse	MHSOUTB	1.16	0.146	4.60	0.132	50	15.24	1.50	0.46	4,500	80	300	42.44	12.94	H	-1030	-314	-1650	-503
53	Tower East Baghouse	MHTWREB	0.80	0.101	3.20	0.092	30	9.14	2.50	0.76	12,000	80	300	40.74	12.42	H	-910	-277	-1500	-457
58	Building No 6 Baghouse	MHBLDG6	0.62	0.078	1.20	0.035	30	9.14	1.16	0.35	3,630	80	300	57.24	17.45	H	-1890	-576	-450	-137
59	Belt 7 to 8 Baghouse	BLT78BH	0.62	0.078	1.90	0.055	45	13.72	1.16	0.35	3,630	80	300	57.24	17.45	H	-1890	-576	-580	-177
60	Belt 8 to 9 Baghouse	BLT89BH	1.19	0.150	3.60	0.104	75	22.86	1.57	0.48	6,930	80	300	59.54	18.15	H	-1030	-314	-1290	-393
	AFI Railcar Unloading	AFIRCUL	1.00	0.126	0.35	0.010	15.00	4.57 [i]	–	–	–	14.0	4.25 [i]	13.95	4.25 [i]	[i]	-850	-259	-1350	-411
61	East Vessel Loading Facility Shiphold Chokefeed	EVSHIPL	0.10	0.013	0.42	0.012	30.00	9.14 [j]	–	–	–	3.49	1.06 [j]	6.98	2.13 [j]	[j]	-890	-271	-1520	-463

[a] For modeling purposes, horizontal discharges were modeled with a velocity of 0.01 m/s

[b] Relative to H2SO4 Plant No. 9 stack location

[c] AIRS Nos. 063, 064, 065, 066, 067, 068, 069, 074

[d] Location represented by centroids of pits

[e,g,h,i,j] Volume source dimensions based on methods presented in accordance with ISCST3 User's Manual

	Source	Physical Dimensions (ft) Height (H)	Physical Dimensions (ft) Width (W)	Model Dimensions (ft) Height (H or H/2)	Model Dimensions (ft) Sigma Y (W/4.3)	Sigma Z (H/2.15)
[e]	Pits 7, 8, and 9	8.0	210	8.0	49	3.7
[g]	EPP Truck Loading Station Fugitive	55.0	600	27.5	140	25.6
[h]	AFI Product Loadout Fugitive	100.0	274	50	63.7	46.5
[i]	AFI Railcar Unloading	30.0	60	15	14.0	14.0
[j]	East Vessel Loading Facility-Shiphold Chokefeed	30.0	15	30	3.5	6.98

[f] Emissions combined with No. 6 Granulation Plant Dryer/RG/Equipment Vents for modeling purposes, since the Molten Sulfur tank will be controlled by the RGV scrubber and will vent through the Dryer/RG/Equipment Vents Stack

Table 6-6. Stack Parameters and Potential Fluoride Emission Rates for Future Cargill Riverview Sources

AIRS Number	Source	ISCST Model ID	Short-Term F Emissions		Annual Average F Emissions		Stack/Vent Release Height		Stack/Vent Diameter		Gas Flow Rate	Gas Exit Temperature		Velocity		Discharge Direction	Location [c]			
																	X Coordinate		Y Coordinate	
			lb/hr	g/sec	TPY	g/sec	ft	m	ft	m	acfm	F	K	ft/sec	m/sec	(Vert./Horiz.)	ft	m	ft	m
FUTURE SOURCES																				
73	Phosphoric Acid Production Facility																			
	Prayon Reactor	PAPPRAY	0.57	0.07	2.51	0.07	110	33.53	4.00	1.22	20,900	105	313.71	27.72	8.45	V	-1140	-347	940	287
	Nos. 1 and 2 Filtration Units	PAPF12	0.57	0.07	2.51	0.07	110	33.53	4.83	1.47	45,000	115	319.26	40.93	12.48	V	-1200	-366	1120[a]	341
	Dorrco Reactor and New Digester	PAPDORR	0.57	0.07	2.51	0.07	95	28.96	4.50	1.37	55,000	110	316.48	57.64	17.57	V	-1070	-326	1110	338
	No. 3 Filtration Unit	PAPF3	0.57	0.07	2.51	0.07	115	35.05	4.92	1.50	57,100	90	305.37	50.06	15.26	V	-1350	-411	984	300
7	No. 6 Granulation Plant																			
	Cooler Stack (South Stack)	DAP6COOL	1.72	0.22	7.52	0.22	126	38.40	8.0	2.4	104,000	104	313.15	34.48	10.51	V	-1727	-526	26	8
	Dryer/RG/Equipment Vents Stack (North Stack)	DAP6DRY	1.72	0.22	7.52	0.22	162	49.38	8.5	2.6	200,000	164	346.48	58.74	17.90	V	-1732	-528	178	54
70,71	Two GTSP Storage Buildings	EPPST24	9.92	1.25	43.46	1.25	55	16.76 [b]	--	--	--	191	58.12 [b]	25.58	7.80 [b]	b	-2680	-817	50	15
	Animal Feed Ingredient Plant Nos. 1 and 2																			
78	Defluorination System Scrubber	AFIDFS	2.11	0.27	9.25	0.27	35	10.67	3.00	0.91	25,400	105	313.71	59.89	18.25	V	-1230	-375	490	149
55	No. 5 DAP Plant																			
	Dryer/Cooler/Equipment Vents Stack	DAPNO5	1.65	0.21	7.25	0.21	133	40.54	7.00	2.13	156,000	110	316.48	67.56	20.59	V	-1744	-532	-380	-116
	Reactor/Granulator Stack	DAP5RG	1.65	0.21	7.25	0.21	134	40.84	5.50	1.68	83,000	166	347.59	58.23	17.75	V	-1841	-561	-309	-94
22,23,24	Nos. 3 and 4 MAP Plants and South Cooler	MAPNO34	2.00	0.25	8.50	0.24	133	40.54	7.00	2.13	165,000	142	334.26	71.46	21.78	V	-1800	-549	-170	-52

[a] Relative to H_2SO_4 Plant No. 9 stack location.

[b] Volume source dimensions based on methods presented in accordance with ISCST3 User's Manual.

Source	Physical Dimensions (ft) Height (H)	Width (W)	Model Dimensions (ft) Height (H or H/2)	Sigma Y (W/4.3)	Sigma Z (H/2.15)
Two GTSP Storage Buildings	55.0	820	55.0	191	25.58

Table 6-7. Summary of Facilities with PM Emissions Sources in the Vicinity of Cargill Riverview

Facility ID	Facility Name	Site Description/Location	Facility Location East (km)	Facility Location North (km)	Relative Location[a] X (km)	Relative Location[a] Y (km)	Relative Location[a] Distance (km)	Relative Location[a] Direction (deg.)	PM Emissions Rate (TPY)	Emissions Threshold Q [(Dist. - SIA) X 20][b]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
0570150	DRAVO LIME, INC.	DRAVO LIME, INC.	362.9	3084.7	0.0	2.2	2.2	0	42.3	14	Yes	No
0570241	RINKER MATERIALS CORP.	RINKER MATERIALS CORP.	364.9	3084.4	2.0	1.9	2.8	46	3.0	25	No	No
0570317	JANET & CHARLIES WOOD	RECYCLING FAC.	363.1	3085.3	0.2	2.8	2.8	4	[c]	26	No	No
0570224	REED MINERALS DIVISION	REED MINERALS DIVISION	362.2	3085.5	-0.7	3.0	3.1	347	32.0	32	Yes	No
0570279	FLORIDA ROCK INDUSTRIES, INC.	FLORIDA ROCK INDUSTRIES, INC.	365.8	3085.0	2.9	2.5	3.8	49	21.9	47	No	No
0571289	NORTH STAR RECYCLING	DOVER STREET	362.3	3086.5	-0.6	4.0	4.0	351	20	51	No	No
0570022	MARATHON ASHLAND PETROLEUM LLC	MARATHON TAMPA ASPHALT	362.2	3087.2	-0.7	4.7	4.8	352	0.1	65	No	No
0570056	BUILDING MATERIALS MAN. CORP.	BUILDING MATERIALS MAN. CORP.	362.2	3087.2	-0.7	4.7	4.8	352	50.8	65	No	No
0570255	LEHIGH PORTLAND CEMENT CO.	LEHIGH PORTLAND CEMENT CO.	360.7	3086.8	-2.2	4.3	4.8	333	11.1	66	No	No
0570024	IMC-AGRICO CO.	PORT SUTTON TERMINAL	361.5	3087.5	-1.4	5.0	5.2	344	383	74	Yes	No
0570344	POPS PAINTING, INC.	TAMPA TANK	362.8	3087.9	-0.1	5.4	5.4	359	[c]	78	No	No
0571102	FLORIDA CRUSHED STONE CO.	FLORIDA CRUSHED STONE CO	359.5	3087.0	-3.4	4.4	5.6	323	89	82	Yes	No
0570040	TAMPA ELECTRIC CO	GANNON	360.1	3087.5	-2.8	5.0	5.7	331	5,267	85	Yes	No
0570252	SOUTHDOWN, INC	SOUTHDOWN, INC	359.3	3087.1	-3.6	4.6	5.8	322	53	87	No	No
0570031	HOLNAM INC.	HOLNAM INC.	359.5	3087.3	-3.4	4.8	5.9	325	72	88	No	No
0571209	APAC-FLORIDA, INC.	APAC-FLORIDA, INC.	359.9	3088.1	-3.0	5.6	6.4	331	38	97	No	No
0570094	IMC-AGRICO CO. (BIG BEND)	BIG BEND	362.1	3076.1	-0.8	-6.4	6.4	187	76	99	No	No
0570033	CSX TRANSPORTATION, INC.	CSX TRANSPORTATION, INC.	362.4	3089.0	-0.5	6.5	6.5	356	242	100	Yes	No
0570029	NITRAM, INC.	NITRAM, INC	362.5	3089.0	-0.4	6.5	6.5	356	222	100	Yes	No
0571242	NATIONAL GYPSUM CO.	APOLLO BEACH PLANT	363.3	3075.6	0.4	-6.9	6.9	177	99	108	No	No
0570014	EASTERN ASSOCIATION TERMINAL	ROCK PORT	360.2	3088.9	-2.7	6.4	6.9	337	266	109	Yes	No
0571100	CHEMICAL LIME CO. OF ALABAMA INC	CHEMICAL LIME CO. OF ALABAMA INC	358.2	3088.3	-4.7	5.8	7.5	321	67	119	No	No
PRPSD	BIG BEND TRANSFER CO. L.L.C.	BIG BEND	361.1	3076.2	-1.8	-6.3	6.6	196	383	101	Yes	Yes
0570039	TAMPA ELECTRIC CO.	BIG BEND STATION	361.9	3075.0	-1.0	-7.5	7.6	188	7,586	121	Yes	Yes
0570018	LAFARGE CORP.	LAFARGE CORP.	357.7	3090.6	-5.2	8.1	9.6	327	323	163	Yes	No
0570038	TAMPA ELECTRIC CO	HOOKERS POINT STATION	358.0	3091.0	-4.9	8.5	9.8	330	1,536	166	Yes	No
0570127	CITY OF TAMPA - MCKAY BAY	REFUSE-TO-ENERGY FAC.	360.2	3092.2	-2.7	9.7	10.1	344	172	172	Yes	Yes
0570025	TRADEMARK NITROGEN CORP	TRADEMARK NITROGEN CORP	367.3	3092.6	4.4	10.1	11.0	24	1,463	190	Yes	No
0570261	HILLSBOROUGH CTY. R.R. FAC.	HILLSBOROUGH CTY. R.R. FAC.	368.2	3092.7	5.3	10.2	11.5	27	92	200	No	No
0570251	CONAGRA	CONAGRA	357.0	3092.5	-5.9	10.0	11.6	329	100	202	No	No
0570028	NATIONAL GYPSUM CO.	NATIONAL GYPSUM CO	348.8	3082.7	-14.1	0.2	14.1	271	189	251	No	No
0570001	JOHNSON CONTROLS	BATTERY GROUP, INC	359.9	3102.5	-3.0	20.0	20.2	351	127	374	No	No
1030011	PROGRESS ENERGY (FPC)	BARTOW PLANT	342.4	3082.6	-20.5	0.1	20.5	270	2,525	380	Yes	No
1030013	PROGRESS ENERGY (FPC)	BAYBORO POWER PLANT	338.8	3071.3	-24.1	-11.2	26.6	245	195	502	No	No
1030117	PINELLAS CO.	RESOURCE RECOVERY FAC.	335.2	3084.1	-27.7	1.6	27.7	273	329	525	No	No
0570468	GATSBY SPAS INC.	GATSBY SPAS INC.	387.1	3097.6	24.2	15.1	28.5	58	15	540	No	No
0810010	FLORIDA POWER & LIGHT	MANATEE POWER STATION	367.2	3054.1	4.3	-28.4	28.7	171	9,472	544	Yes	No
1030128	WEST COAST U-CART CONCRETE LTD	WEST COAST U-CART CONCRETE LTD	332.6	3080.1	-30.3	-2.4	30.4	265	57	578	No	No
	IMC-AGRICO CO.	FORT LONESOME	389.6	3067.9	26.7	-14.6	30.4	119	76	579	No	No
1030012	PROGRESS ENERGY (FPC)	HIGGINS PLANT	336.5	3098.4	-26.4	15.9	30.8	301	1,260	586	Yes	No
0570075	CORONET INDUSTRIES, INC.	CORONET INDUSTRIES, INC.	393.8	3096.3	30.9	13.8	33.8	66	570	647	No	No
1050059	IMC-AGRICO CO.	NEW WALES	396.7	3079.4	33.8	-3.1	33.9	95	1,500	649	Yes	No
1050057	IMC PHOSPHATES	NICHOLS	398.4	3084.2	35.5	1.7	35.5	87	1,514	681	Yes	Yes
0570448	NORTH STAR RECYCLING	PORT SUTTON	398.3	3086.7	35.4	4.2	35.6	83	2	683	No	No
1050047	AGRIFOS, L.L.C.	NICHOLS	398.7	3085.3	35.8	2.8	35.9	86	557	688	No	No
1050034	IMC-AGRICO CO. (CFMO)	CENTRAL FL. MINERAL OP.	398.2	3075.7	35.3	-6.8	35.9	101	1,969	689	Yes	Yes

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Table 6-7. Summary of Facilities with PM Emissions Sources in the Vicinity of Cargill Riverview

Facility ID	Facility Name	Site Description/Location	Facility Location East (km)	Facility Location North (km)	Relative Location[a] X (km)	Relative Location[a] Y (km)	Relative Location[a] Distance (km)	Relative Location[a] Direction (deg.)	PM Emissions Rate (TPY)	Emissions Threshold Q [(Dist. - SIA) X 20][b]	Included in Modeling Analysis? AAQS	Included in Modeling Analysis? PSD Class II
1030026	OVERSTREET PAVING CO.	OVERSTREET PAVING CO.	326.2	3086.9	-36.7	4.4	37.0	277	126	709	No	No
1050200	J. H. HULL, INC.	J. H. HULL, INC.	399.1	3070.6	36.2	-11.9	38.1	108	5	732	No	No
1030244	A-AMERICAN RENT ALL	A-AMERICAN RENT ALL	324.1	3079.2	-38.8	-3.3	38.9	265	2,190	749	Yes	Yes
1050056	IMC-AGRICO CO.	PRAIRIE	402.9	3087.0	40.0	4.5	40.3	84	607	775	No	No
1050015	FLORIDA JUICE PARTNERS, LTD.	FLORIDA JUICE PARTNERS, LTD.	399.0	3101.8	36.1	19.3	40.9	62	140	789	No	No
0570005	CF INDUSTRIES, INC.	PLANT CITY PHOSPHATE	388.0	3116.0	25.1	33.5	41.9	37	957	807	Yes	Yes
1050233	TAMPA ELECTRIC CO.	POLK POWER STATION	402.5	3067.4	39.6	-15.2	42.4	111	222	817	No	No
1050048	CARGILL FERTILIZER, INC	MULBERRY PLANT	406.8	3085.1	43.9	2.6	44.0	87	3	850	No	No
0810007	TROPICANA	BRADENTON	346.8	3040.9	-16.1	-41.6	44.6	201	904	862	Yes	Yes
1050052	CF INDUSTRIES, INC.	BARTOW PHOSPHATE COMPLEX	408.3	3082.5	45.4	0.0	45.4	90	567	878	No	No
1050055	IMC-AGRICO CO.	SOUTH PIERCE	407.5	3071.4	44.6	-11.1	46.0	104	777	889	No	No
1050009	FLORIDA TILE INDUSTRIES, INC.	FLORIDA TILE INDUSTRIES, INC.	405.4	3102.4	42.5	19.9	46.9	65	69	909	No	No
1050046	CARGILL FERTILIZER, INC.	BARTOW PLANT	409.8	3086.6	46.9	4.1	47.1	85	257	912	No	No
1050053	CARGILL FERTILIZER, INC.	GREEN BAY PLANT	410.3	3079.7	47.4	-2.8	47.5	93	410	920	No	No
0490015	HARDEE POWER PARTNERS, LTD	HARDEE POWER STATION	404.8	3057.4	41.9	-25.1	48.8	121	182	947	No	No
1050003	LAKELAND ELECTRIC & WATER UTIL.	LARSEN POWER PLANT	408.9	3102.5	46.0	20.0	50.2	67	631	973	No	No
1050050	U.S. AGRI-CHEMICALS CORP.	BARTOW	413.2	3086.3	50.3	3.8	50.4	86	268	979	No	No
1050004	LAKELAND ELECTRIC & WATER UTIL.	MCINTOSH POWER PLANT[d]	409.0	3106.2	46.1	23.7	51.8	63	2,308	1,007	Yes	Yes
1050034	IMC-AGRICO CO	NORALYN MINE	414.7	3080.3	51.8	-2.2	51.8	92	973	1,007	No	No
1050234	PROGRESS ENERGY (FPC)	HINES ENERGY COMPLEX	414.3	3073.9	51.4	-8.6	52.2	99	200	1,013	No	No
1010017	PROGRESS ENERGY (FPC)	ANCLOTE POWER PLANT[d]	324.4	3118.7	-38.5	36.2	52.8	313	3,761	1,027	Yes	No
1050051	U.S. AGRI-CHEMICALS CORP.	FT. MEADE	416.0	3069.0	53.1	-13.5	54.8	104	137	1,066	No	No
1050223	PROGRESS ENERGY (FPC)	TIGER BAY COGENERATION FAC.	416.3	3069.3	53.4	-13.2	55.0	104	70	1,070	No	No
1050026	ALCOA ALUMINA & CHEMICALS, L.L.C.	ALCOA ALUMINA & CHEMICALS, L.L.C.	416.8	3069.5	53.9	-13.0	55.4	104	69	1,079	No	No
1050045	PASCO PROCESSING, LLC	PASCO PROCESSING, LLC	418.7	3083.6	55.8	1.1	55.8	89	191	1,086	No	No
1050145	BARTOW ETHANOL, INC.	BARTOW ETHANOL, INC.	418.8	3078.8	55.9	-3.7	56.0	94	281	1,089	No	No
1050198	PALEX, INC.	HOMELAND	419.1	3078.1	56.2	-4.4	56.4	94	97	1,097	No	No
0970014	PROGRESS ENERGY (FPC)	INTERCESSION CITY PLANT[d]	446.3	3126.0	83.4	43.5	94.1	62	1,229	1,851	Yes	Yes
0170004	PROGRESS ENERGY (FPC)	CRYSTAL RIVER PLANT[d]	334.3	3,204.5	-28.6	122.0	125.3	347	13,012	2,476	Yes	Yes

[a] The proposed Cargill Riverview facility is located at UTM Coordinates: East 362.9 (km), North 3082.5 (km)

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

[c] Fugitive source emissions were not modeled.

