Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

June 14, 2000

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

Re: Florida Rock Industries, Inc., Brooksville Operations
PSD-FL-293

Dear Mr. Bunyak:

Enclosed is a copy of a PSD permit application for the construction of a new portland cement plant for Florida Rock Industries, Inc. in Hernando County. The application includes the applicant's PSD analyses including a BACT analysis. This is a new PSD major facility, and emissions from this project are significant for VOC, NOx, CO, PM, PM_{10}, and SO_2. The design is a dry process, precalciner system with an inline raw mill. Production capacity will be 2300 tons per day of clinker and 750,000 tons per year of portland cement. ESPs are proposed for the in-line kiln/raw mill and the clinker cooler. Proposed fuels are coal, natural gas, fuel oil and tires.

Please provide your comments as soon as possible. Our rules require us to determine whether an application is complete within 30 days of receipt and to make a Preliminary Determination within 60 days (given that the application is complete). This project is not subject to the Florida Power Plant Siting Act and review by the Governor and Cabinet. If you have any questions regarding this matter, please call me at 850/921-9523.

Sincerely,

A. A. Linero, P.E., Administrator
New Source Review Section

AAL/jk

Enclosure

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

June 14, 2000

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

Re: Florida Rock Industries, Inc., Brooksville Operations
PSD-FL-293

Dear Mr. Worley:

Enclosed is a copy of a PSD permit application for the construction of a new portland cement plant for Florida Rock Industries, Inc. in Hernando County. The application includes the applicant's PSD analyses including a BACT analysis. This is a new PSD major facility, and emissions from this project are significant for VOC, NOx, CO, PM, PM_{10}, and SO_2. The design is a dry process, precalciner system with an inline raw mill. Production capacity will be 2300 tons per day of clinker and 750,000 tons per year of portland cement. ESPs are proposed for the in-line kiln/raw mill and the clinker cooler. Proposed fuels are coal, natural gas, fuel oil and tires.

Please provide your comments as soon as possible. Our rules require us to determine whether an application is complete within 30 days of receipt and to make a Preliminary Determination within 60 days (given that the application is complete). This project is not subject to the Florida Power Plant Siting Act and review by the Governor and Cabinet. If you have any questions regarding this matter, please call me at 850/921-9523.

Sincerely,

A. A. Linero, P.E., Administrator
New Source Review Section

AAL/jk

Enclosure

Department of Environmental Protection

RECEIVED

JUN 13 2000

BUREAU OF AIR REGULATION

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

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

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Florida Rock Industries, Inc.**	
2. Site Name: **Brooksville Operations**	
3. Facility Identification Number: **0530050** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **US 98 at Brittle Road** City: **N. of Brooksville** County: **Hernando** Zip Code:	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **Steven C. Cullen, PE – Project Engineer**
2. Application Contact Mailing Address: Organization/Firm: **Koogler & Associates** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **Florida** Zip Code: **32609**
3. Application Contact Telephone Numbers: Telephone: **(352) 377-5822** Fax: **(352) 377-7158**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	June 13, 2000
2. Permit Number:	0530050-005-AC
3. PSD Number (if applicable):	PSD-FL-293
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

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

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

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

Current construction permit number:________________________________

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

Current construction permit number:________________________________

Operation permit number to be revised:______________________________

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

Operation permit number to be revised/corrected:________________________

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

Operation permit number to be revised:______________________________

Reason for revision:____

Air Construction Permit Application

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

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

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

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

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: **John Baker – President**	
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **Florida Rock Industries, Inc.** Street Address: **155 East 21st Street** City: **Jacksonville** State: **Florida** Zip Code: **32201**	
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: **(904) 355-1781**	Fax: **(355) 355-0817**

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative(check here [X], if so) or the responsible official (check here [X], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

Signature ______________________ Date ______________

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Steven C. Cullen, PE** Registration Number: **45188**	
2. Professional Engineer Mailing Address: Organization/Firm: **Koogler & Associates** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **Florida** Zip Code: **32609**	
3. Professional Engineer Telephone Numbers: Telephone: **(352) 377-5822**	Fax: **(352) 377-7158**

4. Professional Engineer Statement:

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

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

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

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been ~~designed or~~ examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature ______ Date 6/5/2000

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
	Quarry to Storage	AC1A	$7500
	Storage to Raw Mill		
	In-Line kiln/Raw Mill		
	Clinker Cooler		
	Clinker & Cement Processing		
	Coal Processing		

Application Processing Fee

Check one: [X] Attached - Amount: $7500   [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

The project is the construction of a new Portland cement manufacturing plant. The plant will be a precalciner kiln with an in-line raw mill. Raw materials will be processed into clinker. The clinker will be interground with gypsum, limestone, and other mineral aggregates to produce various types of cement. Cement will be shipped in bulk by truck and rail, and will also be bagged.

The primary fuel for the plant will be coal. Natural gas, fuel oil, and tire-derived fuel will be used as supplemental fuels.

Electrostatic precipitators will control particulate emissions from the in-line kiln/raw mill and the clinker cooler. Fabric filters (baghouses) will control particulate matter emissions from other handling and processing operations.

Limestone from the existing quarry will be used as a raw material. The emissions associated with existing operations are not expected to increase as a result of the new plant. Fugitive emissions from truck traffic are expected to decrease as rock hauling is replaced by cement hauling.

2. Projected or Actual Date of Commencement of Construction: **January 2001**

3. Projected Date of Completion of Construction: **January 2006**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **361.08** North (km): **3168.93**			
2. Facility Latitude/Longitude: **See UTM** Latitude (DD/MM/SS): Longitude (DD/MM/SS):			
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **14** **32**	6. Facility SIC(s): **1422** **3241**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Fred Cohrs – Vice President**
2. Facility Contact Mailing Address: Organization/Firm: **Florida Rock Industries, Inc.** Street Address: **155 East 21st Street** City: **Jacksonville** State: **Florida** Zip Code: **32201**
3. Facility Contact Telephone Numbers: Telephone: **(904) 355-1781** Fax: **(904) 355-0817**

Facility Regulatory Classifications

Check all that apply:

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

List of Applicable Regulations

62-4, FAC	**62-204, FAC**
62-210, FAC	**62-212, FAC**
62-213, FAC	**62-296, FAC**
62-297, FAC	
NSPS Subpart F	**NSPS Subpart Y**
NSPS Subpart OOO	**NESHAP Subpart LLL**
NSPS General Provisions	**NESHAP General Provisions**

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
PM	**A**				
PM10	**A**				
SO2	**A**				
NOX	**A**				
CO	**A**				
DIOX	**B**				
VOC	**B**				

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). [ ] 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. [X] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.			
2. Regulated or Unregulated Emissions Unit? (Check one) [X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit. [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.			
3. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Quarry to Storage**			
4. Emissions Unit Identification Number: ID:			[X] No ID [ ] ID Unknown
5. Emissions Unit Status Code: **C**	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **32**	8. Acid Rain Unit? [ ]
9. Emissions Unit Comment: (Limit to 500 Characters) **This addresses raw material (limestone and overburden) processing from the quarry up to raw material storage.**			

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **1000 TPH & 1,348,000 TPY**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:	hours/day	days/week
	weeks/year	**8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart OOO	

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **Quarry**	2. Emission Point Type Code: **4**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): • **In-pit primary crusher** • **Belt conveyor transfer points up to raw material storage**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **F**	6. Stack Height: feet	7. Exit Diameter: feet
8. Exit Temperature: 77°F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: **0** feet	
13. Emission Point UTM Coordinates: Zone: East (km): North (km):		
14. Emission Point Comment (limit to 200 characters):		

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

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Primary Crushing**		
2. Source Classification Code (SCC): **3-05-006-09**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **1000**	5. Maximum Annual Rate: **1,348,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Raw material at nominally 10% moisture**		

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Transfer**		
2. Source Classification Code (SCC): **3-05-006-12**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **1000**	5. Maximum Annual Rate: **1,348,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Unloading**		
2. Source Classification Code (SCC): **3-05-006-07**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **1000**	5. Maximum Annual Rate: **1,348,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			WP
PM10			NS

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 0.0 to 1.0 tons/year	
6. Emission Factor: **0.0009 lb/ton** Reference: **AP-42 Table 11.19.2-2**	7. Emissions Method Code: **3**
8. Calculation of Emissions (limit to 600 characters): **Crushing + transfer + unloading = 0.0009 lb/ton** **1,348,000 TPY x 0.0009 lb/ton ÷2000 lb/ton = 0.6 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ______ of ______

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 0.0 to 1.0 tons/year	
6. Emission Factor: **0.0008 lb/ton** Reference: **AP-42 Table 11.19.2-2**	7. Emissions Method Code: **3**
8. Calculation of Emissions (limit to 600 characters): **Crushing + transfer + unloading = 0.0008 lb/ton** **1,348,000 TPY x 0.0008 lb/ton ÷2000 lb/ton = 0.5 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ______ of ______

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

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE10**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **This limitation applies to belt conveyor transfer points [40CFR60.672(b)].**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE15**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **15%** Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **This limitation applies to the primary crusher [40CFR60.672(c)].**	

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

Continuous Monitoring System: Continuous Monitor _____ of _____

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

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

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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

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

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

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

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

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**32**	[ ]

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

This addresses raw material processing from storage to the raw mill. This also includes the recycling of captured particulate matter.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

Baghouse

E-28: Recycle dust to blend silo

- **3,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

2. Control Device or Method Code(s): **016**

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Baghouses** **G-07: Raw meal to blend silo from raw mill** • **15,000 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf** **H-08: Raw meal from blend silo to preheater** • **3,000 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf**
2. Control Device or Method Code(s): **017**

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **181.0 TPH wet feed to raw mill**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:	hours/day weeks/year	days/week **8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart F	

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **E-28, G-07, H-08**

2. Emission Point Type Code: **3**

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

- **E-28: Recycle dust to blend silo**
- **G-07: Raw meal to blend silo from raw mill**
- **H-08: Raw meal from blend silo to preheater**

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

5. Discharge Type Code: **V**

6. Stack Height: **See Table** feet

7. Exit Diameter: feet

8. Exit Temperature: °F

9. Actual Volumetric Flow Rate: acfm

10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm

12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

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

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

ID	HEIGHT, FT	DIAM., FT	TEMP, F	ACFM	H20	DSCFM
E-28	72	1.0	212	3000	2%	2310
G-07	241	2.2	200	15000	2%	11760
H-08	52	1.0	200	3000	2%	2352
					TOTAL =	16422

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

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Raw Material Transfer**		
2. Source Classification Code (SCC): **3-05-006-12**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **181 (24-hr avg.)**	5. Maximum Annual Rate: **1,348,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Wet feed to raw mill**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
PM10			EL

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.41** lb/hour **6.2** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.01 gr/dscf** Reference: **Performance specification**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.01 gr/dscf x 16,422 dscfm x 60 min/hour ÷7000 gr/lb = 1.41 lb/hour** **@ 8760 hours/year = 6.2 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE – BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: **1.41** lb/hour **6.2** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.20** lb/hour **5.2** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **85% of PM** Reference: **AP-42**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.0085 gr/dscf x 16,422 dscfm x 60 min/hour ÷7000 gr/lb = 1.20 lb/hour** **@ 8760 hours/year = 5.2 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE – BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.0085 gr/dscf**	4. Equivalent Allowable Emissions: **1.20** lb/hour **5.2** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **62-297.620(4), FAC**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **40CFR60.62(c) & 40CFR63.1346** **The alternate opacity limitation for baghouses (5%) is more restrictive.**	

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

Continuous Monitoring System: Continuous Monitor _____ of _____

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

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

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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

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

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

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

In-Line Kiln/Raw Mill

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

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**32**	[ ]

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

This addresses from the raw mill to the clinker cooler. This emissions unit includes fuel used in a 30 MMBtu supplemental air heater for the raw mill.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Electrostatic Precipitator (ESP) – High Efficiency**
2. Control Device or Method Code(s): **010**

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		**364** mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **2300 tons/day clinker**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:	hours/day weeks/year	days/week **8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart F	NESHAP Subpart LLL

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **E-21 Stack**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **250** feet	7. Exit Diameter: **9.42** feet
8. Exit Temperature: **Compound mode 205**°F	9. Actual Volumetric Flow Rate: **194,000** acfm	10. Water Vapor: **6.5**%
11. Maximum Dry Standard Flow Rate: **144,000** 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):		

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

Segment Description and Rate: Segment 1 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Mineral Products: Cement Manufacturing: Dry Process: Raw Mill

2. Source Classification Code (SCC): **3-05-006-24**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **163 (24-hr avg.)**	5. Maximum Annual Rate: **1,211,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:

10. Segment Comment (limit to 200 characters):

Raw meal to preheater

Segment Description and Rate: Segment 2 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Mineral Products: Cement Manufacturing: Dry Process: Preheater/Precalciner Kiln

2. Source Classification Code (SCC): **3-05-006-23**	3. SCC Units: **Tons Clinker**	
4. Maximum Hourly Rate: **95.83 (24-hr avg.)**	5. Maximum Annual Rate: **712,500**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:

10. Segment Comment (limit to 200 characters):

Segment Description and Rate: Segment 3 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use: Bituminous Coal: Cement Kiln**		
2. Source Classification Code (SCC): **3-90-002-01**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **108,700**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **1.5**	8. Maximum % Ash: **10.0**	9. Million Btu per SCC Unit: **25**
10. Segment Comment (limit to 200 characters): **Coal as primary fuel**		

Segment Description and Rate: Segment 4 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use: Natural Gas: Cement Kiln**		
2. Source Classification Code (SCC): **3-90-006-02**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.35**	5. Maximum Annual Rate: **2606**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1050**
10. Segment Comment (limit to 200 characters): **Gas as supplementary fuel**		

Segment Description and Rate: Segment 5 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use: Oil: Cement Kiln**		
2. Source Classification Code (SCC): **3-90-999-99**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **2.6**	5. Maximum Annual Rate: **19360**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **1.5**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **140**
10. Segment Comment (limit to 200 characters): **Oil (distillate, residual) as supplemental fuel.** **This segment includes fuel oil used in a 30 MMBtu supplemental air heater for the raw mill.**		

Segment Description and Rate: Segment 6 of 6

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **In-Process Fuel Use: Solid Waste**		
2. Source Classification Code (SCC): **3-90-012-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **2.0**	5. Maximum Annual Rate: **17,520**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **28**
10. Segment Comment (limit to 200 characters): **Tires (whole and/or TDF) as supplementary fuel, at up to 15% of heat input. If tire gasifier is used, will be up to 40% of heat input: 5.2 tons/hour & 45,550 tons/year.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	**010**		**EL**
PM10	**010**		**EL**
SO2			**EL**
NOX			**EL**
CO			**EL**
VOC			**EL**
DIOX			**EL**

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **21.19** lb/hour **78.7** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **0.13 lb/ton dry feed** Reference: **BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.13 lb/ton x 163 tons/hr = 21.19 lb/hour** **0.13 lb/ton x 1,211,000 tons/yr = 78.7 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **PM back-calculated from PM10 BACT. AP-42 shows that PM10 is 85% of PM.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.13 lb/ton of dry preheater feed**	4. Equivalent Allowable Emissions: **21.19** lb/hour **78.7** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **The allowable emission rate represents BACT, and is more stringent than NSPS/NESHAP.**	

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17.93** lb/hour **66.6** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **0.11 lb/ton dry feed** Reference: **BACT (Lafarge 1997)**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.11 lb/ton x 163 tons/hr = 17.93 lb/hour** **0.11 lb/ton x 1,211,000 tons/yr = 66.6 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE – BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.11 lb/ton of dry preheater feed**	4. Equivalent Allowable Emissions: **17.93** lb/hour **66.6** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **The allowable emission rate represents BACT.**	

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.29** lb/hour **60.6** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **0.17 lb/ton clinker** Reference: **Process Knowledge**	7. Emissions Method Code: **0**

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

0.17 lb/ton x 95.83 tons/hr = 16.29 lb/hour

0.17 lb/ton x 712,500 tons/year = 60.6 TPY

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

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **AMBIENT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.17 lb/ton clinker**	4. Equivalent Allowable Emissions: **16.29** lb/hour **60.6** tons/year

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

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

The allowable emission rate is more stringent than BACT, and results in less than significant ambient concentrations at Chassahowitzka NWR.

Potential/Fugitive Emissions

1. Pollutant Emitted: **NOX**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **268.32** lb/hour **997.5** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **2.8 lb/ton clinker** Reference: **BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **2.8 lb/ton x 95.83 tons/hr = 268.32 lb/hour** **2.8 lb/ton x 712,500 tons/yr = 997.5 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **2.8 lb/ton clinker, 30-day average**	4. Equivalent Allowable Emissions: **268.32** lb/hour **997.5** tons/year
5. Method of Compliance (limit to 60 characters): **CEM**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **The allowable emission rate represents BACT.**	

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **344.99** lb/hour **1282.5** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **3.6 lb/ton clinker** Reference: **BACT**	7. Emissions Method Code: **0**

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

3.6 lb/ton x 95.83 tons/hr = 344.99 lb/hour

3.6 lb/ton x 712,500 tons/yr = 1282.5 TPY

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

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **3.6 lb/ton clinker**	4. Equivalent Allowable Emissions: **344.99** lb/hour **1282.5** tons/year

5. Method of Compliance (limit to 60 characters): **Method 10**

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

The allowable emission rate represents BACT.

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:	
3. Potential Emissions: **11.50** lb/hour **42.8** tons/year		4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year		
6. Emission Factor: **0.12 lb/ton clinker** Reference: **BACT**		7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.12 lb/ton x 95.83 tons/hr = 11.50 lb/hour** **0.12 lb/hr x 712,500 tons/yr = 42.8 TPY**		
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):		

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.12 lb/ton clinker**	4. Equivalent Allowable Emissions: **11.50** lb/hour **42.8** tons/year
5. Method of Compliance (limit to 60 characters): **Method 25A**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **The allowable emission rate represents BACT. VOC is assumed as equivalent to THC for compliance with the NESHAP. The proposed rate is more stringent than the NESHAP (50 ppmvd as propane at 7% O_2 = 49.5 lb/hr).**	

Potential/Fugitive Emissions

1. Pollutant Emitted: **DIOX**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.0000002** lb/hour **0.0000009** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **1.7 x 10^{-10} gr/dscf TEQ** Reference: **MACT**	7. Emissions Method Code: **0**

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

1.7 x 10^{-10} gr/dscf x 144,000 x 60 min/hr x 1.0 lb/7000 grains = 0.0000002 lb/hour

at 8760 hour/yr = 0.0000009 TPY

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

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - MACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.7 x 10^{-10} gr/dscf**	4. Equivalent Allowable Emissions: **0.0000002** lb/hour **0.0000009** tons/year

5. Method of Compliance (limit to 60 characters): **Method 23**

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

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE10**	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: **COM**	
5. Visible Emissions Comment (limit to 200 characters): **This limitation is more stringent than NSPS/NESHAP.**	

Visible Emissions Limitation: Visible Emissions Limitation ___ of ___

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

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

Continuous Monitoring System: Continuous Monitor 1 of 4

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

Continuous Monitoring System: Continuous Monitor 2 of 4

1. Parameter Code: **EM**	2. Pollutant(s): **SO2, NOX**
3. CMS Requirement:	[ ] Rule [X] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **CEM required by Department to satisfy BACT.**	

Continuous Monitoring System: Continuous Monitor 3 of 4

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

Continuous Monitoring System: Continuous Monitor 4 of 4

1. Parameter Code: **TEMP**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Required by NESHAP at inlet to control device.**	

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

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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

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

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

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

Clinker Cooler

4. Emissions Unit Identification Number:
ID:

[X] No ID
[ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**32**	[ ]

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

This addresses the clinker cooler.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Electrostatic Precipitator (ESP) – High Efficiency**
2. Control Device or Method Code(s): **010**

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **2300 tons/day clinker**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:	hours/day	days/week
	weeks/year	**8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart F	NESHAP Subpart LLL

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **K-15 Stack**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **115** feet	7. Exit Diameter: **7.0** feet
8. Exit Temperature: **480°F**	9. Actual Volumetric Flow Rate: **160,000** acfm	10. Water Vapor: **2%**
11. Maximum Dry Standard Flow Rate: **88,000** 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):		

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

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Clinker Cooler**		
2. Source Classification Code (SCC): **3-05-006-14**	3. SCC Units: **Tons Clinker**	
4. Maximum Hourly Rate: **95.83 (24-hr avg.)**	5. Maximum Annual Rate: **712,500**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	**010**		**EL**
PM10	**010**		**EL**

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **11.41** lb/hour **42.4** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **0.07 lb/ton dry feed** Reference: **BACT**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.07 lb/ton x 163 tons/hr = 11.41 lb/hour** **0.07 lb/ton x 1,211,000 tons/yr = 42.4 TPY**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **PM is back-calculated from PM10. AP-42 shows that PM10 is 85% of PM.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE - BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.07 lb/ton of dry preheater feed**	4. Equivalent Allowable Emissions: **11.41** lb/hour **42.4** tons/year
5. Method of Compliance (limit to 60 characters): **Method 5**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **The allowable emission rate represents BACT, and is more stringent than NSPS/NESHAP.**	

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **9.78** lb/hour **36.3** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ____ to ____ tons/year	
6. Emission Factor: **0.06 lb/ton dry feed** Reference: **BACT (Lafarge 1997)**	7. Emissions Method Code: **0**

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

0.06 lb/ton x 163 tons/hr = 9.78 lb/hour

0.06 lb/ton x 1,211,000 tons/yr = 36.3 TPY

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

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE – BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.06 lb/ton of dry preheater feed**	4. Equivalent Allowable Emissions: **9.78** lb/hour **36.3** tons/year

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

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

The allowable emission rate represents BACT.

