File Copy

CARGILL FERTILIZER, INC.

8813 Highway 41 South - Riverview, Florida 33569 - Telephone 813-677-9111 - TWX 810-876-0648 - Telex 52666 - FAX 813-671-6146

Certified Mail: P 204 944 556

June 27, 1996

RECEIVED
JUL 1 1996
BUREAU OF
AIR REGULATION

Mr. Clair H. Fancy, Bureau Chief
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

Dear Mr. Fancy:

Re: Cargill Fertilizer, Inc. - Tampa Plant
Phosphate Rock Drying/Grinding System Construction Permit Application
AIRS No. 0570008; Emission Unit ID 034

Please find enclosed four hard copies and one electronic copy of a construction permit application for the modification of our existing phosphate rock drying/grinding system currently operating under Permit No. AO29-239263. Included with these applications is a check in the amount of $7,500 (check # 577232327) for the Florida Department of Environmental Protection. If you have any questions or require additional information, please call me at (813) 671-6369.

Sincerely,

Kathleen Edgemon
Environmental Engineer

cc: Morris
Russo
File P-30-32-3

cc: Hillsboro. Co. ✓
SWD ✓

recycled paper

DATE	INVOICE #	GROSS	DISC	NET
960221	962102	7500.00	.00	7500.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00

DATE	INVOICE #	GROSS	DISC	NET
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00
		.00	.00	.00

REMOVE CHECK ALONG THIS PERFORATION

THIS CHECK IS PRINTED IN TWO COLORS DO NOT ACCEPT UNLESS BLUE AND BROWN ARE PRESENT

CARGILL FERTILIZER, INC.

Norwest Bank Lewistown, N.A.
Lewistown, Montana 59457

93-516
929

577232327

DATE:	VENDOR NUMBER	AMOUNT
02/21/96	4115	$*********7,500.00

THE SUM OF Seven Thousand Five Hundred and NO/100 Dollars

PAY TO THE ORDER OF
FLORIDA DEPT. OF ENVIRONMENTAL
PROTECTION
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399-2400

AUTHORIZED SIGNATURE

[redacted] 262

SEE REVERSE SIDE FOR OPENING INSTRUCTIONS

Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, FL 33569

FLORIDA DEPT. OF ENVIRONMENTAL
PROTECTION
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399-2400

Logged in Airs July 2, '96

CARGILL FERTILIZER, INC.

8813 Highway 41 South - Riverview, Florida 33569 - Telephone 813-677-9111 - TWX 810-876-0648 - Telex 52666 - FAX 813-671-6146

Certified Mail: P 204 944 556

June 27, 1996

RECEIVED
JUL 1 1996
BUREAU OF
AIR REGULATION

Mr. Clair H. Fancy, Bureau Chief
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

Dear Mr. Fancy:

Re: Cargill Fertilizer, Inc. - Tampa Plant
Phosphate Rock Drying/Grinding System Construction Permit Application
AIRS No. 0570008; Emission Unit ID 034

Please find enclosed four hard copies and one electronic copy of a construction permit application for the modification of our existing phosphate rock drying/grinding system currently operating under Permit No. AO29-239263. Included with these applications is a check in the amount of $7,500 (check # 577232327) for the Florida Department of Environmental Protection. If you have any questions or require additional information, please call me at (813) 671-6369.

Sincerely,

Kathleen Edgemon
Environmental Engineer

cc: Morris
Russo
File P-30-32-3

PSD PERMIT APPLICATION FOR PHOSPHATE ROCK GRINDING/DRYING SYSTEM CARGILL FERTILIZER, INC. RIVERVIEW, FLORIDA

Prepared For:

Cargill Fertilizer, Inc.
8813 Highway 41 south
Riverview, FL 33569

Prepared By:

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

June 1996
15281Y/F2

TABLE OF CONTENTS

(Page 1 of 2)

TABLE OF CONTENTS
(Page 2 of 2)

PART A

APPLICATION FOR AIR PERMIT - LONG FORM
LONG FORM

Department of
Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

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

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name:	**Cargill Fertilizer, Inc.**	
2. Site Name:	**Riverview**	
3. Facility Identification Number:	**0570008**	[ ] Unknown
4. Facility Location Information: Street Address or Other Locator:	**8813 Highway 41 South**	
City: **Riverview**	County: **Hillsborough**	Zip Code: **33569**
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	July 1, 1996
2. Permit Number:	0570008-011-AC
3. PSD Number (if applicable):	PSD-FL-234
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:

Melody Russo, Environmental Superintendent

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) 677-9111** Fax: **(813) 671-6149**

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. 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.*

Melody Russo
Signature

6/27/96
Date

* Attach letter of authorization if not currently on file.

Scope of Application

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

Emissions Unit ID		Description of Emissions Unit	Permit Type
Unit #	Unit ID		
1R	034	Phosphate Rock Grinding/Drying System	AC1A

See individual Emissions Unit (EU) sections for more detailed descriptions.
Multiple EU IDs indicated with an asterisk (*). Regulated EU indicated with an "R".

Purpose of Application and Category

Check one (except as otherwise indicated):

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

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

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

Current construction permit number: _____

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

Operation permit to be renewed: _____

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

Current construction permit number: _____

Operation permit to be renewed: _____

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

Operation permit to be revised/corrected: _____

_____

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

Operation permit to be revised: _____

Reason for revision: _____

_____

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

This Application for Air Permit is submitted to obtain:

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

Current operation/construction permit number(s): _____

_____

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

Operation permit to be renewed: _____

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

Operation permit to be revised: _____

Reason for revision: _____

_____

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

This Application for Air Permit is submitted to obtain:

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

Current operation permit number(s), if any: _____

AO29-239263

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

Current operation permit number(s): _____

_____

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

Application Processing Fee

Check one:

[x] Attached - Amount: $ $ 7,500.00 [ ] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations:

This application is to modify the existing phosphate rock grinding/drying operation to allow for increased moisture removal. In addition, the unground and ground rock handling systems will be modified. Refer to Attachment A for further details.

2. Projected or Actual Date of Commencement of Construction :

1 Jul 1996

3. Projected Date of Completion of Construction :

1 Jul 1999

Professional Engineer Certification

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

2. Professional Engineer Mailing Address:
   Organization/Firm: **KBN Eng and Applied Sciences**
   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**

4. Professional Engineer's Statement:

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

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

June 24, 1996 — Date

* Attach any exception to certification statement.

Application Contact

1. Name and Title of Application Contact:
   Kathy Edgemon, Environmental Engineer

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) 677-9111** Fax: **(813) 671-6149**

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 / 30 Longitude: (DD/MM/SS): 82 / 23 / 57

3. Governmental Facility Code:	4. Facility Status Code:	5. Facility Major Group SIC Code:	6. Facility SIC(s):
0	A	28	

7. Facility Comment (limit to 500 characters):

Facility Contact

1. Name and Title of Facility Contact:
   Melody Russo, Environmental Superintendent

2. Facility Contact Mailing Address:
   Organization/Firm: **Cargill Fertilizer, Inc.**
   Street Address: **8813 Highway 41 South**
   City: **Riverview** State: **FL** Zip Code: **33569**

3. Facility Contact Telephone Numbers:
   Telephone: **(813) 677-9111** Fax: **(813) 671-6149**

Facility Regulatory Classifications

1. Small Business Stationary Source? [ ] Yes [x] No [ ] Unknown
2. Title V Source? [x] Yes [ ] No
3. Synthetic Non-Title V Source? [ ] Yes, [x] No
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)? [x] Yes [ ] No
5. Synthetic Minor Source of Pollutants Other than HAPs? [ ] Yes [x] No
6. Major Source of Hazardous Air Pollutants (HAPs)? [x] Yes [ ] No
7. Synthetic Minor Source of HAPs? [ ] Yes [x] No
8. One or More Emissions Units Subject to NSPS? [x] Yes [ ] No
9. One or More Emissions Units Subject to NESHAP? [x] Yes [ ] No
10. Title V Source by EPA Designation? [ ] Yes [x] No
11. Facility Regulatory Classifications Comment (limit to 200 characters): **NESHAP: 40 CFR 61 Subpart R**

B. FACILITY REGULATIONS

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

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

62-212.200 - Permits Required
62-212.400 - PSD

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted		2. Pollutant Classification
PM	Particulate Matter - Total	A
PM10	Particulate Matter - PM10	A
SO2	Sulfur Dioxide	A
NOX	Nitrogen Oxides	A
H107	Hydrogen fluoride	A
SAM	Sulfuric Acid Mist	A
Fl	Fluorides - Total	A

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information:

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hr)	(tons/yr)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

Facility Pollutant Detail Information:

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hr)	(tons/yr)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

2. Facility Plot Plan:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

3. Process Flow Diagram(s):
   [X] Attached, Document ID(s): Part B
   [ ] Not Applicable [ ] Waiver Requested

4. Precautions to Prevent Emissions of Unconfined Particulate Matter:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

5. Fugitive Emissions Identification:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

6. Supplemental Information for Construction Permit Application:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities:
   [ ] Attached, Document ID: _____
   [X] Not Applicable

8. 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

9. Alternative Methods of Operation:
   [ ] Attached, Document ID: _____
   [X] Not Applicable

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

11. Identification of Additional Applicable Requirements: [ ] Attached, Document ID: _____ [x] Not Applicable
12. Compliance Assurance Monitoring Plan: [ ] Attached, Document ID: _____ [x] Not Applicable
13. Risk Management Plan Verification: [ ] Plan Submitted to Implementing Agency - Verification Attached Document ID: _____ [ ] Plan to be Submitted to Implementing Agency by Required Date [x] Not Applicable
14. Compliance Report and Plan [ ] Attached, Document ID: _____ [x] Not Applicable
15. Compliance Statement (Hard-copy Required) [ ] Attached, Document ID: _____ [x'] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L 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. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. 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.

2. Single Process, Group of Processes, or Fugitive Only? 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.

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Phosphate Rock Grinding/Drying System; EU IDs 34, 100, 101**		
2. Emissions Unit Identification Number: [ ] No Corresponding ID [ ] Unknown **034**		
3. Emissions Unit Status Code: **A**	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code: **28**
6. Emissions Unit Comment (limit to 500 characters): **EU ID 34 = Phos. Rock Railcar Unloading; EU ID 100 = Raymond Mill No. 5; EU ID 101 = Raymond Mill No. 9.**		

Emissions Unit Control Equipment Information

A.

1. Description (limit to 200 characters): **Three Fabric Filters**
2. Control Device or Method Code: **18**

B.

1. Description (limit to 200 characters):
2. Control Device or Method Code:

C.

1. Description (limit to 200 characters):
2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date:	
2. Long-term Reserve Shutdown Date:	
3. Package Unit: Manufacturer:	Model Number:
4. Generator Nameplate Rating:	MW
5. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate:		26	mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr		tons/day
3. Maximum Process or Throughput Rate:		58	tons/hr (wet)
4. Maximum Production Rate:	50	tons/hr (dry)	

5. Operating Capacity Comment (limit to 200 characters):

Production rate is the total for both mills. Each mill can operate at a rate up to 25 TPH (dry), (29.41 TPH, wet basis).

Emissions Unit Operating Schedule

1. Requested Maximum Operating Schedule:

24	hours/day	7	days/week
52	weeks/yr	8,760	hours/yr

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

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

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

40 CFR 60.11
40 CFR 60.12
40 CFR 60.13(a)
40 CFR 60.13(b)
40 CFR 60.13(c)
40 CFR 60.13(d)(2)
40 CFR 60.13(e)(1)
40 CFR 60.13(f)
40 CFR 60.13(h)
40 CFR 60.13(i)
40 CFR 60.19
40 CFR 60.400 Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.402(a)(1) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.402(a)(5) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.403(a) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.403(b) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.403(d) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.403(e) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.404(a) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.404(b) Subpart NN, Standards of Performance for Phosphate Rock Plants
40 CFR 60.7
40 CFR 60.8
62-296.320(c), Unconfined Particulate Matter Emissions
62-296.705(2)(b) RACT for Phosphate Processing operations
62-296.711 RACT for Materials Handling operations
62-296.800, New Source Performance Standards
62-297.310 General Compliance Test Requirements

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See Comment**	
2. Emission Point Type Code: [ ] 1 [ ] 2 [X] 3 [ ] 4	
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Railcar unloading; Mill No.5 and No.9 Baghouses**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W	
6. Stack Height:	**70** feet
7. Exit Diameter:	**2.5** feet
8. Exit Temperature:	**170** °F

9. Actual Volumetric Flow Rate:	**22,500**	acfm
10. Percent Water Vapor:	**5**	%
11. Maximum Dry Standard Flow Rate:	**18,000**	dscfm
12. Nonstack Emission Point Height:		feet
13. Emission Point UTM Coordinates:		
Zone: East (km):		North (km):
14. Emission Point Comment (limit to 200 characters):		
Stack parameters are representative for the No. 5 and No. 9 mill baghouses.		

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Rock Dryer and Grinding System**	
2. Source Classification Code (SCC): **3-05-019-01**	
3. SCC Units: **Tons Phos. Rock**	
4. Maximum Hourly Rate: **58.24**	5. Maximum Annual Rate: **510,141**
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment (limit to 200 characters): **Process rate is the combined maximum input rate of wet rock to both No.5 and No.9 Mills. This equates to 50 TPH of dry rock @ 1% moisture. Each mill can operate at up to 25 TPH (dry basis).**	

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-Process Fuel Use, Natural Gas: General**
2. Source Classification Code (SCC): **3-90-005-98**
3. SCC Units: **Million Cubic Feet Burned**

4. Maximum Hourly Rate: **0.026**	5. Maximum Annual Rate: **228**
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit: **1,000**	

10. Segment Comment (limit to 200 characters):
Maximum natural gas to each mill is 13,000 scf/hr; max. operating hours are 8,760 hr/yr each mill.

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters):

   In-Process Fuel Use, No.2 Fuel Oil: General

2. Source Classification Code (SCC):

   3-90-005-98

3. SCC Units:

   Thousand Gallons Burned

4. Maximum Hourly Rate:	5. Maximum Annual Rate:
0.19	**74**

6. Estimated Annual Activity Factor:

7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
0.5	

9. Million Btu per SCC Unit:

   140

10. Segment Comment (limit to 200 characters):

    Maximum Hourly Rate: 0.1857. Maximum Annual Rate: 74.28, based on 400 hr/yr oil firing. Maximum fuel oil to each mill is 92.85 gal/hr.

Segment Description and Rate: Segment _____ of _____

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

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	018		EL
SO2			NS
NOX			NS
CO			NS
PM10	018		EL

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **PM**

2. Total Percent Efficiency of Control: %

3. Potential Emissions: **6.2** lb/hour **27.2** tons/year

4. Synthetically Limited? [ ] Yes [X] No

5. Range of Estimated Fugitive/Other Emissions:

   [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr

6. Emission Factor: **0.02 gr/dscf**

   Reference: **Baghouse Design**

7. Emissions Method Code:

   [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

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

   See Part B, Table 3-2.