[d] Large emissions source (>1,000 TPY PM emissions) outside of the modeling area (SIA + 50 km), but included in the modeling analysis.

Table 6-8 Stack Parameters and Baseline (1974) PM_{10} and SO_2 Emission Rates for Cargill Riverview

Source	ISC ID No	Short-Term Particulate Matter Emissions lb/hr	Short-Term Particulate Matter Emissions g/sec	Annual Particulate Matter Emissions TPY	Annual Particulate Matter Emissions g/sec	Short-Term SO_2 Emissions lb/hr	Short-Term SO_2 Emissions g/sec	Annual SO_2 Emissions TPY	Annual SO_2 Emissions g/sec	Stack/Vent Release Height ft	Stack/Vent Release Height m	Stack/Vent Diameter ft	Stack/Vent Diameter m	Design Gas Flow Rate (acfm)	Gas Exit Temperature F	Gas Exit Temperature K	Velocity ft/sec	Velocity m/sec	Location[a] X Coordinate ft	Location[a] X Coordinate m	Location[a] Y Coordinate ft	Location[a] Y Coordinate m
Ammonia Plant	AMMPLTB	18.40	2.318	74.60	2.146	32.80	4.133	132.80	3.820	60	18.29	8.3	2.53	73,800	600	589	22.73	6.93	-2313	-705	-1008	-307
Sodium Silicofluoride/Sodium Fluoride Plant	SSFSFPB	6.06	0.764	9.47	0.272	0.20	0.025	0.59	0.017	28	8.53	2.5	0.76	3,430	95	308	11.65	3.55	-1352	-412	55	17
No 2 and No 3 Rock Silo Bag Filter	NO23RSB	0.90	0.113	3.94	0.113	--	--	--	--	93	28.35	1.1	0.34	2,780	91	306	48.75	14.86	-1352	-412	55	17
Nos 6, 7, and 8 Rock Mills	NO678RB	8.60	1.084	22.80	0.656	--	--	--	--	95	28.96	2.0	0.61	10,460	91	306	55.49	16.91	-1352	-412	55	17
No 10 KVS Mill	10KVSMB	4.40	0.554	17.00	0.489	0.02	0.003	0.11	0.003	87	26.52	1.7	0.52	8,150	118	321	59.84	18.24	-870	-265	684	209
No. 11 KVS Mill	11KVSMB	6.90	0.869	12.20	0.351	--	--	--	--	70	21.34	1.6	0.49	7,670	126	325	63.58	19.38	-870	-265	684	209
No. 12 KVS Mill	12KVSMB	2.90	0.365	5.88	0.169	0.04	0.005	0.18	0.005	71	21.64	1.6	0.49	8,260	135	330	68.47	20.87	-870	-265	684	209
No 2 Air Slide North Bag Filter	2ASNBFB	1.21	0.152	2.33	0.067	--	--	--	--	85	25.91	1.0	0.30	2,250	97	309	47.75	14.55	-1076	-328	1158	353
No 2 Air Slide South Bag Filter	2ASSBFB	0.40	0.050	1.13	0.033	--	--	--	--	96	29.26	0.9	0.27	2,780	115	319	72.83	22.20	-1076	-328	1267	386
No 3 Air Slide North Bag Filter	3ASNBFB	0.21	0.026	0.60	0.017	--	--	--	--	82	24.99	1.2	0.37	1,090	113	318	16.06	4.90	-1076	-328	1158	353
No 3 Air Slide Center Bag Filter	3ARCBFB	0.96	0.121	1.95	0.056	--	--	--	--	115	35.05	1.2	0.37	1,750	118	321	25.79	7.86	-1076	-328	1158	353
No 3 Air Slide South Bag Filter	3ASSBFB	0.84	0.106	3.16	0.091	--	--	--	--	100	30.48	1.2	0.37	1,120	117	320	16.50	5.03	-870	-265	684	209
No 3 Air Slide Bin Bag Filter	3ASBBFB	1.10	0.139	3.57	0.103	--	--	--	--	108	32.92	1.2	0.37	1,580	122	323	23.28	7.10	-1076	-328	1267	386
No 2 Phosphoric Acid System	PASNO2B	14.80	1.865	30.30	0.872	--	--	--	--	110	33.53	4.0	1.22	32,680	145	336	43.34	13.21	-1076	-328	1158	353
No 3 Phosphoric Acid System	PASNO3B	9.20	1.159	20.20	0.581	--	--	--	--	93	28.35	4.0	1.22	17,750	118	321	23.54	7.18	-1076	-328	1267	386
No 1 Horizontal Filter Scrubber	1HZFSB	6.50	0.819	25.30	0.728	--	--	--	--	59	17.98	4.8	1.46	37,750	86	303	35.50	10.82	-1330	-405	1112	339
No 2 Horizontal Filter Scrubber	2HZFSB	10.40	1.310	24.50	0.705	--	--	--	--	51	15.54	4.0	1.22	39,100	93	307	51.86	15.81	-1330	-405	1112	339
No 2 Horizontal Filter Vacuum System	2HZFVSB	0.01	0.001	0.04	0.001	--	--	--	--	4.5	1.37	1.1	0.34	960	153	340	16.84	5.13	-1330	-405	1112	339
No 3 Horizontal Filter Vacuum System	3HZFVSB	0.67	0.084	1.55	0.045	--	--	--	--	4.5	1.37	1.5	0.46	1,730	126	325	16.32	4.97	-1330	-405	1112	339
No 7 Oil-Fired Concentrator	7OFCONB	12.50	1.575	28.90	0.831	41.40	5.216	99.20	2.854	78	23.77	6.0	1.83	29,150	165	347	17.18	5.24	-1330	-405	1112	339
No 8 Oil-Fired Concentrator	8OFCONB	16.80	2.117	32.90	0.946	39.70	5.002	92.00	2.647	78	23.77	6.0	1.83	28,400	159	341	16.74	5.10	-1330	-405	1112	339
GTSP Bag Filter	GTSPBFB	0.49	0.062	1.16	0.033	--	--	--	--	88	26.82	1.3	0.40	2,120	153	340	26.62	8.11	-1555	-365	87	27
GTSP Plant	GTSPAPD	19.10	2.407	62.20	1.789	71.40	8.996	229.60	6.605	126	38.40	8.0	2.44	105,400	129	327	34.95	10.65	-1730	-527	50	15
No 5 and No 9 Mills Bag Filter	RXMIL59B	12.40	1.562	44.70	1.286	0.01	0.001	0.06	0.002	66	20.12	2.0	0.61	10,950	115	319	58.25	17.75	-1625	-495	485	148
No 3 Triple Reactor Belt	3TRJPLB	11.60	1.457	11.10	0.319	--	--	--	--	65	19.81	4.0	1.22	36,480	77	298	48.38	14.75	-1330	-405	703	214
No 4 Triple Reactor Belt	4TRJPLB	8.59	1.082	9.45	0.272	--	--	--	--	65	19.81	4.0	1.22	38,340	84	302	50.85	15.50	-1330	-405	703	214
No 3 Continuous Triple Dryer	3CONTDB	18.20	2.293	25.00	0.719	22.80	2.873	32.90	0.946	68	20.73	3.5	1.07	26,440	115	319	45.80	13.96	-1330	-405	703	214
No 4 Continuous Triple Dryer	4CONTDB	11.80	1.487	15.90	0.457	23.20	2.923	34.80	1.001	68	20.73	3.5	1.07	35,700	134	330	61.84	18.85	-1330	-405	703	214
Nos 2 & 4 Swing Units	24SIZUB	9.68	1.220	8.14	0.234	--	--	--	--	74	22.56	4.0	1.22	22,420	73	296	29.74	9.06	-1330	-405	703	214
Normal Superphosphate	NORMSPB	2.32	0.292	0.97	0.028	--	--	--	--	73	22.25	2.5	0.76	15,630	104	313	53.07	16.18	-1330	-405	703	214
No 1 Ammonium Phosphate Plant	1AMMPPB	11.70	1.474	37.30	1.073	--	--	--	--	90	27.43	4.0	1.22	38,640	141	334	51.25	15.62	-1776	-541	284	87
No 2 Ammonium Phosphate Plant	2AMMPPB	16.10	2.029	46.40	1.335	--	--	--	--	90	27.43	3.5	1.07	37,240	132	329	64.51	19.66	-1776	-541	284	87
No 3 Ammonium Phosphate Plant	3AMMPPB	12.90	1.625	54.20	1.559	--	--	--	--	90	27.43	3.5	1.07	36,340	144	335	62.95	19.19	-1740	-530	366	111
No 4 Ammonium Phosphate Plant	4AMMPPB	18.90	2.381	26.90	0.774	--	--	--	--	90	27.43	3.5	1.07	34,640	149	338	60.01	18.29	-1740	-530	366	111
North Ammonium Phosphate Cooler	NAMMPCB	61.80	8.165	182.60	5.397	--	--	--	--	55	16.76	4.3	1.31	53,050	144	335	60.88	18.56	-1776	-541	284	87
South Ammonium Phosphate Cooler	SAMMPCB	67.30	8.480	137.40	3.953	--	--	--	--	55	16.76	4.3	1.31	60,730	125	325	69.70	21.24	-1740	-530	366	111
Molten Sulfur Handling - Pits 7 & 8	MSPTSB	0.08	0.011	b	b	0.08	0.010	b	b	8	2.44 c	--	--	--	48.8	14.87 c	3.72	1.13 c	78	24	-238	-73
Molten Sulfur Handling - Pits 4,5, & 6	PTS456B	1.31	0.165 d	b	b	0.13	0.017 e	b	b	8	2.44 f	--	--	--	48.8	14.87 f	3.72	1.13 f	-340	-104	-300	-91
Molten Sulfur Handling - Tanks	MSTKTLB	2.65	0.334	f	f	2.12	0.267	f	f	36	10.97 g	--	--	--	29	8.84 g	16.74	5.10 g	-650	-198	-380	-116
No 4 Sulfuric Acid Plant	NO4SAPB	--	--	--	--	282.0	35.531	1,094.0	31.471	80	24.38	4.7	1.43	21,260	194	363	20.42	6.23	-320	-98	180	55
No 5 Sulfuric Acid Plant	NO5SAPB	--	--	--	--	480.0	60.479	1,951.0	56.123	74	22.56	5.3	1.62	33,320	169	360	25.32	7.72	-420	-128	-230	-70
No 6 Sulfuric Acid Plant	NO6SAPB	--	--	--	--	688.0	86.687	2,602.0	74.850	72	21.95	5.9	1.80	51,290	189	360	31.27	9.53	-320	-98	-420	-128
No 7 Sulfuric Acid Plant	NO7SAPB	--	--	--	--	1,503.0	189.375	6,102.0	175.533	92	28.04	9.4	2.87	92,830	183	357	22.29	6.80	-60	-18	-460	-140
No 8 Sulfuric Acid Plant	NO8SAPB	--	--	--	--	1,679.0	211.551	6,462.0	185.889	96	29.26	10.7	3.26	130,420	174	352	24.17	7.37	340	104	-90	-27
Railcar Unloading	RCULTB	1.60	0.202	4.36	0.125	--	--	--	--	15.0	4.57 c	--	--	--	14.0	4.27 c	13.95	4.25 c	-850	259	-1350	-411
Vessel Ship Loading	VLSLTB	1.20	0.151	3.27	0.094	--	--	--	--	15.0	4.57 c	--	--	--	14.0	4.25 c	13.95	4.25 c	-890	-271	-1520	-463

a Relative to H_2SO_4 Plant No. 9 stack location

b No information available for annual emissions, assumed insignificant

c,f,g,i Volume source dimensions based on methods presented in accordance with ISCST3 User's Manual

Source	Physical Dimensions (ft) Height (H)	Physical Dimensions (ft) Width (W)	Model Dimensions (ft) Height (H or H/2)	Model Dimensions (ft) Sigma Y (W/4.3)	Model Dimensions (ft) Sigma Z (H/2.15)
c Molten Sulfur Handling - Pits 7 & 8	8.0	210	8.0	48.8	3.72
f Molten Sulfur Handling - Pits 4,5, & 6	8.0	210	8.0	48.8	3.72
h Molten Sulfur Handling - Tanks	36.0	125	36.0	29	16.7
i Railcar Unloading	30.0	60	15.0	14.0	14.0
i Vessel/Ship Loading	30.0	60	15.0	14.0	14.0

d Emissions for molten sulfur pits 4, 5, and 6 based on current emission rates for pit 7 multiplied by 3

e No information available for annual emissions, assumed insignificant

f Emissions combined with No. 6 Granulation Plant Dryers/RG Equipment Vents for modeling purposes, since the Molten Sulfur tank will be controlled by the RGV Scrubber and will vent through the Dryer/RG Equipment Vents Stack

g No information available for annual emissions, assumed insignificant

Source: 1974 AOR submitted by Gardinier, Inc., to the Hillsborough County Environmental Protection Commission (September 24, 1975)

Table 6-9. Summary of SO_2, SAM, and NO_x Emission Rates due to the Project-Affected Sources Used in the Regional Haze Analysis, Cargill Riverview

Source	SO_2 Emissions		SAM Emissions		NO_x Emissions	
	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
Current Operations						
Phosphoric Acid Plant	--	--	--	--	--	--
EPP Plant [a]	40.57	5.112	0.70	0.088	11.43	1.440
Material Handling System	--	--	--	--	--	--
Molten Sulfur Tank [a]	0.15	0.019	--	--	--	--
Future Operations						
Phosphoric Acid Plant	--	--	--	--	--	--
No. 6 Granulation Plant (EPP Plant) [b]	40.57	5.112	0.70	0.088	11.43	1.440
Molten Sulfur Tank [c]	0.15	0.019	--	--	--	--
Material Handling System	--	--	--	--	--	--

[a] Construction permit was issued in 2001. Construction not yet complete on the plant, therefore current actual emission rates are equal to allowable emission rates or maximum potential (Permit No. 0570008-036-AC).

[b] Refer to Table 2-3 for derivation of emissions.

[c] Refer to Appendix B for derivation of emissions. Emissions combined with emissions from No. 6 Granulation Plant for modeling purposes, since the Molten Sulfur tank emissions are controlled by the RGV scrubber and vent through the No. 6 Granulation Plant dryer stack.

Table 6-10. 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

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Table 6-11. Building Dimensions Used in the Modeling Analysis

Structure	Height		Length		Width	
	(ft)	(m)	(ft)	(m)	(ft)	(m)
Phosphoric Acid Plant						
South Building	100	30.48	95	28.96	60	18.29
North Building	100	30.48	90	27.43	80	24.38
Dry Rock Processing Plant						
Nos. 5/9 Mills Building	35	10.67	75	12.19	47	9.14
Animal Feed Ingredient Plant						
AFI Building No. 1	173	52.73	120	36.58	70	21.34
AFI Loadout Silos	100	30.48	274	83.52	37	11.28
AFI Building No. 2	147	44.81	90	27.43	60	18.29
Material Storage Area						
Building No. 6	74	22.56	790	240.79	120	36.58
Building No. 5	54.7	16.67	790	240.79	110	33.53
Building No. 4	54.7	16.67	830	252.98	100	30.48
Building No. 2 (Bottom)	62	18.90	830	252.98	100	30.48
Building No. 2 (Top)	70	21.34	410	124.97	120	36.58
GTSP Building	127	38.71	150	45.72	90	27.43
DAP 5 Building Tier A	86.5	26.37	260	79.25	225	68.58
DAP 5 Building Tier B	126.5	38.56	50	15.24	50	15.24
Map 3/4 Building	90	27.43	100	30.48	90	27.43
Docks						
West Building	30	9.14	330	100.58	85	25.91
East Building Tier A	30	9.14	370	112.78	30	9.14
East Building Tier B	45	13.72	30	9.14	30	9.14
Belt 8 to 9 Building	75	22.86	59	17.98	28	8.53
Sulfuric Acid Plant						
Auxiliary Boiler Building	18	5.49	80	24.38	50	15.24

Table 6-12. Maximum Predicted PM_{10} Concentrations for the Proposed Project Only, Cargill Riverview

Averaging Time	Concentration [a] (µg/m³)	Receptor Location [b] Direction (degree)	Receptor Location [b] Distance (m)	Time Period (YYMMDDHH) [c]	EPA Significant Impact Level (µg/m³)
Annual	3.5	205	515	91123124	1
	4.5	205	515	92123124	
	4.3	205	515	93123124	
	3.4	205	515	94123124	
	3.5	205	515	95123124	
Highest 24-Hour	3.1	-1100	0	91051124	5
	3.7	-983	-234	92101124	
	4.4	-1147	238	93090824	
	3.7	-983	-234	94060124	
	4.1	-1000	-200	95080724	

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to No. 9 Sulfuric Acid Plant stack.

[c] YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-13. Maximum Predicted PM_{10} Impact After Completion of the Proposed Project, AAQS Screening Analysis, Cargill Riverview

Averaging Time	Concentration [a] ($\mu g/m^3$)	Receptor Location [b] Direction (degree)	Distance (m)	Time Period (YYMMDDHH) [c]
Highest Annual	16.3	259	1,020	91123124
	17.5	205	515	92123124
	18.5	212	601	93123124
	17.8	212	601	94123124
	20.1	212	601	95123124

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to No. 9 Sulfuric Acid Plant stack.

[c] YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-14. Maximum Predicted PM_{10} Concentrations for All Sources Compared to the AAQS, Refined Analysis

Averaging Time	Concentration (μg/m³) [a] Total	Modeled Source	Background	Receptor Location [b] Direction (degree)	Distance (m)	(μg/m³) (YYMMDDHH) [c]	Florida AAQS (μg/m³)
Annual	45.1	20.1	25	212	601	95123124	50

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stati in Tampa and Ruskin, respectively.

[b] Relative to No. 9 Sulfuric Acid Plant stack.

[c] YYMMDDHH = Year, Month, Day, Hour Ending

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Table 6-15. Maximum Predicted PM_{10} Pollutant Impacts After Completion of the Proposed Project, PSD Class II Screening Analysis, Cargill Riverview

Averaging Time	Concentration [a] ($\mu g/m^3$)	Receptor Location [b] Direction (degree)	Receptor Location [b] Distance (m)	Time Period (YYMMDDHH)[d]
Annual	0.0 [c]	360	0	91123124
	0.0 [c]	360	0	92123124
	0.0 [c]	360	0	93123124
	0.0 [c]	360	0	94123124
	0.0 [c]	360	0	95123124

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to No. 9 Sulfuric Acid Plant stack.

[c] Maximum concentrations were predicted to be less than zero at all receptors.

