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

263-01-10
November 28, 2001

RECEIVED

NOV 29 2001

BUREAU OF AIR REGULATION

Mallika Muthiah
Chief, Air Facilities Section
Air Quality Management Division
Metropolitan Dade County
Environmental Resources Management
33 S.W. 2nd Avenue, Suite 900
Miami, Florida 33130-1540

Subject: ***Rinker Materials Corporation***
Miami Cement Plant
Title V Permit Revision

Dear Mallika:

Please find enclosed four copies of an application for a Title V Permit revision for the Rinker Materials (Rinker) Miami Cement Plant. This is a companion application to the PSD Construction Permit application submitted to FDEP in Tallahassee on or about November 16, 2001 for an increase in the VOC emission rate from the kiln/raw mill/cooler (Emission Unit 018). Also enclosed, for your information, are copies of the report supporting the PSD Construction Permit application. An updated signature page signed by Mr. Ed Allsopp, Vice President of Cement Operations for Rinker, will be forwarded to you under separate cover.

It is my understanding that this application will be reviewed parallel with the Air Construction Permit application so that a single public notice, covering both permits can be published by Rinker at the appropriate time.

If you have any questions regarding this application please do not hesitate to contact me at 352-377-5822 or at jkoogler@kooglerassociates.com.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK/jm
cc: Al Linero, FDEP Tallahassee
Ed Allsopp, Rinker
Scott Benyon, Rinker
Mike Vardeman, Rinker
Segundo Fernandez, OHFC Tallahassee

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Department of Environmental Protection

NOV 19 2001

Division of Air Resources Management

BUREAU OF AIR REGULATION

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: **Rinker Materials Corporation**	
2. Site Name: **Miami Cement Plant**	
3. Facility Identification Number: **0250014** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **1200 NW 137th Avenue** City: **Miami** County: **Dade** Zip Code: **33182**	
5. Relocatable Facility? [ ] Yes [**X**] No	6. Existing Permitted Facility? [**X**] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **John B. Koogler, Ph.D., P.E.**
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** e-mail: jkoogler@kooglerassociates.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	11-19-01
2. Permit Number:	0250014-008-AC
3. PSD Number (if applicable):	PSD-FL-324
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:
Ed Allsopp – Vice President of Cement Operations

2. Owner/Authorized Representative or Responsible Official Mailing Address:
Organization/Firm: **Rinker Materials Corporation**
Street Address: **1200 NW 137th Avenue**
City: **Miami** State: **Florida** Zip Code: **33182**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
Telephone: **(305) 229-2951** Fax: **(305) 229-8015**

4. Owner/Authorized Representative or Responsible Official Statement:

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

[signature] 11/15/01

Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **John B. Koogler, Ph.D., P.E.**
Registration Number: **12925**

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**
e-mail: **jkoogler@kooglerassociates.com**

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 11/16/01

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
018	In-Line Kiln/Raw Mill/Clinker Cooler	AC1A	$7500

Application Processing Fee

Check one: [X] Attached - Amount: $____7500________________ [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **The purpose of this project is to increase in the short-term and annual VOC emission limits for a recently modernized precalciner Portland cement plant. The short-term VOC emission limit will be increased from 0.1 to 0.12 pounds of VOC per ton of clinker, 30-day rolling average and the annual VOC emission cap will be increased from 60.0 to 72.0 tons of VOC per year.** **The annual VOC increase of 12.0 ton per year will subject the project to a PSD review pursuant to Rule 62-212.400, F.A.C.** **The project will involve no new construction or physical modification to the cement plant nor will it affect the basic raw material or fuels presently permitted for the plant. The increased VOC emission limit will allow more flexibility in the choice of certain raw materials and will set an emission limit that is more representative of a well operated modern cement plant. The only Emission Unit affected is EU-018, the kiln/raw mill/clinker cooler.**
2. Projected or Actual Date of Commencement of Construction: **Upon issuance of permit**
3. Projected Date of Completion of Construction: **Upon issuance of permit**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **558.20** North (km): **2851.20**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **25/46/45** Longitude (DD/MM/SS): **80/25/10**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **32**	6. Facility SIC(s): **3241**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Michael D. Vardeman – Cement Division Environmental Manager**
2. Facility Contact Mailing Address: Organization/Firm: **CSR Rinker Materials Corporation** Street Address: **1200 NW 137th Avenue** City: **Miami** State: **Florida** Zip Code: **33182**
3. Facility Contact Telephone Numbers: Telephone: **(305) 229-2955** Fax: **(305) 229-8015** e-mail: **mvardeman@rinker.com**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [X] 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): **Kiln and Clinker Cooler subject to NSPS Subpart F and plant is subject to NESHAP, Subpart LLL.**	