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

   Potential emissions are the total from the Nos. 5 and 9 Rock Grinders/Dryers.

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code:	**OTHER**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**0.02 gr/dscf**
4. Equivalent Allowable Emissions:	**3.1** lb/hour **13.6** tons/year
5. Method of Compliance (limit to 60 characters):	**Annual VE test using EPA Method 9**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Based on baghouse design. Limits apply to each of the No. 5 and No. 9 Rock Grinders/Dryers baghouses.**

B.

1. Basis for Allowable Emissions Code:	**RULE**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**0.26 lb/ton wet feed**
4. Equivalent Allowable Emissions:	**3.1** lb/hour **13.6** tons/year
5. Method of Compliance (limit to 60 characters):	**Annual VE test using EPA Method 9**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Based on NSPS and Rule 62-296.705(2)(b). Applies to No. 5 and No. 9 Rock Ginders/Dryers baghouses.**

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SO2**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **13.19** lb/hour **2.7** tons/year
4. Synthetically Limited? [**X**] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **See Comment** Reference: **AP-42**
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [**X**] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **See Part B, Table 3-1.**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Emission Factor: 142*S lb/Mgal and 0.6 lb/MM ft^3. No.2 Fuel Oil is limited to 400 hr/yr; Maximum Sulfur content is 0.5% wt.**

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

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

B.

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

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **NOX**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **3.71** lb/hour **15.96** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **See Comment** Reference: **AP-42**
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [**X**] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **See Part B, Table 3-1.**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Emission Factor: 140 lb/MM ft^3 for gas and 20 lb/Mgal for fuel oil.**

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

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

B.

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

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: CO
2. Total Percent Efficiency of Control: %
3. Potential Emissions: 0.93 lb/hour 3.99 tons/year
4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: See Comment Reference: AP-42
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [X] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **See Part B, Table 3-1.**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Emission Factor: 35 lb/MM ft^3 for gas and 5 lb/Mgal for fuel oil.**

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

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

B.

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

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **PM10**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **6.2** lb/hour **27.2** tons/year
4. Synthetically Limited? [ ] Yes [x] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.02 gr/dscf** Reference: **Baghouse Design**
7. Emissions Method Code: [x] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **See Part B, Table 3-2.**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Potential emissions are the total from the Nos. 5 and 9 Rock Grinders/Dryers.**

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code:	**OTHER**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**0.02 gr/dscf**
4. Equivalent Allowable Emissions:	**3.1** lb/hour **13.6** tons/year
5. Method of Compliance (limit to 60 characters):	**Annual VE test using EPA Method 9**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Based on baghouse design. Limits apply to each of the No. 5 and No. 9 Rock Grinders/Dryers baghouses.**

B.

1. Basis for Allowable Emissions Code:	**RULE**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**0.26 lb/ton wet feed**
4. Equivalent Allowable Emissions:	**3.1** lb/hour **13.6** tons/year
5. Method of Compliance (limit to 60 characters):	**Annual VE test using EPA Method 9**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Based on NSPS and Rule 62-296.705(2)(b). Applies to No. 5 and No. 9 Rock Grinders/Dryers baghouses.**

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitations: Visible Emissions Limitation 1 of 3

1.	Visible Emissions Subtype: VE
2.	Basis for Allowable Opacity: [X] Rule [ ] Other
3.	Requested Allowable Opacity Normal Conditions: 5 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4.	Method of Compliance: **Annual Testing using EPA Method 9**
5.	Visible Emissions Comment (limit to 200 characters): **Rule 62-297.620(4) - F.A.C.; General VE limit of 20% opacity applies to rock grinders exhaust, however 5% limit is accepted in lieu of annual PM stack test.**

Visible Emissions Limitations: Visible Emissions Limitation 2 of 3

1.	Visible Emissions Subtype: VE
2.	Basis for Allowable Opacity: [X] Rule [ ] Other
3.	Requested Allowable Opacity Normal Conditions: 10 % 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): **40 CFR 60.402(a)(1); VE limitation applies to rock dryers.**

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitations: Visible Emissions Limitation 3 of 3

1.	Visible Emissions Subtype: VE
2.	Basis for Allowable Opacity: [X] Rule [ ] Other
3.	Requested Allowable Opacity Normal Conditions: 0 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4.	Method of Compliance: **Annual Test using EPA Method 9**
5.	Visible Emissions Comment (limit to 200 characters): **Opacity limit for ground rock handling system, based on 40 CFR 60.402(a)(5).**

Visible Emissions Limitations: 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):

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System Continuous Monitor 1 of 1

1. Parameter Code:	2. Pollutant(s):
2. CMS Requirement: [X] Rule [ ] Other	
3. Monitor Information: Monitor Manufacturer: **Auburn International (or equivalent)** Model Number: **2240-2** Serial Number:	
4. Installation Date:	
5. Performance Specification Test Date:	
6. Continuous Monitor Comment (limit to 200 characters): **A broken bag detector will be installed at the exit of each mill's baghouse. The detector is an alternative to a continuous opacity monitor. Parameter Code: Broken Bag.**	

Continuous Monitoring System Continuous Monitor _____ of _____

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

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

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

   [x] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

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

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.

[x] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3.	Increment Consuming/Expanding Code:			
	PM	[x] C	[ ] E	[ ] Unknown
	SO_2	[ ] C	[ ] E	[x] Unknown
	NO_2	[x] C	[ ] E	[ ] Unknown
4.	Baseline Emissions:			
	PM	lb/hour		tons/year
	SO_2	lb/hour		tons/year
	NO_2			tons/year
5.	PSD Comment (limit to 200 characters):			

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

Supplemental Requirements for All Applications

1.	Process Flow Diagram	
	[X] Attached, Document ID: Part B	
	[ ] Not Applicable	[ ] Waiver Requested
2.	Fuel Analysis or Specification	
	[X] Attached, Document ID: Part B	
	[ ] Not Applicable	[ ] Waiver Requested
3.	Detailed Description of Control Equipment	
	[X] Attached, Document ID: Part B	
	[ ] 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: _____	[X] Not Applicable
	[ ] Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	
	[ ] Attached, Document ID: _____	[X] Not Applicable
7.	Operation and Maintenance Plan	
	[ ] Attached, Document ID: _____	[X] Not Applicable
8.	Supplemental Information for Construction Permit Application	
	[X] Attached, Document ID: Part B	[ ] Not Applicable
9.	Other Information Required by Rule or Statute	
	[X] Attached, Document ID: Part B	[ ] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

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. Compliance Assurance Monitoring Plan

[ ] Attached, Document ID: _____ [X] Not Applicable

14. Acid Rain Permit 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: _____

[X] Not Applicable

PART B

PSD REPORT FOR CARGILL FERTILIZER, INC.
PHOSPHATE ROCK GRINDING/DRYING SYSTEM

1.0 INTRODUCTION

Cargill Fertilizer, Inc., operates a phosphate fertilizer manufacturing facility located in Riverview, Florida, just south of Tampa (refer to Figures 1-1 and 1-2). As part of the overall manufacturing process, two existing phosphate rock dryers/grinders are operated. The phosphate rock dryers/grinders are referred to as the No. 5 and No. 9 Raymond Mills. Phosphate rock is dried and ground in the mills. The dried rock is then used to make GTSP in the GTSP plant.

Cargill is proposing to change its present method of operation of this system to a system that allows for increased moisture removal. The current permitted maximum process rate for each mill of 25 tons per hour (TPH) of phosphate rock will not change. The existing fuel burner system on the No. 5 and No. 9 Raymond Mills will be upgraded to provide additional heat for drying. The existing phosphate elevator and rock bin will be modified to accommodate wet phosphate rock. A new rock bin and transfer conveyor will be installed to feed one of the mills. Two new baghouses will be installed, one serving each mill, to replace the existing single baghouse serving both mills. These new baghouses will replace the dust collection system currently in service. In addition, a new ground rock pneumatic transfer system and storage bin will be added. Emissions from the ground rock handling system will be vented to the new mill baghouses.

This attachment presents a detailed project description, proposed maximum emission rates, and source applicability for the proposed project. Supportive information is presented in additional attachments.

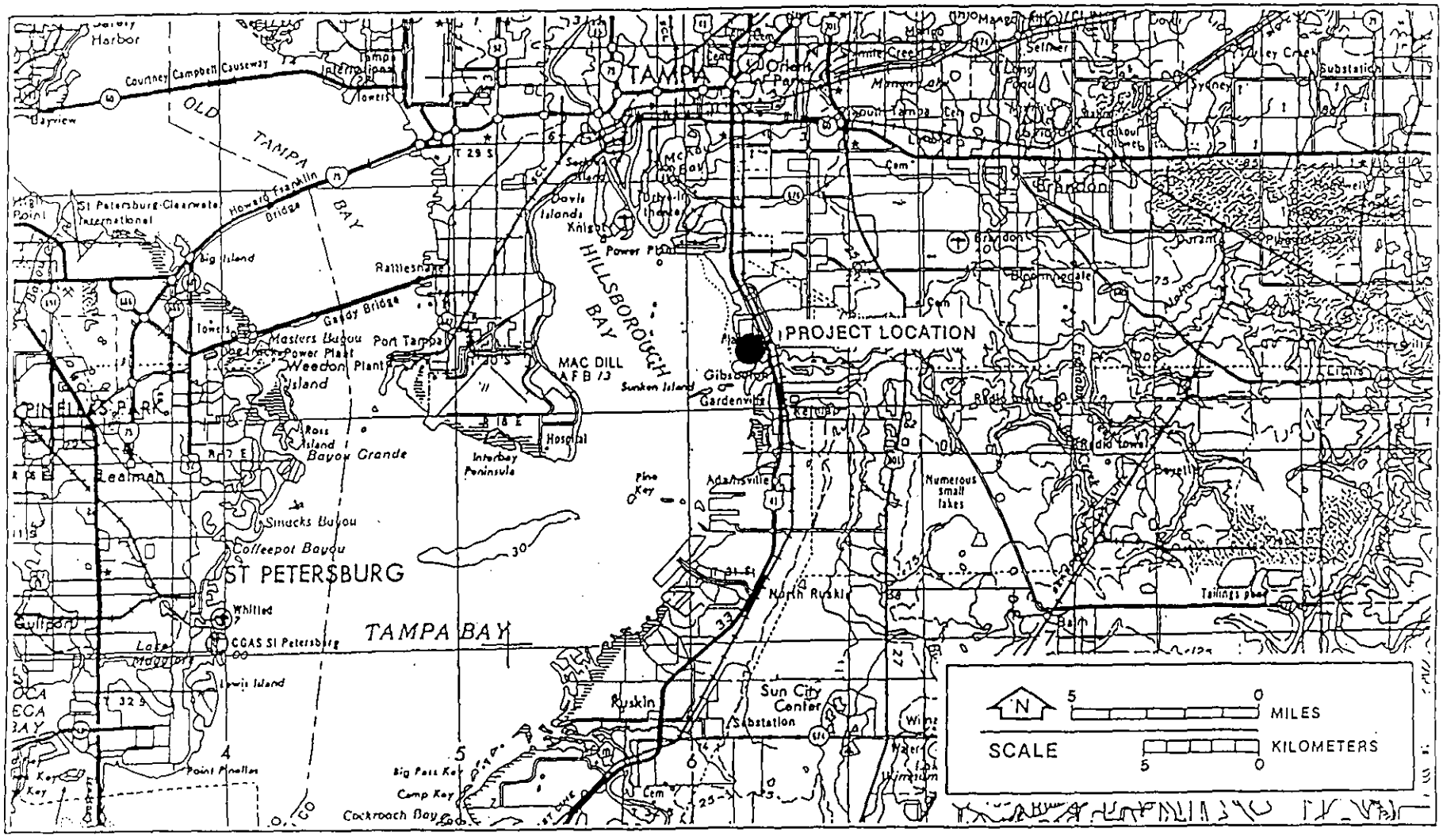

Figure 1-1
General Location Map of Cargill Fertilizer, Inc.

Source: USGS, 1981.

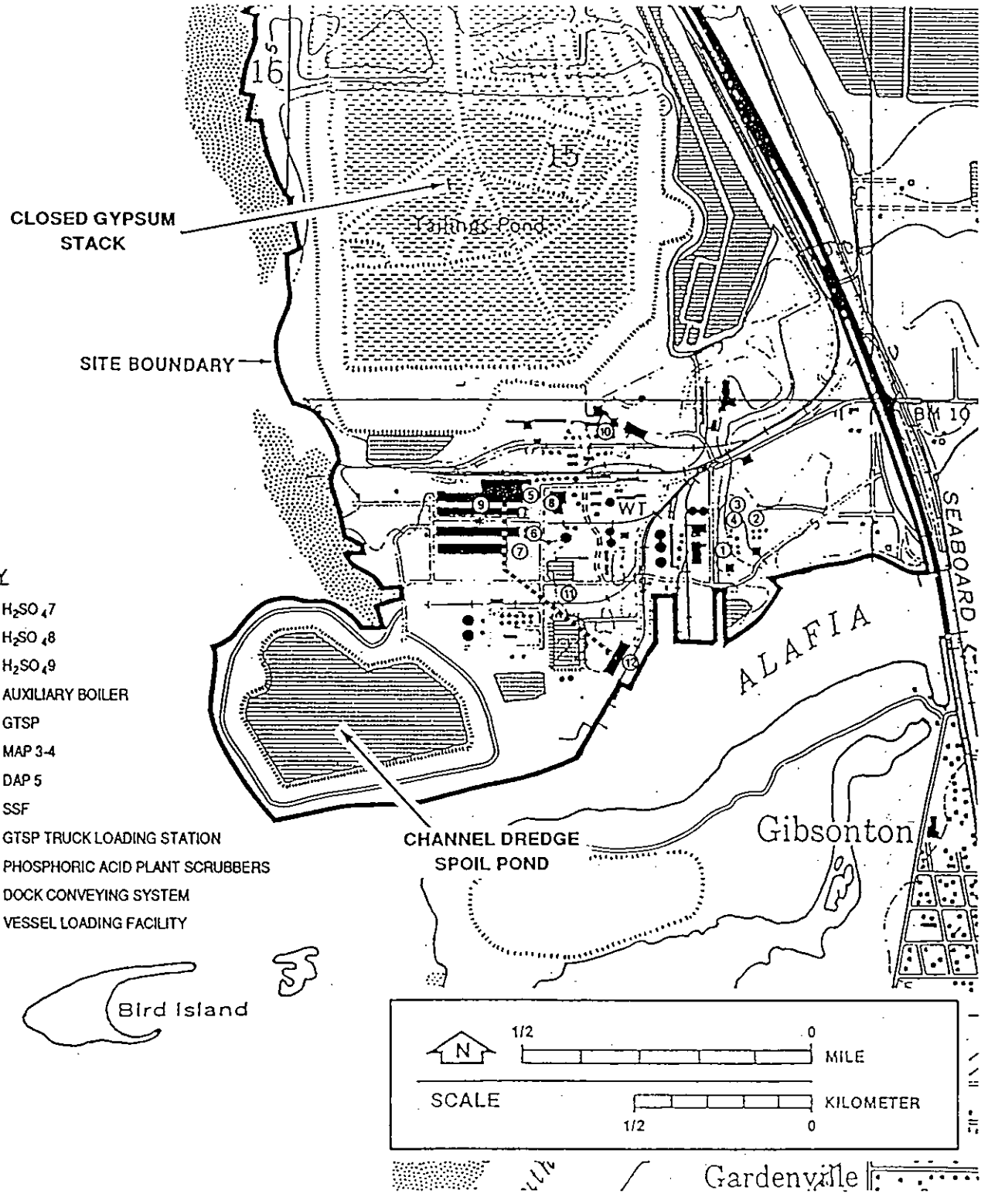

Figure 1-2
Site Location Map of Cargill Fertilizer, Inc.