[d] YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-16. Summary of Maximum Pollutant Concentrations Predicted for the Project Only Compared to the EPA Class I Significant Impact Levels and PSD Class I Increments

Pollutant/ Averaging Time	Year	Maximum Concentration[a] (µg/m³)	EPA Class I Significant Impact Levels (µg/m³)	PSD Class I Increments (µg/m³)
PM_{10}				
Annual	1990	0.00017	0.2	4
	1992	0.00025		
	1996	0.00017		
24-Hour	1990	0.0135	0.3	8
	1992	0.0056		
	1996	0.0118		
Fluoride				
Annual	1990	0.0 [b]	--	--
	1992	0.0 [b]		
	1996	0.0 [b]		
24-Hour	1990	0.0013	--	--
	1992	0.0009		
	1996	0.0011		
8-Hour	1990	0.0046	--	--
	1992	0.0041		
	1996	0.0026		
3-Hour	1990	0.0124	--	--
	1992	0.0083		
	1996	0.0055		
1-Hour	1990	0.0159	--	--
	1992	0.0188		
	1996	0.0099		

[a] Highest Predicted with CALPUFF model and CALMET Tampa Bay Domain, 1990, 1992, and 1996.

[b] Concentrations were predicted to be less than 0 µg/m³ at all receptors.

Table 6-17. Predicted Fluoride Impacts due to the Proposed Project in the Site Vicinity, Cargill Riverview

Averaging Time	Concentration[a] (µg/m³)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)[c]
Annual	0.02	270	1,100	91123124
	0.01	270	1,100	92123124
	0.02	270	1,100	93123124
	0.03	270	1,100	94123124
	0.04	270	1,100	95123124
Highest 24-Hour	0.6	257	1,011	91022524
	1.0	257	1,011	92101124
	1.1	282	1,172	93090824
	0.9	257	1,011	94060124
	0.8	259	1,020	95080724
Highest 8-Hour	2.3	257	1,011	91022508
	3.0	257	1,011	92101108
	3.0	284	1,237	93090816
	2.6	253	1,044	94051808
	2.7	259	1,020	95080708
Highest 3-Hour	4.6	257	1,011	91022506
	5.9	257	1,011	92101109
	4.3	259	1,020	93100418
	5.5	257	1,011	94060106
	4.2	259	1,020	95081806
Highest 1-Hour	11.8	262	1,026	91102107
	17.8	257	1,011	92101108
	10.7	257	1,011	93112017
	16.4	257	1,011	94060106
	11.4	259	1,020	95031307

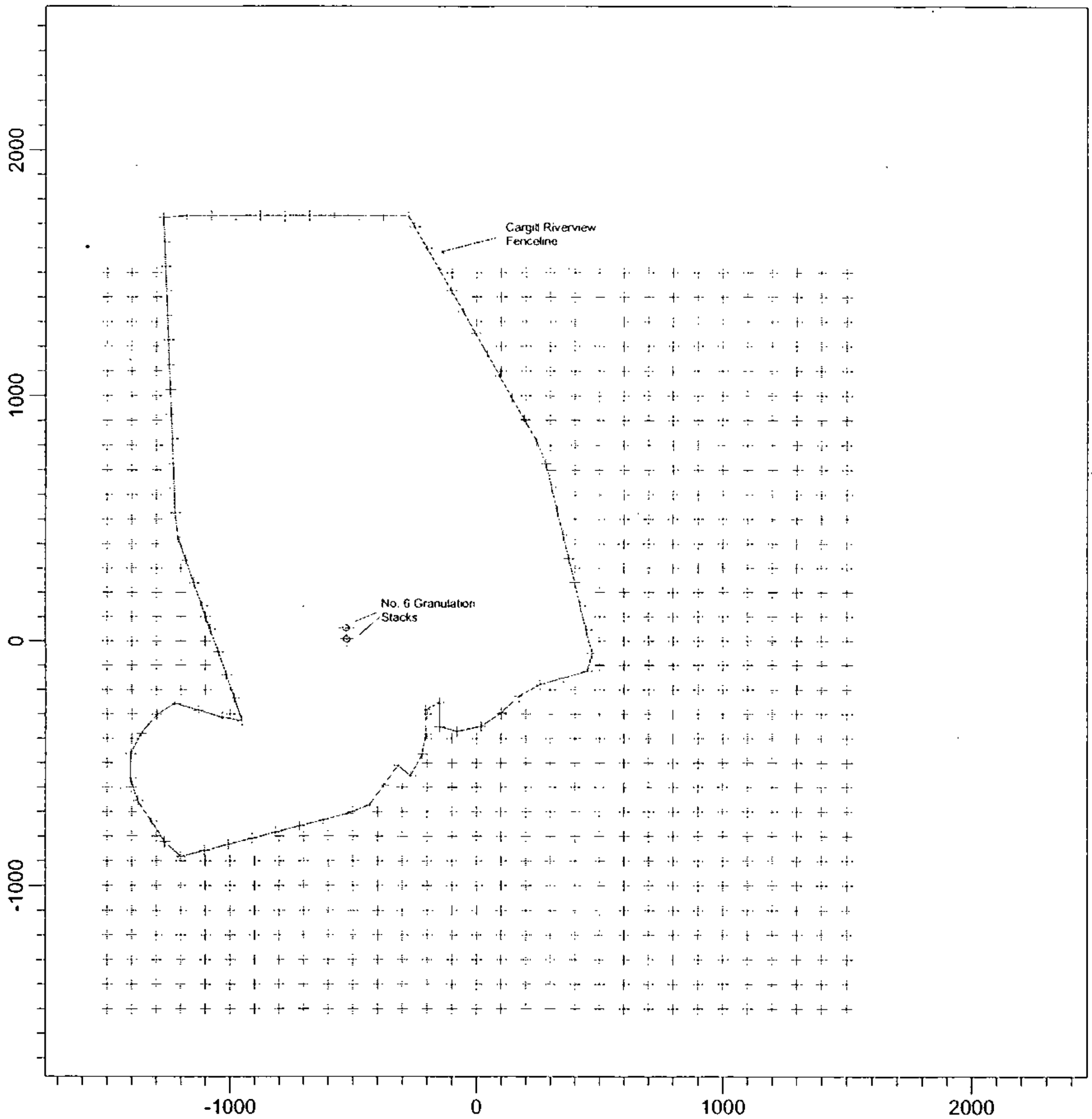
[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to No. 9 Sulfuric Acid Plant stack.

[c] YYMMDDHH = Year, Month, Day, Hour Ending

PROJECT TITLE.

Figure 6-1. Property Boundary and Off-Site Receptors out to 1.5 km.
Cargill Riverview, No. 6 Granulation Plant

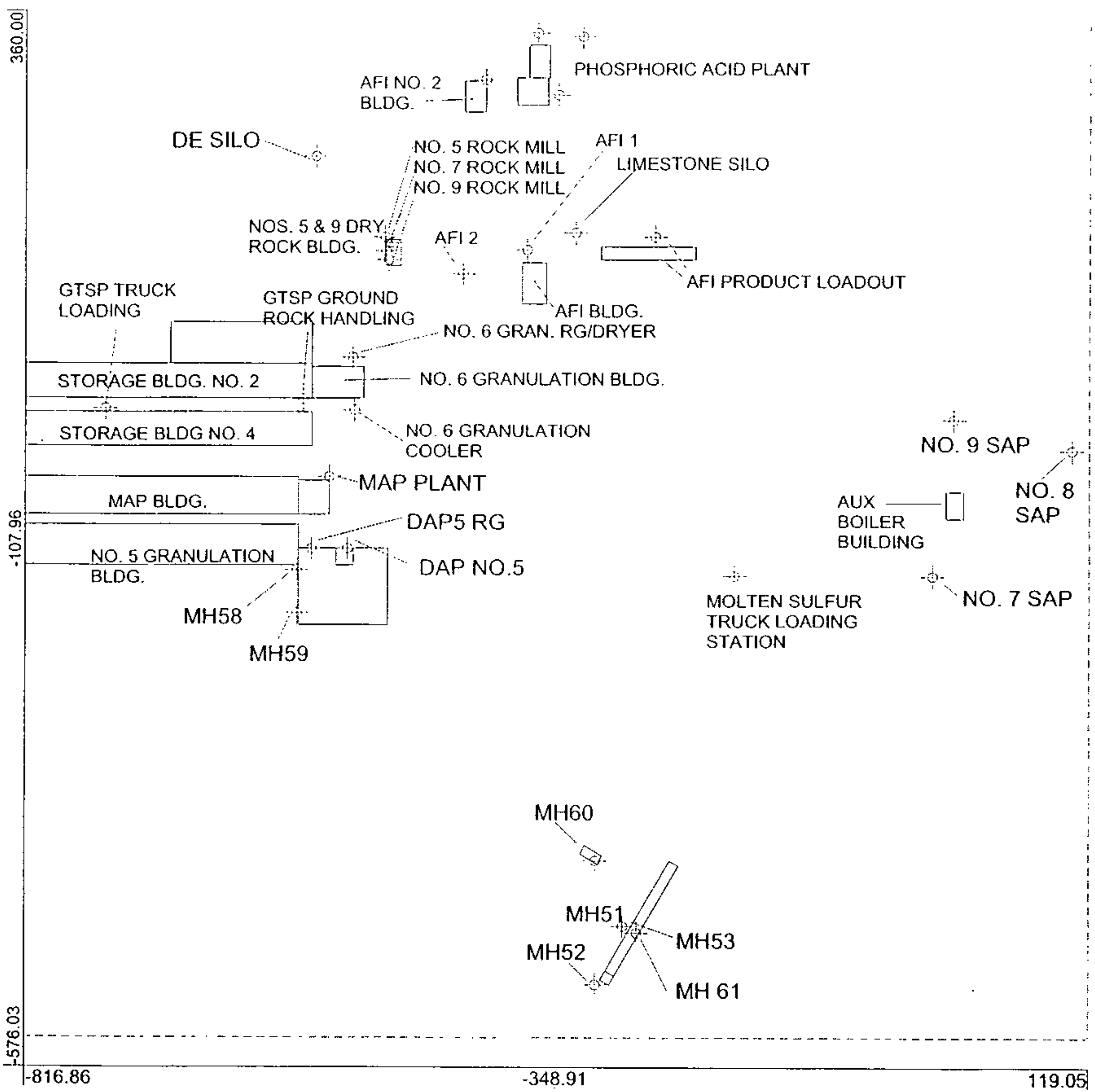


COMMENTS:	SOURCES:	COMPANY NAME:	
	3	**Golder Associates Inc.**	
	RECEPTORS: 1481	MODELER: **Fawn Bergen**	SCALE: 0 — 0.5 km
		DATE: **9/18/2003**	PROJECT NO.: **023-7575**

ISC-AERMOD View - Lakes Environmental Software   T:\PROJECTS\cargill\riverview\EPP PLANT\final.isc

PROJECT TITLE:

Figure 6-2. Building and Stack Locations
Cargill Riverview



COMMENTS:	BUILDINGS: 19	COMPANY NAME: Golder Associates Inc.	
	SOURCES: 30	MODELER: Fawn Bergen	SCALE: 0 — 0.1 km
		DATE: 9/17/03 9/17/2003	PROJECT NO.: 023-7575 **023-7575-0400**

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

Cargill is proposing to modify its existing facility in Riverview, Florida. The facility is subject to the PSD new source review requirements for PM_{10} 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 86 km north-northwest of the Cargill Riverview 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 the Cargill plant 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 CNWA, 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 PLANT

Because the project's impacts on the local air quality are predicted to be less than the significant impact levels for 24-hour PM_{10} and less than the AAQS or PSD Class II increment levels for annual PM_{10}, the project's impacts on soils, vegetation, and wildlife in the project's vicinity are also not expected to be significant. According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Cargill facility emitting at maximum rate are predicted to be below Class II increments and AAQS for PM_{10}. In addition, no visibility impairment in the vicinity of Cargill is expected since no new emission sources are proposed for this project. 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.

7.3.1 IMPACTS TO SOILS

Soils in the vicinity of the Cargill site consist primarily of tidal lands and poorly drained sands with organic pans. The tidal lands, found along the coast between the tidal swamps and the flatwoods, consist of mucky fine sand to dark-gray fine sand overlying gray fine sand, mixed with broken and whole shells. The poorly drained sands are strongly acidic, requiring liming for agricultural uses. Many of the soils in the region and a large portion of the site have been disturbed and altered by industrial activities.

Since both the underlying substrate and sea spray from the nearby Hillsborough bay are neutral to alkaline, any acidifying effects of NO_x, SO_2, and SAM deposition on soils in the vicinity of the project would be buffered. In addition, liming practices currently used on soils in the vicinity of Cargill by agricultural interests will effectively mitigate the small effects of any increased NO_x, SO_2, and SAM deposition resulting from emissions from the proposed expansion. The PM/PM_{10} emissions are composed primarily of limestone, which is a naturally occurring substance in the area. The additional PM/PM_{10} concentrations resulting from the proposed modification will not affect soils in the vicinity of the Cargill site.

7.3.2 IMPACTS TO VEGETATION

Cut-over pine flatwoods and mixed forest comprise the natural vegetation in the vicinity of the Cargill site. Mangrove trees and salt-tolerant plants are found near the coast. Winter vegetables and pasture greens are cultivated inland from the facility.

The sensitivity of plants to fluorides varies widely, from 16 μg/m³ of fluoride in sensitive plants to 500 μg/m³ of fluoride in tolerant plants for 3-hour exposures. As fluoride accumulates in plants, it causes an inhibition of plant metabolism and chlorosis (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).

The predicted maximum increase in 3-hour, 8-hour, 24-hour, and annual fluoride concentrations in the vicinity of the Cargill plant due to the proposed plant expansion are 5.9, 3.0, 1.1, and 0.04 μg/m³, respectively (refer to Table 6-17). These concentrations are less than those that caused injury to sensitive species, therefore no significant effects are expected to occur as a result of fluoride exposure.

7.4 IMPACTS UPON VISIBILITY IN THE VICINITY OF CARGILL

No new emission sources will be created by the proposed Cargill Riverview modification. These sources will be controlled by wet scrubbers; therefore, a visible emission plume may occur at times. However, Cargill has a number of similar type sources already in operation. All 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.

7.5 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 Riverview facility is in a remote part of Hillsborough County, primarily industry, 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 Riverview since 1977. Cargill Riverview will "affect" an area of approximately 1.5 km surrounding the facility, based on the significant impact analysis. Three quarters of the property boundary is surrounded by water; Tampa Bay and the Alafia River. At the outer edge of the affected area is the northwestern portion of the small town of Gibsonton. This part of Gibsonton 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 Cargill Riverview 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.

7.6 IMPACTS UPON PSD CLASS I AREAS

7.6.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

The Cargill Riverview facility is located about 86 km from the PSD Class I area of the CNWA. Other PSD Class I areas are located more than 200 km from the Site. An AQRV analysis was conducted to assess the potential risk to AQRVs of the CNWA due to the proposed emissions from the Cargill expansion project. 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 CNWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the CNWA.

Vegetation type AQRVs and their representative species types have been defined by the U.S. Fish and Wildlife as:

- Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass
- Marsh Islands - cabbage palm and eastern red cedar
- Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle
- Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm

- Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto
- Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

The maximum pollutant concentrations due to the Cargill expansion project's emissions predicted at the PSD Class I area of the CNWA are presented in Table 7-1. These results are based on using the CALPUFF model (see Appendix D).

Similar to the evaluation performed in Section 7.2, a screening approach was used that compared the maximum ambient concentration of air pollutants of concern due to the project's emissions at the PSD Class I area of the CNWA 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 CNWA. 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 CNWA, 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.

7.6.2 IMPACTS TO 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 U.S. Department of Agriculture (USDA) Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the CNWA. 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 CNWA 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 CNWA, 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 CNWA from the proposed project's emissions precludes any significant impact on soils.

7.6.3 IMPACTS TO VEGETATION

In general, the effects of air pollutants on vegetation occur primarily from SO_2, nitrogen dioxide (NO_2), ozone, and PM. Effects from minor air contaminants, such as F, 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. For purposes of this analysis, it was assumed that 100 percent of each air contaminant of concern is accessible to the plants.

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 concentrations of the pollutants, duration of exposure and frequency of exposures influence the response of vegetation and wildlife to atmospheric pollutants. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

7.6.3.1 PM_{10}

Although information pertaining to the effects of particulate matter on plants is scarce, some research results are available. In a study conducted by Mandoli and Dubey (1988), ten species of native Indian plants were exposed to levels of particulate matter that ranged 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 with modeled concentrations, the possibility of plant damage in the CNWA can be determined. The maximum PM_{10} concentrations predicted by the Cargill Riverview modification in the Class I area are 0.03 and 0.014 $\mu g/m^3$ for 8- and 24-hour averaging times, respectively (refer to Table 7-1). The 24-hour average background PM_{10} concentration reported for CNWA is 21 $\mu g/m^3$. The 8-hour average background was estimated by multiplying the 24-hour average concentration by three. This produced a conservative 8-hour average background concentration of 63 $\mu g/m^3$. When added to the maximum 8-hour average PM_{10} concentrations of 0.03 $\mu g/m^3$ predicted by the project in the CNWA, the maximum total 8-hour average concentration of 63.03 $\mu g/m^3$ is well below the lower threshold value that reportedly affects plant foliage. As a result, no effects to vegetative AQRVs are expected from the project's emissions.

7.6.3.2 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 maximum F concentrations in the CNWA due to the Cargill expansion are 0.019 and 0.0013 $\mu g/m^3$ for 1-hr and 24-hr averaging times, respectively (refer to Table 7-1). These concentrations are less than 1 percent of those that cause injury to the most sensitive plant species. No significant adverse effects are predicted to occur to the vegetative AQRVs of CNWA. Since the predicted annual concentration 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.

7.6.3.3 Summary

In summary, the phytotoxic effects from the Cargill expansion project's emissions are minimal. It is important to note that the elements were conservatively modeled with the assumption that 100 percent was available for plant uptake. This is rarely the case in a natural ecosystem.

7.6.4 IMPACTS TO WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the NAAQS. 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. For impacts on wildlife, the lowest threshold values of SO_2, NO_2, and particulates which are reported to cause physiological changes are shown in Table 7-2. These values are orders of magnitude larger than maximum concentrations predicted for the Cargill expansion for the Class I area. No effects on wildlife AQRVs from SO_2, NO_2, and particulates are expected. The proposed project's contribution to cumulative impacts is negligible.

7.7 IMPACTS UPON VISIBILITY

7.7.1 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 Riverview 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.

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 D) 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.

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 Riverview modification. The emission rates and source parameters for the affected sources are presented in Chapter 6.0.

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.

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.

Background Extinction Coefficients 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.

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 D.

Chemical Transformation

The air modeling analysis included all chemical transformation processes that occur for the emitted species.

Results

The visibility modeling results are presented in Table 7-3. The maximum predicted 24-hour change in background extinction coefficient is 0.21 percent. As this percentage is well 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.

Table 7-1. Summary of Maximum Pollutant Concentrations Predicted for the Project Only at the PSD Class I Area of the Chassahowitzka NWA

Pollutant/ Averaging Time	Maximum Concentration[a] ($\mu g/m^3$)		
	1990	1992	1996
PM_{10}			
Annual	0.00017	0.00025	0.00017
24-Hour	0.0135	0.0056	0.0118
8-Hour	0.029	0.019	0.030
3-Hour	0.062	0.038	0.067
1-Hour	0.089	0.057	0.107
Fluoride			
Annual	0.0 [b]	0.0 [b]	0.0 [b]
24-Hour	0.00128	0.00087	0.00109
8-Hour	0.0046	0.0041	0.0026
3-Hour	0.0124	0.0083	0.0080
1-Hour	0.016	0.019	0.014

[a] Highest Predicted with CALPUFF model and CALMET Tampa Bay Domain, 1990, 1992, and 1996.