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE10**	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: **COM**	
5. Visible Emissions Comment (limit to 200 characters): **This limitation represents BACT and is equivalent to NSPS/NESHAP.**	

Visible Emissions Limitation: Visible Emissions Limitation ___ of ___

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

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

Continuous Monitoring System: Continuous Monitor 1 of 1

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

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

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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

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

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

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

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

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**32**	[ ]

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

This addresses from the clinker cooler to finished cement loadout and bagging. This emissions unit is the storage, conveying and finish milling of clinker, gypsum, limestone, and other mineral aggregates into Portland and masonry cements. This unit also includes the storage, loadout, and bagging of finished cement.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

Baghouses

L-03: Clinker cooler discharge
- **3,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

L-06: Clinker silos
- **4,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

2. Control Device or Method Code(s): **016**

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

Baghouses

M-08: Clinker silos discharge
- **4,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

N-91: Finish mill
- **6,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

N-94: Finish mill
- **35,000 acfm**
- **Pulsed jet bag cleaning**
- **Specified performance standard = 0.01 gr/dscf**

2. Control Device or Method Code(s): **017**

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **<u>Baghouses</u>** **N-93: Finish mill air separator** • **128,600 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf** **Q-14 & Q-17: Cement loadout** • **3,000 acfm each** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf** **Q25 & Q26: Cement silos** • **12,000 acfm each** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf** **R-12: Bagging** • **12,000 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf**
2. Control Device or Method Code(s): **018**

<u>Emissions Unit Details</u>

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **136 TPH cement from finish mill**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart F	

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **L-03, L-06, M-08, N-91, N-93, N-94, Q-14, Q-17, Q-25, Q-26, R-12**	2. Emission Point Type Code: **3**

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

L-03: Cooler discharge
L-06: Clinker silos
M-08: Clinker silos discharge
N-91: Finish mill
N-93: Finish mill air separator
N-94: Finish mill
Q-14: Cement loadout
Q-17: Cement loadout
Q-25: Cement silos
Q-26: Cement silos
R-12: Bagging

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

5. Discharge Type Code: **V**	6. Stack Height: **See Table** feet	7. Exit Diameter: feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %

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

13. Emission Point UTM Coordinates:

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

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

Baghouse Table

ID	HEIGHT, FT	DIAM., FT	TEMP, F	ACFM	H20	DSCFM
L-03	37	1.0	300	3000	2%	2043
L-06	190	1.1	300	4000	2%	2723
M-08	3	1.1	212	4000	2%	3080
N-91	44	1.4	200	6000	2%	4704
N-93	127	7.5	158	128600	2%	107674
N-94	127	4.0	230	35000	2%	26247
Q-14	30	1.0	150	3000	2%	2545
Q-17	30	1.0	150	3000	2%	2545
Q-25	190	2.0	150	12000	2%	10179
Q-26	190	2.0	150	12000	2%	10179
R-12	37	2.0	150	12000	2%	10179
					TOTAL =	182098

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

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Clinker Grinding**		
2. Source Classification Code (SCC): **3-05-006-17**	3. SCC Units: **Tons Cement Produced**	
4. Maximum Hourly Rate: **136 (24-hr avg.)**	5. Maximum Annual Rate: **750,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Cement Loadout**		
2. Source Classification Code (SCC): **3-05-006-19**	3. SCC Units: **Tons Throughput**	
4. Maximum Hourly Rate: **500 (24-hr avg.)**	5. Maximum Annual Rate: **750,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			**EL**
PM10			**EL**

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **15.61** lb/hour **68.4** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.01 gr/dscf** Reference: **Performance specification**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.01 gr/dscf x 182,098 dscfm x 60 min/hour ÷7000 gr/lb = 15.61 lb/hour** **at 8760 hours/year = 68.4 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE -- BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: **15.61** lb/hour **68.4** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **13.27** lb/hour **58.1** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **85% of PM** Reference: **AP-42**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.0085 gr/dscf x 182,098 dscfm x 60 min/hour ÷7000 gr/lb = 13.27 lb/hour** **at 8760 hours/year = 58.1 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE -- BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.0085 gr/dscf**	4. Equivalent Allowable Emissions: **13.27** lb/hour **58.1** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **62-297.620(4), FAC**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **40CFR60.62(c) & 40CFR63.1346** **The alternate opacity limitation for baghouses (5%) is more restrictive.**	

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

Continuous Monitoring System: Continuous Monitor _____ of _____

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

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

Supplemental Requirements

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

III. EMISSIONS UNIT INFORMATION

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

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[**X**] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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

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

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

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

Coal Processing

4. Emissions Unit Identification Number:
ID:

[**X**] No ID
[ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**32**	[ ]

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

This addresses coal processing.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Baghouses** **S-17: Coal mill** • **24,000 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf** **S-21: Coal bin** • **2,000 acfm** • **Pulsed jet bag cleaning** • **Specified performance standard = 0.01 gr/dscf**
2. Control Device or Method Code(s): **018**

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **20 TPH**		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	**8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-210, FAC	62-212, FAC
62-213, FAC	62-296, FAC
62-297, FAC	
NSPS Subpart Y	

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **S-17, S-21**	2. Emission Point Type Code: **3**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **S-17: Coal mill** **S-21: Coal storage bin**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **The coal mill baghouse is ducted to a common stack with the clinker cooler ESP.**		
5. Discharge Type Code: **V**	6. Stack Height: **See Table** feet	7. Exit Diameter: feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: East (km): North (km):		
14. Emission Point Comment (limit to 200 characters): **The coal mill baghouse is ducted to a common stack with the clinker cooler ESP.**		

ID	HEIGHT, FT	DIAM., FT	TEMP, F	ACFM	H20	DSCFM
S-17	115	7.0	150	24,000	7%	19423
S-21	63	0.8	150	2000	2%	1697
					TOTAL =	21120

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

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Coal Cleaning: Material Handling: Crushing**		
2. Source Classification Code (SCC): **3-05-010-10**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **20**	5. Maximum Annual Rate: **108,700**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			**EL**
PM10			**EL**

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.81** lb/hour **7.9** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.01 gr/dscf** Reference: **Performance specification**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.01 gr/dscf x 21,120 dscfm x 60 min/hour ÷7000 gr/lb = 1.81 lb/hour** **at 8760 hours/year = 7.9 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE -- BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: **1.81** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:	
3. Potential Emissions: **1.81** lb/hour **7.9** tons/year		4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year		
6. Emission Factor: **0.01 gr/dscf** Reference: **Performance specification**		7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **0.01 gr/dscf x 21,120 dscfm x 60 min/hour ÷7000 gr/lb = 1.81 lb/hour** **at 8760 hours/year = 7.9 tons/year**		
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Assume PM10 = PM**		

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE – BACT**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.01 gr/dscf**	4. Equivalent Allowable Emissions: **1.81** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE05**	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: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **62-297.620(4), FAC**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: 20% Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **NSPS Subpart Y** **40 CFR 60.252(a) & (c)**	

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

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: **TEMP**	2. Pollutant(s):
3. CMS Requirement:	[**X**] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **40 CFR 60.253(a)(1)**	

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

Supplemental Requirements

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

EVALUATION OF NITROGEN DEPOSITION AT CHASSAHOWITZKA CLASS I AREA

FLORIDA ROCK INDUSTRIES, INC.
BROOKSVILLE CEMENT PLANT
US 98 at BRITTLE ROAD
HERNANDO COUNTY, FLORIDA

June 2, 2000

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX 377-7158

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BUREAU OF AIR REGULATION

INTRODUCTION

Florida Rock Industries, Inc. proposes to construct a Portland cement plant near Brooksville, Hernando County, Florida. The proposed project is less than 50 kilometers (km) from Chassahowitzka Class I area, and all portions of the Class I area are less than 50 km from the proposed source. The project will be subject to Prevention of Significant Deterioration (PSD) review, which includes an impact analysis in the Class I area for particulate matter (PM10), sulfur dioxide (SO_2) and nitrogen oxides (NOx). Additionally, the U.S. Fish and Wildlife Service (FWS) is requesting an analysis of nitrogen deposition.

The deposition analysis has been performed in substantial accordance with the document *Interim Guidance for Deposition Analyses For PSD Permit Applicants Near Chassahowitzka National Wildlife Refuge* (U.S. Fish and Wildlife Service, Air Quality Branch, March 2000).

CONCERN THRESHOLD

The U.S. Fish and Wildlife Service (FWS) has established a concern threshold for nitrogen deposition in Chassahowitzka NWR. The FWS defines the concern threshold as a significant increase in nitrogen deposition over the background deposition rate. The current total inorganic nitrogen (NH_4 plus NO_3) deposition rate to Chassahowitzka NWR is approximately five kilograms per hectare per year (kg/ha/yr). This estimate is derived from the two years of National Atmospheric Deposition Program (NADP) data now available for Chassahowitzka NWR, 1997-1998. For this period, average inorganic nitrogen wet deposition is approximately 2.6 kg/ha/yr. Assuming that dry deposition equals wet deposition, total inorganic nitrogen deposition is approximately five kg/ha/yr (Note: FWS recognizes that dry deposition may not always equal wet deposition; however, FWS considers this to be the best available estimate at present.) FWS considers a significant increase in deposition to equal four percent or more of the background total deposition. Four percent is the same value proposed by the Environmental Protection Agency (EPA) to evaluate significant contributions to Class I PSD air quality increments. Using this significance value and a background deposition rate of five kg/ha/yr, an additional nitrogen deposition of 0.2 kg/ha/yr of inorganic nitrogen would be considered significant by the FWS.

The wet deposition rate provided by the National Atmospheric Deposition Program for the Chassahowitzka site is for inorganic nitrogen expressed in terms of kilograms per hectare (kg/ha) as nitrogen[1]. It follows that the concern threshold of 0.2 kg/ha/yr of additional inorganic nitrogen is expressed in terms of nitrogen. Therefore, the deposition rate calculated in the deposition analysis will be expressed in terms of kg/ha/yr as nitrogen.

NITROGEN OXIDES CONCENTRATIONS

To evaluate contributions to deposition, the ISCST model (version 00101) was used to obtain the concentration of nitrogen oxides (NOx) at Chassahowitzka. A receptor list of 151 receptors at Chassahowitzka was prepared, and the mathematical average NOx concentrations for all receptors were determined for each of the five years of meteorological data. The greatest annual average impact of FRI NOx emissions was with 1991 meteorological data and was 0.11521 $\mu g/m^3$.

As the source is less than 50 kilometers from all receptors in the Class I area, the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 1 modeling guidance was used with the EPA ISCST model, to determine nitrogen deposition.

DEPOSITION VELOCITY

Deposition velocities for nitric acid (HNO_3) were obtained from the Clean Air Status and Trends Network (CASTNET). A value of 1.222838 cm/sec (0.01222838 m/sec), which is the average of 43 samples from the Florida CASTNET site in Sumatra, Florida, was selected as the deposition velocity for HNO_3. This value is consistent with a value of 1.283854 cm/sec averaged from 1907 samples from over 70 monitoring stations across the United States[2]. This value is also consistent with a dry deposition for HNO_3 provided in the *Mercury Study Report to Congress*. The average deposition velocity from this reference for the agricultural land-use category, averaged over all seasons and atmospheric stability categories, is 1.24 cm/sec[3].

CALCULATION OF NITROGEN DEPOSITION FOR LEVEL I ANALYSIS

Deposition rates of total nitrogen were calculated in substantial accordance with the procedures found on page 5-6 of the IWAQM Phase 1 document. The final deposition rate is expressed as kilograms of total inorganic nitrogen per hectare per year (kg/ha/yr). A Level I approach for depositional impacts assumes that concentrations of NOx are deposited as HNO_3. Since the steady-state, Gaussian plume models do not actually remove any mass from the plume, when run in their recommended dispersion modes, this will provide a conservative deposition estimate, as all NOx is assumed to reach the Class I area.

The step-by-step procedure for determining nitrogen deposition is as follows:

1. Run appropriate model for Level I analysis; the ISCST model (Version 00101) to determine the average NOx concentrations in the Class I area.

2. Assume no conversion NOx to other species (i.e., assume all NOx is emitted as NO_2).

3. Convert the NO_2 concentration to an HNO_3 concentration by multiplying the concentration of NO_2 ($\mu g/m^3$), by the ratio of the molecular weights of the secondary species (HNO_3) to the primary species (NO_2). The molecular weights of NO_2 and HNO_3 are 46 and 63. Thus multiplying the concentration of NO_2 ($\mu g/m^3$) by 1.37 will yield the concentration of HNO_3 ($\mu g/m^3$), as follows:

   0.11521 $\mu g/m^3$ of NO_2 (annual average) X 1.37 = 0.15784 $\mu g/m^3$ of HNO_3

4. The averaging times for nitrogen deposition will generally require a long-term value (annual). Since the Level I model produces average values, they must be converted to total rates. Multiply the concentration of HNO_3 by the number of seconds in the averaging time of interest to obtain a total rate (i.e., 3.1536×10^7 seconds/year).

0.15784 $\mu g/m^3$ of HNO_3 X 3.1536 $\times 10^7$ seconds/year = 4.9776 $\times 10^6$ μg-sec/m^3/yr

5. Multiply the result by the deposition velocity for HNO_3 (0.01222838 m/sec). This will result in a deposition value in units of $\mu g/m^2$/yr.

4.9776 $\times 10^6$ μg-sec/m^3-yr X 0.01222838 m/sec = 6.0868 $\times 10^4$ $\mu g/m^2$/yr

6. To convert to kg/hectare, multiply the result by 1 $\times 10^{-5}$.

6.0868 $\times 10^4$ $\mu g/m^2$/yr X 1 $\times 10^{-5}$ = 0.60868 kg/ha/yr as HNO_3

7. To convert to inorganic nitrogen as expressed in terms of kg/ha/yr as nitrogen, multiply the deposition rate of HNO_3 by the ratio of the molecular weights of nitrogen to the secondary species (HNO_3). The molecular weights of N and HNO_3 are 14 and 63. Thus multiplying the deposition of HNO_3 (kg/ha/yr) by 0.22 will yield the deposition of inorganic nitrogen expressed in terms of kg/ha/yr as nitrogen.

0.60868 kg/ha/yr as HNO_3 X 0.22 = **0.13 kg/ha/yr as N**

CONCLUSION

As the deposition rate of additional inorganic nitrogen resulting from the source is less than the level of concern of 0.2 kg/ha/yr established by FWS, no adverse impacts to this air quality related value (AQRV) are expected.

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[1] e-mail from Bob Larson, NADP-UIUC, May 31, 2000.
[2] Clean Air Status and Trends Network (CASTNET), http://www.epa.gov/acidrain/castnet/, May 31, 2000.
[3] Mercury Study Report to Congress, Table 4-3, December 1997.

REPORT IN SUPPORT OF
AN APPLICATION FOR A PSD
CONSTRUCTION PERMIT REVIEW

FLORIDA ROCK INDUSTRIES, INC.
BROOKSVILLE CEMENT PLANT
US 98 at BRITTLE ROAD
HERNANDO COUNTY, FLORIDA

June 5, 2000

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
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SECTION 1: PROJECT DESCRIPTION

1.1 Applicant

FLORIDA ROCK INDUSTRIES, INC. – CEMENT GROUP

155 East 21st Street

Jacksonville, Florida 32202

1.2 Facility Location

Florida Rock Industries plans to construct a new cement plant at the existing Brooksville Quarry. The quarry is located on U.S. 98 at Brittle Road, north of Brooksville, Hernando County, Florida. The UTM coordinates of the Florida Rock Industries facility are Zone 17, 361.1 km East and 3168.9 km North. See Figure 1 – Site Location Map.

1.3 Project Overview

The plant site consists of approximately 48 acres located amongst limestone and overburden reserves. The cement plant will have a dry process precalciner kiln system. The plant will produce 2300 tons per day of clinker and up to 750,000 tons per year of various types and grades of Portland cement. The cement will be stored in silos, will be shipped in bulk by trucks and rail, and will be bagged and palletized for shipping by trucks and rail.

Florida Rock Industries is submitting this report in support of the application to the Florida Department of Environmental Protection for an Air Construction Permit.

1.4 Raw Material Processing: Quarry to Storage

Limestone will be mined above and below the water table. The overburden, consisting of sand and clay, will be removed from the limestone surface and stockpiled onsite. The crusher will be portable, and will be relocated periodically in accordance with the mining plan. The overburden and the limestone will be fed into the crusher by a front-end loader in the ratio dictated by the target chemical composition of the desired raw mix. These raw materials, called "quarry mix", will be delivered to the storage hall by a conveyor belt system.

The covered storage hall for the quarry mix will hold two (2) piles of 15,000 tons each. Stacking will be done with a traversing tripper conveyor from the apex of an A-frame cover. A scraper and rake device will reclaim the mix at the ground level of the stockpiles. The quarry mix will have a moisture content of approximately 10%. The storage hall also has space for iron ore and/or coal ash, with hoppers and feeders to meter the additives into the quarry mix.

No baghouses or other air pollution control devices are utilized for these activities. Negligible emissions are expected from the handling of moist materials.

1.5 Raw Material Processing: Storage to Raw Mill

From the reclaim belt, the materials will be transported to a belt that feeds a raw mill feed bin. An apron feeder under the bin will control the feed rate to the roller mill rated at 212 tons/hour.

The raw mill will be equipped with a high efficiency air separator and a reject recirculating bucket elevator. The product of the raw mill is called the raw meal. The raw meal will be collected in cyclones, and conveyed with airslides to an airlift. The ESP Fan will provide draft. Heat for raw material drying will be provided by the preheater exhaust gases and by a 30 MMBtu/hour air heater. The ESP catch and the raw mill product will be conveyed to the blend silo or directly to the preheater kiln system.

1.6 In-Line Kiln/Raw Mill

The kiln feed from the blend silo will be conveyed to the preheater airlift. The feed will enter the top stage of the preheater.

Coal and oil will be burned in the precalciner near the inlet to the kiln as well as at the main burner at the discharge end of the kiln. Natural gas will be used as a startup fuel and as a supplemental fuel. Used tires will be used as a supplemental fuel. Combustion air for the precalciner will be provided through a tertiary air duct from the clinker cooler. Fuel oil or natural gas will be burned in the raw mill air heater when necessary.

The kiln system will convert the raw meal into clinker, which consist primarily of gray, glass-hard, spherically shaped nodules that range from 0.125 to 2.0 inches in diameter. The rotary kiln will produce 2300 tons/day of clinker.

The emissions from burning oil, gas or tires will be equal or less than the emissions from burning only coal. Various references have shown that the emissions from cement kilns using tires or tire-derived fuel (TDF) are not significantly different from emissions from kilns burning only fossil fuel.

Tires will be introduced in the vicinity of the feed shelf. Introduction of tires in this region, between the kiln feed end and the precalciner burner, will ensure that the precalciner burner will act as an afterburner. This will create conditions which enhance combustion of organic compounds.

1.7 Clinker Cooler

Upon discharge from the kiln, the clinker will be quenched in a reciprocating grate cooler with flow control grates. The exhaust from the cooler will go to an ESP and a stack. A portion of the clinker cooler gases will be ducted to the coal mill to dry the coal.

1.8 Clinker and Cement Processing

A fabric filter will vent the discharge point of the clinker cooler. The clinker will be conveyed to clinker storage silos. The silos and conveying system will be vented by a fabric filter. The clinker will be withdrawn from the silos through flow control gates, and discharged onto the finish mill feed conveyor. The transfer points will be vented through a baghouse. The mill feed conveyor will be a covered conveyor.

Gypsum and limestone will be received by truck and stored under cover. Each material will be transferred by a front-end loader to its designated feed hopper. These materials will then be transferred to the finish mill feed conveyor. The gypsum and limestone, grinding aids and other mineral additives will be interground with the clinker in the finish mill. The finish mill will produce 136 tons/hour of cement.

The finish mill will be in a closed circuit with a high efficiency air separator and cyclones. The mill will be vented by a fabric filter. A fabric filter will vent all the conveying equipment. The finished cement will be conveyed pneumatically to the product storage silos.

Finished cement will be stored in concrete silos, vented by baghouses. Cement withdrawal will occur through rotary shut-off valves, flow control valves, and airslides to vented retractable loading spouts. There will be a truck scale under each pair of silos and a rail scale adjacent to the silos. The silos will have additional outlets to convey cement to the bagging operation. Cement silo unloading rates will be 500 tons/hour. Each loading spout will be equipped with its own fabric filter.

The cement bagging operation will consist of a screen, a surge hopper, a bucket elevator, and a rotary packer. The bags will be palletized after being air cleaned. The pallets will be moved by forklift to storage and onto trucks and railcars. A fabric filter will vent all equipment.

1.9 Coal Processing

Coal will be received by rail. The coal will be conveyed to a bucket elevator at a rate of 200 tons/hour. The bucket elevator will discharge the coal either into a covered storage facility or onto a belt and then to a bin. Coal will be stockpiled in the covered storage facility and in an adjacent uncovered pile. Coal in covered storage will be reclaimed by a front-end loader through the unloading system.

The coal will be metered from the bin to a vertical mill. The coal will be dried in the mill with hot air drawn from the clinker cooler. The milled coal will be collected in a product fabric filter, and stored in a milled coal bin. The milled coal bin will be vented through a fabric filter. The milled coal will be pneumatically conveyed to the main burner and precalciner burner.

1.10 Cement Kiln Dust (CKD)

CKD is defined in the EPA's Report to Congress on CKD (December 1993), as follows:

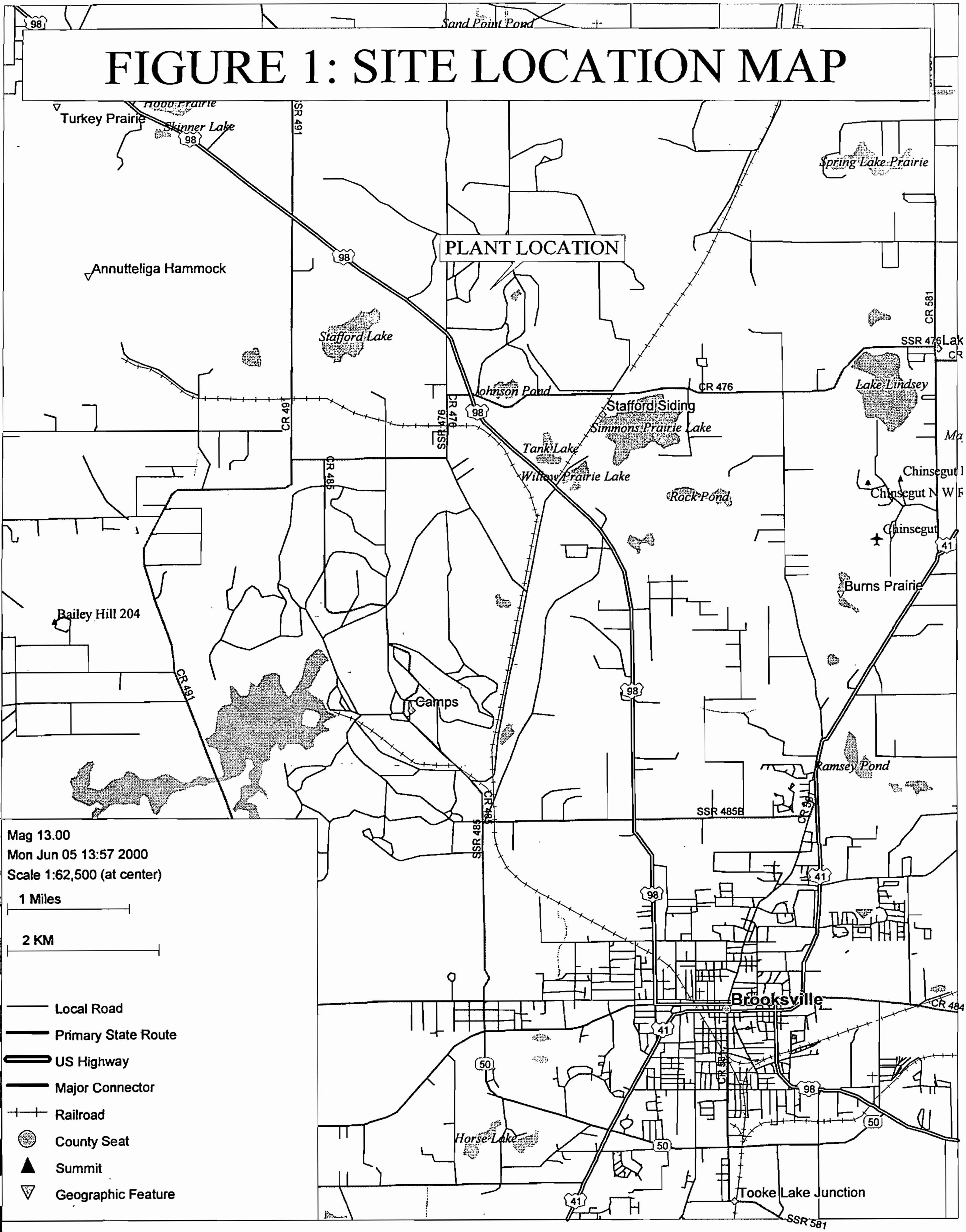
"CKD is a fine-grained solid material generated as the primary by-product of the production of cement. CKD generation results directly from control of particulate matter that would otherwise be discharged. In contrast to many other residues of industrial production, CKD is essentially an off-specification product: it much more closely resembles the raw material entering and product leaving the operation than many other industrial wastes."