List of Applicable Regulations

Title V Core List	
NSPS Subpart Y	
NSPS Subpart F	
NSPS General Provisions	
Code of Metropolitan Dade County, Chapter 24	
NESHAP Subpart LLL	
NESHAP General Provisions	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

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

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID:**PSD Report** [] Not Applicable [ ] Waiver Requested **On file with DERM and FDEP, also see PSD Report**
2. Facility Plot Plan: [X] Attached, Document ID: **PSD Report**[] Not Applicable [ ] Waiver Requested **On file with DERM and FDEP, also see PSD Report**
3. Process Flow Diagram(s): [X] Attached, Document ID: **PSD Report**[] Not Applicable [ ] Waiver Requested **On file with DERM and FDEP, also see PSD Report**
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification: [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [ ] Attached, Document ID:___**PSD Report**_____ [ ] Not Applicable
7. Supplemental Requirements Comment: **Project permitted 9/11/1997 under FDEP File No. 0250014-002-AC. Basic site information is in that file and is unchanged. This application addresses only VOC emissions from EU-018, the kiln/raw mill/clinker cooler which exhaust through a common stack.**

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

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):
Kiln/Raw Mill/Clinker Cooler

4. Emissions Unit Identification Number: [ ] No ID
ID: **018** [ ] ID Unknown

5. Emissions Unit Status Code: **C**	6. Initial Startup Date: **5/2000**	7. Emissions Unit Major Group SIC Code: **32**	8. Acid Rain Unit? [ ]

9. Emissions Unit Comment: (Limit to 500 Characters)
This Emission Unit covers all components from the raw mill to the clinker cooler; all of which is exhausted through a single stack. This emission unit includes fuel used in the kiln and the supplemental air heater for the raw mill. There will be no new construction or physical modifications to the EU nor will there be a change in the fuel or basic raw materials. This application addresses only the VOC emission limit for this EU.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Fabric Filter - High Temperature (T > 250°F)** **Kiln/Raw Mill and Clinker Cooler exhaust through a common baghouse.**
2. Control Device or Method Code(s): **016**

Emissions Unit Details

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

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	**437**	mmBtu/hr
2. Maximum Incineration Rate: **NA**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **220 TPH dry preheater feed, 30-day avg**		
4. Maximum Production Rate: **3312 TPD, 30-day avg, and 1,200,000 TPY Clinker**		
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7** days/week
	52 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

Title V Core List	
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? **Kiln/Raw Mill/Clinker Cooler 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): **NA**

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **EU-018**

5. Discharge Type Code: **V**	6. Stack Height: **359** feet	7. Exit Diameter: **11.0** feet
8. Exit Temperature: **260°F**	9. Actual Volumetric Flow Rate: **330,000** acfm	10. Water Vapor: **13.0%**

11. Maximum Dry Standard Flow Rate: **210,000** dscfm	12. Nonstack Emission Point Height: **NA** feet

13. Emission Point UTM Coordinates:

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

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

Flow in direct operating mode (raw mill down; kiln and cooler only) is 349,000 acfm at 430 °F and 9.0% moisture.