[b] Concentrations were predicted to be less than 0 $\mu g/m^3$ at all receptors.

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 and 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 Riverview at the PSD Class I Area of the Chassahowitzka NWA

Ranking	Visibility Impairment (%)[a]			Visibility Impairment Criteria (%)
	1990	1992	1996	
Highest	0.13	0.21	0.11	5.0

[a] Concentrations are highest predicted using the CALPUFF model and CALMET windfields for central Florida.

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APPENDIX A

BASIS OF ACTUAL EMISSIONS

Table A-1. Actual Emissions [a] for 2001--Cargill Riverview

Source Description	EU ID	Hours (Hr/yr)	Pollutant Emission Rate (TPY)								
			SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
Material Handling System											
West Baghouse Filter	051	3,251	--	--	--	0.55	0.55	--	--	--	--
South Baghouse	052	3,146	--	--	--	0.64	0.64	--	--	--	--
Vessel Ldng. System--Twr. Baghouse Exhaust[c]	053	3,146	--	--	--	0.64	0.64	--	--	--	--
Building No. 6 Belt to Conveyor No. 7	058	1,428	--	--	--	0.31	0.31	--	--	--	--
Conveyor No. 7 to Conveyor No. 8	059	3,251	--	--	--	0.68	0.68	--	--	--	--
Conveyor No. 8 to Conveyor No. 9	060	3,251	--	--	--	0.68	0.68	--	--	--	--
Railcar Unloading of AFI Product [b]			--	--	--	0.32	0.06	--	--	--	--
E. Vessel Ldg. Facility-Shiphold/Chokefeed	061	3,146	--	--	--	0.46	0.28	--	--	--	--
Total			**--**	**--**	**--**	**4.29**	**3.84**	--	--	--	--

[a] Emissions from the 2001 AOR.

[b] Refer to Table A-3 for derivation of emission rate.

Table A-2. Actual Emissions [a] for 2002--Cargill Riverview

Source Description	EU ID	Hours (Hr/yr)	Pollutant Emission Rate (TPY)								
			SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
Material Handling System											
West Baghouse Filter	051	3,132	--	--	--	1.82	1.82	--	--	--	--
South Baghouse	052	2,889	--	--	--	1.68	1.68	--	--	--	--
Vessel Ldng. System--Twr. Baghouse Exhaust[a]	053	2,889	--	--	--	4.48	4.48	--	--	--	--
Building No. 6 Belt to Conveyor No. 7	058	1,606	--	--	--	0.50	0.50	--	--	--	--
Conveyor No.7 to Conveyor No. 8	059	3,132	--	--	--	0.97	0.97	--	--	--	--
Conveyor No.8 to Conveyor No. 9	060	3,132	--	--	--	1.86	1.86	--	--	--	--
Railcar Unloading of AFI Product [b]			--	--	--	0.25	0.05	--	--	--	--
E. Vessel Ldg. Facility-Shiphold/Chokefeed	061	2,889	--	--	--	0.14	0.14	--	--	--	--
Total			0.00	0.00	0.00	11.70	11.50	0.00	0.00	0.00	0.00

[a] Emissions from the 2002 AOR.

[b] Refer to Table A-4 for derivation.

Table A-3. Actual 2001 Fugitive PM and PM_{10} Emissions for the AFI Railcar Unloading Station
Cargill Fertilizer, Inc., Riverview

Pollutant	AFI Throughput TPH	AFI Throughput TPY	Control Type	Control Efficiency (%)	No. of Transfer Points	Emission Factor (lb/ton)	Emission Rates lb/hr	Emission Rates TPY
PM	250	64,197	Enclosures	90	2	0.05 [a]	2.50	0.32
PM_{10}	250	64,197	Enclosures	90	2	0.01 [b]	0.50	0.06

[a] Based on stack test data for IMC-Agrico, Big Bend Terminal for GTSP (refer to Attachment A).

[b] PM_{10} emissions assumed to be 20% of PM emissions.

Table A-4. Actual 2002 Fugitive PM and PM_{10} Emissions for the AFI Railcar Unloading Station
Cargill Fertilizer, Inc., Riverview

Pollutant	AFI Throughput		Control Type	Control Efficiency (%)	No. of Transfer Points	Emission Factor (lb/ton)	Emission Rates	
	TPH	TPY					lb/hr	TPY
PM	250	49,566	Enclosures	90	2	0.05 [a]	2.50	0.25
PM_{10}	250	49,566	Enclosures	90	2	0.01 [b]	0.50	0.05

[a] Based on stack test data for IMC-Agrico, Big Bend Terminal for GTSP (refer to Attachment A).

[b] PM_{10} emissions assumed to be 20% of PM emissions.

ATTACHMENT A

STACK TEST SUMMARY

SUMMARY OF EMISSION
FACTOR TESTS

IMC-AGRICO BIG BEND TERMINAL
6/17-19/2000

METHOD 5 TESTS AT INLET TO BAGHOUSE ON TRANSFER POINT NO. 3

Test	Mass Total PM at Baghouse Inlet (lb/hr)	Oiled Fertilizer Transfer Rate (short tons/hr)	Emission Factor (lb total PM/ton)
1	12.22	1286	0.010
2	15.47	909	0.017
3	15.47	1021	0.015
4	8.13	1141	0.007
5	4.13	1155	0.004
Avg	11.08	1102	0.010

Oiled material emission factor for a 33 ft. drop is 0.010 lb/ton. Assuming 80% control for oil, the uncontrolled (unoiled) total PM Emission Factor is 0.050 lb/ton.

PM 10 FRACTION TESTS

Test	PM10 (Fraction of Total PM)
1A	0.28
2A	0.12
3A	0.14
Avg	0.18

Use PM10 fraction of 20% .
Uncontrolled (unoiled) PM10 Emission Factor is 0.010 lb/short ton.

BAGHOUSE EFFICIENCY TESTS

Test	Baghouse Inlet		Baghouse Outlet	
	(lb/hr)	(gr/dscf)	(lb/hr)	(gr/dscf)
1	12.22	0.6889	0.12	0.0038
2	15.47	0.8773	0.12	0.0041
3	15.47	0.8763		
4	8.13	0.4874		
5	4.13	0.2174		
Avg	11.08	0.6294	0.12	0.0039

Efficiency (mass) = (1 – 0.12/11.08) x 100 = 98.9%
Efficiency (conc) = (1 – 0.0039/0.6294) x 100 = 99.4%

Use baghouse efficiency of 99%.

(Note: Dust loading at baghouse outlet represents dust from the major material transfer point plus two minor dust pickup points, whereas the dust loading at the inlet represents dust only from the major material transfer point. Because of this, the 99% control efficiency is conservative.)

APPENDIX B

BASIS OF FUTURE POTENTIAL EMISSIONS

Table B-1. Summary of Emission Rate Calculations for the Molten Sulfur Storage Tank at the No. 6 Granulation Plant

Parameters	Units	Molten Sulfur Tank: Tank Loading from H_2SO_4 Plants	Unloading Into GTSP Plant	Storage/ Idle	Total Emissions (TPY)	Max Emissions (lb/hr)
SULFUR FLOW RATES						
Maximum loading rate	TPH	15	15	0		
Annual loading rate	TPY	131,400	131,400	0		
VENTILATION RATES						
Loading/Unloading	dscfm	4	0	0		
Natural Ventilation through vents	dscfm	30	30	30		
Total Ventilation	dscfm	34	30	30		
TRANSFER TIMES						
Loading/Unloading	hr/yr	8,760	8,760	--		
Idle	hr/yr	--	--	0		
UNCONTROLLED EMISSION FACTORS						
Sulfur particulate	grains/dscf	0.66	0.29	0.29		
TRS (as H_2S)	lb/dscf	3.50E-05	3.50E-05	3.50E-05		
SO_2	lb/dscf	7.30E-05	7.30E-05	7.30E-05		
VOC	lb/dscf	5.20E-05	5.20E-05	5.20E-05		
CONTROL EFFICIENCY						
Sulfur particulate	%	0	0	0		
TRS (as H_2S)	%	0	0	0		
SO_2	%	0	0	0		
VOC	%	0	0	0		
EMISSION RATES					Annual Emission Rate (TPY)	Maximum Hourly Emission Rate (lb/hr)
Sulfur Particulate	lb/hr	0.19	0.075	0.075	--	0.19
	TPY	0.854	0.327	0.00	0.85	--
TRS (as H_2S)	lb/hr	0.07	0.063	0.063	--	0.07
	TPY	0.317	0.276	0.00	0.32	--
Sulfur Dioxide	lb/hr	0.15	0.13	0.13	--	0.15
	TPY	0.661	0.576	0.00	0.66	--
Volatile Organic Compounds	lb/hr	0.11	0.094	0.094	--	0.11
	TPY	0.471	0.410	0.00	0.47	--

Notes:
TPH = tons per hour
TPY = tons per year
Density of Sulfur (280°F) = 112 lb/cf

APPENDIX C

PM_{10} AAQS AND PSD CLASS II INVENTORY

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	Relative Location East (m)	Relative Location North (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity ms	Emission Rate lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570150	DRAVO LIME, INC.																	
	Quicklime Railcar Unloading Facility - Silo #1, East	1	DRAVO1	0	2,200	560	170.69	2	0.6	77	298	6	1.83	0 6	0.076	B	Yes	No
	Quicklime Storage Bin #1 (Westernmost)	2	DRAVO2	0	2,200	18	5.49	0.4	0.1	78	299	37	11.28	0.1	0.009	B	Yes	No
	Quicklimedsilos#2 (Easternmost)	4	DRAVO3	0	2,200	18	5.49	0.5	0.2	77	298	23	7.01	2.0	0.252	B	Yes	No
	Quicklime Silo #2 Truckloading	5	DRAVO4	0	2,200	18	5.49	0.4	0.1	77	298	37	11.28	2.0	0.252	B	Yes	No
0570224	REED MINERALS DIVISION																	
	Coal Slag Rotary Dryer W/Scrubber System A	1	REED1	-700	3,000	30	9.14	3.9	1.2	132	329	32	9.75	3 4	0 428	B	Yes	No
	Screening,Transport,Material Handling W/Scrubber & Aux Bghs	2	REED2	-700	3,000	30	9.14	5.5	1.7	92	306	32	9.75	11.5	1.449	B	Yes	No
	Truck, Railcar And Bagging Operation	3	REED3	-700	3,000	30	9.14	2.76	0.8	70	294	52	15.85	0.5	0.062	B	Yes	No
0570024	IMC-AGRICO CO.(PORT SUTTON TERMINAL)																	
	Phosphate Rock Dryer With Wet Cyclonic Scrubber	1	IMCSUT1	-1,420	4,990	65	19.81	8.0	2.4	150	339	41	12.50	43.80	5.519	B	Yes	No
	Railcar Unloading Facility W/6 Cyclone & Wet Scrubber	2	IMCSUT2	-1,420	4,990	65	19.81	6.0	1.8	79	299	58	17.68	25.70	3.238	B	Yes	No
	Shiploader - Oba Choked Feeder Loader Sprout W/Baghouse	3	IMCSUT3	-1,420	4,990	45	13.72	1.5	0.5	90	305	113	34 44	3.09	0.389	B	Yes	No
	C17 Conveyor Transfer Point E	4	IMCSUT4	-1,420	4,990	7	2 13	1.1	0.3	120	322	105	32.00	1.54	0.194	B	Yes	No
	C12 Conveyor Transfer Point A	5	IMCSUT5	-1,420	4,990	32	9.75	1.7	0.5	120	322	51	15.54	1.80	0.227	B	Yes	No
	C30 Conveyor Transfer Point C	6	IMCSUT6	-1,420	4,990	18	5.49	1.1	0.3	120	322	105	32.00	1.54	0.194	B	Yes	No
	C18 Conveyor Transfer Point D	7	IMCSUT7	-1,420	4,990	39	11.89	1.1	0.3	120	322	105	32.00	1.54	0.194	B	Yes	No
	Afi Handling	8	IMCSUT8	-1,420	4,990	97	29.57	1.1	0.3	130	328	59.5	18.14	0 90	0.113	B	Yes	No
	C19 Conveyor Transfer Point G	9	IMCSUT9	-1,420	4,990	101	30.78	1.3	0.4	120	322	43	13.11	1.05	0.132	B	Yes	No
	Dry Rock Storage Silos With Scrubber	12	IMCSUT12	-1,420	4,990	10	3 05	2.0	0 6	100	311	132	40 23	5.94	0.748	B	Yes	No
0571102	FLORIDA CRUSHED STONE COMPANY																	
	Kiln Exhaust	1	FLTON1	-3,400	4,450	168	51.21	4	1.2	320	433	92.8	28.29	10 60	1.336	B	Yes	No
	Sn-1, Wh-1, Sh-1, Bc-4 And Bc-5	2	FLTON2	-3,400	4,450	60	18.29	4	1.2	68	293	6 6	2.01	1.29	0.163	B	Yes	No
	Bn-3, Vf-9, And Vf-10	3	FLTON3	-3,400	4,450	140	42.67	4	1.2	68	293	4	1.22	0 77	0 097	B	Yes	No
	Ss-5	8	FLTON8	-3,400	4,450	180	54.86	4	1.2	68	293	4	1.22	0.77	0 097	B	Yes	No
	Truck Loading 1: As-1, As-2, And Ls-1	9	FLTON9	-3,400	4,450	20	6 10	4	1.2	68	293	4	1 22	0.77	0.097	B	Yes	No
	Truck Loading 2: As-3 And Ls-2	10	FLTON10	-3,400	4,450	20	6.10	4	1.2	68	293	4	1.22	0.77	0.097	B	Yes	No
	Mill Separator, Wh-1, Fk-1, And Rm-1	11	FLTON11	-3,400	4,450	50	15.24	4	1.2	100	311	6.6	2.01	1.21	0.152	B	Yes	No
0570040	TECO - GANNON STATION																	
	Unit #1 Steam Generator	1	TECOGN1	-2800	5000	315	96.01	10.0	3.0	277	409	124	37.93	126 0	15.876	B	Yes	No
	125mw Babcock&Wilcox Corp Wet Bottom Cyclonic Firing Type Bl	2	TECOGN2	-2800	5000	315	96.01	10.0	3.0	299	421	126	38.50	126.0	15 876	B	Yes	No
	Unit #3 - B&W Wet Bottom Coal Fired Boiler	3	TECOGN3	-2800	5000	315	96.01	10.6	3.2	271	406	114	34 60	160.0	20.160	B	Yes	No
	Unit#4- B&W Wet Bot Cyclonic Fir'G Coal Fir Bolr, East Stack	4	TECOGN4	-2800	5000	315	96.01	10 0	3.0	289	416	97	29 60	188 0	23.688	B	Yes	No
	Unit #5 Coal Fired Boiler	5	TECOGN5	-2800	5000	315	96.01	14 6	4.5	293	418	166	50 74	228.0	28.728	B	Yes	No
	Unit #6 - Coal Fired Boiler With Esp	6	TECOGN6	-2800	5000	315	96.01	17.6	5.4	260	400	109	33.28	380.0	47.880	B	Yes	No
	14 Mw Gas Fired Turbine	7	TECOGN7	-2800	5000	35	10 67	11.0	3.4	1,010	816	93	28.22	122 0	15.372	B	Yes	No
	Economizer Ash Silo	9	TECOGN8	-2800	5000	72	21.95	0.7	0.2	350	450	35	10 67	0.14	0.018	B	Yes	No
	Flyash Silo No. 1 For Units 5 & 6	10	TECOGN9	-2800	5000	107	32.61	1.0	0.3	350	450	99	30.18	1.20	0 151	B	Yes	No
	Fly Ash Silo No 2 Units 1-4	11	TECOGN11	-2800	5000	104	31.70	2.0	0.6	350	450	59	17.98	2.90	0.365	B	Yes	No
	Unit 1 Coal Bunker W/Roto-Clone	13	TECOGN13	-2800	5000	175	53.34	1.7	0.5	78	299	70	21.34	0.19	0.024	B	Yes	No
	Unit 2 Coal Bunker W/Roto-Clone	14	TECOGN14	-2800	5000	175	53.34	1.7	0.5	78	299	70	21.34	0.19	0 024	B	Yes	No
	Unit 3 Coal Bunker W/Roto-Clone	15	TECOGN15	-2800	5000	177	53.95	2.0	0.6	78	299	50	15.24	0.19	0.024	B	Yes	No
	Unit 4 Coal Bunker W/Roto-Clone	16	TECOGN16	-2800	5000	175	53.34	1.7	0.5	78	299	70	21.34	0.19	0 024	B	Yes	No
	Unit 5 Coal Bunker W/Roto-Clone	17	TECOGN17	-2800	5000	174	53.04	1.2	0.4	78	299	79	24.08	0 19	0 024	B	Yes	No
	Unit 6 Coal Bunker W/Roto-Clone	18	TECOGN18	-2800	5000	175	53 34	1.7	0.5	78	299	70	21.34	0 19	0.024	B	Yes	No