Source: USGS, 1981.

KBN
A GOLDER ASSOCIATES COMPANY

2.0 PROJECT DESCRIPTION

2.1 EXISTING SYSTEM

The existing phosphate rock unloading and grinding system at Cargill Riverview is depicted in the flow diagram shown in Figure 2-1. Phosphate rock ranging from approximately 1 to 3 percent moisture is received from rail cars and discharged to an unloading pit. From the pit, pit conveyors transfer the material to a bucket elevator, which transfers material to the unground rock silo. The phosphate rock is then introduced into one of two identical dryer/grinder units by means of feed chutes. The dryer/grinder units are integral devices which provide heated air for drying as the phosphate rock is ground in the grinder. A natural gas burner with a maximum heat input of 9.0 MMBtu/hr supplies the two dryer/grinder units with heated air for drying. The moisture content of the rock is reduced from approximately 1 to 3 percent to a moisture content of approximately 1 percent in the dryers/grinders.

After exiting the dryer/grinder units, the ground rock is pneumatically conveyed to cyclones, one per mill. The ground rock is then separated from the conveying air stream and discharged to a transfer screw conveyer and to the ground rock bin or surge bin. A portion of the conveying air streams for both mills are recirculated back to the mills, and the remainder is vented to a single dust collector for particulate matter (PM) control. The No. 5 and No. 9 Raymond Mills are currently permitted to process up to a total of 50 TPH of phosphate rock (dry basis).

The dust collector also controls dust emissions from the bucket elevator and the ground rock bin and surge bin. Captured rock product from the baghouse is discharged to a conveyor, and conveyed to either the ground rock bin or to the surge bin.

2.2 PROPOSED MODIFICATIONS

The existing unloading system will be modified to allow wet rock unloading and storage, and Raymond Mills No. 5 and No. 9 will be modified to allow drying and grinding of high grade wet phosphate rock at a total design rate of 50 tons per hour (dry @ 1 percent moisture). Each mill will be rated at 25 tons per hour (dry @ 1 percent moisture). The wet phosphate rock feed will contain 10 to 15 percent moisture by weight. The ground phosphate rock product will be dried to approximately 1 percent moisture and ground to finer than 90 percent minus 200 mesh. The equivalent maximum wet rock feed at 15 percent moisture is 58.24 TPH total or 29.12 TPH each mill. A flow diagram of the proposed system is shown in Figure 2-2.

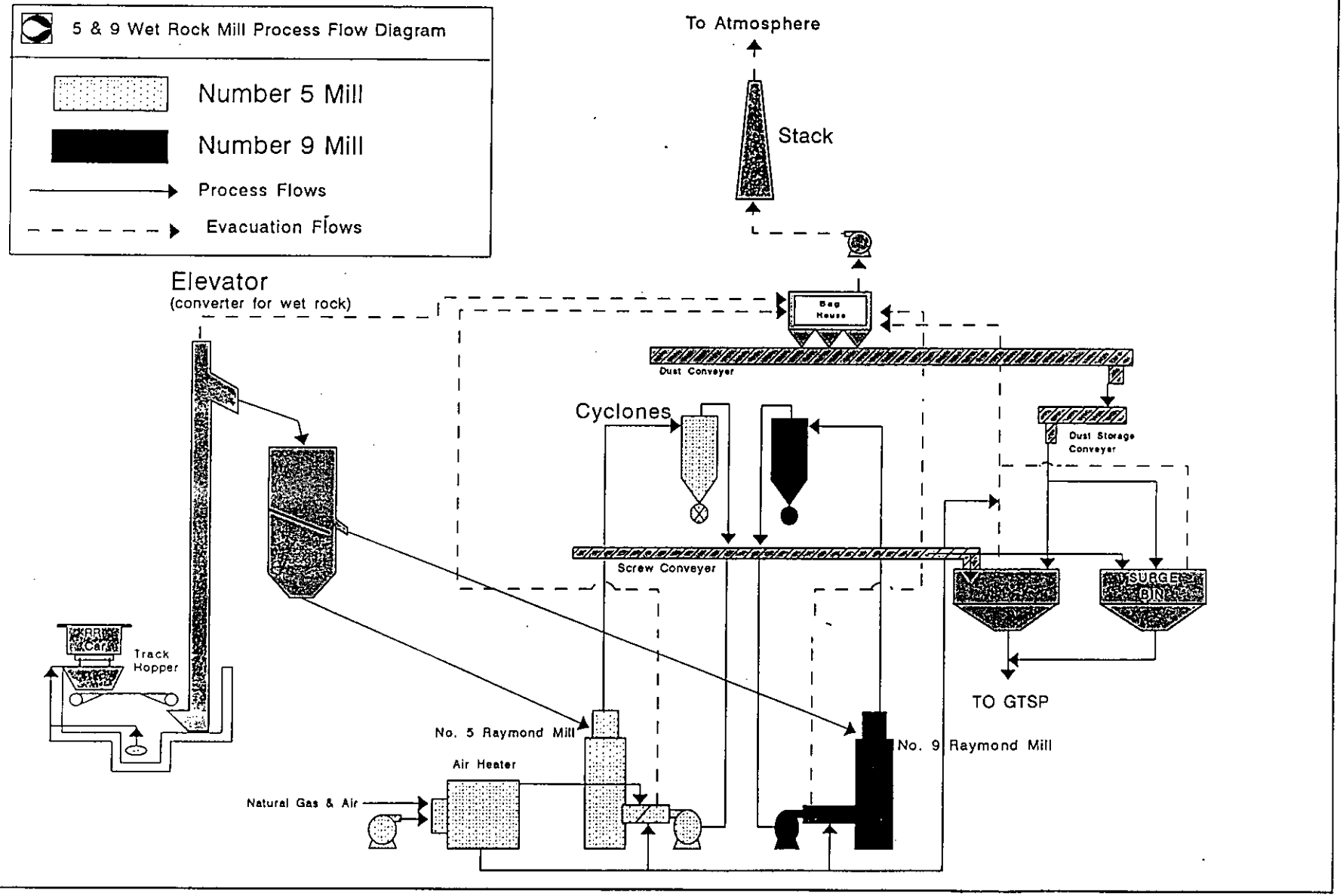

Figure 2-1
Process Flow Diagram of Existing System

KBN
A GOLDER ASSOCIATES COMPANY

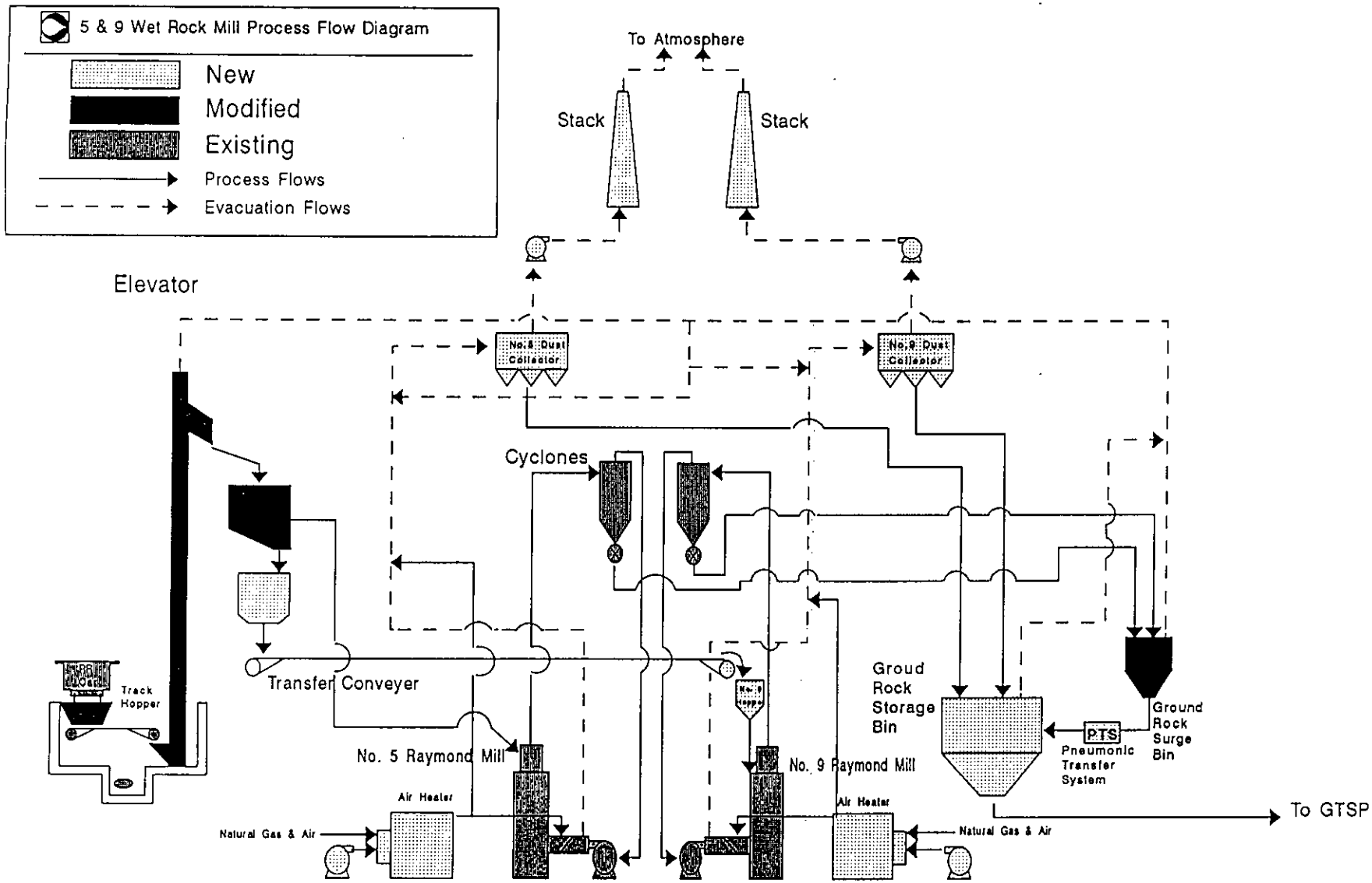

Figure 2-2
Process Flow Diagram of Proposed System

KBN
A GOLDER ASSOCIATES COMPANY

Dry rock is now received at the No. 5 and No. 9 Raymond mills. Reasonable precautions to prevent fugitive PM emissions, implemented now and in the future, include:

- Partial enclosure of railcar unloading station
- Bottom loading from railcar
- Underground receiving hopper
- Elevator and transfer to the mills are totally enclosed.

Although minimal PM emissions are expected from wet rock unloading, these preventative measures will be retained for both wet and dry rock.

Although it is expected that normally wet rock will be received in the future at Riverview, Cargill will retain the ability to receive and process dry rock at up to 50 TPH, as presently permitted.

2.2.1 Wet Rock Unloading and Storage

The equipment in this area will be modified to handle both dry and wet phosphate rock. The bucket elevator and rock bin will be modified to accommodate wet rock. The phosphate rock will be unloaded from railcars and onto the existing pit conveyors. The conveyor discharges into a transfer hopper, which feeds the transfer conveyor. This conveyor will discharge to the existing unground rock elevator that discharges into the existing 180-ton unground rock bin. This unground rock bin will feed rock via an existing chute to the No. 5 mill. In order to feed the No. 9 mill, a new surge bin, transfer conveyor and feed hopper will be installed. The feed hopper will discharge phosphate rock to the No. 9 mill.

The moisture content of wet phosphate rock varies, and can range from 10 percent to 15 percent moisture. The moisture content of dry phosphate rock can also vary, and ranges from 1 percent to 3 percent moisture. The equipment will continue to be able to process dry rock, as it does now, as well as wet rock. There are no plans to formally document or routinely measure the moisture content of wet or dry rock. The dry rock moisture is now controlled through operator experience. There is no regulatory requirement or basis for regulating the moisture content, and the proposed maximum emissions are not dependent upon the moisture content. The emission sources are all enclosed and/or controlled.

2.2.2 Rock Mill Drying and Grinding Systems

There will be two separate but identical systems in terms of capacity and equipment. The grinding equipment systems are already in operation and are called No. 5 and No. 9 Raymond mills. The drying and dust collection equipment that will be added also will be alike in terms of capacity for each of the individual systems. Both systems may be run completely independently of each other at up to 25 TPH (dry) each. However, the two systems will have a common surge bin and product storage bin.

The No. 5 Raymond mill (existing) will receive wet rock from the modified unground rock bin by gravity feed. Hot air from the upgraded air heaters also will be sent to the mill. When wet rock is being processed, the hot air will flash-dry the moisture in the rock feed from approximately 10 to 15 percent moisture to approximately 1 percent moisture. The mill will grind the rock to >90 percent minus 200 mesh.

As the mill grinds and drys the rock, air will be swept through the mill by the existing recirculation air fans. This air will carry the ground rock to the existing cyclones (one per mill). The cyclones will separate the majority of the ground rock from the air stream and discharge the rock directly to the existing ground rock surge bin. The cyclone discharge air then will return to the main recirculation fan and will be sent through the mill again.

The hot air for drying in the mills will be produced in the new air heaters (one for each mill) by burning natural gas. Each air heater will have a natural gas burner designed for up to 13 MMBtu/hr heat input. Additional quench air will be pulled into the air heater by a new dilution air fan. The heated air at approximately 700°F will be introduced into each mill through the hot air duct.

The entire mill circuit will be maintained under negative pressure by the new exhaust fans. This will keep a negative pressure on the entire system thus preventing fugitive dust emissions, and it also will exhaust the water vapor produced by drying the wet rock. The hot exhaust gases will be pulled from the circuit at the discharge of the existing recirculation fan.

The exhaust gases will pass through the new dust collectors (one per mill), which will filter the gases through fabric bags to remove any dust that is entrained in this air stream. The dust will be

collected in the bottom of the dust collector and gravity fed to the new ground rock storage bin. The combustion gases and water vapor discharged from the new exhaust fans will be sent via the new baghouses and stacks (one per mill) to the atmosphere, discharging approximately 70 feet above grade.

A new ground rock storage bin will be added to pneumatically receive ground rock from the ground rock surge bin. As shown in Figure 2-2, product storage will occur in both the existing product storage bin and the new ground rock bin. PM emissions from these bins will be controlled by the ground rock dust system, which will vent to the No. 5 and No. 9 mill baghouses.