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

Segment Description and Rate: Segment 1 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products: Cement Manufacturing: Dry Process: Preheater/Precalciner Kilns**		
2. Source Classification Code (SCC): **3-05-006-23**	3. SCC Units: **Tons Produced (Clinker)**	
4. Maximum Hourly Rate: **137 Tons, 30-day avg**	5. Maximum Annual Rate: **1,200,000**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **NA**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **NA**
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment 2 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Natural Gas: Cement Kiln**		
2. Source Classification Code (SCC): **3-05-006-02**	3. SCC Units: **Million Cubic Feet (MMcf) Burned**	
4. Maximum Hourly Rate: **0.42 MMcf Burned**	5. Maximum Annual Rate: **3,646 MMcf Burned**	6. Estimated Annual Activity Factor: NA
7. Maximum % Sulfur: **NA**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **1050 MMBtu/MMcf**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 MMcf/1050 MMBtu = 0.42 MMcf/hr** **@ 8760 hr/yr = 3646 MMcf/yr**		

Segment Description and Rate: Segment 3 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: 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: **16.8 Tons burned**	5. Maximum Annual Rate: **147,168 Tons Burned**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **3.5**	8. Maximum % Ash: **28.0**	9. Million Btu per SCC Unit: **26 MMBtu/Ton**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 tons/26 MMBtu = 16.8 tons/hr** **@ 8670 hr/yr = 147,168 ton/yr**		

Segment Description and Rate: Segment 4 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Coke: Cement Kiln** **Petroleum Coke as In-Process Fuel**		
2. Source Classification Code (SCC): **3-90-008-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **14.6 Tons Burned**	5. Maximum Annual Rate: **127,896 Tons Burned**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **NA**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **30 MMBtu/Ton**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 Ton/30 MMBtu = 14.6 tons/hr** **@ 8760 hr/yr = 127,896 tons/yr**		

Segment Description and Rate: Segment 5 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Liquefied Petroleum Gas (LPG): General Use of Propane in Kiln**		
2. Source Classification Code (SCC): **3-90-010-99**	3. SCC Units: **Thousand Gallons Burned (TGB)**	
4. Maximum Hourly Rate: **4.65 TGB**	5. Maximum Annual Rate: **40,734 TGB**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **negligible**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **94 MMBtu/TGB**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 TGB/ 94 MMBtu = 4.65 TGB/hr** **@ 8760 hr/yr = 40,734 TGB/yr**		

Segment Description and Rate: Segment 6 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Distillate Oil: Cement Kiln** **Use of No. 2 Fuel Oil in Kiln**		
2. Source Classification Code (SCC): **3-90-005-02**	3. SCC Units: **Thousand Gallons Burned (TGB)**	
4. Maximum Hourly Rate: **3.1 TGB**	5. Maximum Annual Rate: **27,156 TGB**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur:**0.5**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **141 MMBtu/TGB**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 TGB/ 141 MMBtu = 3.1 TGB/hr** **@ 8760 hr/yr = 27,156 TGB/yr**		

Segment Description and Rate: Segment 7 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Residual Oil: Cement Kiln**		
2. Source Classification Code (SCC): **3-90-004-02**	3. SCC Units: **Thousand Gallons Burned (TGB)**	
4. Maximum Hourly Rate: **2.99 TGB**	5. Maximum Annual Rate: **26,192 TGB**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **2.5**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **146 MMBtu/TGB**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 TGB/ 146 MMBtu = 2.99 TGB/hr** **@ 8760 hr/yr = 26,192 TGB/yr**		

Segment Description and Rate: Segment 8 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Liquid Waste: General Use of Used Oil in Kiln**		
2. Source Classification Code (SCC): **3-90-013-99**	3. SCC Units: **Thousand Gallons Burned (TGB)**	
4. Maximum Hourly Rate: **3.64 TGB**	5. Maximum Annual Rate: **31,886 TGB**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **0.4**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **120 MMBtu/TGB**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 1.0 TGB/120 MMBtu = 3.64 TGB/hr** **@ 8760 hr/yr = 31,886 TGB/yr**		