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility Emission Unit Description	Unit No.	ISCST Source ID	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 lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570033	CSX TRANSPORTATION, INC.																	
	Rotary Rail Car Dumper W/ Bghs #1	1	CSX1	-510	6,490	45	13.72	7.8	2.4	77	298	43	13.11	30.80	3.881	B	Yes	No
	Transfer Pt Belt 5 & 7 To Belt 8 Controlled By Baghouse #4	2	CSX2	-510	6,490	3	0.91	0.5	0.2	77	298	636	193.85	3.60	0.454	B	Yes	No
	Rotary Railcar Dumper #2 Controlled By Mikro Pulsaire Bghs #	3	CSX3	-510	6,490	40	12.19	6.7	2.0	77	298	47	14.33	35.87	4.520	B	Yes	No
	Transfer Pt #3 To 4a & #6 Conveyor Belts W/ Bghs 2a	4	CSX4	-510	6,490	40	12.19	2.2	0.7	77	298	63	19.20	3.73	0.470	B	Yes	No
	Transfer Pt. #4a To #5 Conveyor Belt Controlled By Bghs 3a	5	CSX5	-510	6,490	40	12.19	1.8	0.5	77	298	59	17.98	2.34	0.295	B	Yes	No
	Transfer Pt. #3 To #5 Conveyor Belt W/Baghouse #2b	6	CSX6	-510	6,490	4	1.22	0.5	0.2	77	298	360	109 73	1.10	0.139	B	Yes	No
	Transfer Pt. # 4 To # 6 Conveyor Belt W/ Bghs #3	7	CSX7	-510	6,490	3	0.91	0.5	0.2	77	298	275	83.82	0.80	0.101	B	Yes	No
	Transfer Pt #6 To #7 Conveyor Belt W/ Baghouse #5	8	CSX8	-510	6,490	3	0.91	0.5	0.2	77	298	275	83.82	0.80	0.101	B	Yes	No
	Transfer Pt. #8 To #9 Conveyor Belt W/Baghouse #6	9	CSX9	-510	6,490	36	10.97	3.3	1.0	77	298	37	11.28	3.93	0 495	B	Yes	No
	7elt To Gantry Transfer Point, Controlled By Baghouse #7	10	CSX10	-510	6,490	54	16.46	6 0	1.8	77	298	12	3 66	0.27	0 034	B	Yes	No
	Loading Of Shiphold At CSX	11	CSX11	-510	6,490	60	18.29	9.0	2.7	78	299	12.82	3.91	12.58	1.585	B	Yes	No
0570029	NITRAM, INC.																	
	B & W Package Boiler, Gas Fired	3	NITRM3	-400	6,500	90	27.43	4.5	1.4	260	400	35	10.67	7.50	0.945	B	Yes	No
	Fw Package Boiler, Gas Fired	4	NITRM4	-400	6,500	30	9.14	4.5	1 4	450	505	35	10.67	5 00	0 630	B	Yes	No
	Ammonium Nitrate Prill Tower No. 2	6	NITRM6	-400	6,500	173	52.73	15 0	4 6	100	311	19	5.79	26.00	3.276	B	Yes	No
	Kaolin Clay Handling And Storage W/ Flex-Kleen Baghouse	8	NITRM8	-400	6,500	36	10.97	1.9	0 6	77	298	47	14.33	0 60	0.076	B	Yes	No
	Coated Nh4no3 Stg And Loadout W/ Research Cotrell Baghouse	9	NITRM9	-400	6,500	39	11.89	1.9	0 6	77	298	14	4 27	2.10	0 265	B	Yes	No
	Mgo Silo W/Griffin Environmental Baghouse (Silo #1)	10	NITRM10	-400	6,500	63	19 20	0.3	0.1	77	298	106	32.31	0.12	0.015	B	Yes	No
	Mgo Day Tank W/Griffin Environmental Baghouse (Silo #2)	11	NITRM11	-400	6,500	35	10.67	0 3	0.1	77	298	129	39.32	0.14	0 018	B	Yes	No
	Prill Rotary Drums W/ Wet Cyclones And Peabody Scrubber	12	NITRM12	-400	6,500	35	10 67	5 0	1.5	101	311	35	10 67	9.24	1.164	B	Yes	No
	Gas Fired Hurst Package Boiler	13	NITRM13	-400	6,500	9	2.74	1.7	0.5	260	400	24	7.32	0.03	0.004	B	Yes	No
0570014	EASTERN ASSOCIATION TERMINAL ROCK PORT																	
	Phos Rock Ship Loader Baghouse System	1	ETERM1	-2,700	6,400	55	16.76	4.2	1.3	77	298	62	18.90	12.03	1.516	B	Yes	No
	Storage Building Elevator Baghouse-South End	2	ETERM2	-2,700	6,400	70	21.34	0.5	0 2	77	298	25	7.62	0.07	0.009	B	Yes	No
	Railcar Unloading System With Baghouse A	3	ETERM3	-2,700	6,400	14	4 27	2 0	0 6	78	299	636	193 85	19 89	2.506	B	Yes	No
	1f2 Mikro Pulsaire B Conveyor Transfer Point @ #7 To #9 Or #	4	ETERM4	-2,700	6,400	11	3.35	1 6	0 5	78	299	93	28.35	2 46	0.310	B	Yes	No
	645 820 Mikro Pulsaire Baghouse D On Outgoing Trans. Pt.	6	ETERM6	-2,700	6,400	11	3.35	1.1	0.3	77	298	78	23 77	1.04	0.131	B	Yes	No
	645820 Mikro Pulsaire Baghouse G On Out Going Trns. Pt.	9	ETERM9	-2,700	6,400	11	3.35	1.1	0.3	78	299	78	23.77	1 04	0.131	B	Yes	No
	Storage Building Baghouse #1, Se	11	ETERM11	-2,700	6,400	15	4.57	2.5	0.8	77	298	268	81.69	18 28	2.303	B	Yes	No
	Storage Building Baghouse #2,Sw	12	ETERM12	-2,700	6,400	15	4.57	2.5	0.8	77	298	268	81.69	18.28	2.303	B	Yes	No
	Storage Building Baghouse #3,Nw	13	ETERM13	-2,700	6,400	15	4.57	2.5	0.8	77	298	268	81.69	18.28	2.303	B	Yes	No
	Storage Building Baghouse #4,Ne	14	ETERM14	-2,700	6,400	15	4.57	2.5	0 8	77	298	268	81.69	18.28	2.303	B	Yes	No
	Belt 9 Transfer Point To Belt 4	16	ETERM16	-2,700	6,400	11	3.35	1.1	0.3	77	298	78	23.77	1.04	0 131	B	Yes	No
	Belt 5 Transfer Point To Belt 6	17	ETERM17	-2,700	6,400	11	3.35	1.1	0.3	78	299	78	23.77	1 04	0 131	B	Yes	No
	BIG BEND TRANSFER, CO. L.L.C.																	
	Ship Unloader Scrubber	1	BBTC1	-1,800	-6,300	83	25.30	2 43	0.7	100	311	58.2	17.74	0.02	0.003	C	Yes	Yes
	Conveyor Transfer Point Stack	2	BBTC2	-1,800	-6,300	20	6.10	0.83	0 3	80	300	42.6	12.98	0 08	0.009	C	Yes	Yes
	Storage Building Scrubber Stacc	3	BBTC3	-1,800	-6,300	106	32.31	3.67	1.1	88	304	55.3	16.86	0 01	0.001	C	Yes	Yes
	Melter/Molten Scrubber Stack	4	BBTC4	-1,800	-6,300	95	28.96	2.17	0.7	97	309	57.0	17.37	2.94	0.370	C	Yes	Yes
	Package Boiler Stack	5	BBTC5	-1,800	-6,300	106	32.31	4.0	1.2	350	450	29 7	9 05	0.50	0.063	C	Yes	Yes
	Lime Silo Baghouse Stack	6	BBTC6	-1,800	-6,300	80	24.38	1.0	0.3	110	316	0.03	0.01	0.11	0 014	C	Yes	Yes
	Diatomaceous Earth Silo Stack	7	BBTC7	-1,800	-6,300	80	24.38	1.0	0.3	110	316	0.03	0.01	0.11	0 014	C	Yes	Yes

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	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 ms	Emission Rate lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570039	TECO - BIG BEND STATION																	
	Unit #1 Coal Fired Boiler W/Research-Cotrell Esp	1	TECOBB1	-1,000	-7,500	490	149.35	24.0	7.3	300	422	116	35.36	404	50.904	B	Yes	No
	Unit #2 Riley-Stoker Coal Fired Boiler W/ Esp	2	TECOBB2	-1,000	-7,500	490	149.35	24.0	7.3	300	422	116	35.36	400	50.400	B	Yes	No
	Unit #3 Riley-Stoker Coal-Fired Boiler W/ Esp	3	TECOBB3	-1,000	-7,500	499	152.10	24.0	7.3	292	418	51.2	15.61	412	51.912	B	Yes	No
	Unit #4 Coal-Fired Boiler W/ Belco Esp Psd-Fl-040	4	TECOBB4	-1,000	-7,500	499	152.10	24.0	7.3	156	342	59	17.98	130	16.380	C	Yes	Yes
	Big Bend Station Combust. Turbine #2 - Fired By No. 2 Fuel O	5	TECOBB5	-1,000	-7,500	75	22.86	14.0	4.3	928	771	61	18.59	33.0	4.158	B	Yes	No
	Gas Turbine #3 - Westinghouse Turbine Fired By No. 2 Fuel Oi	6	TECOBB6	-1,000	-7,500	75	22.86	14.0	4.3	928	771	61	18.59	33.0	4.158	B	Yes	No
	Gas Turbine #1 Fired By #2 Fuel Oil	7	TECOBB7	-1,000	-7,500	35	10.67	11.0	3.4	1010	816	91.9	28.01	33.0	4.158	B	Yes	No
	Big Bend Station Unit No. 1 & No. 2 Fly Ash Silo With Baghou	8	TECOBB8	-1,000	-7,500	102	31.09	2.5	0.8	250	394	52	15.85	5.16	0.650	B	Yes	No
	Fly-Ash Silo For Unit #3	9	TECOBB9	-1,000	-7,500	113	34.44	0.9	0.3	250	394	406	123.75	3.00	0.378	B	Yes	No,
	Limestone Silo A W/ 2 Baghouses. 1 Is 100% Back-Up P	12	TECOBB12	-1,000	-7,500	101	30.78	0.5	0.2	150	339	46	14.02	0.05	0.006	B	Yes	—No
	Limestone Silo B W/ 2 Baghouses. 1 Is 100% Back-Up P	13	TECOBB13	-1,000	-7,500	101	30.78	0.5	0.2	150	339	46	14.02	0.05	0.006	B	Yes	No
	Flyash Silo For Unit #4 P	14	TECOBB14	-1,000	-7,500	139	42.37	1.6	0.5	140	333	59	17.98	0.20	0.025	B	Yes	No
	Unit 1 Coal Bunker W/Roto-Clone	15	TECOBB15	-1,000	-7,500	179	54.56	1.7	0.5	78	299	69	21.03	0.48	0.060	B	Yes	No
	Unit 2 Coal Bunker W/Roto-Clone	16	TECOBB16	-1,000	-7,500	179	54.56	1.7	0.5	78	299	69	21.03	0.48	0.060	B	Yes	No
	Unit 3 Coal Bunker W/Roto-Clone	17	TECOBB17	-1,000	-7,500	179	54.56	1.7	0.5	78	299	69	21.03	0.48	0.060	B	Yes	No
0570018	LAFARGE CORP.																	
	Gray Cement Silos #1,2,3,4,5,6,	1	LAFRG1	-5,200	8,100	98	29.87	1.6	0.5	77	298	39	11.89	1.23	0.155	B	Yes	No
	Grey Cement Stporage Silos #1,2,3,4,5,6	2	LAFRG2	-5,200	8,100	98	29.87	1.6	0.5	77	298	39	11.89	1.23	0.155	B	Yes	No
	Masonry Cement Silos #7,8,9,10,13,14,15 &16 & Two Rail/Trk S	3	LAFRG3	-5,200	8,100	102	31.09	1.9	0.6	77	298	64	19.51	2.80	0.353	B	Yes	No
	White Storage Silos #11,12,17,18,I&J	5	LAFRG5	-5,200	8,100	100	30.48	2.5	0.8	77	298	40	12.19	3.10	0.391	B	Yes	No
	Bulk Cement Storage Silos # 21 & 26	6	LAFRG6	-5,200	8,100	147	44.81	1.7	0.5	77	298	44	13.41	1.54	0.194	B	Yes	No
	Bulk Cement Storage Silo# 20,23 & 24	7	LAFRG7	-5,200	8,100	147	44.81	1.7	0.5	77	298	44	13.41	1.54	0.194	B	Yes	No
	Bulk Storage Silos # 19,22,25 & West Trk Stn	8	LAFRG8	-5,200	8,100	147	44.81	1.7	0.5	77	298	44	13.41	1.54	0.194	B	Yes	No
	East Truck Loading Stn	9	LAFRG9	-5,200	8,100	171	52.12	1.1	0.3	77	298	84	25.60	1.23	0.155	B	Yes	No
	Cement From Silos To Railcars And Trucks	11	LAFRG11	-5,200	8,100	47	14.33	1.3	0.4	77	298	62	18.90	1.30	0.164	B	Yes	No
	8 Clinker/Cement Storage Silos # 7a,7b,7c,8a,8b,9a,9b,10b	12	LAFRG12	-5,200	8,100	83	25.30	2.3	0.7	77	298	80	24.38	5.14	0.648	B	Yes	No
	Finish Mill #8- Two Separators	13	LAFRG13	-5,200	8,100	83	25.30	3.4	1.0	77	298	62	18.90	8.74	1.101	B	Yes	No
	Finish Mill #9- Raw Material Screening	16	LAFRG16	-5,200	8,100	83	25.30	3.4	1.0	77	298	62	18.90	8.74	1.101	B	Yes	No
	Finish Mill #9- Elevator And Drag Line	17	LAFRG17	-5,200	8,100	90	27.43	1.1	0.3	77	298	87	26.52	3.34	0.421	B	Yes	No
	Finish Mill#9- Raw Material Grinding	18	LAFRG18	-5,200	8,100	16	4.88	2.4	0.7	77	298	55	16.76	3.86	0.486	B	Yes	No
	Finish Mill #10- Screening Of Ground Raw Material	19	LAFRG19	-5,200	8,100	83	25.30	3.4	1.0	77	298	62	18.90	8.74	1.101	B	Yes	No
	Finish Mill #10b- Elevator And Drag Line	20	LAFRG20	-5,200	8,100	57	17.37	2.2	0.7	77	298	56	17.07	3.34	0.421	B	Yes	No
	Finish Mill #10- Raw Material Grinding	21	LAFRG21	-5,200	8,100	30	9.14	2.4	0.7	77	298	55	16.76	3.86	0.486	B	Yes	No
	Grey Cement Packer System	23	LAFRG23	-5,200	8,100	49	14.94	2.2	0.7	77	298	35	10.67	2.06	0.260	B	Yes	No
	Grey Cement Packaging System	24	LAFRG24	-5,200	8,100	49	14.94	2.2	0.7	77	298	35	10.67	2.06	0.260	B	Yes	No
	White Cement Packaging System	25	LAFRG25	-5,200	8,100	72	21.95	0.8	0.2	77	298	265	80.77	2.06	0.260	B	Yes	No
	Dust Collector #27 - Clinker Unloading From Ship	27	LAFRG27	-5,200	8,100	20	6.10	2.2	0.7	100	311	78	23.77	4.63	0.583	B	Yes	No
	Clinker Unloading Transfer Point 28	28	LAFRG28	-5,200	8,100	115	35.05	1.9	0.6	100	311	70	21.34	3.09	0.389	B	Yes	No
	Three Masonry Cement Packer -Screening & Storage	31	LAFRG31	-5,200	8,100	49	14.94	2.0	0.6	77	298	63	19.20	3.09	0.389	B	Yes	No
	Masonry Cement Packaging- Storage, Conveying & Packers	32	LAFRG32	-5,200	8,100	73	22.25	1.9	0.6	77	298	76	23.16	3.09	0.389	B	Yes	No
	Vacuum Unloading System W/Dust Collection Systems	42	LAFRG42	-5,200	8,100	174	53.04	1.5	0.5	77	298	75	22.86	2.05	0.258	B	Yes	No
	Vacuum Unloading System W/Dust Collection Systems	43	LAFRG43	-5,200	8,100	174	53.04	1.5	0.5	77	298	94	28.65	2.33	0.294	B	Yes	No
	Vacuum Unloading System W/Dust Collection Systems	44	LAFRG44	-5,200	8,100	60	18.29	1.0	0.3	77	298	112	34.14	1.36	0.171	B	Yes	No
	Vacuum Unloading System W/Dust Collection Systems	45	LAFRG45	-5,200	8,100	60	18.29	1.0	0.3	77	298	112	34.14	1.36	0.171	B	Yes	No
	Vacuum Unloading System W/Dust Collection Systems	50	LAFRG50	-5,200	8,100	123	37.49	1.0	0.3	77	298	84	25.60	1.03	0.130	B	Yes	No