This definition identifies CKD as the particulate matter captured by the main particulate control device at the cement plant; and further describes the CKD as resembling the raw material and product streams. At many cement plants the CKD is a waste material which is not returned to the process for various process or product quality reasons, such as:

- Raw materials high in alkalis result in CKD high in alkalis, reintroduction to the process would result in off-specification product
- Raw materials high in chlorides result in CKD high in chlorides, reintroduction to the process tends to clog the ducts in the preheater
- Most wet-process kilns are unable to reintroduce the collected dust, as it is difficult to mix the hot dust with the cold slurry

The raw materials to be used at the cement plant are low in alkalis and chlorides. Reintroduction of the CKD into the process precludes the generation of CKD as a waste material. The proposed cement plant will not generate cement kiln dust (CKD) as a waste product. All generated and captured dust will be returned to the production process to supplement the raw materials in the raw meal or into the preheater kiln system. There will be no disposal of captured dust. The process equipment utilized to transport the captured dust from the ESP back into the process will be enclosed and vented to baghouses. No unconfined emissions are expected from dust handling and transport activities. Dust will be gravity-fed to a pneumatic screw pump through a conveying pipe. The dust will then be pumped either into the raw meal silo or into the preheater kiln system.

FIGURE 1: SITE LOCATION MAP



SECTION 2: GENERAL PRECONSTRUCTION REVIEW

2.1 Applicability

The Department of Environmental Protection has adopted Chapter 62-212, F.A.C. to establish the preconstruction review requirements for proposed new emissions units or facilities, and proposed modifications.

The requirements apply to those proposed activities for which an air construction permit is required pursuant to Chapter 62-210, F.A.C. The chapter includes general preconstruction review requirements and specific requirements for emissions units subject to prevention of significant deterioration (PSD) and nonattainment-area preconstruction review.

2.2 Other Applicable Regulations

The facility will be subject to applicable provisions of three New Source Performance Standards (NSPS) and applicable provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP).

NSPS Subpart F: Standards of Performance for Portland Cement Plants (40CFR60.60)

NSPS Subpart Y: Standards of Performance for Coal Preparation Plants (40CFR60.250)

NSPS Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants (40CFR60.670)

NESHAP Subpart LLL: Standards of Performance for Portland Cement Plants (40CFR63.1340)

SECTION 3: PREVENTION OF SIGNIFICANT DETERIORATION

3.1 Applicability

The provisions of Rule 62-212.400 apply to the construction or modification of air pollutant emitting facilities in those parts of the state in which the state ambient air quality standards are being met. The rule establishes the criteria for determining whether or not a proposed new facility or modification to a facility is subject to the preconstruction review requirements. For the proposed facility the sum of the quantifiable fugitive emissions and the potential emissions of regulated pollutants of all emissions units at the facility which have the same "Major Group" Standard Industrial Classification (SIC) Code will be equal to or greater than 100 tons per year; and the facility belongs to any of the major facility categories.

This cement plant is considered a major new facility subject to both state and federal regulations as set forth in Chapter 62-212, FAC. The facility is located in an area classified as attainment for each of the regulated air pollutants. The proposed facility has quantifiable fugitive emissions and potential emissions of the following regulated pollutants equal to or greater than 100 tons per year:

- Particulate Matter (total)
- Particulate Matter (<10 microns)
- Nitrogen Oxides
- Carbon Monoxide

The proposed facility will be subject to preconstruction review to include a determination of Best Available Control Technology, an air quality review, Good Engineering Practice stack height analysis and an evaluation of impacts to soils, vegetation and visibility. This report accompanies an Application for Air Permit. Construction of the proposed facility will not commence until an air construction permit has been issued by the Department of Environmental Protection.

TABLE 1 -- MAJOR FACILITY CATEGORIES (LIST OF 28)

Fossil fuel fired steam electric plants of more than 250 million Btu/hr heat input
Coal cleaning plants (with thermal dryers)
Kraft pulp mills
PORTLAND CEMENT PLANTS
Primary zinc smelters
Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators capable of charging more than 250 tons of refuse per day
Hydrofluoric acid plants
Sulfuric acid plants
Nitric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants
Fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu/hr heat input
Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
Taconite ore processing plants
Glass fiber processing plants
Charcoal production plants

Reference: Table 62-212.400-1, F.A.C.

3.2 Pollutants Subject to PSD Preconstruction Review

The preconstruction review requirements apply to all pollutants regulated under the Act for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be equal to or greater than the significant emission rates listed in Table 2, Regulated Air Pollutants - Significant Emission Rates; or for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be greater than zero when the facility is located within 10 kilometers of a Class I area and the potential and quantifiable fugitive emissions would have an impact on the Class I area equal to or greater than 1.0 microgram per cubic meter (24-hour average).

The operation of the proposed plant will result in significant levels (as defined by Rule 62-212.400, FAC) of particulate matter (PM), particulate matter smaller than 10 microns in diameter (PM10), nitrogen oxides (NOx), sulfur dioxide (SO_2), carbon monoxide (CO), and volatile organic compounds (VOC), as defined by Rule 62-212.400 FAC, and will therefore be subject to PSD review requirements in accordance with FAC Rule 62-212.400, FAC.

The proposed facility is greater than 19 kilometers from Chassahowitzka NWR, which is the nearest Class I Area.

3.2.1 Estimation of Mercury Emissions

Mercury emissions were estimated to ensure that mercury was not a pollutant subject to PSD review. The available emission factor in AP-42 for cement kilns with ESPs is 0.00022 pounds/ton of clinker:

0.00022 pounds/ton of clinker X 712,500 tons/year = 157 pounds per year

Mercury emission data from nine cement plants were evaluated as reported in the EPA Document *Locating and Estimating Air Emissions From Sources of Mercury and Mercury Compounds.* These data are shown below:

Company	Location	lb/ton clinker
Lone Star	Cape Girardeau, MO	0.00002
Lone Star	Cape Girardeau, MO	0.00043
Lafarge Corp	Demopolis, AL	0.00016
Ash Grove	Foreman, AK	0.000035
Ash Grove	Foreman, AK	0.00007
Ash Grove	Chanute, KS	0.00097
Ash Grove	Chanute, KS	0.00015
Ash Grove	Louisville, NE	0.000095
Ash Grove	Louisville, NE	0.00003
ESSROC	Fredrick, MD	0.00022
ESSROC	Fredrick, MD	0.00022
Lafarge Corp	Paulding, OH	0.000032

Lone Star	Oglesby, IL	0.0000045
Lone Star	Oglesby, IL	0.000028
Holnam	Clarksville, MO	0.000097
	Average =	0.00017 lb/ton

The use of the average value from these tests results in a lower and consistent value:

0.00017 pounds/ton of clinker X 712,500 tons/year = 121 pounds per year

Mercury contents of the soils in the vicinity of the plant are approximately 0.02 parts per million (ppm).[1] These soils (limestone and overburden) comprise 90% of the raw materials. Limestone and overburden input (less water) is 1,211,000 tons per year. This is approximately 48 pounds per year of potential mercury emissions from limestone and overburden.

A source of fly ash reported 0.1 ppm of mercury. At a 6.5% utilization rate (78,715 tons per year), this is approximately 16 pounds per year of mercury from fly ash.

Mercury content for eastern U.S. coal averages 0.2 ppm.[2] Maximum coal input is 108,700 tons per year. This is approximately 44 pounds of mercury per year from coal. Reported mercury content for tires is approximately 0.1 ppm – the replacement of coal with tires could reduce potential mercury emissions.

[1] *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States.* 1984. United States Geological Survey.

[2] *Trace Elements in Coal: Occurrence and Distribution.* 1977. Environmental Protection Agency.

The combined potential mercury emissions are approximately 108 pounds per year. This is a conservative assumption that all mercury input would be emitted. As mercury is present in detectable quantities in clinker, this assumption is conservative. Approximately 60% of the mercury is present in the raw materials and 40% is present in the fuels.

There are no currently applicable and available control methods for mercury emissions from cement kilns. Activated carbon injection and other sorbent-based methods are in various stages of development for other source categories.

Based on information provided in this response, it is our professional opinion that the best estimate of mercury emissions from the proposed facility is 156 pounds per year; the estimate calculated based on expected mercury concentrations in raw materials and fuels. In all cases, the estimated mercury emissions were less than the 200 pound per year threshold defined by Rule 62-212.400(2)(f) and Table 212.400-2, F.A.C. for a significant emission rate increase. As the expected mercury emissions will not exceed the significant emission rate threshold, there is no regulatory requirement to address control technology for mercury emissions.

Even though there is no regulatory requirement to address the control of mercury emissions, a brief review will be provided. With dry air pollution control systems (baghouses and electrostatic precipitators), such as proposed for this facility, the demonstrated control technology for mercury is the injection of powdered, activated carbon into the stack gas stream prior to the gas stream entering the air pollution control device. As the particulate matter collected by the electrostatic precipitator is reintroduced into the processing system as kiln feed, the activated carbon (with any absorbed mercury) would be reintroduced into the pyroprocessing system and the mercury would again be released to the gas stream. Additionally, the added carbon in the raw feed will significantly increase carbon monoxide emissions from the plant.

If carbon injection was employed and the particulate matter collected in the electrostatic precipitator was not recycled as feed material, approximately 25 tons per hour (approximately 186,000 tons per year) of particulate matter classified as cement kiln dust would have to be disposed of at the site. From this brief review, it is quite apparent that there is no practical means of controlling the less than significant amount of mercury that will be potentially discharged from the cement plant.

TABLE 2 --REGULATED AIR POLLUTANTS SIGNIFICANT EMISSION RATES

Pollutant	Significant Emission Rate (Tons/Year)	Facility Emission Rate (Tons/Year)	PSD ?
Carbon monoxide	100	1283	YES
Nitrogen oxides	40	998	YES
Sulfur dioxide	40	61	YES
Ozone	40 VOC	43 VOC	YES
Particulate matter	25	204	YES
PM10	15	175	YES
Fluorides	3	0.32	NO
Lead	0.6	0.25	NO
Mercury	0.1	0.08	NO
Beryllium	4.0×10^{-4}	2.4×10^{-4}	NO
Asbestos	7.0×10^{-3}	Not Applicable	
Sulfuric acid mist	7	Not Applicable	
Hydrogen sulfide (H_2S)	10	Not Applicable	
Total reduced sulfur (including H_2S)	10	Not Applicable	
Reduced sulfur compounds (including H_2S)	10	Not Applicable	
Vinyl chloride	1	Not Applicable	
Municipal waste combustor organics	3.5×10^{-6}	Not Applicable	
Municipal waste combustor metals	15	Not Applicable	
Municipal waste combustor acid gases	40	Not Applicable	
Municipal solid waste landfill emissions	50	Not Applicable	

References: Table 62-212.400-2, F.A.C. and 40 CFR 51.166(b)(23)

3.3 Ambient Impact Analysis

The air quality modeling is required to provide assurance that the emissions from the proposed project, together with the emissions of all other air pollutants in the project area, will not cause or contribute to a violation of any ambient air quality standard.

The EPA and the State of Florida have adopted ambient air quality standards (AAQS). Primary AAQS protect the public health while secondary AAQS protect the public welfare from adverse effects of air pollution. Areas of the country have been designated as attainment or nonattainment for specific pollutants. Areas not meeting the AAQS for a given pollutant are designated as nonattainment areas for that pollutant. Any new source or expansion of existing sources in or near these nonattainment areas are usually subject to more stringent air permitting requirements. Projects proposed in attainment areas are subject to air permit requirements that would ensure continued attainment status.

In promulgating the 1977 CAA Amendments, Congress quantified concentration increases above an air quality baseline for sulfur dioxide and particulate matter which would constitute significant deterioration. The size of the allowable increment depends on the classification of the area in which the source would be located or have an impact. Class I areas include specific national parks, wilderness areas and memorial parks. Class II areas are all areas not designated as Class I areas and Class III areas are industrial areas in which greater deterioration than Class II areas would be allowed. There are no Class III areas in Florida.

In 1988, EPA promulgated PSD regulations for nitrogen oxides and PSD increments for nitrogen dioxide concentrations. FDEP adopted the nitrogen dioxide increments in July 1990.

An application for a PSD permit requires an analysis of ambient air quality in the area affected by the proposed facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts.

A source impact analysis is required for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate. Specific atmospheric dispersion models are required in performing the impact analysis. The analysis demonstrates the project's compliance with AAQS and allowable PSD increments.

Typically, a five-year period is used for the evaluation of the highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors. The second-highest concentration is considered because short-term AAQS specify that the standard should not be exceeded at any location more than once a year.

Air quality modeling was performed for the following pollutants subject to PSD review to demonstrate compliance with applicable ambient air quality standards and PSD increments:

- Carbon monoxide
- Nitrogen oxides

- Sulfur dioxide
- PM10

The modeling demonstrated compliance with all applicable standards, including Ambient Air Quality Standards (AAQS), PSD Class II increments, and PSD Class I increments.

The source-alone emissions were modeled using the ISCST3 model (Version 99155) to determine the Area of Significant Impact (ASI) for the various averaging periods. The modeling utilized upper-air meteorological data and surface meteorological data from the Tampa International Airport station for a five year period from 1987-1991. Modeling to determine significance was conducted using facility fence line receptors with 50-meter spacing and radial rings using 10° spacing from 1 kilometer to 10 kilometers at 1 kilometer intervals.

Sulfur dioxide and carbon monoxide were determined to have less than significant impacts in the Class II area, and sulfur dioxide was determined to have less than significant impacts in the Class I area (Chassahowitzka). This demonstrates compliance with ambient air quality standards and PSD increments for these pollutants. No further dispersion modeling was performed for these pollutants.

The ambient air concentrations for nitrogen oxides were below the Class II significance levels within a 5-kilometer radius of the facility. The ambient air concentrations PM10 for all periods were below the Class II significance levels within a 2-kilometer radius of the facility. Refined dispersion modeling was conducted for these pollutants. The refined modeling was conducted to demonstrate compliance with the PSD increments and the AAQS.

An inventory was obtained from the Department's Bureau of Information Systems of all permitted air emission sources within the following counties:

- Citrus
- Hernando
- Hillsborough
- Lake
- Levy
- Marion
- Pasco
- Pinellas
- Polk
- Sumter

This master inventory includes all permitted sources in an area greater than 75 kilometers radius from the proposed facility. The modeling inventories for compliance with PSD increments and AAQS were developed from the master inventory. Two sets of inventories were developed: the 20-D inventories for use in the Class II area to demonstrate compliance with the AAQS, and the PSD inventories for use in both the Class I and Class II areas to demonstrate compliance with the PSD increments.

The 20-D analysis calculates two things: The total emissions of a given pollutant from a given facility are calculated in tons per year and the distance between the proposed cement plant and the existing facility is calculated in kilometers (D). The distance is multiplied by 20, and this value is compared to the facility's emissions in tons per year. Any facility where the 20-D value is greater than the emission value is assumed to have a negligible effect on the ambient air concentrations of the given pollutant at the proposed cement plant.

The ambient air impacts of the proposed cement plant were evaluated with respect to the allowable PSD Class II increments. The PSD inventories were developed that include those facilities that have consumed the available PSD Class II increments. The PSD inventories for NOX and PM10 were modeled with the facility's emissions to determine compliance with the PSD increments.

Additionally, background concentrations of PM10 and NOX were estimated from the Department's ALLSUM reports. These background concentrations account for unpermitted sources, mobile sources, and other background concentrations. The background concentrations are added to the modeled concentrations to evaluate compliance with the AAQS. The ambient air concentrations from the proposed cement plant, plus the 20-D inventories, plus the background concentrations, were evaluated with respect to the applicable AAQS.

TABLE 3 – CLASS II AREA SIGNIFICANCE

Pollutant	Averaging Period	Significance Level (μg/m³)	Modeled Concentration (μg/m³)	Refined Modeling Required?
PM10	Annual	1	6.75172 (1990)	Yes
	24-hour	5	17.18003 (1990)	Yes
Sulfur dioxide	Annual	1	0.11609 (1989)	No
	24-hour	5	1.19538 (1989)	No
	3-hour	25	4.31756 (1990)	No
Nitrogen dioxide	Annual	1	1.91452 (1989)	Yes
Carbon Monoxide	1-hour	2000	143.86488 (1988)	No
	8-hour	500	53.97570 (1988)	No

Reference: Rule 62-204.200(29), F.A.C. and Rule 62-204.260, F.A.C.
Annual average concentrations are high 1st high values,
Short-term average concentrations are high 2nd high values.

The proposed facility is located within 100 kilometers of Chassahowitzka NWR. Table 5 shows the modeled concentrations at Chassahowitzka compared to the significance levels. For those pollutants and averaging periods shown as less than significant, no further review for compliance with PSD increments is required.

TABLE 4 – CLASS I AREA SIGNIFICANCE

Pollutant	Averaging Period	Significance Level (μg/m³)	Modeled Concentration (μg/m³)	Significant?
PM10	Annual	0.2	0.06593 (1990)	No
	24-hour	0.3	0.66189 (1989)	Yes
Sulfur dioxide	Annual	0.1	0.01612 (1991)	No
	24-hour	0.2	0.14822 (1991)	No
	3-hour	1.0	0.74961 (1991)	No
Nitrogen dioxide	Annual	0.1	0.26593 (1991)	Yes

Reference: Chassahowitzka Class I Area Study Description, FDEP, May 1996 draft
Annual average concentrations are high 1st high values
Short-term average concentrations are high 2nd high values

TABLE 5 – CLASS I AREA INCREMENT ANALYSIS

Pollutant	Averaging Period	Increment (μg/m³)	Modeled Concentration (μg/m³)	> increment?
PM10	24-hour	8	6.48980 (1989)	No
Nitrogen dioxide	Annual	2.5	2.27638 (1990)	No

Reference: Rule 62-204.260, F.A.C.
Annual average concentrations are high 1st high values,
Short-term average concentrations are high 2nd high values.

It is concluded that the proposed facility will not cause or significantly contribute to any violations of the PSD increments at Chassahowitzka.