Segment Description and Rate: Segment 9 of 9

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Industrial Process: In-Process Fuel Use: Solid Waste: Cement Kiln** **Combustion of nonhazardous solid waste at up to 40% of total heat input. Materials include, but are not limited to:** • **Whole Tires and/or Tire-Derived Fuel (TDF)** • **Oil Filters** • **Booms and Rags from Spill Cleanuip** • **Unused Diapers** • **Paper Products** • **Plastic Waste from Non-chlorinated Plastics**		
2. Source Classification Code (SCC): **3-90-012-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **6.7 Tons Burned**	5. Maximum Annual Rate: **58,692 Tons Burned**	6. Estimated Annual Activity Factor: **NA**
7. Maximum % Sulfur: **NA**	8. Maximum % Ash: **NA**	9. Million Btu per SCC Unit: **~ 26 MMBtu/Ton**
10. Segment Comment (limit to 200 characters): **437 MMBtu/hr x 40% = 174.8 MMBtu/hr** **174.8 MMBtu/hr x 1.0 ton/26 MMBtu = 6.7 ton/hr** **@ 8760 hr/yr = 58,692 ton/yr**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			**EL**
NOTE: VOCs are the only emissions affected by this application			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.4** lb/hour **72.0** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: **NA** [ ] 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 clinker x138 TPH = 16.4 lb/hour** **16.4 lb/hour x 8760 hours/year x 1.0 ton/2000 lb = 72.0 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: **NA**
3. Requested Allowable Emissions and Units: **0.12 lb/ton clinker**	4. Equivalent Allowable Emissions: **16.4** lb/hour **72.0** 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 emissions rate represents BACT.**	

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

Visible Emissions Limitation: Visible Emissions Limitation _ of _

1. Visible Emissions Subtype: **NA**	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: **EM**	2. Pollutant(s):
3. CMS Requirement: **NA for VOC**	[ ] Rule [ ] Other
4. Monitor Information: **NA** Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **This section addresses only VOC continuous monitoring requirements. This EU has CMS for SO2, NOx, and opacity and Flow Rate.**	

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

Supplemental Requirements

1. Process Flow Diagram [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **On file with DERM and FDEP**
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 **On file with DERM and FDEP**
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [X] Previously submitted, Date:__**12/2000**____________ [ ] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID:__**PSD Report**______ [ ] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

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

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

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

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

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

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

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

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

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

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

    [X] Not Applicable

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

RINKER MATERIALS CORP.
Miami Cement Plant
1200 N.W. 137th Avenue
Miami, Florida 33182

November 15, 2001

263-01-10

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

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KOOGLER & ASSOCIATES
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1.0 APPLICANT

Rinker Materials Corporation
Miami Cement Plant
1200 N.W. 137th Avenue
Miami, Dade County, Florida 33182

Authorized Representative: Ed Allsopp, Vice President, Cement Operations

2.0 FACILITY INFORMATION

2.1 Facility Location

Rinker Materials Corporation (Rinker) currently operates a 1.2 million ton per year (clinker) precalciner Portland cement plant at 1200 N.W. 137th Avenue in Miami, Dade County, Florida. The UTM Coordinates of the Rinker plant are Zone 17, 558.20 km East and 2851.20 km North. The plant site is about 8.2 kilometers east of the Everglades National Park; the nearest Class 1 PSD area, and is in the Dade County ozone maintenance area.

The plant location is shown in Figure 2-1 and a site plan is shown in Figure 2-2.

2.2 Standard Industrial Classification Codes (SIC)

Industrial Group No.	32	Stone, clay, glass, and concrete products
Industry No.	3241	Cement-hydraulic

2.3 Project Overview

Rinker recently modernized it's existing Miami Portland cement manufacturing facility by replacing the existing 650,000 ton per year wet-process cement plant with a dry-process precalciner plant capable of producing 1,200,000 tons per year (about 3,300 tons per day) of clinker. A flow diagram of the modernized dry-process cement plant is presented in Figure 2-3.