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	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 lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570038	TECO - HOOKERS POINT STATION																	
	Boiler #1 298 MMBtu/Hr (Phase II Acid Rain Unit)	1	TECOHOK1	-4,900	8,500	280	85.34	11.3	3.4	356	453	82	24.99	37.30	4.700	B	Yes	No
	Boiler #2 298 MMBtu/Hr (Phase II Acid Rain Unit)	2	TECOHOK2	-4,900	8,500	280	85.34	11.3	3.4	356	453	82	24.99	37.30	4.700	B	Yes	No
	Boiler #3 411 MMBtu/Hr (Phase II Acid Rain Unit)	3	TECOHOK3	-4,900	8,500	280	85.34	12.0	3.7	341	445	62.7	19.11	51.40	6.476	B	Yes	No
	Boiler #4 411 MMBtu/Hr (Phase II Acid Rain Unit)	4	TECOHOK4	-4,900	8,500	280	85.34	12.0	3.7	341	445	62.7	19.11	51.40	6.476	B	Yes	No
	Boiler #5 610 MMBtu/Hr (Phase II Acid Rain Unit)	5	TECOHOK5	-4,900	8,500	280	85.34	11.3	3.4	356	453	82	24.99	76.30	9.614	B	Yes	No
	Boiler #6 778 MMBtu/Hr (Phase II Acid Rain Unit)	6	TECOHOK6	-4,900	8,500	280	85.34	9.4	2.9	329	438	75.2	22.92	97.30	12.260	B	Yes	No
0570127	CITY OF TAMPA -MCKAY BAY RRF																	
	Flyash Silo In Refuse To Energy Facility	5	MCK5	-2,700	9,710	57	17.37	2.0	0.6	200	366	11	3.35	0.36	0.045	C	Yes	Yes
	Municipal Waste Combustor & Auxiliary Burners - Unit No. 1	103	MCK103	-2,700	9,710	201	61.26	4.2	1.3	289	416	73.3	22.34	2.76	0.348	C	Yes	Yes
	Municipal Waste Combustor & Auxiliary Burners - Unit No 2	104	MCK104	-2,700	9,710	201	61.26	4.2	1.3	289	416	73.3	22.34	2.76	0.348	C	Yes	Yes
	Municipal Waste Combustor & Auxiliary Burners - Unit No 3	105	MCK105	-2,700	9,710	201	61.26	4.2	1.3	289	416	73.3	22.34	2.76	0.348	C	Yes	Yes
	Municipal Waste Combustor & Auxiliary Burners - Unit No 4	106	MCK106	-2,700	9,710	201	61.26	4.2	1.3	289	416	73.3	22.34	2.76	0.348	C	Yes	Yes
0570025	TRADEMARK NITROGEN CORP																	
	125 TPD Nitric Acid Plant W/ 2 Absorption Towers In Series	1	TRADE1	4,400	10,100	50	15.24	1.7	0.5	350	450	17.9	5.45	334.00	42.084	B	Yes	No
1030011	FPC - BARTOW PLANT																	
	Bartow Plant Unit #1, 300 Ft. Stack	1	FPCBAR1	-20,500	100	300	91.44	9.0	2.7	312	429	119	36.27	122.00	15.372	B	Yes	No
	Bartow Plt Boiler #2 Test Annually 300 Ft Stack	2	FPCBAR2	-20,500	100	300	91.44	9.0	2.7	305	425	102	31.09	131.70	16.594	B	Yes	No
	Bartow Plant Boiler #3 Test Annually 300 Ft Stack	3	FPCBAR3	-20,500	100	300	91.44	11.0	3.4	275	408	113	34.44	221.10	27.859	B	Yes	No
	Industrial Boiler-Bartow/Anclote Oil Pipeline Heater-15.5 MMBtu	4	FPCBAR4	-20,500	100	30	9.14	3.0	0.9	515	541	17	5.18	0.22	0.028	B	Yes	No
	Gas Turbine Peaking Unit # P-1	5	FPCBAR5	-20,500	100	45	13.72	17.3	5.3	930	772	73	22.25	25.40	3.200	B	Yes	No
	Gas Turbine Peaking Unit # P-2	6	FPCBAR6	-20,500	100	45	13.72	17.3	5.3	930	772	73	22.25	25.40	3.200	B	Yes	No
	Gas Turbine Peaking Unit # P-3	7	FPCBAR7	-20,500	100	45	13.72	17.3	5.3	930	772	73	22.25	25.40	3.200	B	Yes	No
	Gas Turbine Peaking Unit #P-4	8	FPCBAR8	-20,500	100	45	13.72	17.3	5.3	930	772	73	22.25	25.40	3.200	B	Yes	No
	Flyash System	9	FPCBAR9	-20,500	100	25	7.62	0.9	0.3	77	298	1.3	0.39	0.10	0.013	B	Yes	No
0810010	FLORIDA POWER & LIGHT - MANATEE																	
	Combined Facility		FPLMAN1	4,300	-28,400	475	144.78	26.2	8.0	307	426	77.5	23.62	1730	217.980	B	Yes	No
1030012	FPC - HIGGINS PLANT																	
	Fffsg-Sg 1 (Phase II, Acid Rain Unit)	1	FPCHIG1	-26,400	15,900	174	53.04	12.5	3.8	312	429	27	8.23	54.80	6.905	B	Yes	No
	Fffsg-Sg 2 (Phase II, Acid Rain Unit)	2	FPCHIG2	-26,400	15,900	174	53.04	12.5	3.8	310	428	27	8.23	52.30	6.590	B	Yes	No
	Fffsg-Sg 3 (Phase II, Acid Rain Unit)	3	FPCHIG3	-26,400	15,900	174	53.04	12.5	3.8	301	423	24	7.32	54.80	6.905	B	Yes	No
	Combustion Turbine Peaking Unit-Ctp 1	4	FPCHIG4	-26,400	15,900	55	16.76	15.1	4.6	850	728	93.1	28.38	20.16	2.540	B	Yes	No
	Combustion Turbine Peaking Unit-Ctp 2	5	FPCHIG5	-26,400	15,900	56	17.07	15.1	4.6	850	728	93.1	28.38	20.16	2.540	B	Yes	No
	Combustion Turbine Peaking Unit-Ctp 3	6	FPCHIG6	-26,400	15,900	55	16.76	15.1	4.6	850	728	93.1	28.38	22.47	2.831	B	Yes	No
	Combustion Turbine Peaking Unit-Ctp 4	7	FPCHIG7	-26,400	15,900	55	16.76	15.1	4.6	850	728	93.1	28.38	22.47	2.831	B	Yes	No
1050059	IMC-AGRICO CO (NEW WALES)																	
	Phosphate Rock Railcar Unloading (80 Tph Maximum Rate)	5	IMCWAL5	33,800	-3,100	40	12.19	3.0	0.9	108	315	58	17.68	6.40	0.806	E	No	Yes
	Ground Rock Silo W/Pneumatic 80 Tph Load Rate	6	IMCWAL6	33,800	-3,100	110	33.53	1.4	0.4	110	316	45	13.72	1.30	0.164	E	No	Yes
	Dap Plant No. 1 W/3 Teller Venturi Scrubbers,	9	IMCWAL9	33,800	-3,100	133	40.54	7.0	2.1	105	314	49	14.94	28.60	3.604	B	Yes	No
	Gtsp Plant (65 Tph) W/Teller Packed Bed Scrubber	10	IMCWAL10	33,800	-3,100	133	40.54	6.0	1.8	125	325	83.1	25.33	33.75	4.253	B	Yes	No
	Map Prill Tower W/Venturi Scrubber And Cyclonic Demister	11	IMCWAL11	33,800	-3,100	120	36.58	4.0	1.2	155	341	57	17.37	15.00	1.890	C	Yes	Yes
	Gtsp Storage (65 Tph) W/ Fume Scrubber	12	IMCWAL12	33,800	-3,100	133	40.54	6.0	1.8	108	315	61	18.59	28.70	3.616	E	No	Yes
	Animal Feed Shipping/Truck Loadout (200 Tph), With Baghouse	15	IMCWAL15	33,800	-3,100	65	19.81	1.0	0.3	105	314	169	51.51	1.08	0.136	C	Yes	Yes
	Ground Phosphate Rock Bin At Gtsp Plant	21	IMCWAL21	33,800	-3,100	82	24.99	1.0	0.3	105	314	53	16.15	4.80	0.605	E	No	Yes
	Animal Feed Storage Silos (3) -"A"Side	23	IMCWAL23	33,800	-3,100	114	34.75	1.0	0.3	105	314	33	10.06	4.75	0.599	C	Yes	Yes
	Animal Feed Storage/Shipping/Railcar Loadout	24	IMCWAL24	33,800	-3,100	103	31.39	1.0	0.3	105	314	140	42.67	3.60	0.454	C	Yes	Yes
	Animal Feed - (2) Limestone Silos	25	IMCWAL25	33,800	-3,100	119	36.27	1.0	0.3	105	314	127	38.71	3.60	0.454	C	Yes	Yes
	Animal Feed - Silica Storage Bin	26	IMCWAL26	33,800	-3,100	18	5.49	1.0	0.3	105	314	31	9.45	1.60	0.202	C	Yes	Yes
	Animal Feed Ingredient Granulation Plant	27	IMCWAL27	33,800	-3,100	172	52.43	8.0	2.4	130	328	66.3	20.21	36.80	4.637	C	Yes	Yes
	Animal Feed Storage Silos (3) - "B Side"	28	IMCWAL28	33,800	-3,100	114	34.75	1.0	0.3	105	314	33	10.06	4.75	0.599	C	Yes	Yes
	#1 Fertilizer Rail/Truck Shipping	29	IMCWAL29	33,800	-3,100	133	40.54	3.0	0.9	90	305	42.4	12.92	4.70	0.592	C	Yes	Yes
	Multifos Soda Ash Conveying System W/Baghouse	31	IMCWAL31	33,800	-3,100	108	32.92	0.8	0.2	80	300	31	9.45	3.60	0.454	C	Yes	Yes
	Multifos "A" Kiln Cooler W/Baghouse	32	IMCWAL32	33,800	-3,100	86	26.21	1.5	0.5	220	378	258	78.64	7.70	0.970	C	Yes	Yes

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	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 lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
	Multifos "B" Kiln Cooler W/Baghouse	33	IMCWAL33	33,800	-3,100	86	26.21	1.5	0.5	274	408	225	68.58	7.70	0.970	C	Yes	Yes
	Multifos Plant Milling & Sizing System West Baghouse	34	IMCWAL34	33,800	-3,100	71	21.64	1.7	0.5	125	325	87	26.52	0.93	0.118	C	Yes	Yes
	Multifos Milling & Sizing System East Baghouse	35	IMCWAL35	33,800	-3,100	71	21.64	1.0	0.3	100	311	253	77.11	0.93	0.118	C	Yes	Yes
	Multifos Production 1 Dryer 2 Kilns (A/B) For Multifos Plant	36	IMCWAL36	33,800	-3,100	172	52.43	4.5	1.4	105	314	52	15.85	29.83	3.759	C	Yes	Yes
	Map/Dap #2 Truck Loadout	37	IMCWAL37	33,800	-3,100	107	32.61	1.8	0.5	100	311	68	20.73	3.60	0.454	C	Yes	Yes
	Multifos Milling & Sizing Syst Surge Bin Baghouse	38	IMCWAL38	33,800	-3,100	65	19.81	1.1	0.3	100	311	79	24.08	7.50	0.945	C	Yes	Yes
	Gtsp Truck Loadout Facility W/Baghouse	41	IMCWAL41	33,800	-3,100	104	31.70	1.5	0.5	100	311	179	54.56	5.00	0.630	C	Yes	Yes
	Map/Dap No. 2 Rail Loadout	43	IMCWAL43	33,800	-3,100	104	31.70	1.6	0.5	105	314	70	21.34	3.60	0.454	C	Yes	Yes
	Dap Plant Ii - East Train	45	IMCWAL45	33,800	-3,100	171	52.12	6.0	1.8	110	316	58	17.68	6.40	0.806	C	Yes	Yes
	Dap Plant Ii - West Train	46	IMCWAL46	33,800	-3,100	171	52.12	6.0	1.8	110	316	58	17.68	6.40	0.806	C	Yes	Yes
	Dap Ii West Product Cooler	47	IMCWAL47	33,800	-3,100	147	44.81	4.3	1.3	175	353	68.9	21.00	4.22	0.532	C	Yes	Yes
	Uranium Recovery Acid Cleanup Scrubber	48	IMCWAL48	33,800	-3,100	60	18.29	3.5	1.1	80	300	31.2	9.51	1.00	0.126	C	Yes	Yes
	Uranium Refinery W/Baghouse	50	IMCWAL51	33,800	-3,100	100	30.48	1.8	0.5	102	312	37	11.28	1.50	0.189	C	Yes	Yes
	Uranium Recovery - Clay Storage Bin	51	IMCWAL52	33,800	-3,100	86	26.21	0.7	0.2	80	300	54	16.46	1.50	0.189	C	Yes	Yes
	Animal Feed - Limestone Feed Bin	52	IMCWAL53	33,800	-3,100	114	34.75	1.0	0.3	105	314	33	10.06	4.75	0.599	C	Yes	Yes
	Dap Plant #1 Product Cooler	54	IMCWAL54	33,800	-3,100	107	32.61	3.5	1.1	150	339	77	23.47	7.70	0.970	E	No	Yes
	Map Plant Cooler	55	IMCWAL55	33,800	-3,100	25	7.62	4.3	1.3	140	333	34	10.36	5.14	0.648	C	Yes	Yes
	Dap Ii East Product Cooler	56	IMCWAL56	33,800	-3,100	170	51.82	5.0	1.5	110	316	64.5	19.66	6.06	0.764	C	Yes	Yes
	Gtsp Railcar Loadout Facility W/ Baghouse	59	IMCWAL59	33,800	-3,100	104	31.70	1.5	0.5	100	311	68.9	21.00	5.00	0.630	C	Yes	Yes
	5000 Ton Molten Sulfur Storage Tank (Tank #3)	62	IMCWAL62	33,800	-3,100	40	12.19	2.0	0.6	240	389	4.2	1.28	0.60	0.076	C	Yes	Yes
	1500 Ton Truck Unloading Pit, Sulfur Pit Cannon.	63	IMCWAL63	33,800	-3,100	40	12.19	2.0	0.6	240	389	4.2	1.28	0.20	0.025	C	Yes	Yes
	350 Ton Truck Unloading Pit, Sulfur Pit Cannon.	64	IMCWAL64	33,800	-3,100	40	12.19	2.0	0.6	240	389	4.2	1.28	0.10	0.013	C	Yes	Yes
	Molten Sulfur Storage - Railcar Unloading Pit	65	IMCWAL65	33,800	-3,100	40	12.19	2.0	0.6	240	389	4.2	1.28	0.20	0.025	C	Yes	Yes
	200 Ton Molten Sulfur Transfer Pit.	66	IMCWAL66	33,800	-3,100	40	12.19	2.0	0.6	240	389	4.2	1.28	0.10	0.013	C	Yes	Yes
	1500 Ton Truck Unloading Pit, Sulfur Pit Front Vent	67	IMCWAL67	33,800	-3,100	25	7.62	0.1	0.03	90	305	0.003	0.001	0.20	0.025	C	Yes	Yes
	1500 Ton Truck Unloading Pit, Sulfur Pit Rear Vent.	68	IMCWAL68	33,800	-3,100	25	7.62	0.1	0.03	90	305	0.003	0.001	0.20	0.025	C	Yes	Yes
	350 Ton Truck Unloading Pit, Sulfur Pit Vent	69	IMCWAL69	33,800	-3,100	25	7.62	0.1	0.03	90	305	0.003	0.001	0.10	0.013	C	Yes	Yes
	Limestone Storage Silo With Baghouse.	70	IMCWAL70	33,800	-3,100	110	33.53	0.8	0.2	110	316	113.2	34.50	0.70	0.088	C	Yes	Yes
	Kiln C Scrubber Stack - Multifos Plant	74	IMCWAL74	33,800	-3,100	172	52.43	4.5	1.4	105	314	70.2	21.40	14.30	1.802	C	Yes	Yes
	Multifos Kiln C Cooler Baghouse	75	IMCWAL75	33,800	-3,100	86	26.21	3.0	0.9	250	394	106.1	32.34	1.90	0.239	C	Yes	Yes
	Multifos Kiln C Milling & Sizing Baghouse	76	IMCWAL76	33,800	-3,100	90	27.43	1.5	0.5	130	328	113.2	34.50	1.90	0.239	C	Yes	Yes
1050057	IMC PHOSPHATES (NICHOLS)																	
	Phosphoric Acid Plant	1	IMCNIC1	35,500	1,700	42	12.80	4.0	1.2	100	311	34	10.36	39.00	4.914	B	Yes	No
	Dap Cooler Using Venturi Scrubber With Cyclonic Mist Separat	2	IMCNIC2	35,500	1,700	52	15.85	2.5	0.8	120	322	66	20.12	11.00	1.386	B	Yes	No
	Dap Plant Dryer	3	IMCNIC3	35,500	1,700	80	24.38	3.5	1.1	130	328	78	23.77	11.00	1.386	B	Yes	No
	Dap Plt Scrubber 4a Serves Reactor/Granulator	4	IMCNIC4	35,500	1,700	72	21.95	3.2	1.0	190	361	101	30.78	11.00	1.386	B	Yes	No
	North Ball Mill	9	IMCNIC9	35,500	1,700	207	63.09	1.4	0.4	135	330	69	21.03	5.00	0.630	B	Yes	No
	South Ball Mill	10	IMCNIC10	35,500	1,700	207	63.09	1.4	0.4	135	330	69	21.03	5.00	0.630	B	Yes	No
	Phosphate Rock Dryer W/ Wet Scrubber	12	IMCNIC12	35,500	1,700	81	24.69	7.5	2.3	130	328	12	3.66	35.24	4.440	B	Yes	No
	Leffel Scotch Marine Package Boiler (North Standby Boiler)	15	IMCNIC15	35,500	1,700	27	8.23	2.0	0.6	500	533	45	13.72	0.36	0.045	B	Yes	No
	Babcock-Wilcox Package Boiler Total Emissions On Pt 14	16	IMCNIC16	35,500	1,700	39	11.89	3.2	1.0	500	533	29	8.84	0.72	0.091	B	Yes	No
	Dry Phosphate Rock Storage Bin -- North	19	IMCNIC19	35,500	1,700	207	63.09	0.9	0.3	140	333	168	51.21	11.00	1.386	B	Yes	No
	Molten Sulfur Storage & Handling - South Storage Tank	21	IMCNIC21	35,500	1,700	6	1.83	0.8	0.2	77	298	11.2	3.40	0.40	0.050	B	Yes	No
1050034	IMC-AGRICO CO. (CFMO)																	
	Raymond Mills 1 And 2 Grinders W/Scrubbers @ Kingsford Mine	2	IMCFMO2	35,300	-6,800	60	18.29	2.5	0.8	110	316	64	19.51	33.50	4.221	B	Yes	No
	Raymond Mill No 3 Grinder W/Scrubber @ Kingsford Mine	3	IMCFMO3	35,300	-6,800	58	17.68	1.9	0.6	100	311	49	14.94	30.00	3.780	B	Yes	No
	Phos Rk Dryer W/Scrubber @ Kingsford Mine	4	IMCFMO4	35,300	-6,800	70	21.34	7.0	2.1	165	347	47	14.33	44.20	5.569	B	Yes	No
	Phos Rock Transfer And Storage Silos W/Scrubber @ Kingsford	5	IMCFMO5	35,300	-6,800	106	32.31	2.5	0.8	95	308	67	20.42	20.00	2.520	B	Yes	No
	Unground Phosphate Rock Rr Car Load Out @ Kingsford Mine	6	IMCFMO6	35,300	-6,800	35	10.67	2.5	0.8	75	297	33	10.06	20.00	2.520	B	Yes	No
	Boiler @ Four Corners Mine	8	IMCFMO8	35,300	-6,800	26	7.92	1.0	0.3	400	478	23.5	7.16	0.06	0.007	C	Yes	Yes
	Magnetite Storage Bin @ Four Corners Mine (009)	9	IMCFMO9	35,300	-6,800	122	37.19	0.6	0.2	77	298	29.5	8.99	0.13	0.016	C	Yes	Yes
	Ferrosilicon Storage Bin @ Four Corners Mine	10	IMCFMO10	35,300	-6,800	122	37.19	0.6	0.2	77	298	22.4	6.83	1.37	0.173	C	Yes	Yes