TABLE 6 -- PM10 AAQS Inventory (20-D Inventory)

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	1	2097.144	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	2	787.57	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	3	2836.05	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	4	2872	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	6	15	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	8	3	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	9	10	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	10	10	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	13	925	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	14	57.1	45
0530005	CHEMICAL LIME INC.	CHEMICAL LIME INC.	6	54.75	7
0530005	CHEMICAL LIME INC.	CHEMICAL LIME INC.	10	21.9	7
0530005	CHEMICAL LIME INC.	CHEMICAL LIME INC.	11	1.9656	7
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	2	4.18	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	3	169.8	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	4	28.14	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	5	158	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	6	5.72	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	8	9.72	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	9	155.5	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	11	9.43	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	12	4.57	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	13	55.35	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	14	118	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	15	60	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	16	5.95	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	17	1.91	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	18	5.44	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	19	15	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	21	4.1	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	22	1.88	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	23	1.88	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	24	2.54	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	25	11.3	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	26	1.87	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	27	4.4	5
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	1	3.066	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	2	1.752	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	4	0.876	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	6	9.636	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	7	3.504	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	8	3.066	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	10	1.314	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	11	2.628	7

TABLE 6 -- PM10 AAQS Inventory (20-D Inventory) – Continued

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	12	5.256	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	13	22.338	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	14	1.752	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	15	4.38	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	17	2.19	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	19	5.08	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	20	216	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	21	5.1	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	22	2.7	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	23	0.44	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	25	7.39	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	26	210	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	28	68.66	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	29	6.2	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	30	8.28	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	1	4.818	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	2	6.1758	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	3	1.5	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	4	9.6	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	5	3.2	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	9	686	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	10	12	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	14	131.4	7
0530044	FLORIDA CRUSHED STONE	GREGG MINE	1	24.8	6
0530044	FLORIDA CRUSHED STONE	GREGG MINE	2	0.6	6
0530044	FLORIDA CRUSHED STONE	GREGG MINE	3	0.7	6
0530050	FLORIDA ROCK INDUSTRIES, INC.	BROOKSVILLE QUARRY	1	55.45	1
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	2	139.28	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	3	139.28	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	5	3.7449	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	6	1.971	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	7	5.3217	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	10	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	11	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	12	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	13	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	14	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	15	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	16	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	17	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	18	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	19	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	20	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	21	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	22	20.1918	37

TABLE 6 -- PM10 AAQS Inventory (20-D Inventory) – Continued

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	23	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	24	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	25	20.1918	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	26	8.541	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	27	36.6	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	28	36.6	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	29	36.6	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	30	36.6	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	33	6.2	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	34	6.5	37
1010002	LYKES PASCO, INC.	LYKES PASCO, INC.	35	2	37

TABLE 7 -- PM10 PSD Inventory (Class I and Class II)

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	1	2097.144	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	2	2100.21	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	3	2836.05	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	4	2872	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	6	15	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	8	3	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	9	10	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	10	10	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	13	925	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	14	57.1	45
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	2	4.18	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	3	169.8	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	4	28.14	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	5	158	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	6	5.72	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	8	9.72	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	9	155.5	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	11	9.43	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	12	4.57	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	13	55.35	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	14	118	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	15	60	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	16	5.95	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	17	1.91	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	18	5.44	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	19	15	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	21	4.1	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	22	1.88	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	23	1.88	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	24	2.54	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	25	11.3	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	26	1.87	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	27	4.4	5
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	1	3.066	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	2	1.752	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	4	0.876	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	6	9.636	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	7	3.504	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	8	3.066	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	10	1.314	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	11	2.628	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	12	5.256	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	13	22.338	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	14	1.752	7

TABLE 7 -- PM10 PSD Inventory (Class I and Class II) – Continued

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	15	4.38	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	17	2.19	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	19	5.08	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	20	216	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	21	5.1	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	22	2.7	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	23	0.44	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	25	7.39	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	26	210	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	28	68.66	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	29	6.2	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	30	8.28	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	1	4.818	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	2	6.1758	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	3	1.5	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	4	9.6	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	5	3.2	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	9	686	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	10	12	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	14	131.4	7
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	1	1.05	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	9	136	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	10	143	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	11	156	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	12	142.8	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	13	67	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	14	164.25	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	15	22	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	19	1.1	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	20	0.8	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	22	0.876	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	23	0.438	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	24	2.35206	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	32	13.1	59
0570005	CF INDUSTRIES, INC., PLANT CITY PHOSP	CF INDUSTRIES, INC., PLANT CITY	34	92.7246	59
0690046	OGDEN MARTIN SYSTEMS OF LAKE, INC.	OGDEN MARTIN SYSTEMS OF LAKE, INC.	1	16.6	53
0690046	OGDEN MARTIN SYSTEMS OF LAKE, INC.	OGDEN MARTIN SYSTEMS OF LAKE, INC.	2	16.6	53
0690046	OGDEN MARTIN SYSTEMS OF LAKE, INC.	OGDEN MARTIN SYSTEMS OF LAKE, INC.	3	0.001	53
1010071	PASCO COGEN LIMITED	PASCO COGEN LIMITED	1	13.5	38
1010071	PASCO COGEN LIMITED	PASCO COGEN LIMITED	2	13.5	38

TABLE 8 -- NOx AAQS Inventory (20-D Inventory)

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	3	19852.35	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	4	20109.894	45
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	3	1318	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	14	1130	5
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	20	1572	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	26	1280	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	9	4863	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	14	8983.38	7
1010056	PASCO COUNTY (OWNER)	PASCO COUNTY RESOURCE RECOVERY	1	394.2	33
1010056	PASCO COUNTY (OWNER)	PASCO COUNTY RESOURCE RECOVERY	2	394.2	33
1010056	PASCO COUNTY (OWNER)	PASCO COUNTY RESOURCE RECOVERY	3	394.2	33
1010056	PASCO COUNTY (OWNER)	PASCO COUNTY RESOURCE RECOVERY	5	1.32	33

TABLE 9 -- NOx PSD Inventory (Class I and Class II)

FACILITY ID	OWNER/COMPANY	SITE NAME	EU ID	Allowable (tpy)	distance
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	3	19852.35	45
0170004	FLORIDA POWER CORPORATION	CRYSTAL RIVER POWER PLANT	4	20109.894	45
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	3	1318	5
0530010	SOUTHDOWN, INC.	FLORIDA MINING & MATERIALS	14	1130	5
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	20	1572	7
0530021	FLORIDA CRUSHED STONE CO., INC.	FLORIDA CRUSHED STONE CO., INC	26	1280	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	9	4863	7
0530032	CENTRAL POWER & LIME, INC.	CENTRAL POWER & LIME, INC.	14	8983.38	7
0570005	CF INDUSTRIES, INC., PLANT CITY	CF INDUSTRIES, INC., PLANT CITY	1	694	59
0690046	OGDEN MARTIN SYSTEMS OF LAKE, INC.	OGDEN MARTIN SYSTEMS OF LAKE,	1	361.4	53
0690046	OGDEN MARTIN SYSTEMS OF LAKE, INC.	OGDEN MARTIN SYSTEMS OF LAKE,	2	361.4	53
1010071	PASCO COGEN LIMITED	PASCO COGEN LIMITED	1	202.35	38
1010071	PASCO COGEN LIMITED	PASCO COGEN LIMITED	2	202.35	38

3.4 Refined Modeling

Refined modeling for NOx and PM10 was conducted using a 100-meter receptor fine-grid for PSD increments and AAQS in the Class II Area. Through the coarse grid runs, the regulatory high value receptors were identified. For NOx, a 2 km by 2 km receptor fine-grid was centered on the high value receptor. For PM10, as all of the regulatory high value receptors were located along the property line generally west of the main stack, a 2 km by 2 km receptor fine grid was placed adjacent to and west of the property boundary. The grid was centered in the north-south direction along the x-axis through the main stack.

The greatest regulatory concentration values from the modeling runs were used to demonstrate compliance with PSD increments and ambient air quality standards.

TABLE 10 – CLASS II AREA INCREMENT ANALYSIS

Pollutant	Averaging Period	Increment (µg/m³)	Modeled Concentration (µg/m³)	>increment?
PM10	Annual	17	7.67325 (1990)	No
	24-hour	30	17.18627 (1990)	No
Nitrogen dioxide	Annual	25	5.90073 (1989)	No

Reference: Rule 62-204.200(29), F.A.C. and Rule 62-204.260, F.A.C.
Annual average concentrations are high 1st high values,
Short-term average concentrations are high 2nd high values.

The ambient air concentrations from the proposed cement plant, plus the 20-D inventories, plus the background concentrations, were evaluated with respect to the applicable AAQS. This refined air quality modeling demonstrated that the AAQS were not violated for PM10 or NOx.

TABLE 11 – AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	State Ambient Standard ($\mu g/m^3$)	Federal Primary Ambient Standard ($\mu g/m^3$)	Federal Secondary Ambient Standard ($\mu g/m^3$)	Modeled Concentration Facility + Inventory ($\mu g/m^3$)
Sulfur Dioxide	3-hour	1300	---	1300	Facility Not Significant
	24-hour	260	365	---	
	Annual	60	80	---	
PM10	Annual	50			8.64397 (1990) plus 17 (background) = 25.6 $\mu g/m^3$
	24-hour	150			20.43702 (1991) plus 53 (background) = 73.4 $\mu g/m^3$
Carbon Monoxide	1-hour	40,000		---	Facility Not Significant
	8-hour	10,000		---	
Ozone	1-hour	---	235		Not Applicable <100 TPY VOC
	8-hour	---	157		
	Daily	235	---	---	
Nitrogen Dioxide	Annual	---	100		5.77691 (1989) plus 19 (background) = 24.8 $\mu g/m^3$

References: Rule 62-204.240, F.A.C. and 40 CFR 50

TABLE 12 – PM10 MONITOR DATA FOR BACKGROUND CONCENTRATION

YEAR	COUNTY	MONITOR LOCATION	Concentration ($\mu g/m^3$) 1st High	Concentration ($\mu g/m^3$) Arithmetic Mean
1995	Hernando	Brooksville/Dade Avenue	38	16
		Brooksville/Buczak Road	43	19
		Ridge Manor/Kettering Road	47	17
		Spring Hill/Forest Oaks Blvd.	44	18
1996	Hernando	Brooksville/Dade Avenue	64	16
		Brooksville/Buczak Road	67	16
		Ridge Manor/Kettering Road	62	16
		Spring Hill/Forest Oaks Blvd.	60	16
		24-hour avg. =	53 $\mu g/m^3$ background	
		Annual avg. =		17 $\mu g/m^3$ background

Reference: FDEP ALLSUM Reports

TABLE 13 – NOx MONITOR DATA FOR BACKGROUND CONCENTRATION

YEAR	COUNTY	MONITOR LOCATION	Concentration ($\mu g/m^3$) Arithmetic Mean
1995	Hillsborough	Tampa/Gandy Boulevard	21
	Pinellas	St. Petersburg/Azalea Park	22
1996	Hillsborough	Hillsborough Bay/Simons Park	13
		Tampa/Gandy Boulevard	18
	Pinellas	St. Petersburg/Azalea Park	21
Annual Average =			19 $\mu g/m^3$ background

Reference: FDEP ALLSUM Reports

3.5 Baseline Related Provisions

The proposed facility is shown to not exceed any applicable Class II area PSD increments, by showing that such increments were not exceeded when the facility's emissions were modeled with the PSD inventories. The inventories are conservative because they all current allowable emissions to be increment consuming. No evaluation of increment expansion was conducted. This approach is considered to be more conservative, more accurate and less cumbersome than determining baseline emissions.

3.6 Limited Exemptions and Special Provisions

The preconstruction review requirements establish exemptions and exclusions from certain of the General Provisions of Rule 62-212.400(4), F.A.C., and PSD Review Requirements of Rule 62-212.400(5), F.A.C.

3.6.1 Temporary Emissions

A proposed facility subject to preconstruction review is exempt from certain requirements of Rule 62-212.400, for a particular pollutant, provided:

The duration of emissions of the facility would not exceed two years;

The owner or operator of the facility has provided the Department with reasonable assurance that the emissions of the facility would not cause or contribute to a violation of any ambient air quality standard or have a significant impact on any Class I area or area where an applicable maximum allowable increase is known to be violated.

3.6.2 *Construction Related Emissions*

Concentrations of particulate matter attributable to the increase in emissions from construction or other temporary emission-related activities of new or modified facilities shall be excluded in determining compliance with any maximum allowable increase.

3.6.3 *General Ambient Monitoring Exemption*

The air quality monitoring is required when the impact of air pollutant emission increases and decreases associated with a proposed project exceed the de minimis impact levels defined by Rule 62-212, FAC or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. A proposed facility or modification subject to preconstruction review is exempt from preconstruction and postconstruction ambient monitoring with respect to a specific pollutant if:

The emissions of the pollutant from the new facility or the net emissions increase of the pollutant from the modification would not have an impact on any area equal to or greater than that listed in Table 212.400-3, De Minimis Ambient Impacts; or

The ambient concentration of the pollutant in the area that the proposed facility or modification would affect is less than the appropriate de minimis concentration listed in Table 212.400-3; or

The pollutant is not listed in Table 212.400-3.

Of the nine pollutants in Table 212.400-3, four are subject to PSD review for the proposed facility – NOX, SO2, PM10, and CO. Of these, NOX, SO2, and CO result in ambient concentrations well below the de minimis levels.

The ambient concentrations resulting from the emissions of PM10 exceed the de minimis levels. The Department operates PM10 monitors in Hillsborough County and in Pinellas County, and has previously operated monitors in Hernando County.

The Department has waived the requirement for ambient monitoring on similar recent PSD facilities.

TABLE 14 – DE MINIMIS AMBIENT IMPACTS

Pollutant	Averaging Period	Concentration (µg/m³)	Modeled Concentration (µg/m³)
Nitrogen dioxide	Annual	14	1.9
Sulfur dioxide	24-hour	13	1.2
PM10	24-hour	10	17.2
Carbon monoxide	8-hour	575	54.0
Ozone	Not Applicable – Less Than 100 tons/year VOC		
Lead	Quarterly	0.1	Not Subject to PSD Review
Fluorides	24-hour	0.25	
Mercury	24-hour	0.25	
Hydrogen sulfide	1-hour	0.2	

Reference: Table 62-212.400-3, F.A.C.

3.7 Additional Impact Analyses

Federal Secondary Ambient Air Quality Standards are established to protect the public welfare including the protection of animal and plant life, property, visibility and atmospheric clarity, and the enjoyment of life and property.

The U. S. Environmental Protection Agency was directed by Congress to develop primary and secondary ambient air quality standards. The primary standards were to protect human health and the secondary standards were to:

"... protect the public welfare from any known or anticipated adverse effects of a pollutant." The public welfare was to include soils, vegetation and visibility.

As a basis for promulgating the air quality standards, EPA undertook studies related to the effects of all major air pollutants and published criteria documents summarizing the results of the studies. The studies included in the criteria documents were related to both acute and chronic effects of air pollutants. Based on the results of these studies, the criteria documents recommended air pollutant concentration limits for various periods of time that would protect against both chronic and acute effects of air pollutants with a reasonable margin of safety.

The facility will not cause or contribute to any exceedance of established ambient air quality standards. The emissions from the facility will result in ambient impacts that are less than significant and are considered to be de minimis, for all regulated pollutants except for PM10 and NOX.

The impacts to ambient air resulting from emissions of PM10 and NOX are well below the applicable Federal Secondary Ambient Air Quality Standards. Compliance with PSD Class II increments establishes an effective ambient air quality standard that is much more stringent than the ambient air quality standards. It is concluded that there will be no adverse effect to the soils or vegetation of the area.

No quantifiable air quality impacts are projected for the area as a result of general commercial, residential, industrial and other growth associated with the facility.

The proposed construction will require an increase in personnel to construct the cement plant. The overall level of activity at the site will be consistent with previous mining activity. A decrease in the overall number of truck trips is expected as site operations shift to cement production from hard rock production. No increase in residential or commercial construction is expected in the area surrounding the plant. Therefore, no additional growth impacts are expected as a result of the proposed project.

The area the facility will affect is the area of significant impact described in the air quality analysis section of this report. This area is within a radius of 5 kilometers from the proposed facility. The applicant owns a substantial amount of this area.

General commercial, residential, and other growth within the radius has been minimal and is expected to have negligible air quality impacts.

3.8 Good Engineering Practice Stack Height

In accordance with Chapter 62-210, FAC, the degree of emission limitation required for control of any pollutant is not to be affected by a stack height that exceeds GEP, or any other dispersion technique. GEP stack height is defined as the highest of:

- 65 meters (m), or
- A height established by applying the formula:

$$H_g = H + 1.5\,L$$

where:

Hg – GEP stack height,

H – Height of the structure or nearby structure, and

L – Lesser dimension, height or projected width of nearby structure(s)

The GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height. The actual stack height may be higher or lower.

The criteria for good engineering practice stack height in FAC Rule 62-210.550 states that the height of a stack should not exceed the greater of 65 meters (213) feet or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion. The nearby structure for the plant's main stack is the raw meal silo. The main stack height will be 250 feet (76.3 meters).

Stack height: 250 feet (76.3 meters)

Raw meal silo height: 230 feet (70.2 meters)

Raw meal silo width (diameter): 46 feet (14.03 meters)

Therefore, GEP stack height is described by

$Hg = H + 1.5L$, or $Hg = 70.2 + 21 = 91.2$ meters.

The proposed stack height is less than the GEP stack height and was used for air quality modeling.

SECTION 4: BEST AVAILABLE CONTROL TECHNOLOGY

Following receipt of a complete application for a permit to construct a facility that requires a determination of Best Available Control Technology (BACT), the Department shall make a determination of Best Available Control Technology during the permitting process. In making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

- All scientific, engineering, and technical material and other information available to the Department.

- The emission limiting standards or BACT determinations of any other state.

- The social and economic impact of the application of such technology.

The PSD control technology review requires that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to the source. The BACT requirements are applicable to all regulated pollutants subject to a PSD review. BACT is defined by Rule 62-212, FAC, as an emission limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead, to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation. Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means that achieve equivalent results.

The BACT review analyzes the control systems utilized in the design of a proposed facility. The BACT, at a minimum, has to comply with the applicable New Source Performance Standards for the source. The BACT analysis requires the evaluation of the available air pollution control methods including a cost-benefit analysis of the alternatives. The cost-benefit analysis includes consideration of materials, energy, and economic penalties associated with the control systems, as well as environmental benefits derived from the alternatives. The top-down approach requires a technology evaluation to start with the most stringent control alternative, and justify its rejection or acceptance as BACT. Rejection of control alternatives may be based on technical or economical unfeasibility, physical differences, location differences, and environmental or energy impact differences when comparing a proposed project with a project previously subject to that BACT.

BACT will be applied for the following pollutants subject to preconstruction review:

- Carbon monoxide
- Nitrogen oxides
- Sulfur dioxide
- Ozone (as VOC)
- Particulate matter
- PM10

The emission rates of particulate matter (PM), particulate matter smaller than 10 microns in diameter (PM10), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOC) represent significant emission rates. BACT analyses are therefore required for these pollutants.

4.1 Control Technology Analysis: Particulate Matter (PM/PM10)

The various physical and chemical processes at a cement plant generate particulate matter (PM/PM10). These pollutants are composed of finely dispersed solids. Control of particulate emissions is achieved by the collection of particles from the facility's stack emissions, and by the prevention of generation of particles from fugitive emission sources. Common control devices for stack gases include fabric filters (baghouses), and electrostatic precipitators (ESP). Fabric filters (baghouses) and electrostatic precipitators (ESP's) are considered analogous for particulate control, with both types of devices achieving removal efficiencies of over 99.9%. ESP's and baghouses are used extensively as control devices at cement plants. Baghouses are used to control particulate emissions from most material processing operations at a cement plant.

Inertial separators (cyclones) can have efficiencies over 90% within narrow particle size ranges, but their overall efficiencies are generally less than 85%. Inertial separators have not been demonstrated as effective controls at cement plants, but they are used extensively as process devices at cement plants. The use of cyclones as process devices at cement plants serves to enhance the overall control efficiency of the system.

ESP's and baghouses are considered as BACT and MACT for particulate collection controls for cement plants. The preamble of the recently proposed NESHAP for cement manufacturing (63FR14182, March 24, 1998) states:

"All kiln exhaust gases are controlled at the existing plants by either [baghouses] or ESPs"

The proposed facility will have baghouses for all controlled material processing operations except for the in-line kiln/raw mill and the clinker cooler, which will have ESP's.

Baghouses remove dust from a gas stream by passing the stream through a porous fabric. Dust particles form a more or less porous cake on the surface of the fabric. It is normally this cake that actually does the filtration. Pulse-jet baghouses are designed to allow collection of the dust on the outside of the bags. The filter cake is periodically removed by a pulsed jet of compressed air into the bags.

The selection of fiber material and fabric construction is important to baghouse performance. The fiber material from which the fabric is made must have adequate strength characteristics at the maximum gas temperature expected and adequate chemical compatibility with both the gas stream and the collected dust.

The following table lists the major fabric alternatives for gas filtration and gives some of the important properties of these fabrics.

TABLE 15 – BAG FABRIC CHART

Fabric	Maximum Temperature, °F	Acid Resistance	Alkali Resistance	Flexural & Abrasion Resistance
Cotton	180	Poor	Good	Very Good
Polypropylene	200	Excellent	Excellent	Very Good
Polyester	275	Good	Good	Very Good
Nomex	400	Poor to fair	Excellent	Excellent
Teflon	450	Excellent	Excellent	Fair
Fiberglass	500	Fair to good	Fair to good	Fair

Air-to-cloth ratio is a measure of the amount of the gas stream driven through the surface area of fabric in the baghouse, and is typically given in terms of the number of cubic feet per minute of gas (acfm) passing through 1 square foot of cloth.

Air-to-Cloth Ratio = [acfm/cloth area (ft^2)]

Typical ranges of air-to-cloth ratios, utilized for various particulate materials, are presented in the following table.

TABLE 16 – TYPICAL AIR-TO-CLOTH RATIOS

Industry/Material Processed	Typical Air-to-Cloth Ratio Range
Cement	2.0 – 8.0
Clay	2.5 – 9.0
Coal	2.5 – 8.0
Fly Ash	2.5 – 5.0
Gypsum	2.0 – 10.0
Lime	2.5 – 10.0
Limestone	2.7 – 8.0
Rock Dust	3.0 – 9.0
Sand	2.5 – 10.0
Silica	2.5 – 7.0

Raw Material Handling

Baghouses are used to control particulate emissions from material storage buildings, enclosures, bins, silos, and conveying equipment. Typical baghouses are pulse-jet type.

Raw Milling, Pyroprocessing, and Clinker Cooler

Typical control equipment for in-line kiln/raw mills and clinker coolers is ESPs.

Clinker & Cement Handling and Storage

Particulate emissions from mill vents, air separator vents, material handling systems, bins, and silos are typically controlled by baghouses. Typical baghouses are pulse-jet type.

Coal Milling

Particulate emissions from milling, transfer points, and storage silos/bins are typically controlled by baghouses. Typical baghouses are pulse-jet type.

TABLE 17 – TYPICAL BAGHOUSE SPECIFICATIONS

OPERATION		
Raw material processing	acfm	4500-25,000
	Fabric type	Polyester
	Temperature range, °F	ambient up to 275°
	Air-to-Cloth Ratio	2.5 – 6.0
	Inlet loading, gr/acf	5 – 40
Clinker and cement processing	acfm	2000 – 75,000
	Fabric type	Polyester
	Temperature range, °F	ambient to 275°
	Air-to-Cloth Ratio	2.0 – 6.0
	Inlet loading, gr/acf	5 – 300
Coal processing	acfm	3000 – 25,000
	Fabric type	Polyester
	Temperature range, °F	ambient to 275°
	Air-to-Cloth Ratio	2.0 – 6.0
	Inlet loading, gr/acf	5 – 40

Fugitive Sources

Common controls to limit particulate emissions from fugitive sources (such as roadways, stockpiles, and material processing/conveying equipment) include wet suppression (to include the processing of wet material), application of surfactants, paving of roadways and covering of stockpiles to reduce wind erosion.

Wet suppression of fugitive particulate emissions is considered as BACT for most material handling operations and unpaved roadways. The paving of roadways is also considered to be a control technique for fugitive particulate emissions. Wind erosion of particles from stockpiles can be limited by the processing of wet material (defined as materials with moisture content > 1.5%), and by the covering of stockpiles where feasible. The application of dust suppressants has not been demonstrated as effective control of fugitive emissions at cement plants.

TABLE 18 –RECENT PM/PM10 BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	V.E.	CONTROL
Illinois Cement Co.	6/98	Kiln	PM = 0.208 lb/ton clinker		Baghouse
LaFarge Corporation	8/97	Kiln/raw mill Cooler	PM10 = 0.11 lb/ton feed PM10 = 0.06 lb/ton feed		Baghouse
Florida Rock Industries	12/96	Kiln Cooler	PM = 0.20 lb/ton feed PM10 = 0.17 lb/ton feed PM = 0.10 lb/ton feed PM10 = 0.09 lb/ton feed	10%	ESP ESP
Fla. Crushed Stone	11/95	Kiln Cooler	PM = 0.2 lb/ton feed PM = 0.1 lb/ton feed		Baghouse
Great Star Cement	10/95	Kiln Cooler	PM10 = 0.13 lb/ton clinker PM10 = 0.11 lb/ton clinker		Baghouse
Mountain Cement Co.	3/95	Kiln Cooler	PM = 0.3 lb/ton feed PM = 0.1 lb/ton feed	20% 10%	ESP Baghouse

4.2 Top-Down BACT Analysis: Sulfur Dioxide (SO_2)

STEP 1: IDENTIFY ALL CONTROL TECHNOLOGIES

For this review, the control technologies for SO_2 are categorized in three ways:

Inherently Lower-Emitting Process: Alkali/Sulfur Balance in Pyroprocessing System

Add-On Control: Wet Scrubber

Combination of Lower-Emitting Process and Add-On Control

Alkali/Sulfur Balance with a Wet Scrubber

STEP 2: ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

None of the referenced control technologies are rejected as technically infeasible.