2.2.3 Pollution Control Equipment

The air pollution control equipment for this operation will consist of two baghouses: one for each mill. Each mill baghouse will have approximately 6,380 sq. ft. of filter area. Each will be equipped with an automatic air pulse system which will continuously remove the dust from the bags. Each of the mill baghouses will have a capacity of 22,500 acfm and be designed to achieve an outlet dust loading of 0.02 gr/dscf. Dacron fabric bags or equivalent will be used. Both baghouses will be operated under negative pressure to prevent fugitive emissions. Each baghouse will have its own fan. The exhaust from the fans will be sent to the new stacks. Additional information regarding the dust collectors is provided in Section 3.0 (Table 3-2).

2.2.4 Fuel Utilization Rates

The two upgraded air heaters each will be rated at 13.0 million Btu per hour. The maximum gas usage per mill will be approximately 13,000 scf/hr of natural gas. Natural gas is the primary fuel source and will be used most of the time. Provisions are made to use No. 2 fuel oil as a stand-by fuel in case of natural gas interruption. No. 2 fuel oil may be used for up to 400 hours per year.

3.0 EMISSION RATES

Air emissions due to fuel combustion are presented for nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and volatile organic compounds (VOC) in Table 3-1. Estimated emissions from fuel combustion were developed using factors specified in the Environmental Protection Agency's (EPA) Compilation of Air Pollution Emission Factors (AP-42) (see Attachment A). Emissions are presented for natural gas and No. 2 fuel oil use. Fuel oil use will be limited to 400 hr/yr. Maximum operating hours for the mills and the ground rock silo dust collector will be 8,760 hr/yr.

Total PM emissions, as well as control equipment data for each of the three proposed baghouses, are presented in Table 3-2. The PM emissions from each of the mill baghouses are required to meet the current Florida emission limiting standard for phosphate rock processing operations located in PM nonattainment or maintenance areas (Rule 62-296.705), which limits PM emissions to 0.2 lb/ton of phosphate rock processed. This limitation is the current PM limitation which applies to the No. 5 and No. 9 mills. Based on the maximum phosphate rock production rate of 25 TPH for each mill, the maximum PM emissions based on Rule 62-296.705 are 5.0 lb/hr and 21.9 TPY for each mill. However, Cargill will utilize baghouses capable of achieving an outlet dust loading of 0.02 gr/dscf, which equates to a PM emission rate for each mill of 3.1 lb/hr and 13.6 TPY (see Table 3-2). This equates to an emission rate of 0.11 lb/ton of wet rock feed at the maximum operating rate of 29.12 TPH wet rock feed to each mill.

Table 3-1. Summary of Emissions from Fuel Combustion, Nos. 5 and 9 Raymond Mills

Parameter	No. 2 Fuel Oil	Natural Gas
OPERATING DATA		
Operating Time (hr/yr)	400	8,760
Combined Heat Input Rate (MMBtu/hr)	26.00	26.00
Fuel Oil Use (gal/hr)[a]	185.7	NA
Fuel Oil Use (gal/yr)	74,286	NA
Maximum Sulfur Content (Wt %)	0.5	NA
Natural Gas Use (scf/hr)	NA	26,000
Natural Gas Use (MMscf/yr)	NA	227.76

Pollutant	Emission Factor[b]	No. 2 Fuel Oil lb/hr	Natural Gas lb/hr	Maximum Annual Emissions (TPY) 400 hr/yr fuel oil and Natural Gas	Maximum Annual Emissions (TPY) 100% Natural Gas
EMISSIONS DATA					
SO2: Fuel Oil	142*S lb/Mgal[c]	13.19	0.016	2.70	0.07
Natural Gas	0.6 lb/MMft³				
NOx: Fuel Oil	20 lb/Mgal	3.71	3.64	15.96	15.94
Natural Gas	140 lb/MMft³				
CO: Fuel Oil	5 lb/Mgal	0.93	0.91	3.99	3.99
Natural Gas	35 lb/MMft³				
NMVOC: Fuel Oil	0.2 lb/Mgal	0.037	0.07	0.31	0.32
Natural Gas	2.8 lb/MMft³[d]				

Note: NA = not applicable.
These emissions are discharged through the mill stacks.
PM emission data from both stacks is presented in Table 3-2.

a Based on 140,000 Btu/gal for 0.5% S oil; 1000 BTU/SCF for Natural Gas.
b Emission factors based on AP-42.
c "S" denotes the weight % sulfur in fuel oil; max sulfur content = 0.5%
d Methane comprises 52% of total VOC

Table 3-2. Summary of Pollution Control Equipment and PM/PM10 Emissions

Source	Control Type	Air/Cloth Ratio	Design Capacity		Control Efficiency (percent)	Operating Hours	Production Rate (lb/hr) (a)	PM/PM10 Emissions		
			acfm	dscfm				Basis	(lb/hr)	(TPY)
No.5 Mill Dust Collector	Baghouse	3.5	22,500	18,000	99.9	8,760	25	0.02 gr/dscf	3.10	13.60
No. 9 Mill Dust Collector	Baghouse	3.5	22,500	18,000	99.9	8,760	25	0.02 gr/dscf	3.10	13.60
								Total	6.20	27.20

Note: acfm = actual cubic feet per minute
dscfm = dry standard cubic foot per minute.
gr/scf = grains per standard cubic foot

(a) Dry rock at approximately 1% moisture.

4.0 SOURCE APPLICABILITY

4.1 NEW SOURCE PERFORMANCE STANDARDS

Federal new source performance standards (NSPS) have been promulgated for phosphate rock plants. The NSPS, contained in 40 CFR 60, Subpart NN, apply to all phosphate rock plants that have a maximum production capacity greater than 4 TPH and that were constructed, modified, or reconstructed after September 21, 1979. The NSPS covers several pieces of equipment at phosphate rock plants, including dryers, grinders, calciners, and ground phosphate rock handling and storage systems. A copy of the Subpart NN NSPS is contained in Attachment B. "Modification" under the NSPS is defined as any physical change in, or change in the method of operation of, an existing facility that increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility. The change in emission rate is expressed in units of pounds per hour.

The NSPS, Subpart NN, covers "drying" and "grinding" of phosphate rock, as well as ground rock handling systems. There are separate PM and opacity standards for each of these operations. Therefore, they are considered as separate facilities for NSPS purposes. A "dryer" is defined as a unit in which the moisture content of phosphate rock is reduced by contact with a heated gas stream. A "grinder" is defined as a unit which is used to pulverize dry phosphate rock to the final product size used in the manufacture of phosphate fertilizer and does not include crushing devices used in mining.

Based on the NSPS definitions, Cargill has existing rock dryers and grinders combined within a single piece of equipment. Since Cargill has existing rock grinders and dryers, the project must be evaluated to determine if a modification to an existing facility has occurred. The existing dryers will be physically modified by the addition of upgraded air heaters. Since the emissions of PM on a lb/hr basis likely would be increasing as a result of the modification, the NSPS for the dryers would apply. The NSPS limits for rock dryers is 0.06 lb/ton of phosphate rock feed and 10% opacity.

The existing grinders, although being physically the same piece of equipment as the dryers (excluding the air heaters), are not being physically modified. Since the existing grinders are clearly capable of handling the wet rock, and were also capable of wet rock handling prior to January 5, 1974, the existing grinders are not being modified under the NSPS provisions.

Since the existing grinders are not being modified, the Florida RACT emission limit of 0.2 lb/ton will continue to apply to the grinders. Additional emissions (0.06 lb/ton) would be allowed for the modified rock dryers under the NSPS, resulting in a total allowable of 0.26 lb/ton. However, Cargill will limit total PM emissions from the combination dryers/grinders to 0.02 gr/dscf, or 6.2 lb/hr total for both units together, which is equivalent to 0.11 lb/ton of phosphate rock at the maximum production rate. The 0.26 lb/ton limitation will be met at the maximum production rate, as well as at lower operating rates due to the new baghouse control devices.

At the maximum process rate, the proposed emission limit for the rock grinder/dryers is equivalent to 0.11 lb/ton of wet rock feed (6.2 lb/hr ÷ 58.2 TPH). These maximum emissions are based on the manufacturer's guarantee of the baghouse performance. At these emission levels, each mill would be able to operate at rates as low as 12 TPH and still meet the 0.26 lb/ton combined limit (3.1 lb/hr / 12 TPH = 0.26 lb/ton). However, at lower process rates, it is reasonable to expect that the dust loading to the baghouse will decrease proportionately with the decrease in production rate and that the baghouse efficiency will remain constant. Therefore, there is reasonable assurance that the 0.26 lb/ton limit will be met at all times. Note that Cargill does not normally operate the mills at rates lower than 12 TPH, however, the above discussion should be sufficient to allow the Department to issue the permit without limitations on minimum production rates.

The NSPS also limits visible emissions from ground phosphate rock storage and handling systems to zero-percent opacity (40 CFR 60.402(5)). Cargill will be installing a new ground rock storage silo and pneumatic transfer system, and visible emissions from the storage/handling system will be limited to zero-percent opacity. Emissions from the system will be combined with emissions from the dryers/grinders and controlled by the two new baghouses.

The NSPS requires that a continuous opacity monitoring system (COMS) be installed on rock dryers subject to the NSPS (40 CFR 60.403(a)). However, due to the large expense of installing and operating a COMS, and the utilization of the baghouse control device, an alternative monitoring method is requested under 40 CFR 60.13(i). This NSPS provision allows alternatives to any monitoring procedures or requirements to be approved by the reviewing agency after written request from the permittee. The request for an alternative monitoring method has already

been submitted to FDEP's Bureau of Air Regulation as part of a related minor source construction permit application for the No. 5 and No. 9 Raymond mills.

Cargill now measures the weight of phosphate rock feed to the mills by weighing the incoming railcars. Therefore, there are records of daily phosphate rock feed to the wet rock bin and the mills. Note that this measurement device is only required for the performance tests under 40 CFR 60.8. The measurement device that Cargill uses is a state certified scale, and is accurate within 0.5 percent. This meets the requirement of the NSPS.

4.2 PREVENTION OF SIGNIFICANT DETERIORATION

Cargill has reported PM emissions from the Nos. 5 and 9 Raymond mills for the last 2 years as 22.78 TPY total. However, stack test data to support this level of emissions could not be located. One historic test was found in Cargill's files for the No. 5 and No. 9 mills. These test data, provided in Attachment C, showed an average PM emission rate of 1.93 lb/hr at a production rate of 51.4 TPH.

The No. 5 and No. 9 mills at Cargill operate independently of each other. Total operating hours for each mill are recorded. However, the total operating hours for the single baghouse are not known, but as a minimum, the operating hours would equal the total operating hours of the GTSP plant, which receives the ground rock from the Nos. 5 and 9 mills. Therefore, for estimating baseline PM/PM10 emissions, the GTSP operating hours for the last two years (1994-1995) were used:

$$(7{,}673 \text{ hr/yr} + 7{,}102 \text{ hr/yr}) / 2 \times 1.93 \text{ lb/hr} = 7.13 \text{ TPY}$$

Based on the future total PM/PM10 emissions of 27.2 TPY (see Table 3-2), the net increase in PM/PM10 emissions due to the proposed project is 20.1 TPY. This increase is greater than the PSD significant emission rate for PM10 of 15 TPY, but less than the PSD criteria for PM of 25 TPY. Therefore, PSD review for PM10 is required for this modification.

Under PSD new source review requirements, a proposed modification that results in a significant net emissions increase must undergo the following reviews:

1. Best Available Control Technology (BACT) evaluation,
2. Air quality impact analysis,

ATTACHMENT C

STACK TEST RESULTS FOR EXISTING ROCK DRYERS/GRINDERS

PARTICULATE SOURCE TEST RESULTS

Company Name: Gardinier, Inc. - U. S. Phosphoric Products

Company Conducting Test: Gardinier, Inc. - U. S. Phosphoric Products

Source Identification: 72% BPL Rock Unloading and Grinding System - No. 5 and No. 9 Raymond Mills Bag Filter(Stack)

Date: 10/11/83

Run	Molecular Weight	ACF	ACFM	SCFM	% H_2O	T_s °F	Percent Isokinetic	Grains/SCF	Emissions Lbs./Hr.	Allowable Lbs./Hr.
#1	29.0	49.486	10,122	8,360	6.3	139	101	2.05×10^{-2}	1.5	
#2	29.0	49.775	10,014	8,204	6.5	142	101	2.96×10^{-2}	2.1	
#3	29.0	50.600	10,204	8,435	5.5	142	100	3.05×10^{-2}	2.2	
#4										
Mean	29.0	49.954	10,113	8,333	6.1	141	101	2.69×10^{-2}	1.93	10.3

Standard Conditions = Dry, 68°F, 29.92 in. Hg.

Dry Molecular Weight of gas assumed to be 28.967 when gas composition data not available.

3. Ambient monitoring analysis, and
4. Additional impact analysis.

These requirements are addressed in the following sections.

5.0 AMBIENT MONITORING ANALYSIS

The PSD *de minimis* monitoring concentration for PM10 is 10 $\mu g/m^3$, 24-hour average. The predicted increase in PM10 impacts due to the proposed modification are presented in Section 7.0. The predicted PM10 increase is 4.7 $\mu g/m^3$, 24-hour average. Since the predicted increase in PM10 impacts due to the proposed modification are less than the *de minimis* monitoring concentration level, the project can be exempted from preconstruction ambient monitoring requirements.

6.0 BACT ANALYSIS FOR PARTICULATE MATTER EMISSIONS

6.1 REQUIREMENTS

The 1977 Clean Air Act Amendments established requirements for the approval of preconstruction permit applications under the PSD program. One of these requirements is that the best available control technology (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 so called "top-down" approach to BACT determinations. This approach has been challenged in court and a settlement agreement reached that requires EPA to initiate formal rulemaking on the "top-down" approach. However, EPA has not yet promulgated rules which address this approach. Nonetheless, in the absence of formal rules related to this approach, the "top-down" approach is followed in the Cargill BACT analysis.

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 modification at Cargill, only PM10 requires BACT analysis. The following section presents the BACT analysis.

6.2 BACT ANALYSIS

The phosphate rock grinding/drying system is an existing plant that uses a baghouse to control PM10 emissions. The existing baghouse will be replaced by two new baghouses with low air-to-cloth ratios (3.5:1). Baghouse technology represents the state of the art in control of PM10 emissions for phosphate rock grinders and dryers. Baghouses are highly efficient and allow collected material to be recovered as product. Although wet PM controls (i.e., scrubbers) could be employed, these would not be as efficient as a baghouse, and an additional liquid waste stream would be generated.

A review of previous BACT determinations for PM emissions from phosphate rock dryers, asphaltic dryers, and similar materials dryers was conducted. The results of this review is presented in Table 6-1. It is noted that determinations issued prior to 1990 are not included in Table 6-1.