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	Relative Location East (m)	Relative Location North (m)	Height ft	Height m	Diameter ft	Diameter m	Temperature °F	Temperature K	Velocity ft/s	Velocity ms	Emission Rate lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
	PSD Expanding Source		12IMCF	35,300	-6,800	125	38.10	8.0	2.4	151	339	49.7	15.15	-25.20	-3.175	E	No	Yes
	PSD Expanding Source		13IMCF	35,300	-6,800	125	38.10	8.0	2.4	151	339	55.1	16.79	-24.90	-3.137	E	No	Yes
	PSD Expanding Source		14IMCF	35,300	-6,800	150	45.72	2.7	0.8	110	316	27.7	8.44	-51.20	-6.451	E	No	Yes
	Dryer No. 1 @ Noralyn Mine (011)	11	IMCFMO11	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	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	35,300	-6,800	135	41.15	2.8	0.9	60	289	55.0	16.8	15.0	1.89	B	Yes	No
1030244	A-AMERICAN RENT ALL																	
	Concrete Batching Plant	1	AAMER1	-38,800	-3,300	5.0	1.52	2.0	0.6	90	305	10 5	3.19	500	63.000	C	Yes	Yes
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP																	
	Graham Scotch Marine Type Boiler	1	CFIPL1	25,100	33,500	25	7.62	3.5	1.1	550	561	58	17.68	0.24	0.030	C	Yes	Yes
	B Phos Acid Plant With Scrubber	9	CFIPL9	25,100	33,500	119	36.27	4.0	1.2	106	314	44	13.41	31.05	3.912	C	Yes	Yes
	A Dorr Oliver Dap Plant W/ Venturi & Packed Bed Scrubber	10	CFIPL10	25,100	33,500	94	28.65	10.0	3.0	128	326	26	7.92	32.66	4.115	C	Yes	Yes
	Z Dorr-Oliver Dap Plant With Venturi Scrubber And Packed B	11	CFIPL11	25,100	33,500	180	54.86	9.2	2.8	137	331	43	13.11	35.56	4 481	C	Yes	Yes
	X Gtsp/Dap/Map Plant With Scrubbers	12	CFIPL12	25,100	33,500	180	54.86	9.2	2.8	105	314	26	7.92	32 60	4.108	C	Yes	Yes
	Y Gtsp/Dap/Map Plant With Scrubbers	13	CFIPL13	25,100	33,500	180	54.86	9.2	2.8	77	298	9.9	3.02	15.30	1.928	C	Yes	Yes
	Storage Bldg. A Shares Scrubber W/ Bldg. B (Pt 18)&B Shipping	14	CFIPL14	25,100	33,500	115	35.05	9.2	2.8	80	300	36	10.97	37.50	4.725	C	Yes	Yes
	A Shipping. Materials Handling Of Dap & Gt Sp	15	CFIPL15	25,100	33,500	90	27.43	1.7	0.5	77	298	62	18.90	5 00	0.630	C	Yes	Yes
	Sizing/Screening Operation In Bldg."B"(Equipped With Baghouse)	18	CFIPL18	25,100	33,500	33	10 06	3.3	1.0	78	299	19	5.79	5 00	0 630	C	Yes	Yes
	Truck Loading Station At "B" Shipping.	19	CFIPL19	25,100	33,500	115	35.05	9.2	2.8	80	300	35	10.67	0.50	0.063	C	Yes	Yes
	2600 Ton Molten Sulfur Storage Tank	22	CFIPL22	25,100	33,500	8	2 44	0.9	0.3	212	373	5	1.52	0.20	0 025	C	Yes	Yes
	Truck Pit A, 679 Tons Molten Sulfur Storage	23	CFIPL23	25,100	33,500	12	3 66	0.3	0.1	212	373	5	1.52	0 10	0.013	C	Yes	Yes
	Molten Sulfur Storage & Handling System	24	CFIPL24	25,100	33,500	12	3.66	0.3	0.1	212	373	5	1.52	0 54	0.068	C	Yes	Yes
	Uranium Recovery Module, Acid Clean Up Scrubber	32	CFIPL32	25,100	33,500	60	18.29	4 0	1 2	118	321	46 4	14.14	3 00	0.378	C	Yes	Yes
	Clay Unloading Operation With Baghouse	34	CFIPL34	25,100	33,500	85	25.91	0.5	0.2	77	298	38	11.58	21.17	2.667	C	Yes	Yes
0810007	TROPICANA																	
	Unit 3	3	TROP3	-16,100	-41,600	95	28.96	3	0.9	140	333	35.2	10.73	95.2	11.995	C	Yes	Yes
	Unit8	8	TROP8	-16,100	-41,600	50	15.24	10.6	3.2	90	305	43.3	13.20	111.2	14.011	C	Yes	Yes
1050004	LAKELAND ELECTRIC - MCINTOSH																	
	McIntosh Unit 1- FFFSG (Phase II Acid Rain Unit)	1	MCINT1	46,100	23,700	150	45.72	9	2.7	277	409	81.2	24.75	520.0	65.520	B	Yes	No
	Diesel Engine Peaking Unit 2	2	MCINT2	46,100	23,700	20	6.10	2.6	0.8	715	653	77	23.47	1.75	0.221	B	Yes	No
	Diesel Engine Peaking Unit 3	3	MCINT3	46,100	23,700	20	6.10	2.6	0.8	715	653	77	23.47	1.75	0.221	B	Yes	No
	Gas Turbine Peaking Unit 1	4	MCINT4	46,100	23,700	35	10.67	13.5	4.1	900	755	79.5	24.23	20 24	2.550	B	Yes	No
	McIntosh Unit 2 FFFSG(Phase II Acid Rain Unit)	5	MCINT5	46,100	23,700	157	47.85	10.5	3.2	277	409	73.2	22.31	519	65.369	B	Yes	No
	McIntosh Unit 3 FFFSG (Phase II Acid Rain Unit)	6	MCINT6	46,100	23,700	250	76.20	18	5.5	167	348	82.6	25.18	1196	150.696	C	Yes	Yes
	250 MW Combustion Turbine (Simple Cycle Operation). Unit 5	28	MCINT28	46,100	23,700	85	25.91	28	8.5	1095	864	82 7	25.21	49	6 174	C	Yes	Yes
1010017	FLORIDA POWER CORP., ANCLOTE POWER PLANT																	
	Steam Turbine Gen. Anclote Unit No.1, 540MW, 4,964.4MMBtu	1	FPCANC1	-38,500	36,200	499	152.10	24	7.3	320	433	62	18.90	621	78.183	B	Yes	No
	525 Mw #6 Oil Fired Steam Generator, 4850 Mmbtu/Hr	2	FPCANC2	-38,500	36,200	499	152.10	24	7.3	320	433	62	18.90	606	76.388	B	Yes	No
0970014	FPC-Intercession City																	
	CT Peaking Units 1 - 6	1-6	FPCINT16	83,400	43,500	48	14.63	14 63	4.5	760	678	174.9	53.31	250.7	31.586	B	Yes	No
	CTs 7 - 10	7-10	FPCIN710	83,400	43,500	50	15 24	13.75	4.2	1043	835	139 4	42 49	60 0	7.560	C	Yes	Yes
	CT 11	11	FPCINT11	83,400	43,500	75	22 86	19	5 8	1034	830	139 4	42.49	17 0	2.142	C	Yes	Yes

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	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 ms	Emission Rate lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0170004	FPC-Crystal River																	
	Fossil Fuel Steam Generator Unit 1	1	FPCCR1	-28,600	122,000	499.0	152.10	15	4.6	291	417	132.8	40.48	1125.0	141.750	B	Yes	No
	Fossil Fuel Steam Generator Unit 2	2	FPCCR2	-28,600	122,000	502.0	153.01	16	4.9	300	422	160.1	48.80	1438.5	181.251	B	Yes	No
	Fossil Fuel Steam Generator- 5	3	FPCCR3	-28,600	122,000	585.0	178.31 [f]	25.5	7.8	253	396	68.9	21.00	667.0	84.042	C	Yes	Yes
	Fossil Fuel Steam Generator- 4	4	FPCCR4	-28,600	122,000	585.0	178.31 [f]	25.5	7.8	253	396	68.9	21.00	667.0	84.042	C	Yes	Yes
	Fly Ash Transfer From FFSG Unit 1	6	FPCCR6	-28,600	122,000	8.0	2.44	0.8	0.2	77	298	60.4	18.41	3.5	0.444	C	Yes	Yes
	Fly Ash Storage Silo for FFSG Units 1 & 2	8	FPCCR8	-28,600	122,000	93.0	28.35	1.5	0.5	77	298	24	7.32	0.6	0.074	C	Yes	Yes
	Fly Ash Transfer From (4) FFSG Unit 2	9	FPCCR9	-28,600	122,000	8.0	2.44	0.8	0.2	77	298	73	22.25	2.2	0.277	C	Yes	Yes
	Fly Ash Transfer From (5) FFSG Unit 2	10	FPCCR10	-28,600	122,000	8.0	2.44	0.8	0.2	77	298	92.8	28.29	2.2	0.277	C	Yes	Yes
	Cooling Towers,FFSG Units 1,2 and Nuclear Unit 3	13	FPCCR13	-28,600	122,000	53.0	16.15	34.5	10.5	77	298	26	7.92	428.0	53.928	C	Yes	Yes
	Bottom Ash Storage Silo for FFSG Units 1 & 2	14	FPCCR14	-28,600	122,000	5.0	1.52	0.8	0.2	77	298	72.946	22.23	13.0	1.642	C	Yes	Yes
	Cooling Towers for FFSG Units 4 & 5	15	FPCCR15	-28,600	122,000	443.0	135.03	214	65.2	100	311	10.8012	3.29	175.0	22.050	C	Yes	Yes
	FUGITIVE SOURCES																	
05700040	TECO GANNON--COAL HANDLING																	
	COAL HANDLING-AAQS/PSD		OMH2T3	-2,800	5,000	16.40	5.00	NA	NA [d]	32.8	0 [d]	0.00	0.00 [d]	0.004	0.0005	C	Yes	Yes
	COAL HANDLING-AAQS		OMHFH21	-2,800	5,000	29.86	9.10	3.3	1	0	0 [e]	0.00	0.00 [e]	1.201	0.151	B	Yes	No
	COAL HANDLING-PSD		OMHFH21	-2,800	5,000	29.86	9.10	3.3	1	0	0 [e]	0.03	0.01 [e]	1.150	0.145	B	No	Yes
	COAL HANDLING-AAQS/PSD		FH22TH46	-2,800	5,000	49.21	15.00	NA	NA [d]	229.7	0 [d]	0.00	0.00 [d]	0.001	0.00013	C	Yes	Yes
	COAL HANDLING-AAQS		FH24T43	-2,800	5,000	155.18	47.30	0.8	0.23	0	0 [e]	0.00	0.00 [e]	1.419	0.179	B	Yes	No
	COAL HANDLING-PSD		FH24T43	-2,800	5,000	29.86	9.10	3.3	1	0	0 [e]	0.03	0.01 [e]	0.001	0.00013	B	No	Yes
	COAL HANDLING-AAQS		ALT1TOT5	-2,800	5,000	10.17	3.10	3.3	1	0	0 [e]	0.00	0.00 [e]	0.110	0.014	B	Yes	No
	COAL HANDLING-PSD		ALT1TOT5	-2,800	5,000	0.00	0.00	0.0	0	0	0 [e]	3.28	1.00 [e]	0.110	0.014	B	No	Yes
	IMC AGRICO--VOLUME SOURCES																	
	VOLUME SOURCES		IMCAGFUG	-800	-6,400	0	0	NA	NA [c]	0	0 [c]		0.00 [c]	0.000	0.000	C	Yes	Yes
	BIG BEND TRANSFER, CO. L.L.C.--TRUCK TRAFFIC																	
	VOLUME SOURCE--TRUCK TRAFFIC		RD1TO10	-733	-6370	23.95	7.3	NA	NA [c]	48.36	14.74 [c]	0.00	0.00 [c]	0.627	0.079	B	Yes	No
	VOLUME SOURCE--TRUCK TRAFFIC		RD11TO20	-1038	-6370	26.25	8	NA	NA [c]	48.36	14.74 [c]	0.00	0.00 [c]	0.627	0.079	B	Yes	No
	VOLUME SOURCE--TRUCK TRAFFIC		RD21TO30	-1343	-6370	24.93	7.6	NA	NA [c]	48.36	14.74 [c]	0.00	0.00 [c]	0.627	0.079	B	Yes	No
	VOLUME SOURCE--TRUCK TRAFFIC		RD31TO40	-1648	-6395	102.03	31.1	NA	NA [c]	48.36	14.74 [c]	0.00	0.00 [c]	0.627	0.079	B	Yes	No
	VOLUME SOURCE--TRUCK TRAFFIC		RD41TO46	-1800	-6364	0	0	NA	NA [c]	48.36	14.74 [c]	0.00	0.00 [c]	0.376	0.047	B	Yes	No
0570039	TECO - BIG BEND STATION-COAL HANDLING																	
	COAL HANDLING-AAQS		FH1TLS8	-1000	-7500	23.95	7.3	3.28	1.0	0	0	0.0033	0.0010 [e]	7.270	0.916	B	Yes	No
	COAL HANDLING-PSD		FH1TLS8	-1000	-7500	24.41	7.4	3.28	1.0	0	0	0.0033	0.0010 [e]	1.429	0.180	B	No	Yes
	COAL HANDLING-AAQS		FH9TGH12	-1000	-7500	26.25	8.0	NA	NA [d]	147.64	45	147.64	45.00 [d]	0.007	0.0009	B	Yes	No
	COAL HANDLING-PSD		FH9TGH12	-1000	-7500	20.01	6.1	NA	NA [d]	124.67	38	124.67	38.00 [d]	0.002	0.0003	B	No	Yes
	COAL HANDLING-AAQS		F18TGH14	-1000	-7500	24.93	7.6	NA	NA [d]	1148.29	350	200.13	61.00 [d]	0.005	0.0006	B	Yes	No
	COAL HANDLING-PSD		F18TGH14	-1000	-7500	20.01	6.1	NA	NA [d]	800.52	244	400.26	122.00 [d]	0.005	0.0006	B	No	Yes
	COAL HANDLING-AAQS		FA1T8GH1	-1000	-7500	102.03	31.1	2.49	0.76	394	474	52.00	15.85 [e]	9.794	1.234	B	Yes	No
	COAL HANDLING-PSD		FA1T8GH1	-1000	-7500	112.86	34.4	0.89	0.27	15.58	244	51.12	15.58 [e]	0.230	0.029	B	No	Yes

Note:
[b] Assumed velocity.

[c] Volume source dimensions based on methods presented in accordance with ISCST3 User's Manual:

Table C-1. Summary of PM Sources Included in the Air Modeling Analysis, Cargill Riverview

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	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 lb/hr	Emission Rate g/s	Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
				Height (m)	Sigma Y (m)	Sigma Z (m)												
	IMC AGRICO																	
	VOLUME SOURCES		IMCAGFUG	0.00	0.00	0.00												
	BIG BEND TRANSFER, CO. L.L.C.																	
	VOLUME SOURCE--TRUCK TRAFFIC		RD1TO10	7.3	14.74	0												
	VOLUME SOURCE--TRUCK TRAFFIC		RD11TO20	8	14.74	0												
	VOLUME SOURCE--TRUCK TRAFFIC		RD21TO30	7.6	14.74	0												
	VOLUME SOURCE--TRUCK TRAFFIC		RD31TO40	31.1	14.74	0												
	VOLUME SOURCE--TRUCK TRAFFIC		RD41TO46	0.0	14.74	0												

[d] Area source dimensions based on methods presented in accordance with ISCST3 User's Manual:

Facility ID	Facility / Emission Unit Description	Unit No.	ISCST Source ID	Height (m)	X initial (m)	Y initial (m)
05700040	TECO GANNON					
	COAL HANDLING-AAQS/PSD		OMH2T3	5.00	0	0.0
	COAL HANDLING-AAQS/PSD		FH22TH46	15.00	0	0.0
0570039	TECO - BIG BEND STATION					
	COAL HANDLING-AAQS		FH9TGH12	8.00000026	45	45.00006
	COAL HANDLING-PSD		FH9TGH12	6.09999898	38	38.00003
	COAL HANDLING-AAQS		F18TGH14	7.59999902	350	60.99993
	COAL HANDLING-PSD		F18TGH14	6.09999898	244	121.9999

[e] Fugitive point sources.

[f] FPC Crystal River Units 3 and 4 are at GEP height.

APPENDIX D

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

D.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 Riverview 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 86 km north-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, and
- Regional haze analysis.

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.

D.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, 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.

D.3 MODEL SELECTION AND SETTINGS

The CALPUFF air modeling system was used 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.

D.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 D-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 D-2.

D.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the facility's emissions, 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.

D.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.

D.5 METEOROLOGICAL DATA

D.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.

D.5.2 CALMET SETTINGS

The CALMET settings contained in Table D-3 were used for the refined modeling analysis.

D.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.

D.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.

D.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 D-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.

D.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 D-4.

D.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 D-5.

D.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 D-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 D-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 D-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 D-4. Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates			Anemometer Height (m)
			Easting (km)	Northing (km)	Zone	
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 D-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name	Station Number	UTM Coordinate Easting (km)	UTM Coordinate Northing (km)	UTM Coordinate 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

APPENDIX E

**UPDATED SITE-SPECIFIC TEST PLAN
FOR THE GTSP STORAGE BUILDING
[PER 40 CFR 63.630(c)]**

Test Program Summary for Fluoride Emissions
From No. 4 GTSP Storage Building
Cargill Riverview Facility

The following is a test program summary for measuring gaseous and water soluble fluoride emissions from the No. 4 GTSP storage building at the Cargill Fertilizer Plant in Hillsborough County, Florida. The measurements will be made in accordance with the protocol that was previously approved by the Florida Department of Environmental Protection (see attached).

Due to the configuration of the No. 2 storage building (the amount of open space in the building), FDEP had previously agreed that fluoride emission measurements could be made only on the No. 4 storage building and that these results could be extrapolated to estimate emissions from the No. 2 storage building. Hence, this test program summary is for fluoride measurements from only the No. 4 storage building.

The plan allows one and a half days to make preliminary measurements of air flow rates through the storage building (including smoke tracer studies, if necessary) and to set up the samplers. This task will be conducted by three individuals. The testing will involve three 8-hour tests. Based on this schedule, it is anticipated that all of the testing will be conducted during a five day week (Monday-Friday).

The GTSP production plant is expected to operate within 10 percent of permitted capacity during the test period and the product will be dropped into the GTSP storage building as close as possible to where the product enters the storage building. During the test period, the storage building should be filled to at least 10 percent capacity and 20 percent of the material in the building should be GTSP product produced no more than five days prior to the test. During one of the 8-hour test periods, GTSP should outloaded from the building at the normal outloading rate.

Approximately 60 samples will be analyzed for total fluorides (Method 13 B without distillation). The laboratory at Cargill's facility will conduct these analyses, unless another certified laboratory is contracted by Cargill.

Included in the 60 samples will be field blanks and an EPA audit sample. The field blanks will consist of samples recovered from blank sample trains; trains identical to those used for sampling. The field blank sample trains will be prepared in a manner identical to those trains used for sampling. The field blank trains will be sealed, transported to a typical sampling location and will remain there for the duration of a Sampling Run. At the end of the Run, the contents of the field blank train will be recovered in a manner identical to sample recovery from the sampling trains and the recovered blank samples will be analyzed with the Run samples. Two field blanks will be prepared for each of the three Sample Runs; six field blanks total.

In addition to the field blanks, one EPA audit sample will be provided to the laboratory for analysis. The results of the audit sample analysis will be sent directly to EPA with a copy to Koogler & Associates.

Other than sample analysis and the recording of wind speed and wind direction, Koogler & Associates will furnish all test equipment and personnel to conduct three 8-hour fluoride emission tests from the No. 4 GTSP storage building; including the ventilation rate measurements.

METHOD FOR DETERMINATION OF GASEOUS
AND WATER SOLUBLE FLUORIDE EMISSIONS
FROM A GTSP STORAGE BUILDING

1. Principle and Applicability

1.1 Principle. Gaseous and water soluble fluorides are withdrawn from various predetermined sample points in the roof monitor and leeward eave vents using several modified EPA Method 13B sampling trains. The concentration of fluoride captured in the sample line, impinger water and filter of each sample train is then determined, using a specific ion electrode.

1.2 Applicability. This method may be used, subject to Department approval and possible site-specific modifications, for determining gaseous and water soluble fluoride emissions from GTSP storage buildings and similar structures.

2. Apparatus

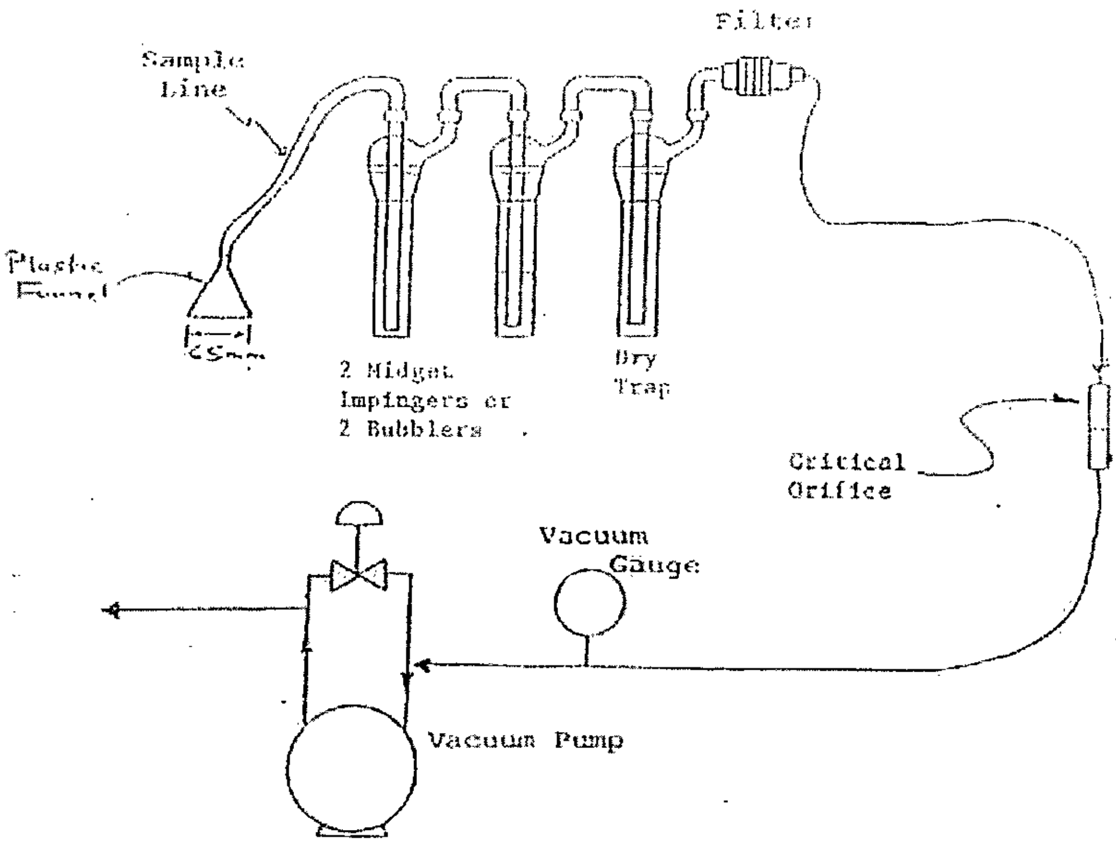
2.1 Sampling Train. Sampling equipment shall meet the specifications listed for Method 13B of 40CFR60, Appendix A with several exceptions as follows. See Figure 1 for sampling train schematic.