The modernization project was initially permitted by FDEP, Permit No. 0250014-002-AC issued on September 11, 1997. Construction of the modernized plant was substantially completed in about May 2000 and compliance with permit conditions and the certification of continuous monitors was demonstrated during the period September 2000 through May 2001. Final Title V Operating Permit 0250014-003-AV was issued to Rinker on October 26, 2000. The Title V permit includes a compliance plan which authorizes the completion of certain construction activities.

This permitting action is independent of previous permitting and involves only an increase in the permitted short-term and annual VOC emission limits of the pyro-processing system (Emission Unit 018) with no new construction or physical modifications to the existing plant.

The emission measurements to demonstrate compliance with the permitted VOC emission limit for the pyro-processing system (EU-018) were conducted in December 2000. These emission measurements showed Total Hydrocarbon (THC) emissions in compliance with, but close to, the emission limit for VOCs of 0.10 pounds per ton of clinker produced.

The VOC emission limit of 0.10 pounds per ton of clinker was proposed by Rinker in the initial permit application for the modernization project because it was reasonable based upon published information in EPA Publication AP-42 and limited test data from wet and dry process Portland cement plants in Florida. The data from AP-42 and test data generated by Koogler & Associates at two dry-process preheater plants and one wet-process plant under coal-fired conditions and coal/tire derived fuel fired conditions indicated that a VOC emission limit of 0.10 pounds per ton of clinker was achievable and would offer a reasonable margin of safety to account for variations in feed materials and plant operating conditions.

Since the time the Rinker permit was issued, better performance based data have been developed regarding VOC emissions from preheater/precalciner Portland cement plants in Florida. Specifically, the data demonstrated that the THC concentration in the gas stream exiting the kiln and precalciner (the pyro-processing system) is essentially non-detectible. The pyro-processing system of the dry-process Portland cement plant is extremely effective in combusting hydrocarbon material in that part of the system. Hydrocarbon measurements made at the top of the preheater tower and in the stack exhausting the kiln/raw mill system, however, have shown varying amounts of hydrocarbons. The hydrocarbons measured at these locations are a function of the hydrocarbon content of the raw meal fed to the preheater and subsequently to the pyro-processing system. It was found that hydrocarbon compounds in the raw meal are volatilized, but not combusted, in the upper stages of the preheater and appear as THC and/or VOC in the stack gas exhausted from the kiln/raw mill system. Relatively small amounts of hydrocarbon compounds occurring naturally (muck and/or other organic compounds) or resulting from oils and greases present in some raw materials (e.g., mill scale) can significantly influence measured THC and VOC emissions from the kiln/raw mill system.

The emission measurements for THC/VOC at the Rinker plant in December 2000 demonstrated compliance with the VOC emission limiting standard of 0.10 pounds per ton of clinker, but with little margin to accommodate normal fluctuations in plant operating conditions and to explore acceptable new material sources without undue internal operating restrictions. Therefore, Rinker is applying to increase the permitted VOC limit from their modernized dry process precalciner Portland cement plant from 0.10 to 0.12 pounds of VOC per ton of clinker, 30 day average, and to increase the annual VOC emission limit from 60.0 to 72.0 tons per year (based on clinker production of 1.2 million tons per year). The proposed VOC emission limit is consistent with BACT limits approved for two other recently permitted Portland cement plants in Florida and will put Rinker in an equivalent competitive position.

The proposed increase will result in a net VOC increase above baseline conditions of 46.4 tons per year (See Table 4-1). This increase exceeds the VOC Threshold Level defined by Rule 62-212.400, F.A.C., making this project subject to a PSD review. As previously stated, there will be no new construction or physical modifications to existing plant structures associated with this request.