As shown, the previous BACT determinations for asphalt plants resulted in PM emissions in the range of 0.03 to 0.04 gr/dscf. All were based on baghouse control technology. A number of other determinations were found in the BACT Clearinghouse for lime kilns and various material dryers. Three of these determinations were expressed in terms of a grain loading, and were set at 0.02 gr/dscf. Nearly all were expressed in terms of lb/ton of material throughput, and the emissions ranged from 0.12 to 0.60 lb/ton. This demonstrates that baghouse technology is the best technology for application on asphalt plants and similar materials dryers.

Cargill's proposed PM10 emission rate of 0.02 gr/dscf for each baghouse is consistent with these previously determined BACT levels. Cargill's proposed maximum PM10 emission rate of 3.1 lb/hr for each grinder/dryer baghouse is equivalent to 0.11 lb/ton PM10 at the maximum production rate of 50 TPH (dry). These PM10 levels are consistent with or below those previously determined as BACT.

Table 6-1. Summary of BACT Determinations for PM Emissions From Dryers of Aggregates/Non-Metallic Minerals

Plant Type/Company	State	Permit #	Permit Issue Date	New Source? (a)	Throughput	Emission Limit	Equivalent Limit (lb/ton)	Equivalent Limit (gr/dscf)	Control Equipment
Asphalt Plants									
Matric Construction Co	CA	7079-101	15-Mar-95	Yes	75 ton/hr	0.04 gr/dscf	--	0.04	Baghouse
Calif. Commercial Asphalt	CA	A/N910794	12-Feb-92	Yes	275 ton/hr	0.03 gr/dscf	0.041	0.03	Baghouse
Horowitz Quarry	CA	230555	25-Feb-91	Yes	8,000 ton/day	150 lb/day	0.019	--	Dust Collector
All American Asphalt	CA	240010	15-Jan-91	Yes	600 ton/hr	150 lb/day	0.021	--	Baghouse
Lime Plants									
CLM Corp.	WI	93-DBY-074	01-Jun-94	Yes	36 ton/hr	0.12 lb/ton	0.12	--	ESP
New River Lime, Inc.	KY	C-93-053	26-Aug-93	No	46 ton/hr	0.02 gr/acf	--	0.02	Baghouse
Dravo Lime Co.	KY	C-93-032	12-Aug-93	Yes	46 ton/hr	0.02 gr/acf	0.41 *	0.02	Baghouse
W.S. Frey Company, Inc.	VA	20504	14-May-93	Yes	182,500 ton/yr	7.2 lb/hr	0.35	--	Baghouse
Dravo Lime Co.	KY	C-93-024	09-Mar-93	Yes	46 ton/hr	0.02 gr/acf	0.60 *	0.02	Baghouse
Western Lime and Cement	WI	90-MWH-060	1990	Yes	350 ton/day	0.6 lb/ton	0.60	--	Baghouse
Stone Crushing Plant									
Luck Stone Corp.	VA	50429	15-Aug-85	Yes	11,025 ton/yr	4.33 ton/yr (each)	0.785	--	Baghouse
					11,025 ton/yr	3.3 ton/yr (each)	0.599	--	Baghouse
Miscellaneous Plants									
A&M Products *	CA	S1233-2-0	13-Apr-95	Yes	210 ton/day	27 lb/day	0.12 *	0.01	Baghouse
Omya, Inc.	VT	VT-009	27-Jul-90	No	20 ton/hr (each)	1.32 lb/hr	0.066	--	Multiple Cyclones

(a) Indicates if emission unit subject to BACT was new construction (yes) or a modification (no).
* Rates verified by permit.
Source: BACT/RACT/LAER Clearinghouse Database, June 1995.

7.0 AIR QUALITY IMPACT ANALYSIS

7.1 SIGNIFICANT IMPACT ANALYSIS

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For all criteria pollutants that 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 off-plant property areas in the vicinity of the plant.

Generally, if the plant undergoing the modification also is within 150 to 200 kilometers of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. Currently, the National Park Service (NPS) has recommended significant impact levels for PSD Class I areas. The recommended levels have not been promulgated as rules.

If the project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is performed. Current FDEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. Based on the screening modeling analysis results, additional modeling refinements with a denser receptor grid are performed, as necessary, to obtain the maximum concentration. Modeling refinements are performed with a receptor grid spacing of 100 meters (m) or less.

7.2 AAQS/PSD MODELING ANALYSIS

For each pollutant for which a significant impact is predicted, a full impact analysis is required. This analysis must consider other nearby sources and background concentrations, and predict concentration for comparison to ambient standards. In general, when 5 years of meteorological data are used in the analysis, the highest annual and the highest, second-highest (HSH) short-term concentrations are compared to the applicable AAQS and allowable PSD increments. 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.

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

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two 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, so refinements can be performed if necessary.

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

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor to be refined. The angular spacing between radials is 2 degrees and the radial distance interval between receptors is 100 m. Annual modeling refinements employ an angular spacing between radials of 2 degrees and a distance interval from 100 to 300 m, depending on the concentration gradient in the vicinity of the screening receptor to be refined. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2 degree angular interval and centered on the screening receptor. The domain of the refinement grid will extend to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to

ensure that a valid HSH concentration is obtained. A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids are presented in the following sections.

7.2.1 Model Selection

The Industrial Source Complex Short-term (ISCST3, Version 96113) dispersion model (EPA, 1995) was used to evaluate the pollutant impacts due to the proposed modification to Cargill's phosphate rock processing plant. This model is maintained on the EPA's Technical Transfer Network (TTN) bulletin board service. A listing of ISCST3 model features in presented in Table 7-1. The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights).

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. Based on the land-use within a 3-km radius of the Cargill facility, the rural dispersion coefficients were used in the modeling analysis. The ISCST3 model was used to provide maximum concentrations for the annual and 24-hour averaging times.

7.2.2 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 Tampa International Airport and Ruskin, respectively. The 5-year period of meteorological data was from 1987 through 1991. The NWS station at Tampa International Airport, located approximately 18 km to the northwest of the Cargill plant site, was selected for use in the study because it is the closest primary weather station to the study area that is representative of the plant site.

7.2.3 Emission Inventory

Cargill's existing and future source inventory data for the phosphate rock processing plant are presented in Table 7-2. The existing source is the baghouse stack for the No. 5 and No. 9 mills. The future proposed source configuration consists of the new No. 5 and No. 9 dust collectors and a new dust collector for the ground rock system. PM10 emissions from the existing dust collector

Table 7-1. Major Features of the ISCST3 Model

ISCST3 Model Features
• 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.

Source: EPA, 1995.

Table 7-2. Summary of Stack Parameters and PM10 Emissions for the Modified Rock Grinding/Drying System, Cargill Riverview

Source	Stack Height (ft)	Stack Height (m)	Stack Diameter (ft)	Stack Diameter (m)	Flowrate (acfm)	Stack Velocity (f/s)	Stack Velocity (m/s)	Stack Temp. (deg F)	Stack Temp. (deg K)	PM10 Emissions (lb/hr)	PM10 Emissions (g/s)
Existing Sources											
No. 5 and 9 Mills Dust Collector	60	18.288	1.92	0.59	10,000	57.6	17.546	140	333.15	1.93	0.24
Proposed Sources											
No. 5 Mill Dust Collector	70	21.3	2.5	0.76	25,000	84.9	25.9	170	350	3.1	0.39
No. 9 Mill Dust Collector	70	21.3	2.5	0.76	25,000	84.9	25.9	170	350	3.1	0.39

Legend
ft = feet
m = meters
acfm = actual cubic feet per minute
f/s = feet per second
m,/s = meters per second
deg F = degrees Fahrenheit
deg K = degrees Kelvin
lb/hr = pounds per hour
g/s = grams per second

are based on an actual measured emission rate of 1.9 lb/hr. Future PM10 emissions are based on the data presented in Table 3-2.

7.2.4 Receptor Locations

For predicting maximum PM10 concentrations in the vicinity of the plant, a polar receptor grid comprised of 119 discrete and 144 regular grid receptors was used for the screening analysis. These receptors included 36 receptors located on the plant property boundary at 10 degree intervals, plus 83 additional off-property receptors at distances of 0.5, 0.8, 1.1, and 1.5 km from the No. 9 Sulfuric Acid Plant stack, which is the origin of the air modeling coordinate system. The 36 property boundary receptors used for the screening analysis are presented in Table 7-3. The additional regular grid receptors are at radial distances of 2.0, 2.5, 3.0, and 5.0 km.

Modeling refinements were performed by employing a polar receptor grid with a maximum spacing of 100 m along each radial and an angular spacing between radials of 2 degrees.

For predicting impacts at the Chassahowitzka National Wilderness Class I Area, 13 discrete receptors located along the border of the PSD Class I area were used. A listing of the Class I receptors is presented in Table 7-4. Modeling refinements at the Chassahowitzka NWA were not performed due to the distance of the Class I area from the Cargill plant site.

7.2.5 Building Downwash Effects

Structures within Cargill's existing phosphate rock processing plant area were determined by a site plot plan (see Figures 7-1 and 7-2). The only significant structure for the existing plant is the No. 5/No. 9 mills building, which is 35 feet high (see Figure 7-3). The proposed modification will result in the construction of a new 60-ft silo. The new silo and the 35-ft building will be the only significant structures affecting the future stacks. The existing and proposed building structure information was 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. The dimensions for the structures are presented in Table 7-5.

Table 7-3. Cargill Property Boundary Receptors Used in the Modeling Analysis

Direction (deg)	Distance (m)	Direction (deg)	Distance (m)
10	965	190	362
20	805	200	390
30	675	210	796
40	597	220	971
50	550	230	1,296
60	525	240	1,512
70	517	250	1,494
80	524	260	1,019
90	550	270	1,064
100	596	280	1,151
110	414	290	1,296
120	338	300	1,421
130	294	310	1,623
140	285	320	1,962
150	293	330	2,000
160	311	340	1,843
170	343	350	1,759
180	347	360	1,245

Note: Distances are relative to the H_2SO_4 No. 9 plant stack location.
deg = degree.
m = meter.

Table 7-4. Chassahowitzka Wilderness Area Receptors Used in the Modeling Analysis