STEP 3: RANK REMAINING CONTROL TECHNOLOGIES BY CONTROL EFFECTIVENESS

A key issue that must be addressed in this step is the determination of common units to compare emissions performance levels among options. This issue arises when comparing inherently lower-emitting processes to add-on controls. It is most effective to express emissions performance as an average steady-state emissions level per unit of product produced (lb/ton clinker). Calculating annual emissions levels (tons/yr) using these units becomes straightforward once the projected annual production rates are known.

Also in this step is the evaluation of control techniques with wide (reported) ranges of emissions performance levels. In accordance with EPA guidance, this top-down review uses the most recent regulatory decisions and performance data for identifying the emissions performance level. It is apparent that the reported control efficiency (85%)[1] for the Holnam scrubber is not directly applicable to sources with different raw materials. Rather, as with most control devices, the control efficiency falls as the uncontrolled emissions levels fall (i.e., diminishing returns).

The projected SO_2 removal efficiency of the total system is calculated from the total SO_2 available for liberation.

<u>Coal:</u> 1.5% sulfur by weight, 14.6 tons/hour combusted = 29,200 lbs/hr

Sulfur to sulfur dioxide ratio = 1:2 (2 lbs. SO_2 per 1 lb. S)

SO_2 from coal combustion =

29,200 lbs. coal/hr X 0.015 lb. S/lb. coal X 2 lbs. SO_2/1 lb. S = 876 lbs/hr

<u>Raw Meal:</u>

Sulfite (SO_3) from raw meal (typical) = 0.1% by weight

Raw meal is processed at the rate of 163 tons/hour = 326,000 lbs/hr

Sulfite to sulfur dioxide ratio = 5:4 (4 lbs. SO_2 per 5 lbs. SO_3)

SO_2 from raw meal =

326,000 lbs/hr X 0.001 lbs. SO_3/lb X 4 lbs. SO_2/5 lbs. SO_3 = 261 lbs/hr

Total SO_2 from coal and raw meal = 876 + 261 = 1137 lbs/hr and 4980 tons/year

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[1] FDEP Letter of February 16, 1999. DEP File No. 1210465-001-AC.

After determining the emissions performance levels (in common units) of each control technology identified in Step 2, a hierarchy is established that places at the top the control technology that achieves the lowest emission level. The following chart displays the control hierarchy for the remaining control technologies.

TABLE 19 – CONTROL TECHNOLOGY RANKING

Control Technology	Expected Emission Rate		Performance Level
	pounds/ton clinker	tons/year	% Removed
Alkali/Sulfur Balance + Wet Scrubber	0.03	14.2	99%
Alkali/Sulfur Balance	0.17	61	98%
Wet Scrubber[1]	1.1	1100	85%
Baseline	11.9	4980	0%

[1] Colorado Department of Health, April 28, 1999.

STEP 4: EVALUATE MOST EFFECTIVE CONTROLS

The available and technically feasible control technologies have been identified above and the environmental, economic, and energy impacts must be considered.

Environmental Impacts

This environmental impacts portion of the BACT analysis concentrates on impacts other than impacts on air quality standards due to emissions of SO_2, such as solid or hazardous waste generation, discharges of polluted water from a control device, visibility impacts, or emissions of unregulated pollutants. These types of environmental concerns become important when sensitive area-specific conditions exist or when the incremental emissions reduction potential of the top control is only marginally greater than the next most effective option.

This analysis starts with the identification of the solid, liquid and gaseous discharges from the control device (wet scrubber), as no environmental impacts within the context of this BACT analysis are associated with the alkali/sulfur balance.

Any wet scrubber will result in generation of scrubber liquor requiring some level of treatment prior to discharge. This is an environmental penalty. Additionally, the use of a wet scrubber could increase acid gas emissions (sulfuric, nitric and hydrochloric) over the process alone.

Economic Impacts

Total Annualized Cost

Wet Scrubber = $2,800,000

annual cost of capital for \$6,600,000 in equipment

annual off-site disposal cost of scrubber water = \$1,600,000

Average Cost Effectiveness

Average cost effectiveness is a way to present the costs of control. Average cost effectiveness is calculated as shown by the following formula:

Average Cost Effectiveness (\$/ton removed) =

$$\frac{\text{Control option annualized cost}}{\text{Baseline emissions rate} - \text{Control option emissions rate}}$$

$$\text{Wet Scrubber + Process} = \frac{\$2{,}800{,}000}{4980\ \text{TPY} - 14.2\ \text{TPY}} = \$564/\text{ton of } SO_2 \text{ removed}$$

Incremental Cost Effectiveness

In addition to the average cost effectiveness of a control option, incremental cost effectiveness between control options are also calculated. The incremental cost effectiveness is examined in combination with the average cost effectiveness in order to justify elimination of a control option (Wet Scrubber).

Incremental Cost Effectiveness (\$/incremental ton removed) =

$$\frac{\text{Control option annualized cost} - \text{Next control option annualized cost}}{\text{Next control option emissions rate} - \text{Control option emissions rate}}$$

$$= \frac{\$2{,}800{,}000 - \$0}{61\ \text{TPY} - 14.2\ \text{TPY}} = \$59{,}829 \text{ per incremental ton of } SO_2 \text{ removed}$$

It is apparent from the incremental cost effectiveness value that a wet scrubber is not incrementally cost effective when compared to the process alone. This is because the process alone is a more effective control option (and hence BACT) and has no annual costs.

Energy Impacts

This analysis examines the energy requirements of the control technologies and determines that the use of a wet scrubber results in energy penalties, as a wet scrubber has direct energy cost for pumps and electrical equipment.

STEP 5: SELECT BACT

The most effective control alternative from Step 4 is selected as BACT (Process: Alkali/Sulfur Balance). This top-down BACT analysis has provided information on the various control options. This analysis has demonstrated that energy, environmental, and economic impacts justify the rejection of a wet scrubber for SO_2 control.

TABLE 20 – TOP-DOWN BACT ANALYSIS

CONTROL OPTION	EMISSIONS (TPY)	ANNUAL COST ($/YR)	AVERAGE COST EFFECTIVENESS ($/TON)	INCREMENTAL COST EFFECTIVENESS ($/TON)	TOXICS IMPACT (YES/NO)	ADVERSE ENVIRONMENTAL IMPACTS (YES/NO)	ENERGY IMPACTS (BENEFIT or PENALTY)
Alkali/Sulfur Balance	61	$0	$0	$0	No	No	None
Alkali/Sulfur Balance + Wet Scrubber	14.2	$2,800,000	$564	$59,829	Yes	Yes	Penalty
Baseline	4980						

TABLE 21 –RECENT SO2 BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
Illinois Cement Co.	6/98	Kiln	0.8 lb/ton clinker	Process
LaFarge Corporation	8/97	Kiln/raw mill	4.06 lb/ton clinker	Process
Florida Rock Industries	12/96	Kiln	0.28 lb/ton clinker	Process
Fla. Crushed Stone	11/95	Kiln	0.27 lb/ton clinker	Process
Great Star Cement	10/95	Kiln	0.42 lb/ton clinker	1% sulfur coal
Mountain Cement Co.	3/95	Kiln	14 lb/ton clinker	Low sulfur coal

4.3 Top-Down BACT Analysis: Nitrogen Oxides (NOX)

STEP 1: IDENTIFY ALL CONTROL TECHNOLOGIES

For this review, the control technologies for NOx are categorized in three ways; inherently lower-emitting processes, add-on controls, and combination of lower-emitting processes and add-on controls.

Inherently Lower-Emitting Processes:

- Staged Combustion (MSC)
- Low-NOx Burners

Add-On Controls:

- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

Combination of Lower-Emitting Processes and Add-on Controls:

- Combination of SNCR with MSC

STEP 2: ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

Technical feasibility is assessed based on an evaluation of pollutant bearing gas stream characteristics.[1] The assessment shows, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of:

[1] New Source Review Workshop Manual.

- Selective Catalytic Reduction (SCR)
- Combination of SNCR with MSC

The use of SCR is eliminated as technically infeasible. The catalysts may be fouled by the presence of particulate matter, alkalis, lime, and sulfur dioxide in the exhaust gas. Since the typical SCR operating temperatures are greater than the typical kiln exhaust gas temperatures, installation of SCR would require gas reheating to be effective. Gas reheating involves an energy penalty, additional emissions, and a potential conflict with the temperature requirements of the NESHAP.[1]

The combination of SNCR with MSC is eliminated as technically infeasible. It is apparent that SNCR requires oxygen to be effective; a gas that is intentionally reduced to very low levels in the MSC system. Regarding the temperature window in which SNCR is effective, this temperature regime can be found in a precalciner kiln in the region between the kiln inlet and the fuel injection point of the precalciner burner (all within the reducing zone). By the time the gases have reached the upper part of the precalciner to the point where the remaining tertiary combustion air is introduced and sufficient oxygen is available for SNCR, the gas temperature has dropped below 900°C.

In the only section of the preheater/precalciner of the kiln system selected by the applicant where the temperature is right for SNCR, a reducing atmosphere (oxygen depleted) has intentionally been created to make NOx reduction by MSC effective. Higher up the preheater/precalciner system where additional tertiary combustion air is introduced to complete the combustion reaction and excess oxygen is present, the gas temperature has dropped below the window for SNCR performance. Therefore it is apparent that SNCR will not work in combination with MSC.

Low-NOx Burners

Low NOx burner technology, as commonly used in power plants, has not been found effective in the cement industry. These burners are always the main burner and are commonly provided from Pillard (Rotaflam) or from KHD (Pyrojet). The only way these burners have demonstrated significant NOx reduction is through reduced heat output of the burner and the associated decrease in production. The quality of the clinker is dependent upon the quality of the main burner flame, requiring a short, compact, intense flame that generates thermal NOx. The best control method to reduce the thermal NOx in a precalciner kiln is to operate the calciner with reducing zones to reduce the NOx back to N_2. This is best accomplished with Multi-Stage Combustion. Therefore, low-NOx burners are not applicable as BACT for cement kilns.

Remaining control technologies are:

Inherently Lower-Emitting Processes -- Staged Combustion (MSC)

Add-On Controls -- Selective Non-Catalytic Reduction (SNCR)

STEP 3: RANK REMAINING CONTROL TECHNOLOGIES BY CONTROL EFFECTIVENESS

[1] Alternative Control Techniques Document – NOx Emissions from Cement Manufacturing. EPA 1994.

A key issue that must be addressed in this step is the determination of common units to compare emissions performance levels among options. This issue arises when comparing inherently lower-emitting processes (MSC) to add-on controls (SNCR). It is most effective to express emissions performance as an average steady-state emissions level per unit of product produced (lb/ton clinker). Calculating annual emissions levels (tons/yr) using these units becomes straightforward once the projected annual production rates are known.

Another issue that must be addressed in this step is the evaluation of control techniques with wide (reported) ranges of emissions performance levels. In accordance with EPA guidance, this top-down review uses the most recent regulatory decisions and performance data for identifying the emissions performance level. It is apparent with SNCR that the reported range of control efficiency (30-70%)[1] is not to be interpreted as being the range of emissions performance levels applicable to a particular source type.

Rather, as with most control devices, the control efficiency falls as the uncontrolled emissions levels fall (i.e., diminishing returns). For this reason, control efficiency for SNCR on a cement kiln with uncontrolled NOx levels in the range of 6-7 pounds per ton of clinker may approach 70%, while control efficiency on a modern precalciner cement kiln with uncontrolled NOx emissions in the range of 4.0-4.5 pounds per ton of clinker is more likely to be on the order of 30%. This discussion confirms that it is most effective (and most appropriate) to express emissions performance as an average steady-state emissions level per unit of product produced (lb/ton clinker).

After determining the emissions performance levels (in common units) of each control technology identified in Step 2, a hierarchy is established that places at the top the control technology that achieves the lowest emission level. The following chart displays the control hierarchy for the remaining control technologies.

TABLE 22 – CONTROL TECHNOLOGY RANKING

Control Technology	Expected Emission Rate		Performance Level % NOx Removed
	pounds/ton clinker	tons/year	
MSC	2.8	998	30%
SNCR[2]	3.1	1104	28%

[1] Alternative Control Techniques Document – NOx Emissions from Cement Manufacturing
[2] Great Star Cement Company, BACT/LAER Clearinghouse, 11/98.

STEP 4: EVALUATE MOST EFFECTIVE CONTROLS

The available and technically feasible control technologies have been identified above and the environmental, economic, and energy impacts must be considered.

Environmental Impacts

This environmental impacts portion of the BACT analysis concentrates on impacts other than impacts on air quality standards due to emissions of NOx, such as solid or hazardous waste generation, discharges of polluted water from a control device, visibility impacts, or emissions of unregulated pollutants. These types of environmental concerns become important when sensitive area-specific conditions exist or when the incremental emissions reduction potential of the top control (MSC) is only marginally greater than the next most effective option (SNCR).

This analysis starts with the identification of the solid, liquid and gaseous discharges from the control device (SNCR), as no environmental impacts within the context of this BACT analysis are associated with the use of MSC.

Any SNCR system will result in some emissions of ammonia, referred to as "ammonia slip". Ammonia is a regulated toxic substance under 40 CFR 68. These ammonia emissions can lead to detached (visible) plumes of $(NH_4)_2SO4$, [1] which is the compound most responsible for regional haze in the southeastern U.S.

Likewise, SNCR control of NOx actually results in creation of N_2O, a greenhouse gas and an "oxide of nitrogen". Higher CO emissions have also been associated with SNCR control.

Significant concerns also exist regarding the handling of ammonia/urea in a karst environment with exposure potential of the Floridan Aquifer System.

Economic Impacts

Total Annualized Cost

MSC = $194,355

annual cost of capital for $1,600,000 in equipment

SNCR = $624,410

annual cost of capital for $959,100 in equipment

$507,675 in annual operating costs

Average Cost Effectiveness:

Average cost effectiveness is a way to present the costs of control. Average cost effectiveness is calculated as shown by the following formula:

Average Cost Effectiveness ($/ton removed) =

$$\frac{\text{Control option annualized cost}}{\text{Baseline emissions rate} - \text{Control option emissions rate}}$$

$$\text{MSC} = \frac{\$194{,}355}{1800\ \text{TPY} - 998\ \text{TPY}} = \$242/\text{ton of NOx removed}$$

$$\text{SNCR} = \frac{\$624{,}410}{1800\ \text{TPY} - 1104\ \text{TPY}} = \$897/\text{ton of NOx removed}$$

Incremental Cost Effectiveness:

[1] Alternative Control Techniques -- NOx

In addition to the average cost effectiveness of a control option, incremental cost effectiveness between control options are also calculated. The incremental cost effectiveness is examined in combination with the average cost effectiveness in order to justify elimination of a control option (SNCR).

Incremental Cost Effectiveness ($/incremental ton removed) =

$$\frac{\text{Control option annualized cost (MSC)} - \text{Next control option annualized cost (SNCR)}}{\text{Next control option emissions rate (SNCR)} - \text{Control option emissions rate (MSC)}}$$

$$= \frac{\$194{,}355 - \$624{,}410}{1104 \text{ TPY} - 998 \text{ TPY}} = \$ -4057 \text{ per incremental ton of NOx removed}$$

It is apparent from the negative incremental cost effectiveness value that SNCR is not incrementally cost effective when compared to MSC. This is because MSC is, first, a more effective control option (and hence BACT) and second, MSC has significantly lower annual costs than SNCR.

An interesting example is provided to show that even if SNCR is as effective as MSC (same emission rate), recognizing that there is no vendor confirmation of this hypothetical supposition, the incremental cost effectiveness of SNCR versus MSC would be over $400,000 per incremental ton of NOx removed!

$$= \frac{\$194{,}355 - \$624{,}410}{997 \text{ TPY} - 998 \text{ TPY}} = \$\ 430{,}055 \text{ per incremental ton of NOx removed}$$

Energy Impacts

This analysis examined the energy requirements of the control technologies and determined that the use of SNCR results in energy penalties while MSC results in energy benefits.

SNCR has direct energy cost for pumps and electrical equipment. These costs are estimated to be $19,800 per year. Also, due to the requirements of the chemical reduction process, SNCR becomes more effective as more fuel is shifted away from the precalciner burner <u>and back to the main burner</u>. Whereas the modern precalciner plant (with or without MSC) will typically combust 60% of fuel in the precalciner and the remaining 40% of fuel in the main burner; SNCR technology becomes effective when less than 40% of the fuel is combusted in the precalciner. The magnitude of this energy penalty is apparent when comparing the energy efficiency of preheater kilns (no precalciner burner) to that of precalciner kilns. The reported heat input requirement for precalciner kilns is 3.3 MMBtu/ton of clinker and for preheater kilns it is 3.8 MMBtu/ton of clinker.

With all other factors held constant, the precalciner kiln is approximately 15% more fuel efficient than the preheater kiln. As fuel is shifted to the main burner to accommodate SNCR, overall fuel efficiency of a precalciner plant drops. This long-dry and other types of cement kilns.

MSC results in energy benefits in a precalciner plant. First, MSC has "no moving parts" and there is no annual electrical cost associated with its use. Second, as MSC requires the operator to control oxygen levels throughout the process <u>to a higher degree</u> than any other configuration, overall energy efficiency is increased. This is because less excess air is heated, and a lower specific exhaust gas volume results. This translates into energy benefits over a precalciner kiln without MSC.

STEP 5: SELECT BACT

The most effective control alternative from Step 4 is selected as BACT (MSC). This top-down BACT analysis has provided information on the various control options. This analysis has adequately demonstrated that energy, environmental, and economic impacts justify the rejection of SNCR.

TABLE 23 – TOP-DOWN BACT ANALYSIS

CONTROL OPTION	EMISSIONS (TPY)	REDUCTION (TPY)	ANNUAL COST ($/YR)	AVERAGE COST EFFECTIVENESS ($/TON)	INCREMENTAL COST EFFECTIVENESS ($/TON)	TOXICS IMPACT (YES/NO)	ADVERSE ENVIRONMENTAL IMPACTS (YES/NO)	ENERGY IMPACTS (BENEFIT or PENALTY)
MSC	998	802	$194,355	$242	$0	NO	NO	Benefit
SNCR	1104	696	$624,410	$897	$430,055[1]	YES	YES	Penalty
Baseline	1800							

See discussion. As MSC is a more effective control (lower emission rate), the incremental cost effectiveness of SNCR is only meaningful if it is assumed to be as effective as MSC.

TABLE 24 –RECENT NOx BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
Illinois Cement Co.	6/98	Kiln	4.5 lb/ton clinker	Precalciner Conversion
LaFarge Corporation	8/97	Kiln/raw mill	3.68 lb/ton clinker	Good combustion
Florida Rock Industries	12/96	Kiln	2.8 lb/ton clinker	Combustion practice
Fla. Crushed Stone	11/95	Kiln	2.8 lb/ton clinker	Combustion practice
Great Star Cement	10/95	Kiln	3.1 lb/ton clinker	SNCR
National Cement Co.	9/95	Kiln	3.4 lb/ton clinker	Precalciner Conversion
Mountain Cement Co.	3/95	Kiln	7.2 lb/ton clinker	Combustion design

4.4 Control Technology Analysis: Carbon Monoxide (CO)

Carbon monoxide is formed as an intermediate product of the chemical reaction between carbonaceous fuels and oxygen. When an insufficient quantity of oxygen is provided, CO occurs as a product of the combustion process. CO may originate in high-temperature regions of the combustion zone, where chemical equilibrium dictates that dissociation of CO_2 into CO should occur. Therefore, the effects of fuel-air ratio, degree of mixing, and temperature may lead to significant CO formation in the hot combustion zone.

The calcining of limestone in the cement manufacturing process liberates large amounts of CO_2, which is available for dissociation into CO. Carbon monoxide, unlike other major gaseous pollutants, does not lend itself to exhaust gas removal techniques. The most productive approach is the control of CO formation. This presents a difficult situation, because the control techniques for reducing NOX and CO are in conflict.

No add-on controls for CO have been demonstrated for cement plants. Process control, process design, and combustion unit design have been determined as BACT for cement plants. Combustion control is proposed as BACT for this plant.

TABLE 25 –RECENT CO BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
LaFarge Corporation	8/97	Kiln/raw mill	1.64 lb/ton clinker	Good combustion
Ash Grove	3/97	Kiln	4.34 lb/ton clinker	Good combustion
Puerto Rican Cement Co.	2/97	Kiln	1.74 lb/ton clinker	Combustion controls
Florida Rock Industries	12/96	Kiln	3.6 lb/ton clinker	Good combustion
Fla. Crushed Stone	11/95	Kiln	2.0 lb/ton clinker	Good combustion
Great Star Cement	10/95	Kiln	5.67 lb/ton clinker	Good combustion

4.5 Control Technology Analysis: Volatile Organic Compounds (VOC)

Add-on control devices can control VOC by the mechanisms of adsorption, absorption, or incineration (afterburning). Incineration processes include flame incineration, thermal incineration, and catalytic incineration.

No add-on controls have been demonstrated for VOC emissions from cement plants. Combustion control, which can limit the products of incomplete combustion (PIC's), has been determined as BACT for VOC control. Process control, process design, and combustion unit design have been determined as BACT for cement plants. Combustion control is proposed as BACT for this plant.

The preamble of the recently proposed NESHAP for cement manufacturing (63FR14182, March 24, 1998) states:

"Methods used in the cement manufacturing industry for the control of organic HAP emissions would be the same methods used to control [VOC] emissions. These emission control methods include using feed materials with relatively low levels of organic matter and achieving good combustion."

TABLE 26 –RECENT VOC BACT DETERMINATIONS

COMPANY	DATE	OPERATION	EMISSION LIMIT	CONTROL
Puerto Rican Cement Co.	2/97	Kiln	0.12 lb/ton clinker	Combustion controls
Florida Rock Industries	12/96	Kiln	0.12 lb/ton clinker	Process
Mountain Cement Co.	3/95	Kiln	0.25 lb/ton clinker	Proper combustion

4.6 Proposed BACT

Based on a review of RECENT BACT determinations and the proposed Maximum Achievable Control Technology (MACT) for the Portland cement manufacturing industry, proposed BACT controls and limits are shown in Table 22. The pollutants PM, PM10, SO2, NOX, CO, and VOC are subject to BACT.