2.1.1 Sample Inlet. The standard sampling nozzle and probe of the 13B sample train shall be replaced with a sample inlet constructed of a material inert to fluoride. The inlet shall consist of an approximate 65 mm diameter funnel fitted into the free end of the sample line. The funnel shall be inverted (facing downward) to sample the area of maximum flow out of the building at the sampling site.

2.1.2 Sampling Line. The sampling line connecting the sample inlet to the impinger assembly shall be leak free and of a material inert to fluoride.

2.1.3 Impinger Assembly. The impinger train shall consist of three (3) midget impingers followed by a dry trap. All three impingers will be of the standard design with standard tips. Each of the three (3) impingers will be charged with 15 ml of distilled-deionized water. The dry trap shall be empty.

Alternatively, the impinger assembly can consist of two polypropylene bubblers followed by a dry trap. Each of the two bubblers will be filled with 50 ml of deionized-distilled water. The polypropylene tube shall be 32 mm in diameter and 164 mm long. The cap of the absorber must be polypropylene cap with two ports. A glass impinger



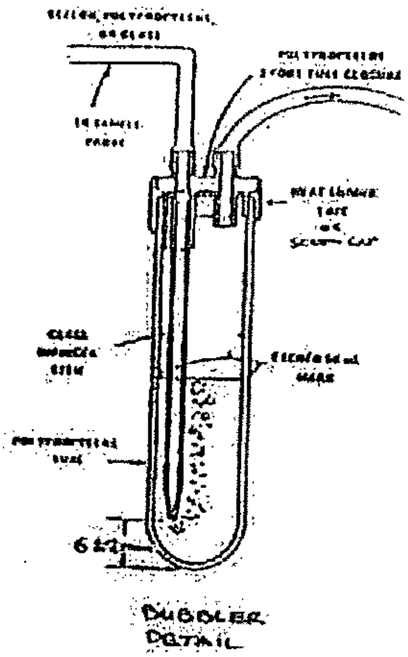
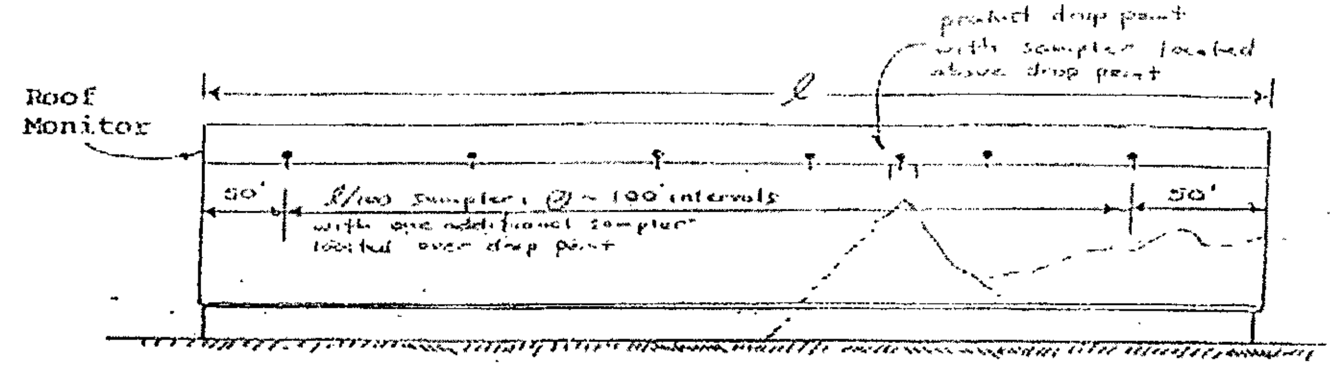


FIGURE 1

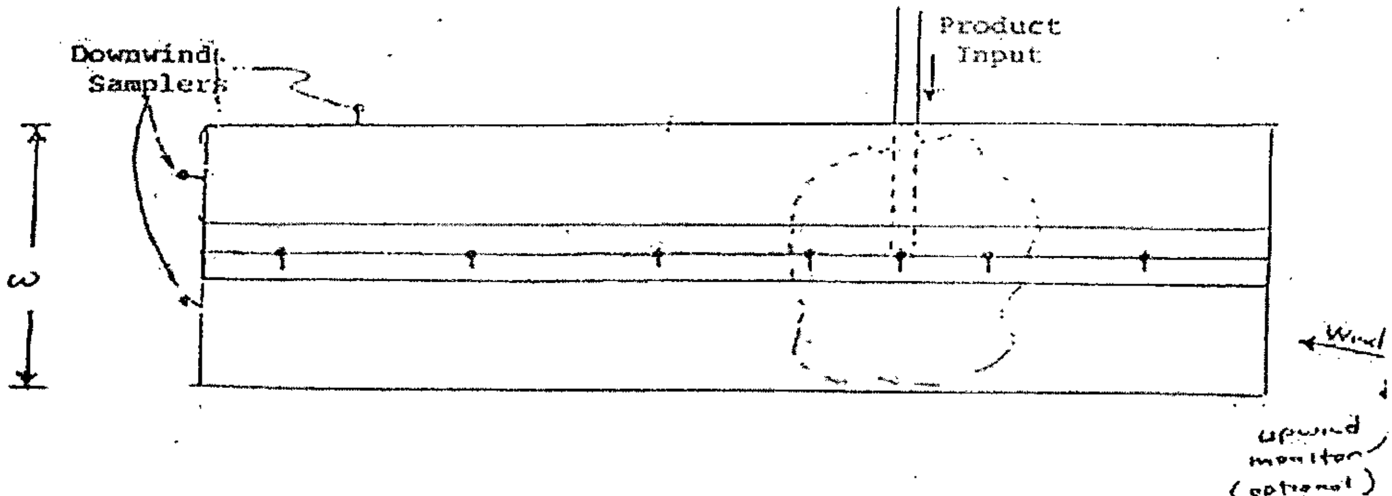
SAMPLING TRAIN

FIGURE 2

SAMPLER LOCATIONS



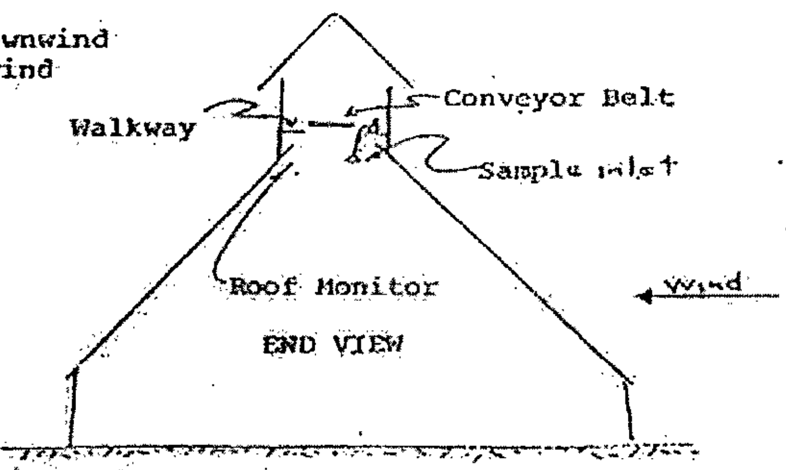
ELEVATION



PLAN VIEW

↓ - Indicate sampler locations

NOTE: Location of upwind & downwind samplers dependent on wind direction.



END VIEW

stem, 6 mm in diameter and 158 mm long, is inserted into one port of the absorber cap. The tip of the stem is tapered, as is the tip of the standard midget impinger. Clearance from the bottom of the absorber to the tip of the stem must be 6 ± 2 mm.

After the first run, specific ion electrode readings will be taken on the three impingers from the sampling train at the site that would reasonably be expected to have the highest fluoride concentrations. If over five percent of the captured fluoride is in the third impinger (or second bubbler), the volume of water in all the sampling equipment will be increased by an amount specified by the Department representative before the second run begins.

2.1.4 Filter. A Whatman No. 1 or comparable filter will be located behind the impinger assembly.

2.1.5 Metering System. The metering system as described in EPA Method 13B can be replaced with a critical flow device and a vacuum pump equipped with a vacuum gage that would allow a constant sampling rate of 1.0 liters per minute. All other necessary equipment will be as described in EPA Method 13B.

2.1.6 Hot-Wire Anemometers. Hot-wire anemometers will be used to measure air velocities in the building. The anemometers shall be calibrated in a manner acceptable to the Department prior to the test. The calibration range shall include the expected velocities within the building, i.e., 0.2-10.0 fps.

2.1.7 Flow Direction Indicator. Since the hot-wire anemometers that will be used to measure velocities cannot measure the direction of those velocities, a device must be used to indicate flow directions at all of the designated velocity measurement points. The type of device used will be at the discretion of the company, subject to approval by the Department.

2.1.8 Wind Speed and Direction Indicator. A wind speed and direction indicator will be located in the vicinity of the GTSP storage building during the sampling effort.

2.2 Sampling Recovery.

2.2.1 Probe Brushes and Extensions. Probe brushes and extensions will be of a material inert to fluoride.

2.2.2 Sample Containers. All containers used to recover wash and impinger solutions will be of a polyethylene material inert to fluoride. Containers will be washed with HCl prior to use.

2.3 Analysis. All analytical equipment will be as described in Method 13B with the exception that all apparatus associated with he fusion and distillation steps will be eliminated.

3. <u>Reagents</u>

Reagents for sampling and analysis will be the same as those described in EPA Method 13B with the exception that all reagents associated with the fusion and distillation steps will be eliminated.

4. <u>Procedure</u>

4.1 Pretest Preparation

4.1.1 Plant. Prior to and during all test runs, the GTSP plant will be operated within 10 percent of its permitted capacity. The storage building will be filled to at least 10 percent capacity, of which 20 percent shall be freshly manufactured GTSP (produced no more than five days prior to the test).

4.1.2 Storage Building. Prior to and during the test, all openings, with the exception of the roof monitor, eave vent, end wall vents and other designed openings in the building, will be sealed.

4.1.3 Outloading. During one sampling run (8 hours), normal outloading of the GTSP product shall occur from the GTSP storage building.

4.1.4 Product Drop point. For the duration of the test periods, the drop point of GTSP into the storage building will be as close as possible to where the product enters the building.

4.1.5 Sampling Train. Clean all impingers as described in EPA Method 13B. Charge all impingers with the appropriate amounts of distilled-deionized water. Perform all necessary calibrations as described in Method 13B. If a critical flow device is used to control the flow through the sampling train, it shall be calibrated prior to the test with a standard dry gas meter or mass flow meter.

4.2 Preliminary Determinations

4.2.1 Weather Conditions. Assess what the probable weather conditions will be during the test effort. If they are less than ideal, the test may be postponed at the option of the Department or the Company.

4.2.2 Sampling Locations. A minimum of one sampler for each 100 feet of building length will be located in the roof monitor. Additionally, one sampler shall be as close as physically practical to the product drop point during the test. The samplers shall be located beginning 50 feet from each end wall and at approximate 100 foot intervals in between. The extra sampler should be located over the GTSP drop point (see Figure 2).

A minimum of three (3) samplers shall be located along the sidewall building vent to obtain a sample of the air leaving the leeward side of the building. The sampling system inlet shall be at the same elevation as the vent opening and between 1 and 2 feet inside the building. The locations of the samplers along the sidewall building vent shall be determined just prior to each test run.

At the option of the Company, a single sampler may be used to measure an upwind or background fluoride concentration. The sampling point shall be no closer than 100 feet to any part of the storage building, including the railcar loading shelter.

4.2.3 Leak Checks. The sampling train shall be checked for leaks before and after each run as per EPA Method 13B.

4.3 Sampling

4.3.1 Velocity Determinations. For the determination of air flow in the roof monitor vent, velocity measurements shall be made in line with each sampling point along the roof monitor vent and 1 to 1.5 feet below the level of the walkway. An average velocity shall be determined, either by taking four readings across the vent each time or by characterizing the flow pattern across the vent at each sampling point and choosing a point of average velocity. The flow pattern should be defined prior to the start of each run and verified at the end. If the Company wishes to use the single, average point option, it shall conduct a one or two day study prior to the actual test to demonstrate that a single point can be used to indicate an average velocity during the entire run.

The velocity measurements at the eave vents shall be made in centroid of the vent opening. Velocity measurements shall be made at least at each sampling point, but no more than 100 feet apart. The velocity reading shall be made for at least 30 seconds at each point and visually averaged by the operator. A velocity measurement shall be made at each point immediately prior to the start of a test run and approximately every hour thereafter until the end of the run. In addition, the flow direction shall be determined when and where each velocity measurement is made.

4.3.2 Sampling Data. Prior to the start of the test, at 60-minute intervals during each test run and at the conclusion of each test run, the velocity, flow direction, DGM reading, temperature and all other pertinent data for each sampling point will be recorded on field data sheets. If a critical flow device is used in lieu of a DGM, the pressure differential across the device shall be recorded at the 60-minute intervals and at the end of the test period. A final flow check shall be made with a standard dry gas meter or a mass flow meter. The flow rate through the critical flow device test period shall be the average of the pre-test and post-test flow rates.

4.3.3 Test Duration. A test shall consist of three runs. Each run shall be a minimum of eight hours. One of the three 8-hour test runs shall coincide with the shift during which GTSP is being loaded into the railcars. The Company shall arrange to load out at a maximum rate of the 8-hour period.

4.3.4 Weather Data. Record the ambient wind speed and direction at hourly intervals during the testing period. If unfavorable weather conditions arise, the test may be halted and/or postponed at the option of the Department representative or the Company.

4.3.5 Plant Stoppages. If the supply of GTSP to the building is reduced or halted during the testing for approximately 15 minutes or more, the testing should be stopped. Sampling should be restarted 15 minutes after the GTSP supply has reached its previous rate to allow the emissions to maximize. The time for that run must be extended by the length of the sampling train downtime.

5. Sample Recovery

5.1 Sample Inlet and Sample Line. At the conclusion of each sampling run, and before the sample pump is turned off, the sample line shall be elevated above the impingers in such a way that particulate matter collected in the sample inlet and sample line cannot be lost. The interior surfaces of each sample inlet and sample line shall then be brushed and rinsed at least three times with distilled-deionized water at per EPA Method 13B, Section 7.2.1. The washings shall be added to a clean polyethylene container.

5.2 Impingers. The solutions from all three impingers will be added to the sample inlet and sample line washings with the exception of the sample train expected to contain the highest fluoride concentration. The impingers and connecting glassware shall be rinsed three (3) times and the washings added to the existing sample container. The filter following the impingers shall be recovered and added to the existing sample container.

5.2.1 Highest Fluoride Sample Train. At the conclusion of each sample run the sample inlet and sample line washings, first and second impinger solutions and washings, and the third impinger solution and washings shall be placed in three (3) separate containers. The filter following the impingers shall be combined with the sample from the third impinger. After fluoride analysis of the impinger solutions, the washings may be combined into one (1) container.

5.3 Prior to analysis, all washings must be measured volumetrically.

6. Analysis

Analysis of all fluoride samples will be as described in EPA Method 13B with the following exceptions:

1. The fusion and distillation steps will be eliminated.

2. The impinger solution may be divided into two or three portions if requested by the Department: one for Company analysis, one for Department analysis and possibly one sealed as a reference sample. The Company's sample will contain the filter.

7. Calculations

For calculating the mass emission rate, each sampling point shall be considered to represent the emissions from a specific area and should be centered in that area. The mass rate from each area will be the measured concentration times the measured flow rate (area represented by monitor times average measured velocity for area). Then the total mass rate for the building will be the sum of all the individual mass rates, as follows:

$e = C_x Q_x$; where e = average emission rate from one area, lbs/hr

C_x = average concentration from one area, lbs/dscf

Q_x = average volumetric flow rate from one area, dscf/hr

then:

$$E = e_1 + e_2 + \ldots + e_n$$

where E = total mass rate from the building, lb/hr, for the run. The test results will be the average emissions, lb/hr, for the three runs.

8. Test Report

The test report shall include all applicable sections described in 62-297.310(8) Florida Administrative Code (F.A.C.) and all other pertinent data collected during the test.

APPENDIX F

COST ANALYSIS AND VENDOR DATA

Ceilcote Air Pollution Control
14965 Sprague Rd., Suite 250
Strongsville, OH 44136-1768
Tel 440-243-0700
Fax 440-243-9854

facsimile transmittal

To:	Golder Associates Fawn Burgen	**Fax:**	352-336-6603
From:	Steve George	**Date:**	8/8/03
Re:	IPG-24158	**Pages:**	1
CC:	AirPro		

☐ Urgent ☑ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Notes:

Ms. Burgen,

Per our earlier conversation to design the MTV scrubber to operate at higher pressure drops 30-60" w.c. would require only a slight increase in wall thickness. The cost associated with this increase would amount to less than $25,000 per scrubber. If we can be of further service please contact us.

Regards,

Steve George

Capital Costs for:

1. Venturi scrubber/mist eliminator $600,000/scrubber
2. Fan/motor $300,000 for one fan for two scrubbers
3. Recycle pump (part of scrubber) If separate then use $50,000/pump

Cost are considered installed cost and include foundation, fabrication, mechanical, and electrical and instrumentation. Some ductwork is included in this cost. Does not include the cost of an additional stack or ductwork from equipment to the scrubbers.

Elton Curran
Cargill Crop Nutrition
8813 Highway 41 South
Riverview, Florida 33569
Nextel 161*143359*1
Office 813 672 7082
Mobile 813 967 7391
Fax 813 671 6351

$300,000 for fabricating the vessel. Does not include piping, installation, etc.

-----Original Message-----
From: Fbergen@golder.com [mailto:Fbergen@golder.com]
Sent: Thursday, September 18, 2003 4:05 PM
To: Curran, Elton /rvew
Cc: Ahrens, Dean /rvew; Herz, Bob /rvew; Thorpe, Henry /rvew
Subject: RE: Control Equipment Cost information

Elton-

Do you have the cost of just the scrubber itself, not including the installed cost, foundation, fabrication, etc.?

Fawn Bergen
Staff Engineer
Golder Associates Inc.
Gainesville, FL
(352) 224-1141 direct
(352) 336-5600 main
(352) 336-6603 fax
email: FBergen@golder.com