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

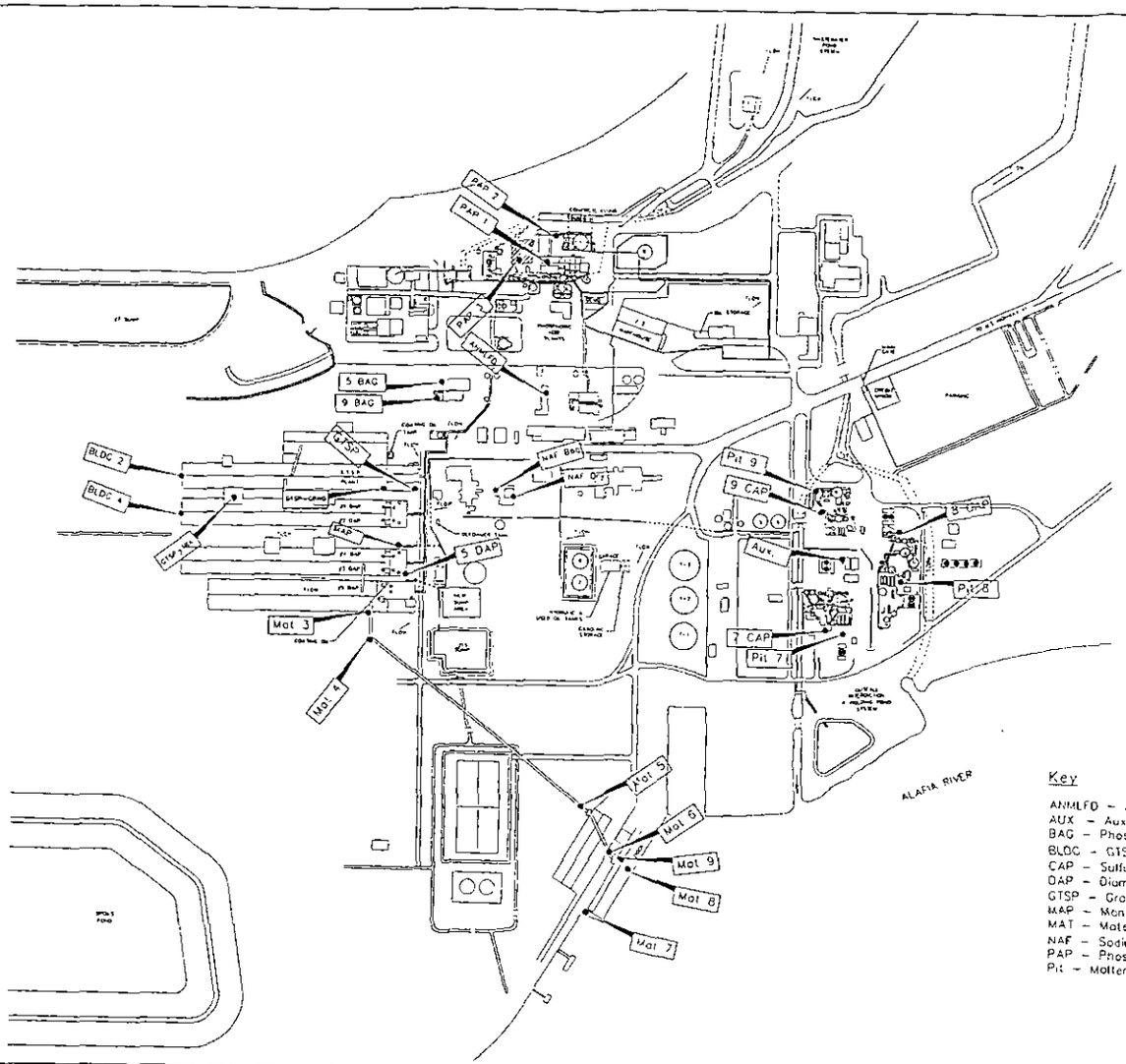

Figure 7-1
Facility Plot Plan

Source: Cargill Fertilizer Plant, 1996

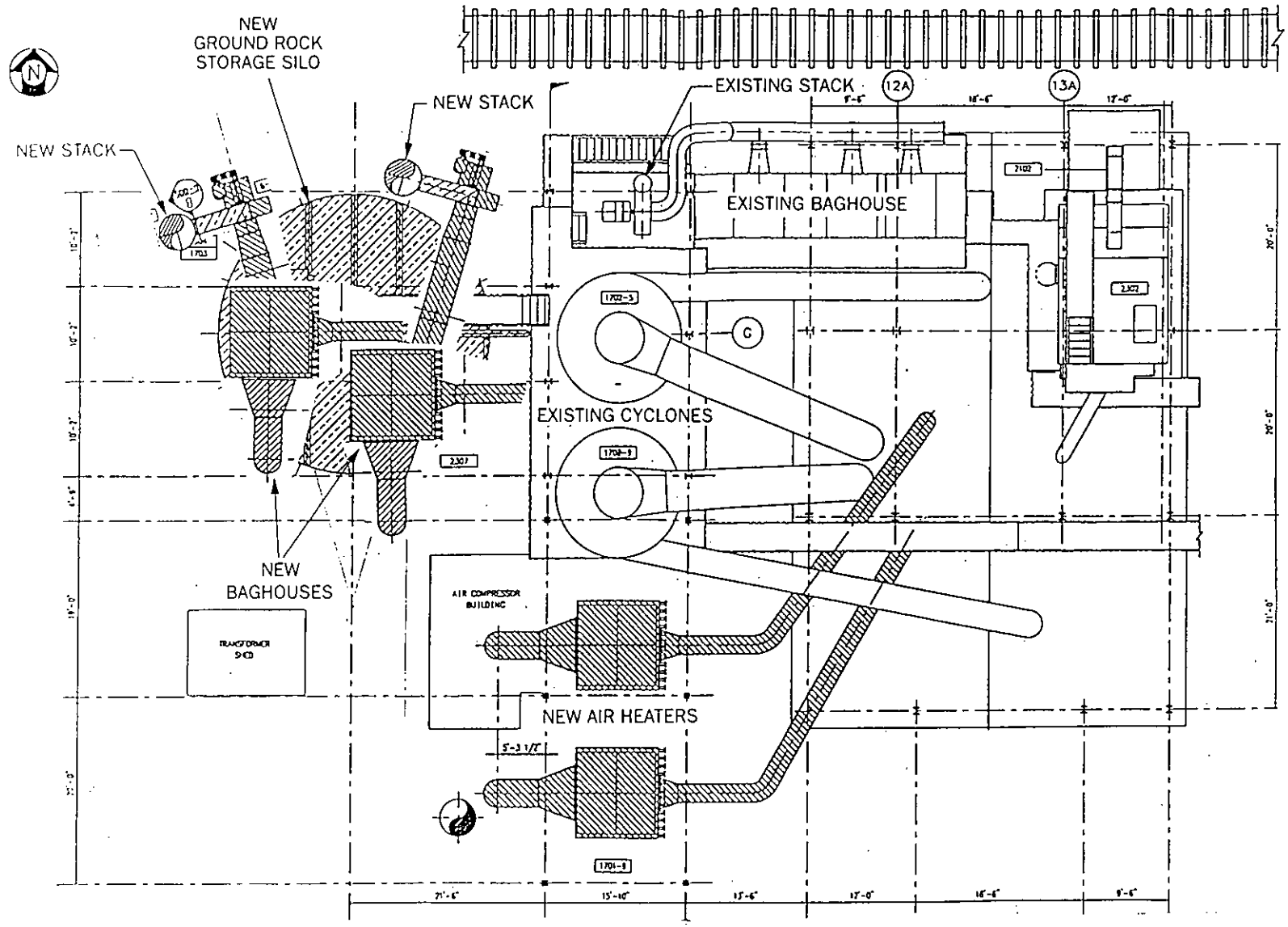

Figure 7-2
Site Layout of Phosphate Rock Grinders/Dryers

KBN
A GOLDER ASSOCIATES COMPANY

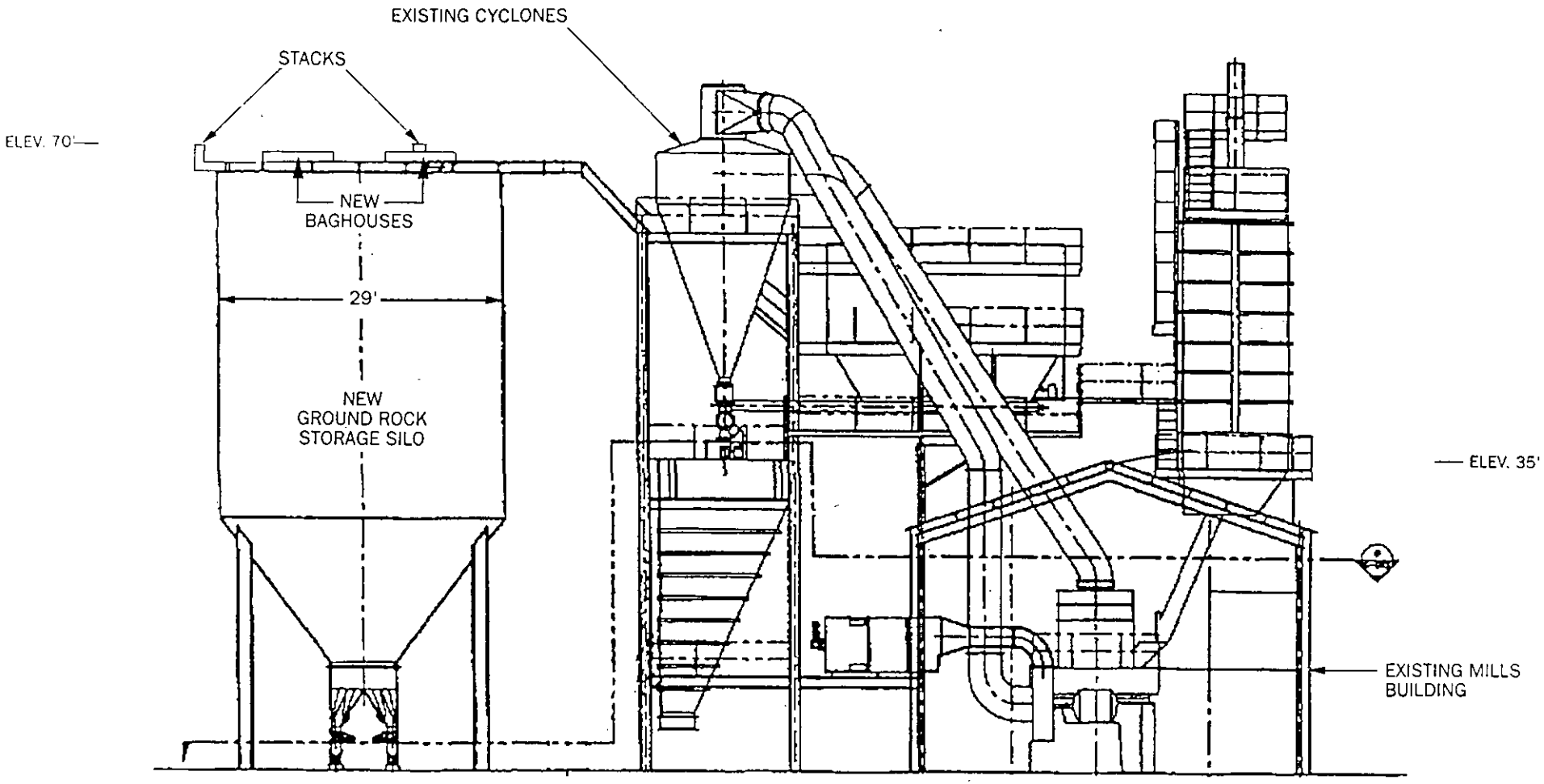

Figure 7-3
Elevation View of Phosphate Rock Grinders/Dryers

KBN
A GOLDER ASSOCIATES COMPANY

Table 7-5. Building Dimensions for Existing and Proposed Phosphate Rock Plant Structures.

Structure	Height		Length		Width	
	(ft)	(m)	(ft)	(m)	(ft)	(m)
Existing						
No 5/9 Mills Building	35	10.67	75	22.86	47	14.33
Future						
No 5/9 Mills Building	35	10.67	75	22.86	47	14.33
New Ground Rock Silo	60	18.29	35	10.67	35	10.67

7.3 MODELING RESULTS FOR SIGNIFICANT IMPACT ANALYSIS

The modeling analysis results for the proposed project only in the vicinity of the plant are summarized in Table 7-6. Based on the screening modeling results, refinements were performed for each averaging time. The maximum refined modeling results are provided in Table 7-7. The maximum predicted PM10 impacts due to the project only are 0.24 and 4.7 $\mu g/m^3$ for the annual and 24-hour average, respectively. As the maximum predicted values are below the EPA significant impact levels of 1 and 5 $\mu g/m^3$, respectively, detailed modeling analyses for comparison to the PM10 AAQS and PSD Class II increments, is not required.

The maximum PM10 concentrations predicted at the Chassahowitzka NWA are presented in Table 7-8. The maximum predicted PM10 impacts are 0.001 and 0.025 $\mu g/m^3$, for the annual and 24-hour average, respectively. These maximum predicted values are below the NPS recommended annual and 24-hour significant impact levels of 0.1 and 0.33 $\mu g/m^3$, respectively. Therefore, a PSD Class I modeling analysis at the Chassahowitzka NWA is not required for PM10.

Table 7-6. Maximum Predicted PM10 Impacts in the Vicinity of the Cargill Plant Due to the Proposed Modification Only - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual				
	0.23	260.	1100.	87123124
	0.18	240.	1512.	88123124
	0.15	210.	800.	89123124
	0.22	270.	1064.	90123124
	0.22	270.	1100.	91123124
High 24-Hour				
	4.35	270.	1064.	87110324
	2.63	260.	1019.	88061124
	2.40	200.	1100.	89030724
	3.01	280.	1151.	90052524
	3.81	280.	1151.	91052124

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

[a] All receptor coordinates are reported with respect the No. 9 plant H_2SO_4 stack location.

Table 7-7. Maximum Predicted PM10 Impacts in the Vicinity of the Cargill Plant Due to the Proposed Modification Only- Refined Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual				
	0.24	262.	1025.	87123124
	0.22	264.	1033.	90123124
	0.23	264.	1033.	91123124
24-Hour				
	4.35	270.	1064.	87110324
	4.66	274.	1200.	91020324

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

[a] All receptor coordinates are reported with respect to the No. 9 H_2SO_4 plant stack location.

Table 7-8. Maximum Predicted PM10 Impacts Due to the Proposed Modification Only at the Chassahowitzka NWA

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual				
	0.00038	343000.	3176200.	87123124
	0.00070	340300.	3165700.	88123124
	0.00124	342000.	3174000.	89123124
	0.00072	340700.	3171900.	90123124
	0.00046	343000.	3176200.	91123124
High 24-Hour				
	0.01392	343000.	3176200.	87121224
	0.02063	340300.	3165700.	88072524
	0.02321	342000.	3174000.	89062824
	0.02536	343700.	3178300.	90021924
	0.01738	340300.	3167700.	91012024

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

[a] All receptor coordinates are reported with respect to the No. 9 H_2SO_4 plant stack location.

8.0 ADDITIONAL IMPACT ANALYSIS

8.1 AIR QUALITY RELATED VALUES

8.1.1 Introduction

An air quality related values (AQRV) analysis was conducted to assess potential incremental and cumulative impacts on vegetation, soils, wildlife, and visibility in the Chassahowitzka NWA PSD Class I area. This AQRV analysis was performed for PM10 because this pollutant is emitted in quantities exceeding the PSD significant emission rate. PSD regulations specifically provide for the use of atmospheric dispersion models in performing AQRV analyses. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models, Revised (EPA, 1993).

The Industrial Source Complex Short Term (ISCST3 Version 96113) model was used to determine potential air quality impacts for this analysis. All air dispersion methodologies used for the AQRV analysis are the same as those used in the air quality impact assessment for the Class I area (see Section 8.3).

The current and future operating conditions of the phosphate rock grinding/drying system were modeled to determine the net air quality change in the Chassahowitzka NWA Class I area due to the proposed modification. These results were presented in Section 7.3. These and additional impacts are presented in Table 8-1. Cumulative Class I impacts were developed from the most recently available (i.e., 1992 and 1993) PM monitoring data collected near the Class I area. These data were used to represent existing background values near the Chassahowitzka NWA. The incremental impacts due to the proposed increase were added to the background values in order to develop a cumulative impact for use in the AQRV analysis.

A summary of the available monitoring data for PM is included in Table 8-2. The nearest monitor to the Class I area is located at the Twin Rivers Marina, approximately 9 miles north of the Class I area. The highest values for any monitor were taken as the existing background values and, therefore, represents a conservative approach to the analysis. These background values were added to the proposed impacts to represent total air quality impacts at the Class I area. Since PM10 is a subset of PM, using PM background concentrations results in conservatively high background PM10 concentrations.

Table 8-1. Maximum Predicted PM10 Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area

Averaging	Concentration	Receptor Location[a] UTM-E	UTM-N	Period Ending (YYMMDDHH)	NPS Recommended Significance Levels ($\mu g/m^3$)
Annual					
	0.00038	343000.	3176200.	87123124	0.1
	0.00070	340300.	3165700.	88123124	
	0.00124	342000.	3174000.	89123124	
	0.00072	340700.	3171900.	90123124	
	0.00046	343000.	3176200.	91123124	
HIGH 24-Hour					
	0.01392	343000.	3176200.	87121224	0.3
	0.02063	340300.	3165700.	88072524	
	0.02321	342000.	3174000.	89062824	
	0.02536	343700.	3178300.	90021924	
	0.01738	340300.	3167700.	91012024	
HIGH 8-Hour					
	0.04057	342000.	3174000.	87072708	
	0.05399	340300.	3165700.	88072508	
	0.06225	331500.	3183400.	89072908	
	0.07601	343700.	3178300.	90021908	
	0.05215	340300.	3167700.	91012008	
HIGH 3-Hour					
	0.08618	342000.	3174000.	87011424	
	0.10797	340300.	3165700.	88072503	
	0.12450	331500.	3183400.	89072903	
	0.12381	343700.	3178300.	90021906	
	0.10089	343000.	3176200.	91060506	
HIGH 1-Hour					
	0.25855	342000.	3174000.	87011423	
	0.26205	340700.	3171900.	88122824	
	0.33951	343000.	3176200.	89062806	
	0.27812	340300.	3167700.	90081802	
	0.30268	343000.	3176200.	91060506	

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

[a] All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

Table 8-2. Summary of PM Monitoring Data Collected Near the Chassahowitzka NWA

Year	County	Station ID	Monitor Location	Number of Observations	Maximum Concentrations Reported ($\mu g/m^3$) 24-Hour	Annual
1993	Citrus	0580-003-J02	Crystal River; Twin Rivers Marina	26[b]	102	38
1993	Citrus	0580-003-J09	Crystal River; Twin Rivers Marina[a]	26[b]	88	33
1993	Citrus	0580-005-J02	Crystal River; East of FPC Plant	28[b]	36	21
1992	Citrus	0580-003-J02	Crystal River; Twin Rivers Marina	58	86	33
1992	Citrus	0580-003-J09	Crystal River; Twin Rivers Marina[a]	59	77	1
1992	Citrus	0580-005-J02	Crystal River; East of FPC Plant	59	69	24

[a] Colocated monitor.
[b] Monitoring discontinued in June 1993.

The predicted impacts of the proposed project at the Class I area (0.025 $\mu g/m^3$, 24-hour maximum; 0.0012 $\mu g/m^3$, annual average) are negligible compared to the existing background values. Therefore, the background value of 102 $\mu g/m^3$, 24-hour average, and 38 $\mu g/m^3$, annual average, also represent the cumulative PM10 concentrations including the proposed project. These cumulative impacts are shown in Table 8-3.

8.1.2 Identification of AQRVs and Methodology

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed increase from the Cargill Riverview facility. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.
>
> Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register 1978).