TABLE 27 - PROPOSED BACT LIMITS

POLLUTANT	OPERATION	EMISSION LIMIT	V.E.	CONTROL
Particulate Matter (PM)	Kiln/raw mill	0.13 lb/ton dry preheater feed	10%	ESP
	Cooler	0.07 lb/ton dry preheater feed	10%	ESP
	Material	0.01 gr/dscf	5%	Baghouses
Particulate Matter (PM10)	Kiln/raw mill	0.11 lb/ton dry preheater feed	10%	ESP
	Cooler	0.06 lb/ton dry preheater feed	10%	ESP
	Material processing	0.0085 gr/dscf	5%	Baghouses
Sulfur Dioxide (SO2)	Kiln	0.17 lb/ton clinker		Process
Nitrogen Oxides (NOX)	Kiln	2.8 lb/ton clinker		Indirect firing MSC
Carbon Monoxide (CO)	Kiln	3.6 lb/ton clinker		Good combustion
Organic Compounds (VOC)	Kiln	0.12 lb/ton clinker		Good combustion

SECTION 5: CONCLUSION

The proposed allowable emission rates of particulate matter (PM), particulate matter (PM10), sulfur dioxide (SO2), nitrogen oxides (NOX), carbon monoxide (CO), and volatile organic compounds (VOC) from the Florida Rock Industries cement plant as described in this report will not cause or contribute to a violation of any air quality standard, PSD increment, or any other provision of Chapter 62-212, FAC.

ATTACHMENT 1

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

PRECAUTIONS TO LIMIT EMISSIONS OF UNCONFINED PARTICULATE MATTER (UPM)

The quarrying activities and material storage piles will involve moist or wet raw materials with negligible UPM emissions. A water truck will sprinkle haul roads as necessary. All CKD handling equipment is enclosed and vented to baghouses, resulting in negligible UPM emissions. There are no dust disposal piles planned for this facility. The manufacturing area will be paved, and all process equipment will process wet materials (moisture > 1.5%) or be vented to a particulate control device (baghouse or ESP).

The provisions of Rule 62-296.320(4)c. shall apply to all sources of unconfined particulate matter emissions, including but not limited to vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or related activities such as loading, unloading, storing and handling.

The applicant will follow the following protocol to limit UPM emissions:

The material handling activities at the plant covered by this protocol include loading and unloading, storage and conveying of:

- Limestone and overburden
- Iron oxide source (coal ash, iron ore, or other)
- Gypsum
- Coal

The following reasonable precautions will be implemented at the facility:

- Most materials at the plant will be stored under roof on compacted clay or concrete.
- The plant area and access roads will be paved to limit the generation of UPM from truck and equipment traffic.
- All materials are to be received and stored with excess surface moisture, or stored in closed bins.
- Water supply lines, hoses and sprinklers will be located near material stockpiles.

ATTACHMENT 2

AMBIENT IMPACT ANALYSIS

```
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THE SUMMARY OF HIGHEST  8-HR RESULTS ***
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THE SUMMARY OF HIGHEST 8-HR RESULTS ***
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THE SUMMARY OF HIGHEST 3-HR RESULTS ***
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THE SUMMARY OF HIGHEST 24-HR RESULTS ***
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THE SUMMARY OF HIGHEST  3-HR RESULTS ***
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D:\STEVE\FLAROCK\BROOKSVILLE\SO2ASI90.ISC                              ***       17:39:53

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.10587 AT (  362082.00,  3168932.00,      0.00,      0.00)
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THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       4.31756  ON 90080803: AT (  360601.00,  3169295.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       1.14325c ON 90080124: AT (  362066.81,  3168758.25,


ISCST3 - VERSION 99155 ***    ***  SO2 ASI 1991
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2ASI91.ISC                          ***        17:46:17

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.10208 AT (  360315.97,  3169574.75,       0.00,      0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       3.68754  ON 91061306: AT (  360600.91,  3169346.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       1.02889  ON 91020824: AT (  361724.78,  3168166.00,


ISCST3 - VERSION 99155 ***    ***  SO2 Chassahowitzka 1987
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2CL187.ISC                          ***        11:04:30

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.01063 AT (  340256.41,  3166632.00,       0.00,      0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.41744  ON 87112224: AT (  340256.41,  3166632.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.09862  ON 87122424: AT (  340252.19,  3167450.00,
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ISCST3 - VERSION 99155 ***    ***  SO2 Chassahowitzka 1988
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2CL188.ISC                          ***        11:09:48

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS      0.01018 AT (  343481.41,  3178351.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.47020  ON 88031203: AT (  342847.31,  3177936.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.10468  ON 88010124: AT (  342847.31,  3177936.00,


ISCST3 - VERSION 99155 ***    ***  SO2 Chassahowitzka 1989
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2CL189.ISC                          ***        11:19:02

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS      0.00686 AT (  341087.31,  3183935.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.55848  ON 89072106: AT (  343476.09,  3179962.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.10653  ON 89072124: AT (  340915.19,  3183759.00,


ISCST3 - VERSION 99155 ***    ***  SO2 Chassahowitzka 1990
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2CL190.ISC                          ***        11:24:15
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THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.01389 AT (  340263.31,  3165312.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.62810  ON 90010403: AT (  342676.81,  3177936.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.12495c ON 90091424: AT (  343080.31,  3175506.00,


ISCST3 - VERSION 99155 ***    ***  SO2 Chassahowitzka 1991
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\SO2CL191.ISC                              ***        11:28:45

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.01612 AT (  343481.41,  3178351.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST  3-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.74961  ON 91080121: AT (  343481.41,  3178351.00,

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.14822c ON 91042524: AT (  342269.91,  3179959.00,


ISCST3 - VERSION 99155 ***    ***  NOx ASI 1987
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXASI87.ISC                              ***        18:07:28

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       1.84277 AT (  362082.00,  3168932.00,       0.00,       0.00)
AREA OF SIGNIFICANCE <3 KM
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ISCST3 - VERSION 99155 ***     ***  NOx ASI 1988
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXASI88.ISC                               ***        18:15:35

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        1.84866 AT (  360439.22,  3169698.00,      0.00,      0.00)
AREA OF SIGNIFICANCE <5 KM


ISCST3 - VERSION 99155 ***     ***  NOx ASI 1989
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXASI89.ISC                               ***        18:24:03

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        1.91452 AT (  360582.00,  3169798.00,      0.00,      0.00)
AREA OF SIGNIFICANCE <5 KM


ISCST3 - VERSION 99155 ***     ***  NOx ASI 1990
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXASI90.ISC                               ***        18:30:22

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        1.74602 AT (  362082.00,  3168932.00,      0.00,      0.00)
AREA OF SIGNIFICANCE <3 KM


ISCST3 - VERSION 99155 ***     ***  NOx ASI 1991
04/25/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXASI91.ISC                               ***        18:36:29

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        1.68357 AT (  360315.97,  3169574.75,      0.00,      0.00)
AREA OF SIGNIFICANCE <4 KM
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ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1987 TO 5 KM WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD87.ISC                                ***          11:21:58

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.88687 AT (  362792.09,  3164233.50,      0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1988 TO 5 KM WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD88.ISC                                ***          11:40:39

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.55598 AT (  358582.00,  3164601.75,      0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1989 TO 5 KM WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD89.ISC                                ***          12:28:19

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.75512 AT (  360387.41,  3164992.75,      0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1990 TO 5 KM WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD90.ISC                                ***          14:14:07

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.86016 AT (  362082.00,  3168932.00,      0.00,       0.00)
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ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1991 TO 5 KM WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD91.ISC                                  ***         14:41:16

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.79661 AT (  362082.00,  3168932.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1987  WITH PSD INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD87R.ISC                                  ***         09:35:19

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.58134 AT (  362792.00,  3163234.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1988  WITH PSD INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD88R.ISC                                  ***         10:00:23

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.62183 AT (  358282.00,  3165102.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1989  WITH PSD INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD89R.ISC                                  ***         10:30:07

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.90073 AT (  360587.00,  3164993.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***     ***  NOx CLASS 2 1990  WITH PSD INVENTORY REFINED FINE-GRID
05/09/00
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D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD90R.ISC                                ***        10:51:23

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.11897 AT (  361382.00,  3168632.00,      0.00,      0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 2 1991  WITH PSD INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\N2PSD91R.ISC                                ***        11:19:57

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.81956 AT (  361982.00,  3168932.00,      0.00,      0.00)
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ISCST3 - VERSION 99155 ***     ***  NOx AAQS 1987 TO 5 KM WITH 20D INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXAQS87.ISC                              ***          11:11:48

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.77715 AT (  362792.09,  3164233.50,      0.00,      0.00)


ISCST3 - VERSION 99155 ***     ***  NOx AAQS 1988 TO 5 KM WITH 20D INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXAQS88.ISC                              ***          11:35:56

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.45656 AT (  358582.00,  3164601.75,      0.00,      0.00)


ISCST3 - VERSION 99155 ***     ***  NOx AAQS 1989 TO 5 KM WITH 20D INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXAQS89.ISC                              ***          11:53:37

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.63203 AT (  360387.41,  3164992.75,      0.00,      0.00)


ISCST3 - VERSION 99155 ***     ***  NOx AAQS 1990 TO 5 KM WITH 20D INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXAQS90.ISC                              ***          12:16:17

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.72368 AT (  362082.00,  3168932.00,      0.00,      0.00)


ISCST3 - VERSION 99155 ***     ***  NOx AAQS 1991 TO 5 KM WITH 20D INVENTORY
05/05/00
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D:\STEVE\FLAROCK\BROOKSVILLE\NOXAQS91.ISC                         ***        13:37:36

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       3.71091 AT (  362082.00,  3168932.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx AAQS 1987 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\NXAQS87R.ISC                         ***        11:48:17

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.47101 AT (  362792.00,  3163234.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx AAQS 1988 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\NXAQS88R.ISC                         ***        12:12:23

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       4.52301 AT (  358282.00,  3165102.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx AAQS 1989 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\NXAQS89R.ISC                         ***        12:41:45

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.77691 AT (  360587.00,  3165093.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx AAQS 1990 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\NXAQS90R.ISC                         ***        14:39:13
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THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***
1ST HIGHEST VALUE IS   3.98681 AT (361382.00, 3168632.00,   0.00,   0.00)

ISCST3 - VERSION 99155 ***   *** NOx AAQS 1991 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\NXAQS91R.ISC   ***   15:01:52

THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***
1ST HIGHEST VALUE IS   3.73417 AT (361982.00, 3168932.00,   0.00,   0.00)

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ISCST3 - VERSION 99155 ***    ***  NOx Chassahowitzka 1987
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXCL187.ISC                              ***        11:42:30

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.17525 AT (  340256.41,  3166632.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx Chassahowitzka 1988
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXCL188.ISC                              ***        11:45:47

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.16783 AT (  343481.41,  3178351.00,      0.00,       0.00)

ISCST3 - VERSION 99155 ***    ***  NOx Chassahowitzka 1989
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXCL189.ISC                              ***        11:51:34

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.11315 AT (  341087.31,  3183935.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx Chassahowitzka 1990
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXCL190.ISC                              ***        11:54:30

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.22907 AT (  340263.31,  3165312.00,      0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx Chassahowitzka 1991
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\NOXCL191.ISC                              ***        11:57:29
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THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.26593 AT (  343481.41,  3178351.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 1 CHASSAHOWITZKA 1987 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N1PSD87.ISC                                   ***         15:14:28

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       2.22800 AT (  340665.41,  3169723.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 1 CHASSAHOWITZKA 1988 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N1PSD88.ISC                                   ***         15:28:04

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       1.84135 AT (  343476.09,  3179962.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 1 CHASSAHOWITZKA 1989 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N1PSD89.ISC                                   ***         15:55:36

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       1.75486 AT (  341003.41,  3183830.00,       0.00,       0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 1 CHASSAHOWITZKA 1990 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N1PSD90.ISC                                   ***         16:05:28

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
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1ST HIGHEST VALUE IS       2.27638 AT (  340263.31,  3165312.00,      0.00,      0.00)


ISCST3 - VERSION 99155 ***    ***  NOx CLASS 1 CHASSAHOWITZKA 1991 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\N1PSD91.ISC                              ***        16:16:11

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       2.26532 AT (  341875.09,  3173363.00,      0.00,      0.00)
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ISCST3 - VERSION 99155 ***     ***  PM10 ASI 1987 RINGS TO 10 KM
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMASI87.ISC                               ***          09:10:09

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        6.25063 AT (  360602.19,  3168895.00,      0.00,       0.00)
AREA OF SIGNIFICANCE <2 KM

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      15.64244c ON 87041324: AT (  360602.19,  3168895.00,
AREA OF SIGNIFICANCE <2 KM


ISCST3 - VERSION 99155 ***     ***  PM10 ASI 1988 RINGS TO 10 KM
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMASI88.ISC                               ***          10:41:05

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        5.11426 AT (  360602.31,  3168845.00,      0.00,       0.00)
AREA OF SIGNIFICANCE <2 KM

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      13.79363c ON 88030724: AT (  360602.19,  3168895.00,
AREA OF SIGNIFICANCE <2 KM


ISCST3 - VERSION 99155 ***     ***  PM10 ASI 1989 RINGS TO 10 KM
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMASI89.ISC                               ***          12:08:26

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS        4.72829 AT (  360602.19,  3168895.00,      0.00,       0.00)
AREA OF SIGNIFICANCE <2 KM
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THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH 2ND HIGH VALUE IS 12.74153c ON 89102324: AT (360730.81, 3168377.00,
AREA OF SIGNIFICANCE <2 KM

ISCST3 - VERSION 99155 *** *** PM10 ASI 1990 RINGS TO 10 KM
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMASI90.ISC *** 14:01:26

THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***
1ST HIGHEST VALUE IS 6.75172 AT (360602.31, 3168845.00, 0.00, 0.00)
AREA OF SIGNIFICANCE <2 KM

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH 2ND HIGH VALUE IS 17.18003c ON 90071924: AT (360602.19, 3168895.00,
AREA OF SIGNIFICANCE <2 KM

ISCST3 - VERSION 99155 *** *** PM10 ASI 1991 RINGS TO 10 KM
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMASI91.ISC *** 15:27:14

THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***
1ST HIGHEST VALUE IS 6.18022 AT (360602.31, 3168845.00, 0.00, 0.00)
AREA OF SIGNIFICANCE <2 KM

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH 2ND HIGH VALUE IS 16.37576 ON 91111524: AT (360602.50, 3168795.00, AREA OF SIGNIFICANCE <2 KM

ISCST3 - VERSION 99155 *** *** PM10 CHASSAHOWITZKA 1987
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMCL187.ISC *** 17:12:29

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THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.05671 AT (  342667.59,  3175116.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.53297c ON 87012424: AT (  341872.31,  3175115.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1988
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMCL188.ISC                         ***       17:45:40

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.04092 AT (  343481.41,  3178351.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.47568  ON 88010124: AT (  343080.19,  3175579.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1989
04/26/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMCL189.ISC                         ***       18:18:26

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.02942 AT (  343476.09,  3179962.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.66189  ON 89072124: AT (  339866.81,  3183127.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1990
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMCL190.ISC                         ***       09:11:02
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THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.06593 AT (  340263.31,  3165312.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.63611  ON 90081024: AT (  343080.19,  3175579.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1991
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMCL191.ISC                              ***        09:59:28

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       0.06297 AT (  343481.41,  3178351.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       0.61018c ON 91062024: AT (  340587.91,  3183563.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1987 WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P1PSD87.ISC                              ***        14:05:22

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       4.31599  ON 87122424: AT (  340256.50,  3168098.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CHASSAHOWITZKA 1988 WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P1PSD88.ISC                              ***        15:16:44

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       5.09297  ON 88032624: AT (  343480.09,  3178771.00,
```

```
ISCST3 - VERSION 99155 ***     ***  PM10 CHASSAHOWITZKA 1989 WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P1PSD89.ISC                             ***        16:53:22

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       6.48980c ON 89111024: AT (  332340.91,  3183935.00,


ISCST3 - VERSION 99155 ***     ***  PM10 CHASSAHOWITZKA 1990 WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P1PSD90.ISC                             ***        16:49:04

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       4.79951c ON 90031224: AT (  337185.19,  3165317.00,


ISCST3 - VERSION 99155 ***     ***  PM10 CHASSAHOWITZKA 1991 WITH PSD INVENTORY
05/08/00
D:\STEVE\FLAROCK\BROOKSVILLE\P1PSD91.ISC                             ***        09:32:39

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS       5.32617  ON 91051124: AT (  340256.50,  3168098.00,
```

```
ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1987 RINGS TO 2 KM WITH PSD INVENTORY
05/03/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD87.ISC                               ***        17:08:27

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.15091 AT (  360602.19,  3168895.00,      0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      16.85269  ON 87120924: AT (  360602.19,  3168895.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1988 RINGS TO 2 KM WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD88.ISC                               ***        09:51:42

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.86334 AT (  360602.31,  3168845.00,      0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      13.93217c ON 88020424: AT (  360602.19,  3168895.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1989 RINGS TO 2 KM WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD89.ISC                               ***        10:48:08

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.59978 AT (  360602.19,  3168895.00,      0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      12.76015c ON 89091624: AT (  360600.09,  3169596.00,
```

```
ISCST3 - VERSION 99155 ***     ***  PM10 CLASS 2 PSD 1990 RINGS TO 2 KM WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD90.ISC                                  ***       11:44:05

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.67325 AT (  360602.31,  3168845.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      17.18627c ON 90071924: AT (  360602.19,  3168895.00,


ISCST3 - VERSION 99155 ***     ***  PM10 CLASS 2 PSD 1991 RINGS TO 2 KM WITH PSD INVENTORY
05/05/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD91.ISC                                  ***       12:13:57

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.01550 AT (  360602.31,  3168845.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      16.37780  ON 91111524: AT (  360602.50,  3168795.00,


ISCST3 - VERSION 99155 ***     ***  PM10 CLASS 2 PSD 1987 WITH PSD INVENTORY FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD87R.ISC                                 ***       11:31:51

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       6.93954 AT (  360602.00,  3168832.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      16.31404  ON 87052424: AT (  360602.00,  3168932.00,
```

```
ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1988 WITH PSD INVENTORY FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD88R.ISC                               ***       12:21:54

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.85671 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      12.96291  ON 88050824: AT (  360602.00,  3168932.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1989 WITH PSD INVENTORY FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD89R.ISC                               ***       14:49:11

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       5.52882 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      12.70898c ON 89091624: AT (  360602.00,  3169632.00,


ISCST3 - VERSION 99155 ***    ***  PM10 CLASS 2 PSD 1990 WITH PSD INVENTORY FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD90R.ISC                               ***       15:38:43

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.63880 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      16.37824c ON 90121424: AT (  360602.00,  3168832.00,
```

```
ISCST3 - VERSION 99155 ***     ***  PM10 CLASS 2 PSD 1991 WITH PSD INVENTORY FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\P2PSD91R.ISC                                ***        16:44:47

THE SUMMARY OF MAXIMUM ANNUAL (    1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.02204 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      15.56112  ON 91102624: AT (  360602.00,  3168832.00,
```

```
ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1987 RINGS TO 2 KM WITH 20D INVENTORY
04/27/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS87.ISC                              ***        17:07:43

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.29188 AT (  360602.19,  3168895.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      17.73314  ON 87102424: AT (  360602.31,  3168845.00,


ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1988 RINGS TO 2 KM WITH 20D INVENTORY
04/28/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS88.ISC                              ***        09:30:59

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.10352 AT (  360602.31,  3168845.00,       0.00,       0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      18.02414  ON 88012824: AT (  360602.81,  3168695.00,


ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1989 RINGS TO 2 KM WITH 20D INVENTORY
04/28/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS89.ISC                              ***        15:10:08

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       6.58148 AT (  360602.19,  3168895.00,       0.00,       0.00)


THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      18.76490  ON 89060924: AT (  361424.03,  3169871.75,
```

```
ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1990 RINGS TO 2 KM WITH 20D INVENTORY
05/01/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS90.ISC                              ***       15:46:13

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.64397 AT (  360602.19,  3168895.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      18.68226  ON 90102724: AT (  360602.50,  3168795.00,


ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1991 RINGS TO 2 KM WITH 20D INVENTORY
05/01/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS91.ISC                              ***       16:44:06

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.21716 AT (  360602.31,  3168845.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      20.43702  ON 91112724: AT (  360602.50,  3168795.00,


ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1987 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS87R.ISC                             ***       17:59:36

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.10484 AT (  360602.00,  3168932.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      17.29682  ON 87100424: AT (  360602.00,  3168832.00,
```

```
ISCST3 - VERSION 99155 ***     ***  PM10 AAQS 1988 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS88R.ISC                          ***        18:56:08

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       7.10449 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      17.58423  ON 88050124: AT (  360602.00,  3168732.00,


ISCST3 - VERSION 99155 ***     ***  PM10 AAQS 1989 WITH 20D INVENTORY REFINED FINE-GRID
05/09/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS89R.ISC                          ***        20:15:34

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       6.56302 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      17.18010c ON 89110524: AT (  360602.00,  3168832.00,


ISCST3 - VERSION 99155 ***     ***  PM10 AAQS 1990 WITH 20D INVENTORY REFINED FINE-GRID
05/10/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS90R.ISC                          ***        08:37:34

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.58778 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      18.91720c ON 90101924: AT (  360602.00,  3168832.00,
```

```
ISCST3 - VERSION 99155 ***    ***  PM10 AAQS 1991 WITH 20D INVENTORY REFINED FINE-GRID
05/10/00
D:\STEVE\FLAROCK\BROOKSVILLE\PMAQS91R.ISC                          ***        09:53:47

THE SUMMARY OF MAXIMUM ANNUAL (   1 YRS) RESULTS ***
1ST HIGHEST VALUE IS       8.21157 AT (  360602.00,  3168832.00,      0.00,      0.00)

THE SUMMARY OF HIGHEST 24-HR RESULTS ***
HIGH  2ND HIGH VALUE IS      19.00385  ON 91010424: AT (  360602.00,  3168832.00,
```

ATTACHMENT 3

CONSTRUCTION SCHEDULE

CONSTRUCTION SCHEDULE

January 2001:
- Contractor selection
- Plans and specifications

July 2001:
- Site clearing
- Contractor mobilization

January 2002:
- Site work and foundations

July 2002:
- Major equipment delivery and erection

January 2003:
- Component tie-in
- Conveyors

July 2003:
- Office and lab setup

January 2004:
- Fuel and raw material delivery
- Trial run
- Equipment check
- Plant start-up

PROTOCOL FOR THE USE OF THE PLUME VISIBILITY MODEL PLUVUE II FOR COHERENT PLUME ANALYSES AT CHASSAHOWITZKA CLASS I AREA

FLORIDA ROCK INDUSTRIES, INC.
BROOKSVILLE CEMENT PLANT
US 98 at BRITTLE ROAD
HERNANDO COUNTY, FLORIDA

June 2, 2000

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX 377-7158

TABLE OF CONTENTS

DRAWINGS: Geometry of Plume and Observer for Coherent Plume Analysis Using PLUVUE II

- Observer #1
- Observer #2
- Observer #3
- Observer #4
- Observer #5
- Observer #6

INTRODUCTION

Florida Rock Industries, Inc. proposes to construct a Portland cement plant near Brooksville, Hernando County, Florida. The project will be subject to Prevention of Significant Deterioration (PSD) review. The proposed project is less than 50 kilometers (km) from Chassahowitzka Class I area, and all portions of the Class I area are less than 50 km from the proposed source. Coherent plume analyses will be conducted in accordance with the document *Current (May 1999) Class I Area Visibility Analyses Guidance for PSD Permit Applications (Guidance),* from the U.S. Fish and Wildlife Service and the National Park Service.