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the Chassahowitzka NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined as:

Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass

Marsh Islands - cabbage palm and eastern red cedar

Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle

Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm

Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto

Mangrove Swamp - red, white, and black mangrove

Table 8-3. Incremental and Cumulative PM10 Impacts at the Class I Area

Averaging Time	Background PM Concentration ($\mu g/m^3$)	Increase Due to Proposed Project ($\mu g/m^3$)	Cumulative PM10 Concentration with Proposed Project ($\mu g/m^3$)	Primary/Secondary Ambient Air Quality Standard ($\mu g/m^3$)
Annual	38	0.0012	38	50
24-hour	102	0.025	102	150
8-hour	179[a]	0.08	179	—
3-hour	230[a]	0.12	230	—
1-hour	255[a]	0.34	255	—

[a] Based on the following factors:
1-hour/24-hour = 1/0.4
3-hour/24-hour = 0.9/0.4
8-hour/24-hour = 0.7/0.4

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

A screening approach was used that compared the maximum predicted ambient concentration of air pollutants of concern in the Chassahowitzka NWA with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species that can be used as predictors. In conducting the assessment, both direct (fumigation) and indirect (soil accumulation/uptake) exposures were considered for flora, and direct exposure (inhalation) was considered for wildlife.

8.1.3 Particulate Matter Exposure: Vegetation

Although information pertaining to the effects of particulate matter on plants is scarce, some concentrations are available (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 (i.e., concentrations for an 8-hour averaging time), the possibility of plant damage in the Chassahowitzka NWA can be determined. The maximum predicted cumulative 8-hour PM10 concentration is 179 $\mu g/m^3$. This concentration is approximately 85 percent of the values that affected plant foliage. The contribution of the proposed project (0.08 $\mu g/m^3$, 8-hour average) is insignificant in comparison to existing PM10 concentrations.

8.1.4 Particulate Matter Exposure: Wildlife

A wide range of physiological and ecological effects to fauna has been reported for particulate pollutants (Newman, 1980; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the PM10 secondary ambient air quality standards (150 $\mu g/m^3$, 24-hour average, and 50 $\mu g/m^3$, annual average). Physiological and behavioral effects have also been observed in experimental animals at or below these standards. However, no observable effects to fauna are expected at concentrations below the values reported in Table 8-4. As shown in Table 8-3, the cumulative concentrations of PM10 with the proposed project are below those that would cause respiratory stress in wildlife. The proposed project's contribution to cumulative impacts is negligible.

8.1.5 Particulate Matter Exposure: Soils

The majority of the soil in the Class I area is classified as Weekiwachee-Durbin muck. This is an euic, hyperthermic type sufihemist that is characterized by high levels of sulfur and organic matter. This soil is flooded daily with the advent of high tide and the pH ranges between 6.1 and 7.8. The upper level of this soil may contain as much as 4 percent sulfur (USDA, 1991).

Any particulate deposition from the proposed project would be neutral or alkaline in nature. Although ground deposition was not calculated, it is evident that the effect of any dust deposited would be inconsequential in light of the existing soil pH. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity.

8.2 IMPACTS UPON VISIBILITY

Because the Chassahowitzka NWA is located approximately 86 km to the north-northwest of the Cargill site, a visibility impact assessment of the Class I area is required. A Level I visibility screening analysis was conducted following the procedures outlined in "Workbook for Estimating Visibility Impairment" (EPA, 1980). The Level I screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts higher than expected). The EPA model, VISCREEN, was used for this analysis. PM10 and NO_x emissions used for the calculations were based upon the total maximum emissions from the phosphate rock grinding/ drying system after the proposed modification.

Table 8-4. Examples of Reported Effects of Air Pollutants at Concentrations Below National Ambient Air Quality Standards

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Particulates[a]	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

[a] Newman and Schreiber, 1988. Env. Tox. Chem. 7:381-390.

Model input and output results are presented in Figure 8-1. As indicated, the maximum visual impacts caused by the phosphate rock grinding/drying system do not exceed the screening criteria inside or outside the Class I area after the proposed modification.

8.3 REGIONAL HAZE ANALYSIS

8.3.1 General

A regional haze analysis was conducted to determine if the proposed Cargill modification would cause a perceptible degradation in visibility at the Chassahowitzka National Wildlife Refuge (CNWR). The CNWR is located approximately 86 kilometers (km) north-northwest of the Cargill plant. Visibility is an Air Quality Related Value (AQRV) at the CNWR. The visibility of an area is generally characterized by either its visual range, V_r (i.e., the greatest distance that a dark object can be seen) or its extinction coefficient, b_{ext} (i.e., the attenuation of light over a distance due to particle scattering and/or gaseous absorption). The visual range and extinction coefficient are related to one another by the following equation[a]:

$$b_{ext} = 3.912 / V_r \quad (km^{-1}) \qquad (1)$$

The National Park Service (NPS) in coordination with the Fish and Wildlife Service (FWS) uses the Deciview index (NPS, 1992), d_v, to describe an area's change in extinction coefficient. The deciview is defined as:

$$d_v = 10 \ln (b_{ext}/0.01) \qquad (2)$$

where ln represents the natural logarithm of the quantity in parentheses. A change in an area's deciview (NPS, 1995), Δd_v, of 1 corresponds to an approximate 10 percent changed in extinction, which is considered as a noticeable change in regional haze. The deciview change is defined by:

$$\Delta d_v = 10 \ln (1 + b_{exts}/b_{extb}) \qquad (3)$$

where b_{exts} and b_{extb} represent the extinction coefficients due to the source (i.e., the proposed expansion) and for the CNWR background visual range, respectively. Based on recent communications with the NPS, the background visual range for the CNWR is 65 km based on air monitoring data (USFWS, 1995).

Visual Effects Screening Analysis for
Source: CARGILL-RIVERVIEW PHOSPHATE ROCK PROCESSING PLANT
Class I Area: CHASSAHOWITZKA NWA

*** Level-1 Screening ***

Input Emissions for

Particulates	6.20	LB /HR
NOx (as NO2)	3.70	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	13.20	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	65.00 km
Source-Observer Distance:	86.00 km
Min. Source-Class I Distance:	86.00 km
Max. Source-Class I Distance:	104.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 6	
Wind Speed: 1.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	86.0	84.	2.00	.188	.05	.003
SKY	140.	84.	86.0	84.	2.00	.079	.05	-.004

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	50.	75.1	119.	2.00	.206	.05	.003
SKY	140.	50.	75.1	119.	2.00	.091	.05	-.004

15281Y/F2/WP/DRYROCK.VIS (06/21/96)

Figure 8-1
Level-1 Visibility Screening Analysis for Cargill Phosphate Rock Grinding/Drying System

8.3.2 Calculation of Source Extinction

The source extinction due to the proposed plant expansion is calculated according to interim recommendations that are provided in the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I Report, Appendix B. The report states that the primary sources of regional visibility degradation are mostly fine particles with diameters ≤ 2.5 μm, ammonium bi-sulfate $[(NH_4)_2SO_4]$ and ammonium nitrate (NH_4NO_3). The procedures for determining the ambient concentration levels of these compounds due to the proposed project are:

1. Obtain the maximum hourly sulfur dioxide (SO_2), nitrogen oxides (NO_x), and sulfuric acid (H_2SO_4) mist impacts due to the proposed expansion from air quality dispersion models such as the Industrial Source Complex Short Term (ISCST3) or the MESOPUFF II model. For the present analysis, the maximum impacts were provided from the ISCST3 model, a steady state model that was used for the modeling analysis for the Prevention of Significant Deterioration (PSD) application. Based on verbal communications with Bud Rolofson of the NPS, the NPS had changed it's policy of using the hourly maximum impacts to using the highest 24-hour impacts for these pollutants. The maximum 24-hour impacts are based on the highest predicted concentrations from the ISCST3 model for the 5-year period, 1987 to 1991. The maximum 24-hour impacts at the CNWR due to the proposed project only are 0.0535, 0.015, and 0.025 $\mu g/m^3$ for SO_2, NO_x, and H_2SO_4 mist (as PM), respectively.

2. Assume a 100 percent conversion of SO_2 to SO_4^{2-} and NO_x to NO_3. Multiplicative factors for this conversion are presented in IWAQM Inset 1, as 1.5 and 1.35, respectively, which are based on the ratios of the molecular weights of the compounds. Based on further discussions with the NPS, a 3 percent per hour conversion rate for SO_2 to SO_4^{2-} was used instead of assuming a 100 percent conversion for SO_2 to SO_4^{2-}. Table 8-5 shows the hourly conversion of SO_2 to SO_4^{2-} for a maximum 24-hour SO_2 concentration of 0.0535 $\mu g/m^3$. For the worst-case 24-hour period, a 24-hour cumulative SO_4^{2-} concentration was calculated to be 0.0277 $\mu g/m^3$. Concentrations of H_2SO_4 mist were assumed to exist as primary fine particulates.

3. Calculate maximum concentrations of ammonium sulfate and ammonium nitrate from multiplicative factors 1.375 and 1.29, respectively, from IWAQM, Appendix B.

Table 8-5. Hourly Conversion Rate of SO2 to SO4 for Proposed Cargill Expansion at the Chassahowitzka NWR

Hour	SO2	SO4
1	0.0535	0.0016
2	0.0519	0.0016
3	0.0503	0.0015
4	0.0488	0.0015
5	0.0474	0.0014
6	0.0459	0.0014
7	0.0446	0.0013
8	0.0432	0.0013
9	0.0419	0.0013
10	0.0407	0.0012
11	0.0395	0.0012
12	0.0383	0.0011
13	0.0371	0.0011
14	0.0360	0.0011
15	0.0349	0.0010
16	0.0339	0.0010
17	0.0329	0.0010
18	0.0319	0.0010
19	0.0309	0.0009
20	0.0300	0.0009
21	0.0291	0.0009
22	0.0282	0.0008
23	0.0274	0.0008
24	0.0266	0.0008
Total		0.0277

a. Assumes hourly conversion rate of 3 percent

4. Obtain hourly values of relative humidity (RH). The maximum predicted 24-hour impacts from the ISCST3 model occurred on 2/19/90. The Tampa Nation Weather Services hourly surface observations for this day indicate an average RH of approximately 82.5 percent.

5. Calculate the extinction coefficients of ammonium sulfate, ammonium nitrate, and primary fine particulate. The extinction coefficients for each compound are defined by:

$$b_{exts} = 0.003 \text{ (comp) } f(RH)$$

where (comp) represents the ambient concentration of the compound in question, and f(RH) is the relative humidity factor. From Figure B-1 in Appendix B, a RH of 82.5 percent corresponds to a RH factor of 4.0. For H_2SO_4 mist (as fine particulate matter), an RH factor of unity was used per IWAQM recommendations. The total source extinction coefficient value is equal to the sum of the calculated extinction coefficients for each compound.

A summary of the calculations are provided in Table 8-6. The total source extinction coefficient due to the proposed project was determined to be 0.0008. From equation (3), above, the total deciview change due to the proposed project is 0.14.

Based on this analysis, the proposed project will result in less that a 10 percent decrease in visibility to the clearest days observed at the CNWR. Therefore, no adverse impacts upon regional haze is expected to occur due to the proposed Cargill project.

Table 8-6. Calculation of Change in Deciview Due to the Proposed Cargill Project

Pollutant	Value	Reference
Maximum Emission Rates (lb/hr)		
SO2	13.20	
NOx	3.70	
H2SO4 (as PM)	6.20	
Highest 24-Hour Chassahowitzka NWR Impacts ($\mu g/m^3$)		
SO2	0.0535	(a)
NOx	0.0150	(b)
H2SO4 (as PM)	0.0251	(b)
SO4	0.0277	(c)
NO3	0.0202	(d)
(NH4)2SO4	0.0381	(e)
NH4NO3	0.0261	(f)
Average RH (percent)	82.5	(g)
RH factor, f(RH)	4.0	(h)
Extinction Coefficients (km^{-1})		
Background: (bextb)	0.0602	(i)
(NH4)2SO4	0.0005	(j)
NH4NO3	0.0003	(j)
H2SO4 (as PM)	0.0001	(k)
Total (bexts)	0.0008	
Deciview Change		
total delta dv =	0.1396	(l)

References:

a. Highest predicted concentration from ISCST3 model using a 5-year meteorological data record from 1987-91
b. Concentration calculated from ratio of emissions to SO2 emissions times the maximum SO2 concentration
c. SO4 concentrations based on 3 percent per hour conversion rate from SO2
d. NO3 = NOx * 1.35 from IWAQM Inset No. 1
e. = SO4 times 1.375 from IWAQM Appendix B
f. = NO3 times 1.29 from IWAQM Appendix B
g. Based on average RH for highest impact day.
h. From IWAQM Figure B-1.
i. = 3.912 / 65 where 65 is background visual range.
j. = .003 * compound * f(RH) from IWAQM Appendix B
k. = .003 * compound. f(RH) set = 1 for fine PM
l. Delta DV = 10 * ln (1 + bexts/bextb)

REFERENCES

Mandoli, B.L. and P.S. Dubey. 1988. The Industrial Emission and Plant Response at Pithampur (M.P.). Int. J. Ecol. Environ. Sci. 14:75-79.

National Park Service (NPS). December 12, 1992. Memorandum from J. Vimont to IWAQM.

National Park Service (NPS). July 10, 1995. Regional Haze Analysis Calculation Worksheet, Facsimile from B. Rolofson, NPS to S. Marks, KBN.

Newman, J.R. 1980. Effects of Air Emissions on Wildlife Resources. U.S. Fish and Wildlife Service. Biological Services Program, National Power Plant Team. FWS/OBS-80/40-1.

Newman, J.R., and R.K. Schreiber. 1988. Air Pollution and Wildlife Toxicology: An Overlooked Problem. Environmental Toxicology and Chemistry, 7-381-390.

U.S. Fish and Wildlife Service (USFWS). 1995. Air Quality Branch, Technical Review of Cargill Fertilizer PSD Application June 26, 1995.