This document is a written protocol for the PLUVUE II analyses required by the Guidance. The PLUVUE II plume visibility model requires numerous data inputs before use. The data preparation algorithm for the model requests the information by entry codes. Entry codes 1-38 are described in detail below, with proposed values for use in the coherent plume analyses for this project. Numerous references are provided in endnotes. Drawings of the plume-observer geometries are also included.

Review and approval of this protocol is requested.

ENTRY CODE 1: PLANT NAME

Plant Name (up to 24 characters): **FRI BROOKSVILLE**

ENTRY CODE 2: WIND SPEED AND STABILITY

Wind speed: **3.9** MPH

- 1.5433 m/s from worst-case dispersion conditions with a cumulative frequency greater than 1%[1]
- Power law extrapolation[2] for Tampa anemometer at less than 10 meters (6.7 meters) as follows: $U_{10m} = U_{6.7m}\ (10/6.7)^{0.3}$ = 1.7403 m/s x 3600 seconds/hour x 3.281 feet/meters x 1.0 mile/5280 feet = 3.8931 mph

Stability index: **6**

For Pasquill-Gifford stability classes, use:

1 for class A, 2 = B, 3 = C, 4 = D, 5 = E, 6 = F, and 7 = G

- Stability class F (6) from worst-case dispersion conditions with a cumulative frequency greater than 1%[3]

Ambient temperature lapse rate: **13.825** degrees F per 1000 feet.

Suggested values are 5.6 for E stability and 13.825 for F stability.

- Model does not accept input for this parameter, defaults to suggested value.

ENTRY CODE 3: WIND SPEED MEASUREMENT HEIGHT FLAG

SWITCH: **1**

0. If wind speed at effective stack height was entered.

1. If wind speed at 10 m height was entered.

ENTRY CODE 4: INITIAL PLUME DIMENSIONS

Initial plume y-dimension for area source: **0**

Initial plume z-dimension for area source: **0**

Use 0 for point sources.[4]

ENTRY CODE 5: MIXING HEIGHT

Depth of atmosphere that is well mixed: **0** meters.

If set to zero, vertical mixing is not limited.[5]

ENTRY CODE 6: RELATIVE HUMIDITY

Relative humidity:[6] March 21: **68%**

June 21: **77%**

September 21: **75%**

December 21: **79%**

See Entry Code 34 for a discussion of days selected for modeling.

ENTRY CODE 7: DIFFUSION PARAMETER FLAG

Flag indicating diffusion parameters: **0**

0 = Pasquill-Gifford-Turner values;

1 = TVA values;

9 = User input values (at end of input data).

ENTRY CODE 8: CALCULATION FLAGS

Switches to determine if the following calculations are done.

0. = Skip calculation

1. = Do calculation

Horizontal Views: **1**

Non-horizontal Views: **1**

Background Objects: **0**

Plume Centerline: **0**

No terrain features (background objects) are present at Chassahowitzka. Therefore, only sky background views are evaluated. No integral vistas or terrain features were identified at Chassahowitzka, and the worst case angle to the plume centerline is used in all runs. Only horizontal and nonhorizontal views with a clear sky background are evaluated.

The number of downwind distances for calculations: At least two distances must be used, and the current dimensions allow up to 16 distances: **9**

Starting and ending indices for light scattering angles used in the plume based calculation. The angles corresponding to indices 1 through 7 are 0, 22, 45, 90, 135, 158 and 180 degrees. The first angle used has an index one greater than the starting index, so a starting index of 3 and an ending index of 4, will cause calculations only at 90 degrees. As only observer-based calculations will be done, the observer-based values are used.[7]

Starting index: **1**

Ending index: **7**

Index for number of altitudes for visual impact calculations: **2**

Plume centerline only = 1

Centerline and ground level =2

Enter the serial numbers of the downwind distances for which optical size modeling is to be done. Up to three downwind distances can be selected by entering their serial numbers (between 1 and number: If optical size modeling is to be done at less than three distances, enter zeros as needed to complete the three entries.

No optical size modeling will be done: **0 0 0**

ENTRY CODE 9: PRINTOUT FLAGS

SWITCH: **0**

0 = No printout of table of initial plume rise data.

1 = Print table.

Enter the number of points to be generated in the vertical scans by the optical size modeling. The maximum number of points is 256. It is recommended that the vertical resolution be set at 256 unless computer resources are limited.

The current number of points is: **0 0**

Enter the resolution desired for the printing of the spatial images.

1 - Print every data point.

2 - Print every other data point.

3 - Print every third data point, etc.

The current resolution is: **0**

Enter a flag to control the printing and plotting of spatial images of the individual channels.

-1 - Each channel is individually printed and plotted.

0 - Both types of printouts and plots are generated.

1 - All channels are printed together and only delta F plotted.

The current value of the flag is: **0**

Enter the FORTRAN unit number to be used for the HVS output. This should be set to the same unit being used for the main PLUVUE output. At present, the output is directed to unit no: **0**

ENTRY CODE 10: DOWNWIND DISTANCES

Enter the values for the downwind distances for which calculations are to be performed. This specifies the distance downwind from the source along the plume trajectory of each point where visibility impairment calculations will be made. The units for this array are kilometers. For accurate prediction of the oxidation of NO_x to NO_2, it is important to use downwind distances that are close together and near the source. The first downwind distance must be 1 km; 2.5 km, 5 km, and 10 km are recommended for the succeeding three distances.[8]

Distance No. 1: **1 km**

Distance No. 2: **2.5 km**

Distance No. 3: **5 km**

Distance No. 4: **10 km**

Distance No. 5: **15 km**

Distance No. 6: (X_{min})

Observer No. 1: **20.4 km**

Observer No. 2: **19.2 km**

Observer No. 3: **19.2 km**

Observer No. 4: **20.8 km**

Observer No. 5: **20.8 km**

Observer No. 6: **20.8 km**

Distance No. 7: (d)

Observer No. 1: **25.0 km**

Observer No. 2: **20.6 km**

Observer No. 3: **20.6 km**

Observer No. 4: **21.1 km**

Observer No. 5: **25.1 km**

Observer No. 6: **25.1 km**

Distance No. 8: **30 km**

Distance No. 9: (X_{max})

Observer No. 1: **34.2 km**

Observer No. 2: **32.8 km**

Observer No. 3: **32.8 km**

Observer No. 4: **30.9 km**

Observer No. 5: **31.4 km**

Observer No. 6: **31.4 km**

ENTRY CODE 11: EMISSION RATES

Emission rates from Application for Air Permit.

Total SO2 emissions rate from all stacks: **0.2** tons per day.

Total NOx Emission rate from all stacks: **3.2** tons per day.

Total primary particle emission rate from all stacks: **0.3** tons per day.

ENTRY CODE 12: STACK PARAMETERS

Flow rate and temperature from Application for Air Permit.

Actual gas flow rate per stack: **194,000** cu ft/min.

Flue gas exit temperature: **205** degrees F.

Flue gas oxygen concentration[9]: **8** mole percent.

Flue gas exit velocity (must be > 0.0): **14.2** meters/sec.

ENTRY CODE 13: STACK HEIGHT

Stack information from Application for Air Permit.

Number of stacks: **1**

Stack height: **250** feet.

ENTRY CODE 14: AMBIENT AIR TEMPERATURE

Ambient air temperature at stack height (must not equal stack temperature):[10]

March 21: **66** degrees F.

June 21: **82** degrees F.

September 21: **82** degrees F.

December 21: **66** degrees F.

ENTRY CODE 15: AMBIENT POLLUTANT CONCENTRATIONS

Concentrations from Air Monitoring Report 1997 (Florida Department of Environmental Protection).

Ambient NOx concentration[11]: **0.06** ppm.

Ambient NO_2 concentration: **0.06** ppm.

Ambient ozone concentration[12]: **0.08** ppm.

Ambient SO2 concentration[13]: **0.03** ppm.

ENTRY CODE 16: MASS MEAN RADII FOR AEROSOL SIZE DISTRIBUTIONS

Mass mean radii in um for aerosol size distributions.[14]

Background accumulation mode aerosol: **0.15** micrometers

Background coarse mode aerosol: **3.0** micrometers

Plume secondary aerosol: **0.10** micrometers

Plume primary aerosol: **1.0** micrometers

ENTRY CODE 17: STANDARD DEVIATION OF SIZE DISTRIBUTIONS

Geometric standard deviation of the aerosol size distribution. (The standard deviation for a monodisperse aerosol = 1.0).[15]

Background accumulation mode aerosol: **2.0**

Background coarse mode aerosol: **2.2**

Plume secondary aerosol: **2.0**

Plume primary aerosol: **2.0**

ENTRY CODE 18: DENSITY OF AEROSOL MATERIAL

Density in grams per cubic centimeter of the aerosol material.[16]

Background accumulation mode aerosol: **1.5** grams per cubic centimeter

Background coarse mode aerosol: **2.5** grams per cubic centimeter

Plume secondary aerosol: **1.5** grams per cubic centimeter

Plume primary aerosol: **2.5** grams per cubic centimeter

ENTRY CODE 19: CARBONACEOUS AEROSOL INFORMATION

Log-normal size distribution parameters for the carbonaceous aerosol.[17]

Geometric mean radius: **0.05** micrometers

Standard deviation: **2.0**

Particle density of the carbonaceous aerosol: **2.0** grams per cubic centimeter

Fraction (on a scale from zero to one) of the plume primary aerosol that is carbonaceous: **0.0**

Concentration of carbonaceous aerosol in the background atmosphere[18]: **2.6** ug/m^3

ENTRY CODE 20: INDICES OF REFRACTION FOR BACKGROUND AEROSOL

Indices of refraction for the background aerosol in the format m - ik:[19]

Accumulation mode: Real part of index: **1.5**

Imaginary part: **0.0**

Coarse mode: Real part of index: **1.5**

Imaginary part: **0.0**

ENTRY CODE 21: INDICES OF REFRACTION EMITTED AEROSOLS

Indices of refraction for the emitted primary aerosol and the carbonaceous aerosol in the format m - ik:[20]

Emitted primary aerosol: Real part of index: **1.5**

Imaginary part: **0.0**

Carbonaceous aerosol: Real part of index: **2.0**

Imaginary part: **1.0**

ENTRY CODE 22: BACKGROUND COARSE MODE AEROSOL CONCENTRATION

Background coarse mode aerosol concentration[21]: **53** ug/m^3

ENTRY CODE 23: BACKGROUND SULFATE/NITRATE FLAG

Switch: **2**

1 = Input background sulfate and nitrate concentrations.

Any other value = input background visual range.

ENTRY CODE 24: AMBIENT BACKGROUND VISUAL RANGE

Ambient background visual range[22]: **65** km.

ENTRY CODE 25: BACKGROUND SULFATE/NITRATE CONCENTRATION

NOTE: Only used if background visual range is not specified above. Not used as visual range is specified.

Background sulfate mass concentration: **12** ug/m3.

Background nitrate mass concentration[23]: **1.3** ug/m3.

ENTRY CODE 26: DEPOSITION VELOCITIES

Deposition velocities[24]:

Coarse-mode aerosol: **0.1** cm/sec

Accumulation-mode aerosol: **0.1** cm/sec

SO2 aerosol: **1.0** cm/sec

NOx aerosol: **1.0** cm/sec

ENTRY CODE 27: SULFUR DIOXIDE TO SULFATE CONVERSION FLAG

Switch to determine the sulfur dioxide to sulfate conversion rate added to the rate, calculated from hydroxyl radical chemistry. Recommended value[25]: 0

SWITCH: **0**

0 = Added rate the same at all distances from the source.

1 = Added rate changes with distance.

ENTRY CODE 28: RATE OF SULFUR DIOXIDE TO SULFATE CONVERSION

Rate of SO2 to sulfate conversion to be added to the value predicted from the HO chemistry in the model. Recommended value is 0.[26]

Rate added: **0.0%** per hour.

ENTRY CODE 29: RATE OF SULFUR DIOXIDE TO SULFATE CONVERSION

NOTE: Only used if Entry Code 27 is set equal to 1.

SO2 to sulfate conversion rate to be added to the rate calculated from the HO model at downwind distances.

ENTRY CODE 30: CALCULATION FLAG

Switches to control calculations performed. If only observer-based calculations are done, there will be no output of plume-based calculation results for plotting. The switch settings are:

Plume-based calculations only: 1. 1.

Observer-based calculations only: 2. 2.

Both calculations: 1. 2.

Switch: **2 2**

Only observer-based calculations are desired to demonstrate compliance with regulatory guidelines.

ENTRY CODE 31: INDICES FOR PLOTTING PLUME-BASED CALCULATIONS

NOTE: Only used if plume-based calculations have been selected in Entry Code 30. Not used as only observer-based calculations were selected above.

A subset of results must be selected for plotting with visplot. The six indices to be entered next determine the subset of results that will be written to logical file unit eight.

- The index NPP determines the distance from the observer to the plume.

NPP	Distance from observer to plume (Fraction of background visual range)
1	0.02
2	0.05
3	0.10

4	0.20
5	0.50
6	0.80

A recommended value is 3.

- The index NAP determines the horizontal azimuthal angle ALPHA between the plume centerline and the line of sight for a sky background:

NAP	ALPHA (degrees)
1	30
2	45
3	60
4	90

A recommended value is 4.

- The index NTP selects the scattering angle between the direct solar beam and the line of sight from the point of analysis to the observer.

NTP	Scattering angle (degrees)
1	22
2	45
3	90
4	135
5	158
6	180

- The index NZF selects the height above ground for the line of sight through the plume to be plotted. An index of 3 selects plume centerline height and an index of 6 selects a view at ground level.
- The index IPP selects the distance from the observer to the plume for plotting results of the calculations for views with white, gray, and black objects behind the plume.

IPP	Distance from observer to plume (Fraction of background visual range)
1	0.02
2	0.05
3	0.10
4	0.20
5	0.50
6	0.80

- The index IO1P selects the distance from the observer through the plume to the white, gray, and black background objects behind the plume. The value of IO1P is limited by the value of IPP because the object background can be no farther than a distance equivalent to 80 percent of the background visual range from the observer. You may select any value shown in the table.

IO1P	Distance from observer to object (Fraction of background visual range)
1	0.02
2	0.05
3	0.10

4	0.20
5	0.50
6	0.80

ENTRY CODE 32: OBSERVER COORDINATES

Position of the observer:

Observer	UTM coordinates X (km)	Y (km)	Elevation (ft msl)
Observer #1	**341.1**	**3183.9**	**0**
Observer #2	**343.5**	**3179.6**	**0**
Observer #3	**340.7**	**3172.1**	**0**
Observer #4	**340.3**	**3165.3**	**0**
Observer #5	**337.8**	**3178.4**	**0**
Observer #6	**335.9**	**3168.7**	**0**

See attached drawings showing source-plume-observer relationships for each observer. All scenarios have the observer at the worst-case offset angle of 11.25° from the plume. 11.25° offset is recommended for the worst-case wind direction sector[27].

ENTRY CODE 33: STACK COORDINATES

UTM coordinates of the source in km, and elevation of the base of the stack in feet msl.

X	Y	Elevation
361.1	**3168.9**	**0**

ENTRY CODE 34: TIME ZONE

Because of the large number of variables important to a visual impact calculation, several model calculations are needed to assess the magnitude of visual impact. It would be ideal to calculate hourly impacts over the course of a year or more using hourly values of the above variables. However, such an extensive database is rarely available for use. Even if it were available, the computing costs involved would be prohibitive. It is therefore preferable to select a few representative values for each of these variables to represent the range of visual impact over a given period of time, such as a season or year.

The largest impact magnitudes are likely to occur for wind directions that would carry the plume closest to the observer, light wind speeds, and stable conditions. Sun angles are specified by the date and time of the simulation. Since worst-case meteorological conditions generally occur in the morning, it is suggested that simulation date/times of an hour after sunrise on 21 March, 21 June, 21 September, and 21 December be analyzed.[28]

The code numbers for the time zones are:

Time zone	Standard time	Daylight time
Eastern	5.	4.
Central	6.	5.
Mountain	7.	6.
Pacific	8.	7.

A time of 3:45 pm is entered as 1545.

UTM zone: **17**

Month: **3** (March)

6 (June)

9 (September)

12 (December)

Day of month: **21**

Time (24-hour clock)[29]: March 21: **0702**

June 21: **0547**

September 21: **0648**

December 21: **0804**

Time zone code: **5**

(all sunrise plus one hour values were presented in Eastern Standard Time)

Year: **1989** (arbitrary year of 1987-1991 available meteorological data)

ENTRY CODE 35: TERRAIN ELEVATION

Elevation of terrain at each downwind point (feet msl) to be used in the calculation of view elevation angle. If zero is entered for the first distance, the elevation at the base of the stack is used for all downwind distances.

Value for the first distance: **0** ft msl.

ENTRY CODE 36: BACKGROUND OBJECT DISTANCES

NOTE: Only used when Entry Code 8 calculates background objects.

Background object distances from observer through plume to background terrain for line-of-sight azimuths of 15, 30, 45, ... , 360 degrees from true north. The distance for each line-of-sight azimuth actually used is interpolated from these values. If the distance at 15 degrees is set equal to zero, the model will set the object distance equal to the plume-observer distance along the line-of-sight to each downwind point.

Distances to the background objects in km are: **0**

ENTRY CODE 37: WIND DIRECTION

Direction from which the wind is blowing. See attached drawings of geometry of plume and observers.

Wind direction for Observer #1: **116** degrees

Wind direction for Observer #2: **110** degrees

Wind direction for Observer #3: **110** degrees

Wind direction for Observer #4: **91** degrees

Wind direction for Observer #5: **101** degrees

Wind direction for Observer #6: **101** degrees

ENTRY CODE 38: USER INPUT DISPERSION PARAMETERS

Not applicable as the index at entry code 7 indicates that Pasquill-Gifford-Turner dispersion parameters are to be used.

ENDNOTES

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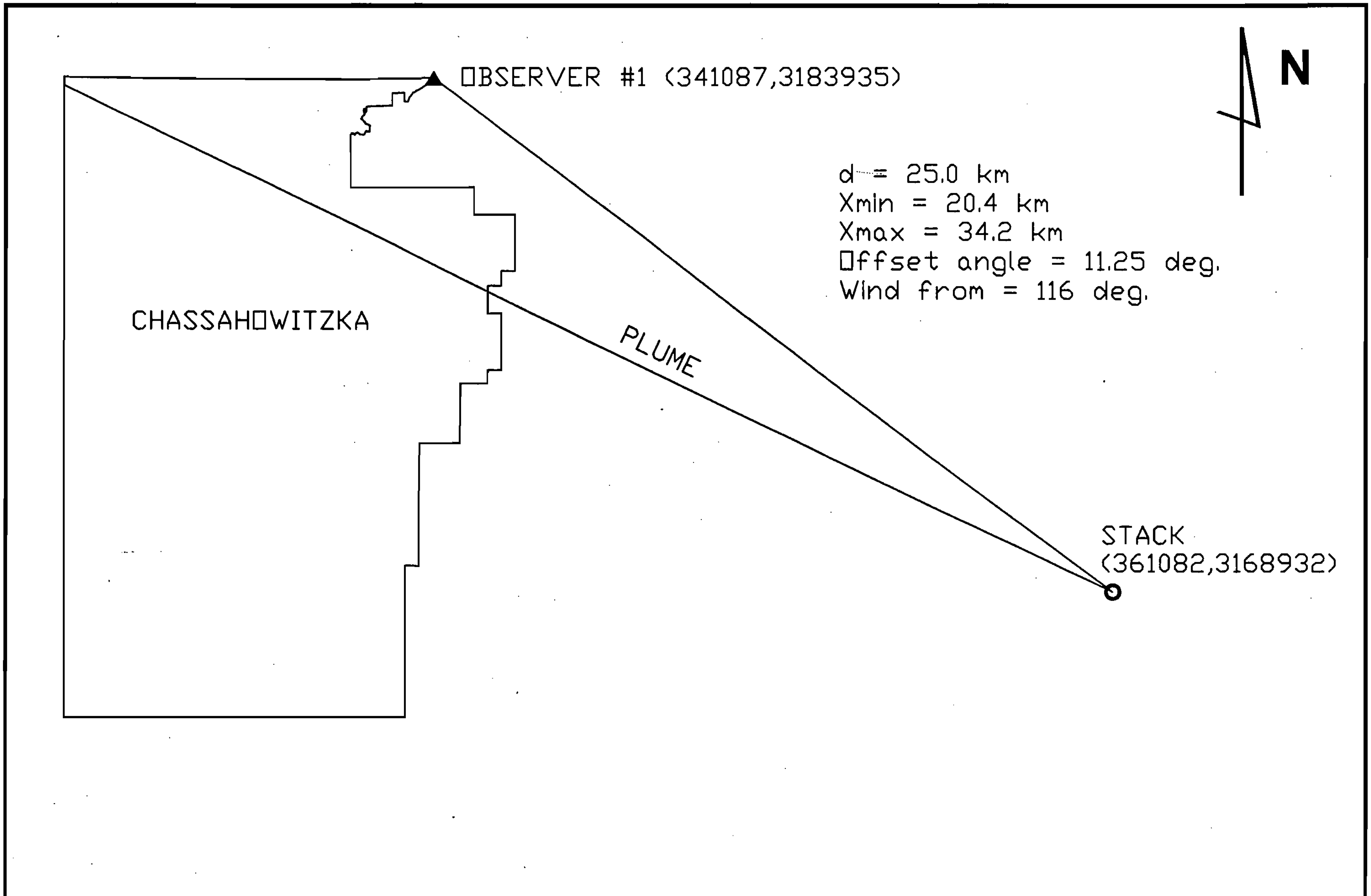
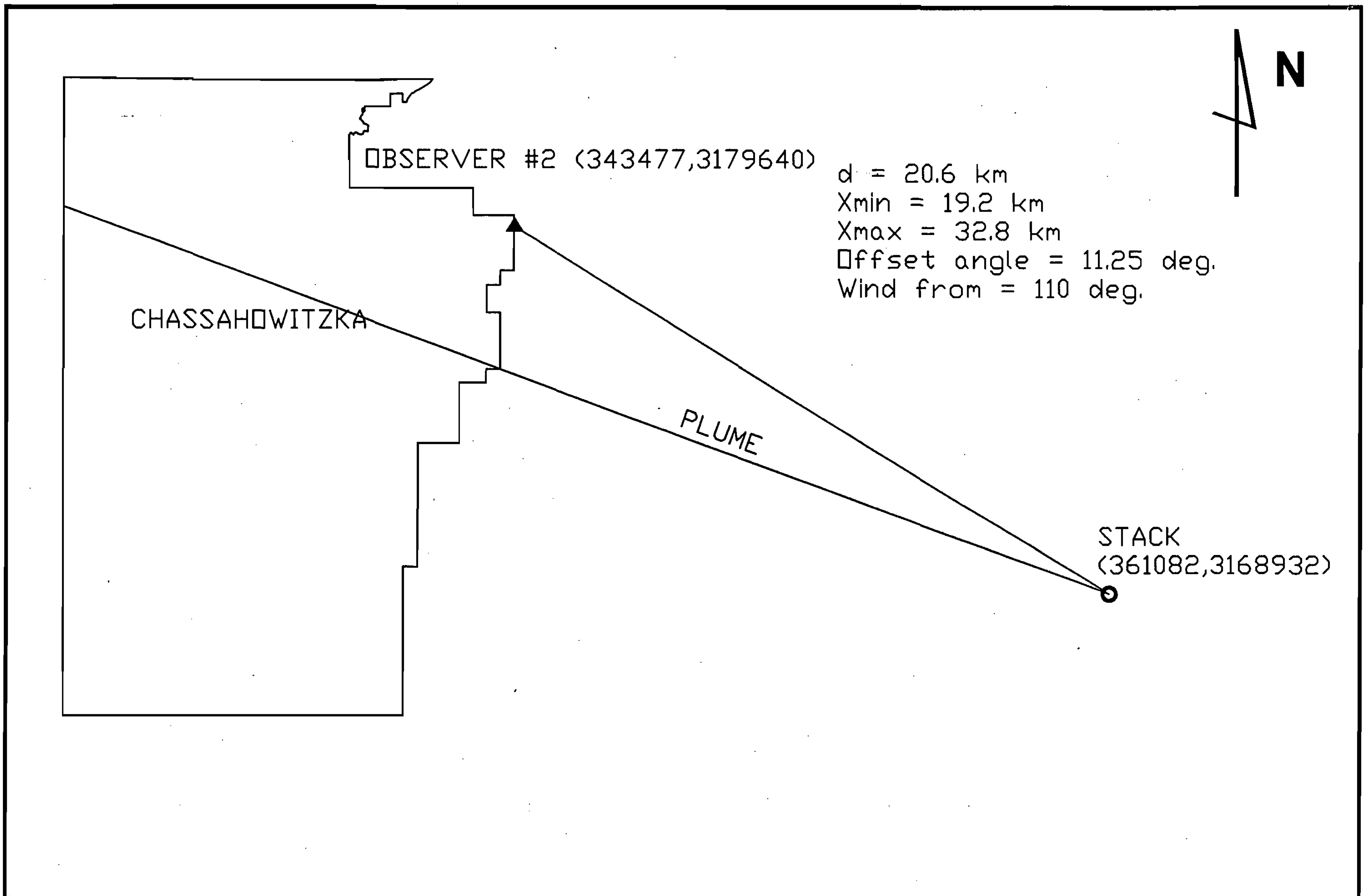
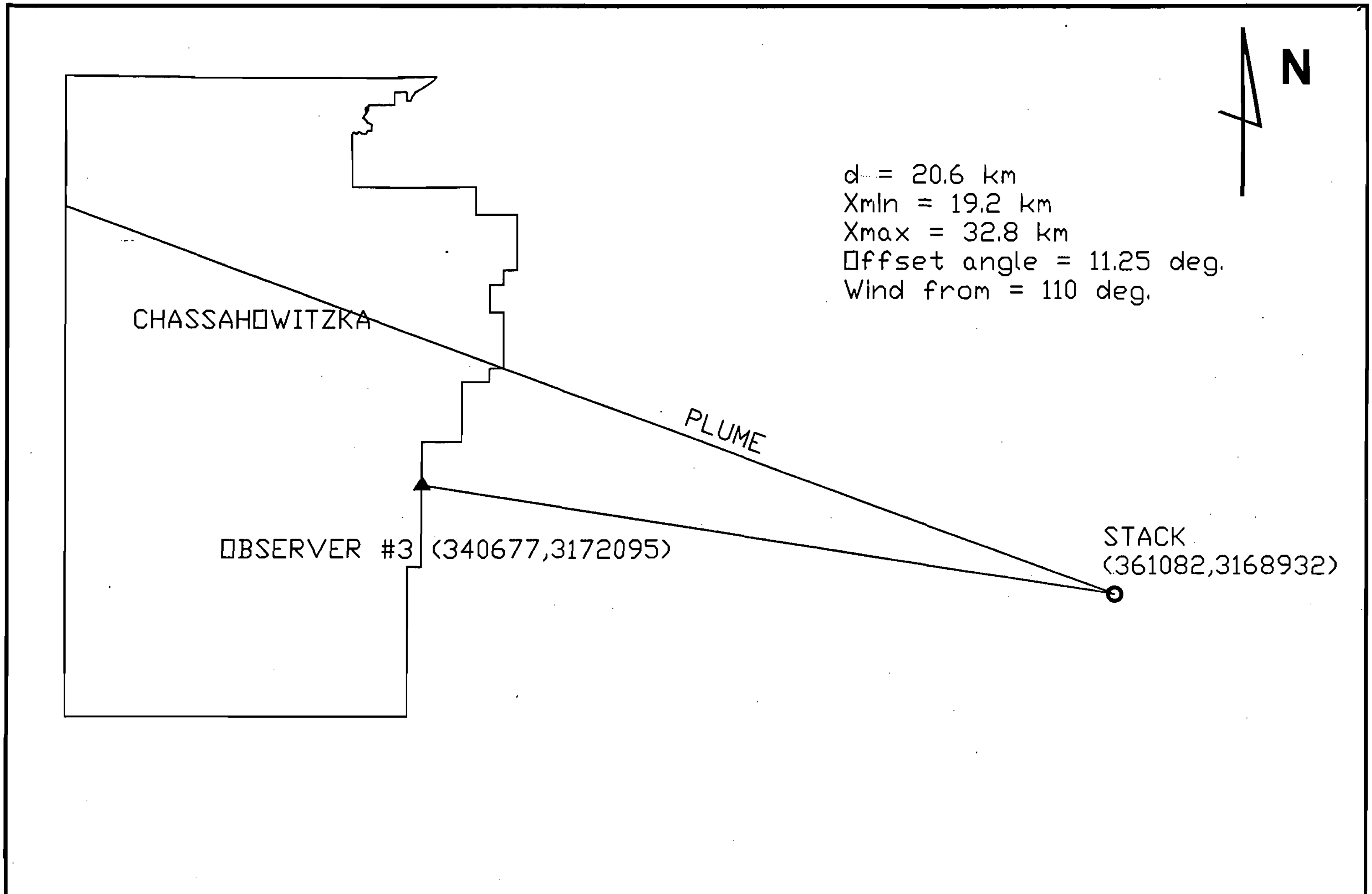
[1] Meteorological data, Tampa International Airport, 1987-1991.
[2] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[3] Meteorological data, Tampa International Airport, 1987-1991.
[4] PLUVUE II Version 96170, 6/20/1996
[5] PLUVUE II Version 96170, 6/20/1996
[6] EarthInfo NCDC Surface Airways East CD-ROM, Average of daily average RH for 1987-1991.
[7] PLUVUE II Version 96170, 6/20/1996.
[8] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[9] Telephone conversation with Mark Terry – Polysius Corporation, May 16, 2000.
[10] Meteorological data, Tampa International Airport, 1987-1991.
[11] Pinellas plus Hillsborough Counties, 1-Hour 2nd high, 1993-1997. Assume NOx = NO_2.
[12] Pasco County, 8-Hour 2nd high, 1993-1997.
[13] Pinellas plus Hillsborough Counties, 24-Hour 2nd high, 1993-1997.
[14] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[15] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[16] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[17] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[18] IMPROVE network aerosol sampler at Chassahowitzka, 1993-1998 and *A Guide to Interpret Data*, University of California – Davis, August 1995.
[19] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[20] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[21] Report in Support of Application for PSD Permit. Hernando County PM monitors 1995-1996. (24-hour)
[22] Telephone conversation with Bud Rolofson (NPS), June 3, 1999.
[23] IMPROVE network aerosol sampler at Chassahowitzka, 1993-1998.
[24] Suggested values from User's Manual for PLUVUE II (Revised), September 1992.
[25] PLUVUE II Version 96170, 6/20/1996.
[26] PLUVUE II Version 96170, 6/20/1996.
[27] Workbook for Plume Visual Impact Screening and Analysis, USEPA, revised October 1992.
[28] Workbook for Plume Visual Impact Screening and Analysis, USEPA, revised October 1992.
[29] Farmer's Almanac for the year 2000, Peter Geiger, Editor, Volume 183.



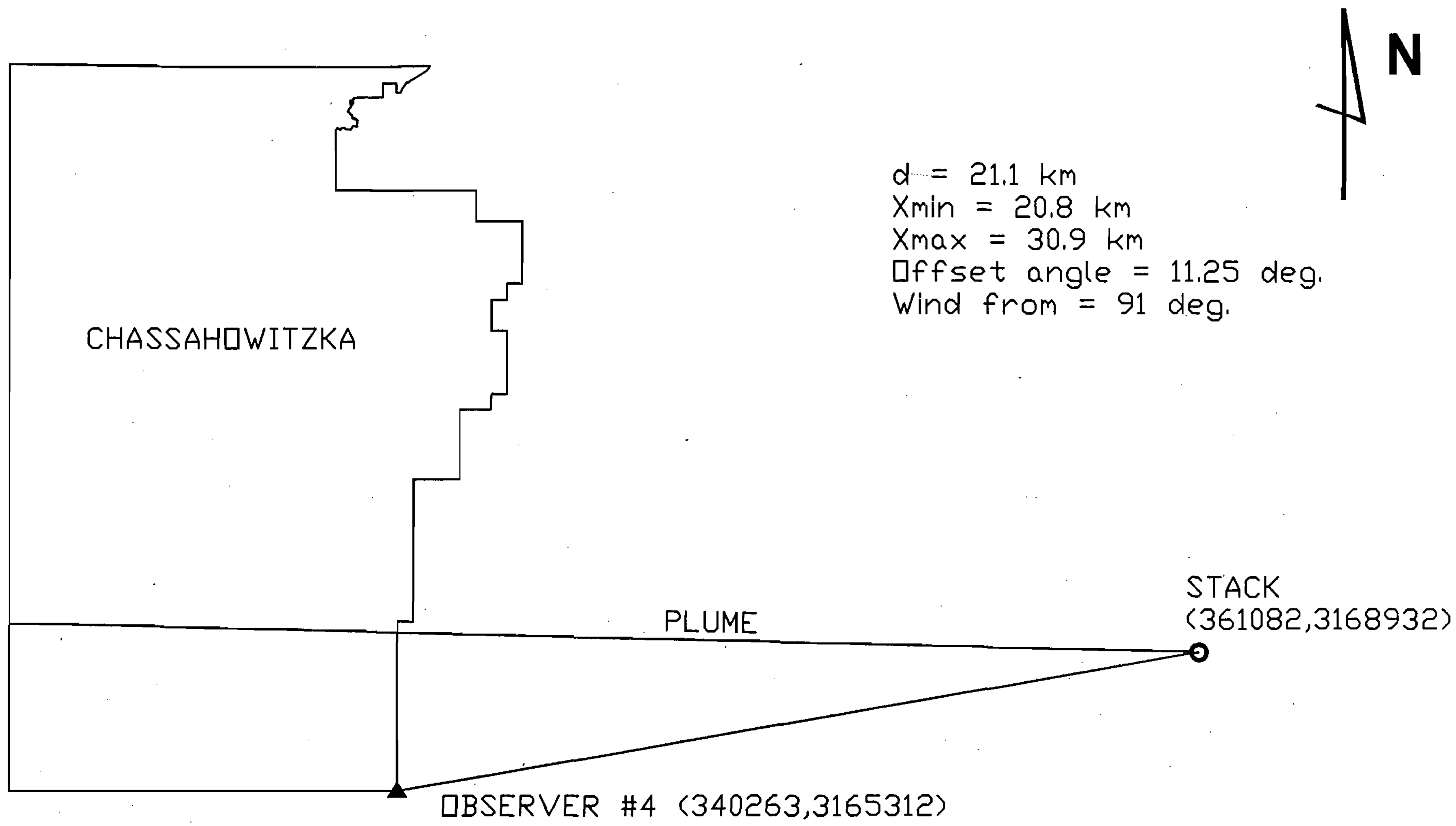
FLORIDA ROCK INDUSTRIES, INC. BROOKSVILLE CEMENT PLANT HERNANDO COUNTY, FLORIDA	GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II	KOOGLER & ASSOCIATES DRAWN BY: SCC FILENAME: VISIBILITY\VSCRN.DWG DATE: MAY 19, 2000 SCALE: 1 INCH = 4000 METERS



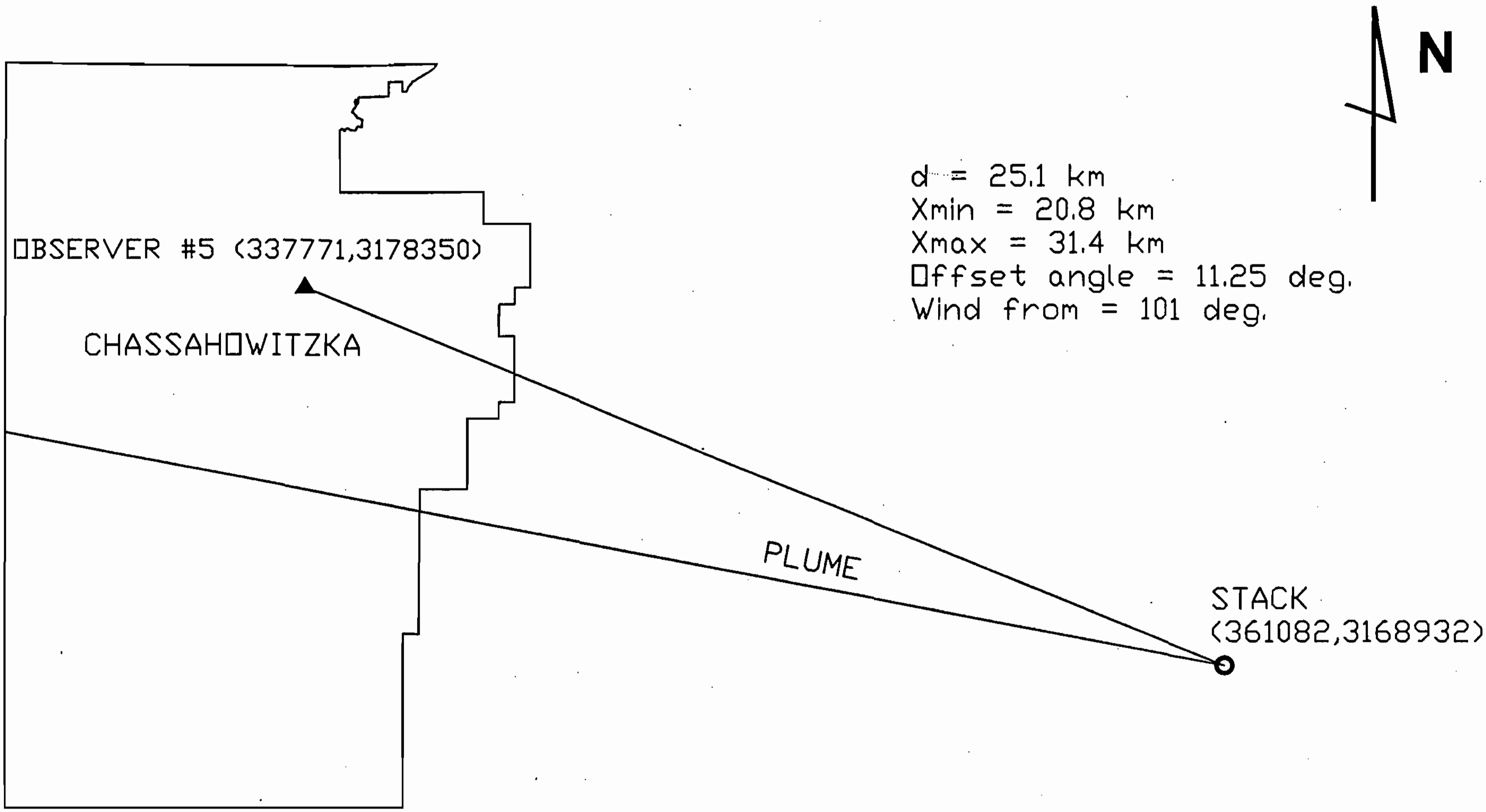
FLORIDA ROCK INDUSTRIES, INC. BROOKSVILLE CEMENT PLANT HERNANDO COUNTY, FLORIDA	GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II	KOOGLER & ASSOCIATES DRAWN BY: SCC FILENAME: VISIBILITY\VSCRN.DWG DATE: MAY 19, 2000 SCALE: 1 INCH = 4000 METERS



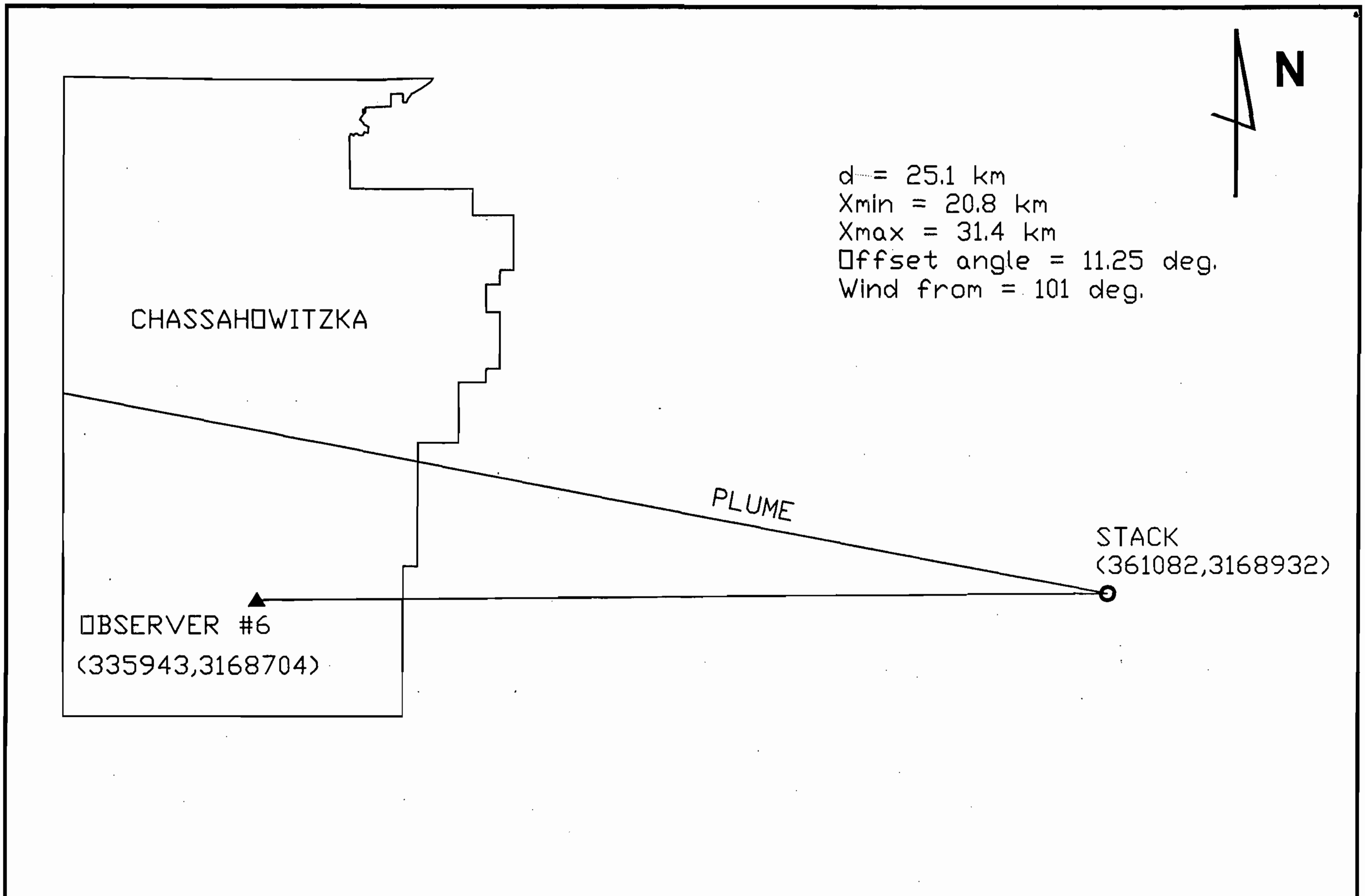
FLORIDA ROCK INDUSTRIES, INC. BROOKSVILLE CEMENT PLANT HERNANDO COUNTY, FLORIDA	GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II	KOOGLER & ASSOCIATES DRAWN BY: SCC FILENAME: VISIBILITY\VSCRN.DWG DATE: MAY 19, 2000 SCALE: 1 INCH = 4000 METERS



FLORIDA ROCK INDUSTRIES, INC. **BROOKSVILLE CEMENT PLANT** **HERNANDO COUNTY, FLORIDA**	**GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II**	**KOOGLER & ASSOCIATES** **DRAWN BY: SCC** **FILENAME: VISIBILITY\VSCRN.DWG** **DATE: MAY 19, 2000** **SCALE: 1 INCH = 4000 METERS**



FLORIDA ROCK INDUSTRIES, INC. BROOKSVILLE CEMENT PLANT HERNANDO COUNTY, FLORIDA	GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II	KOOGLER & ASSOCIATES DRAWN BY: SCC FILENAME: VISIBILITY\VSCRN.DWG DATE: MAY 19, 2000 SCALE: 1 INCH = 4000 METERS



FLORIDA ROCK INDUSTRIES, INC. BROOKSVILLE CEMENT PLANT HERNANDO COUNTY, FLORIDA	GEOMETRY OF PLUME AND OBSERVER FOR COHERENT PLUME ANALYSIS USING PLUVUE II	KOOGLER & ASSOCIATES DRAWN BY: SCC FILENAME: VISIBILITY\VSCRN.DWG DATE: MAY 19, 2000 SCALE: 1 INCH = 4000 METERS