ATTACHMENT A

Table 1.3-2 (English Units). CRITERIA POLLUTANT EMISSION FACTORS FOR UNCONTROLLED FUEL OIL COMBUSTION

Firing Configuration (SCC)[a]	SO_2[b]		SO_3[c]		NO_x[d]		CO[e,f]		Filterable PM[g]	
	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING
Utility boilers										
No. 6 oil fired, normal firing (1-01-004-01)	157S	A	5.7S	C	67	A	5	A	—[h]	A
No. 6 oil fired, tangential firing (1-01-004-04)	157S	A	5.7S	C	42	A	5	A	—[h]	A
No. 5 oil fired, normal firing (1-01-004-05)	157S	A	5.7S	C	67	A	5	A	—[h]	B
No. 5 oil fired, tangential firing (1-01-004-06)	157S	A	5.7S	C	42	A	5	A	—[h]	B
No. 4 oil fired, normal firing (1-01-005-04)	150S	A	5.7S	C	67	A	5	A	—[h]	B
No. 4 oil fired, tangential firing (1-01-005-05)	150S	A	5.7S	C	42	A	5	A	—[h]	B
Industrial boilers										
No. 6 oil fired (1-02-004-01/02/03)	157S	A	2S	A	55	A	5	A	—[h]	A
No. 5 oil fired (1-02-004-04)	157S	A	2S	A	55	A	5	A	—[h]	B
Distillate oil fired (1-02-005-01/02/03)	142S	A	2S	A	20	A	5	A	—[h]	A
No. 4 oil fired (1-02-005-04)	150S	A	2S	A	20	A	5	A	—[h]	B
Commercial/institutional/residential combustors										
No. 6 oil fired (1-03-004-01/02/03)	157S	A	2S	A	55	A	5	A	—[h]	A
No. 5 oil fired (1-03-004-04)	157S	A	2S	A	55	A	5	A	—[h]	B
Distillate oil fired (1-03-005-01/02/03)	142S	A	2S	A	20	A	5	A	—[h]	A
No. 4 oil fired (1-03-005-04)	150S	A	2S	A	20	A	5	A	—[h]	B
Residential furnace (No SCC)	142S	A	2S	A	18	A	5	A	3	A

Table 1.3-2 (cont.).

[a] SCC = Source Classification Code.

[b] References 1-6,23,42-46. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[c] References 1-5,45-46,22.

[d] References 3-4,10,15,24,42-46,48-49. Expressed as NO_2. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical fired boilers use 105 lb/10^3 gal at full load and normal (> 15%) excess air. Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are related to fuel nitrogen content, estimated by the following empirical relationship: lb NO_2 /10^3 gal = 20.54 + 104.39(N), where N is the weight percent of nitrogen in the oil.

[e] References 3-5,8-10,23,42-46,48. CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[f] Emission factors for CO_2 from oil combustion should be calculated using lb CO_2/10^3 gal oil = 259 C (distillate) or 288 C (residual).

[g] References 3-5,7,21,23-24,42-46,47,49. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. PM-10 values include the sum of that particulate collected on the PM-10 filter of an EPA Method 201 or 201A sampling train and condensable emissions as measured by EPA Method 202.

[h] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
No. 6 oil: 9.19(S) + 3.22 lb/10^3 gal, where S is the weight % of sulfur in oil.
No. 5 oil: 10 lb/10^3 gal
No. 4 oil: 7 lb/10^3 gal
No. 2 oil: 2 lb/10^3 gal

Table 1.3-4 (English Units). EMISSION FACTORS FOR TOTAL ORGANIC COMPOUNDS (TOC), METHANE, AND NONMETHANE TOC (NMTOC) FROM UNCONTROLLED FUEL OIL COMBUSTION

Firing Configuration (SCC)[a]	TOC[b]		Methane[b]		NMTOC[b]	
	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING	lb/10^3 gal	EMISSION FACTOR RATING
Utility boilers						
No. 6 oil fired, normal firing (1-01-004-01)	1.04	A	0.28	A	0.76	A
No. 6 oil fired, tangential firing (1-01-004-04)	1.04	A	0.28	A	0.76	A
No. 5 oil fired, normal firing (1-01-004-05)	1.04	A	0.28	A	0.76	A
No. 5 oil fired, tangential firing (1-01-004-06)	1.04	A	0.28	A	0.76	A
No. 4 oil fired, normal firing (1-01-005-04)	1.04	A	0.28	A	0.76	A
No. 4 oil fired, tangential firing (1-01-005-05)	1.04	A	0.28	A	0.76	A
Industrial boilers						
No. 6 oil fired (1-02-004-01/02/03)	1.28	A	1	A	0.28	A
No. 5 oil fired (1-02-004-04)	1.28	A	1	A	0.28	A
Distillate oil fired (1-02-005-01/02/03)	0.252	A	0.052	A	0.2	A
No. 4 oil fired (1-02-005-04)	0.252	A	0.052	A	0.2	A
Commercial/institutional/ residential combustors						
No. 6 oil fired (1-03-004-01/02/03)	1.605	A	0.475	A	1.13	A
No. 5 oil fired (1-03-004-04)	1.605	A	0.475	A	1.13	A
Distillate oil fired (1-03-005-01/02/03)	0.556	A	0.216	A	0.34	A
No. 4 oil fired (1-03-005-04)	0.556	A	0.216	A	0.34	A
Residential furnace (No SCC)	2.493	A	1.78	A	0.713	A

[a] SCC = Source Classification Code.

[b] References 16-19. Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.

Table 1.4-2 (Metric And English Units). EMISSION FACTORS FOR SULFUR DIOXIDE (SO_2), NITROGEN OXIDES (NO_x), AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (Size, 10^6 Btu/hr Heat Input) (SCC)[b]	SO_2[c]			NO_x[d]			CO[e]		
	kg/10^6 m^3	lb/10^6 ft^3	RATING	kg/10^6 m^3	lb/10^6 ft^3	RATING	kg/10^6 m^3	lb/10^6 ft^3	RATING
Utility/large Industrial Boilers (>100) (1-01-006-01, 1-01-006-04)									
Uncontrolled	9.6	0.6	A	8800	550[f]	A	640	40	A
Controlled - Low NO_x burners	9.6	0.6	A	1300	81[f]	D	ND	ND	NA
Controlled - Flue gas recirculation	9.6	0.6	A	850	53[f]	D	ND	ND	NA
Small Industrial Boilers (10 - 100) (1-02-006-02)									
Uncontrolled	9.6	0.6	A	2240	140	A	560	35	A
Controlled - Low NO_x burners	9.6	0.6	A	1300	81[f]	D	980	61	D
Controlled - Flue gas recirculation	9.6	0.6	A	480	30	C	590	37	C
Commercial Boilers (0.3 - <10) (1-03-006-03)									
Uncontrolled	9.6	0.6	A	1600	100	B	330	21	C
Controlled - Low NO_x burners	9.6	0.6	A	270	17	C	425	27	C
Controlled - Flue gas recirculation	9.6	0.6	A	580	36	D	ND	ND	NA
Residential Furnaces (<0.3) (No SCC)									
Uncontrolled	9.6	0.6	A	1500	94	B	640	40	B

[a] Units are kg of pollutant/10^6 cubic meters natural gas fired and lb of pollutant/10^6 cubic feet natural gas fired. Based on an average natural gas fired higher heating value of 8270 kcal/m^3 (1000 Btu/scf). The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. ND = no data. NA = not applicable.

[b] SCC = Source Classification Code.

[c] Reference 7. Based on average sulfur content of natural gas, 4600 g/10^6 Nm^3 (2000 gr/10^6 scf).

Table 1.4-2 (cont.).

[d] References 10,15-19. Expressed as NO_2. For tangentially fired units, use 4400 kg/10^6 m^3 (275 lb/10^6 ft^3). At reduced loads, multiply factor by load reduction coefficient in Figure 1.4-1. Note that NO_x emissions from controlled boilers will be reduced at low load conditions.

[e] References 9-10,16-18,20-21.

[f] Emission factors apply to packaged boilers only.

Table 1.4-3 (Metric And English Units). EMISSION FACTORS FOR CARBON DIOXIDE (CO_2) AND TOTAL ORGANIC COMPOUNDS (TOC) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (Size, 10^6 Btu/hr Heat Input) (SCC)[b]	CO_2[c]			TOC[d]		
	kg/10^6 m^3	lb/10^6 ft^3	RATING	kg/10^6 m^3	lb/10^6 ft^3	RATING
Utility/large industrial boilers (> 100) (1-01-006-01, 1-01-006-04)	ND[e]	ND	NA	28[f]	1.7[f]	C
Small industrial boilers (10 - 100) (1-02-006-02)	1.9 E+06	1.2 E+05	D	92[g]	5.8[g]	C
Commercial boilers (0.3 - < 10) (1-03-006-03)	1.9 E+06	1.2 E+05	C	128[h]	8.0[h]	C
Residential furnaces (No SCC)	2.0 E+06	1.3 E+05	D	180[h]	11[h]	D

[a] All factors represent uncontrolled emissions. Units are kg of pollutant/10^6 cubic meters and lb of pollutant/10^6 cubic feet. Based on an average natural gas higher heating value of 8270 kcal/m^3 (1000 Btu/scf). The emission factors in this table may be converted to other natural gas heating values by multiplying the given factor by the ratio of the specified heating value to this average heating value. NA = not applicable.

[b] SCC = Source Classification Code.

[c] References 10,22-23.

[d] References 9-10,18.

[e] ND = no data.

[f] Reference 8: methane comprises 17% of organic compounds.

[g] Reference 8: methane comprises 52% of organic compounds.

[h] Reference 8: methane comprises 34% of organic compounds.

ATTACHMENT B

40 CFR 60, Subpart NN - NSPS for Phosphate Rock Plants

(BNA - Sept. 1995)

§60.400 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to the following affected facilities used in phosphate rock plants which have a maximum plant production capacity greater than 3.6 megagrams per hour (4 tons/hr): dryers, calciners, grinders, and ground rock handling and storage facilities, except those facilities producing or preparing phosphate rock solely for consumption in elemental phosphorus production.

(b) Any facility under paragraph (a) of this section which commences construction, modification, or reconstruction after September 21, 1979, is subject to the requirements of this part.

§60.401 Definitions.

(a) Phosphate rock plant means any plant which produces or prepares phosphate rock product by any or all of the following processes: Mining, beneficiation, crushing, screening, cleaning, drying, calcining, and grinding.

(b) Phosphate rock feed means all material entering the process unit including, moisture and extraneous material as well as the following ore minerals: Fluorapatite, hydroxylapatite, chlorapatite, and carbonateapatite.

(c) Dryer means a unit in which the moisture content of phosphate rock is reduced by contact with a heated gas stream.

(d) Calciner means a unit in which the moisture and organic matter of phosphate rock is reduced within a combustion chamber.

(e) Grinder means a unit which is used to pulverize dry phosphate rock to the final product size used in the manufacture of phosphate fertilizer and does not include crushing devices used in mining.

(f) Ground phosphate rock handling and storage system means a system which is used for the conveyance and storage of ground phosphate rock from grinders at phosphate rock plants.

(g) Beneficiation means the process of washing the rock to remove impurities or to separate size fractions.

§60.402 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere:

(1) From any phosphate rock dryer any gases which:

(i) Contain particulate matter in excess of 0.030 kilogram per megagram of phosphate rock feed (0.06 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(2) From any phosphate rock calciner processing unbeneficiated rock or blends of beneficiated and unbeneficiated rock, any gases which:

(i) Contains particulate matter in excess of 0.12 kilogram per megagram of phosphate rock feed (0.23 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(3) From any phosphate rock calciner processing beneficiated rock any gases which:

(i) Contain particulate matter in excess of 0.055 kilogram per megagram of phosphate rock feed (0.11 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(4) From any phosphate rock grinder any gases which:

(i) Contain particulate matter in excess of 0.006 kilogram per megagram of phosphate rock feed (0.012 lb/ton), or

(ii) Exhibit greater than zero-percent opacity.

(5) From any ground phosphate rock handling and storage system any gases which exhibit greater than zero-percent opacity.

§60.403 Monitoring of emissions and operations.

(a) Any owner or operator subject to the provisions of this subpart shall install, calibrate, maintain, and operate a continuous monitoring system, except as provided in paragraphs (b) and (c) of this section, to monitor and record the opacity of the gases discharged into the atmosphere from any phosphate rock dryer, calciner, or grinder. The span of this system shall be set at 40-percent opacity.

(b) For ground phosphate rock storage and handling systems, continuous monitoring systems for measuring opacity are not required.

(c) The owner or operator of any affected phosphate rock facility using a wet scrubbing emission control device shall not be subject to the requirements in paragraph (a) of this section, but shall install, calibrate, maintain, and operate the following continuous monitoring devices:

(1) A monitoring device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ± 250 pascals (± 1 inch water) gauge pressure.

(2) A monitoring device for the continuous measurement of the scrubbing liquid supply pressure to the control device. The monitoring device must be accurate within ± 5 percent of design scrubbing liquid supply pressure.

(d) For the purpose of conducting a performance test under §60.8, the owner or operator of any phosphate rock plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device for measuring the phosphate rock feed to any affected dryer, calciner, or grinder. The measuring device used must be accurate to within ±5 percent of the mass rate over its operating range.

(e) For the purpose of reports required under §60.7(c), periods of excess emissions that shall be reported are defined as all 6-minute periods during which the average opacity of the plume from any phosphate rock dryer, calciner, or grinder subject to paragraph (a) of this section exceeds the applicable opacity limit.

(f) Any owner or operator subject to the requirements under paragraph (c) of this section shall report for each calendar quarter all measurement results that are less than 90 percent of the average levels maintained during the most recent performance test conducted under §60.8 in which the affected facility demonstrated compliance with the standard under §60.402.

§60.404 Test methods and procedures.

(a) In conducting the performance tests required in §60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided for in §60.8(b).

(b) The owner or operator shall determine compliance with the particulate matter standards in §60.402 as follows:

(1) The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd})/(P K)$$

where:
E = emission rate of particulate matter, kg/Mg (lb/ton) of phosphate rock feed.
c_s = concentration of particulate matter, g/dscm (g/dscf).
Q_{sd} = volumetric flow rate of effluent gas, dscm/hr (dscf/hr).
P = phosphate rock feed rate, Mg/hr (ton/hr).
K = conversion factor, 1000 g/kg (453.6 g/lb).

(2) Method 5 shall be used to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

(3) The device of §60.403(d) shall be used to determine the phosphate rock feed rate (P) for each run.

(4) Method 9 and the procedures in §60.11 shall be used to determine opacity.

(c) To comply with §60.403(f), if applicable, the owner or operator shall use the monitoring devices in §60.403(c)(1) and (2) to determine the average pressure loss of the gas stream through the scrubber and the average scrubbing supply pressure during the particulate matter runs.

ATTACHMENT C

STACK TEST RESULTS FOR EXISTING ROCK DRYERS/GRINDERS

PARTICULATE SOURCE TEST RESULTS

Company Name: Gardinier, Inc. - U. S. Phosphoric Products

Company Conducting Test: Gardinier, Inc. - U. S. Phosphoric Products

Source Identification: 72% BPL Rock Unloading and Grinding System - No. 5 and No. 9 Raymond Mills Bag Filter(Stack)

Date: 10/11/83

Run	Molecular Weight	ACF	ACFM	SCFM	% H_2O	T_s °F	Percent Isokinetic	Grains/SCF	Emissions Lbs./Hr.	Allowable Lbs./Hr.
#1	29.0	49.486	10,122	8,360	6.3	139	101	2.05×10^{-2}	1.5	
#2	29.0	49.775	10,014	8,204	6.5	142	101	2.96×10^{-2}	2.1	
#3	29.0	50.600	10,204	8,435	5.5	142	100	3.05×10^{-2}	2.2	
#4										
Mean	29.0	49.954	10,113	8,333	6.1	141	101	2.69×10^{-2}	1.93	10.3

Standard Conditions = Dry, 68°F, 29.92 in. Hg.

Dry Molecular Weight of gas assumed to be 28.967 when gas composition data not available.