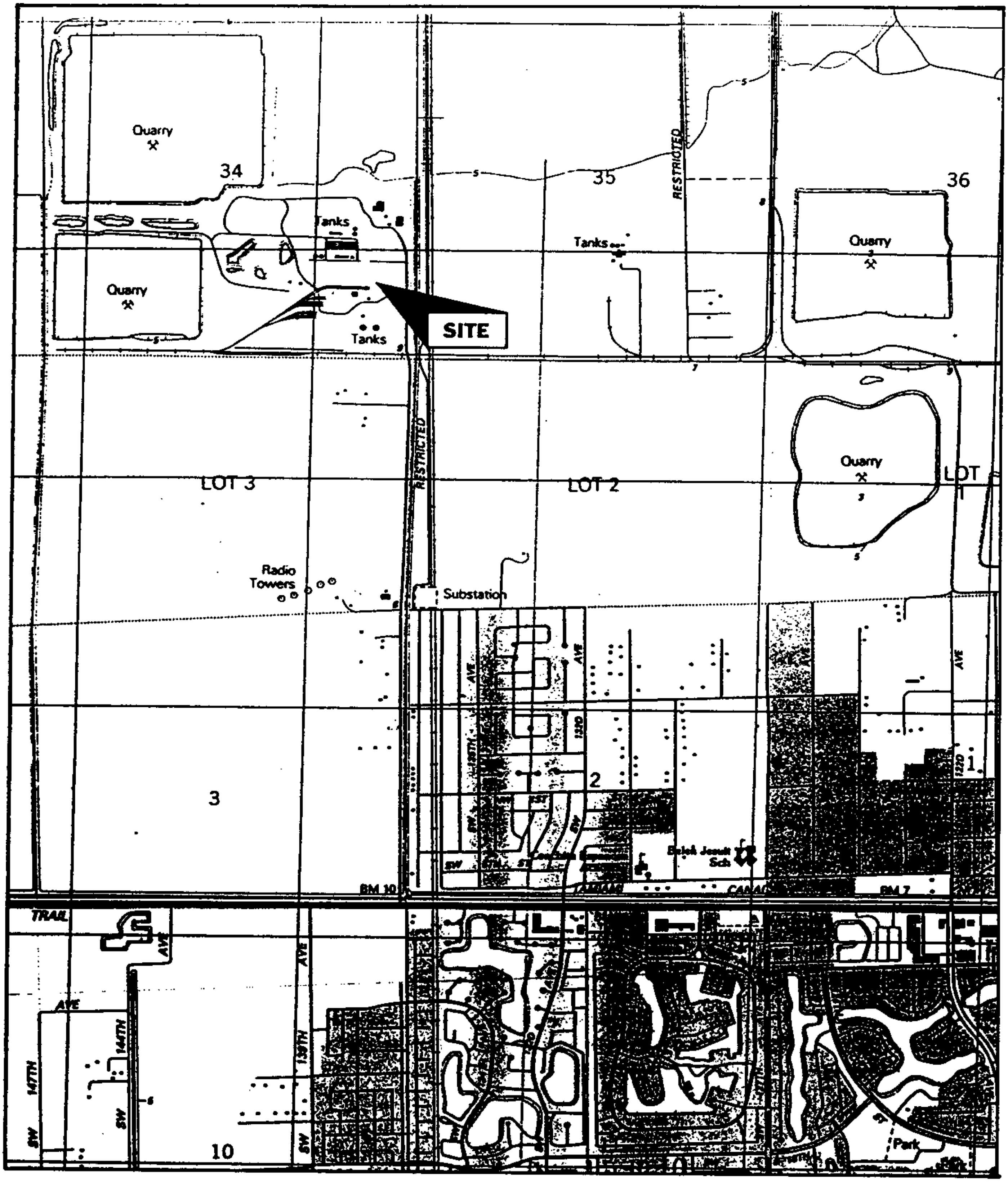
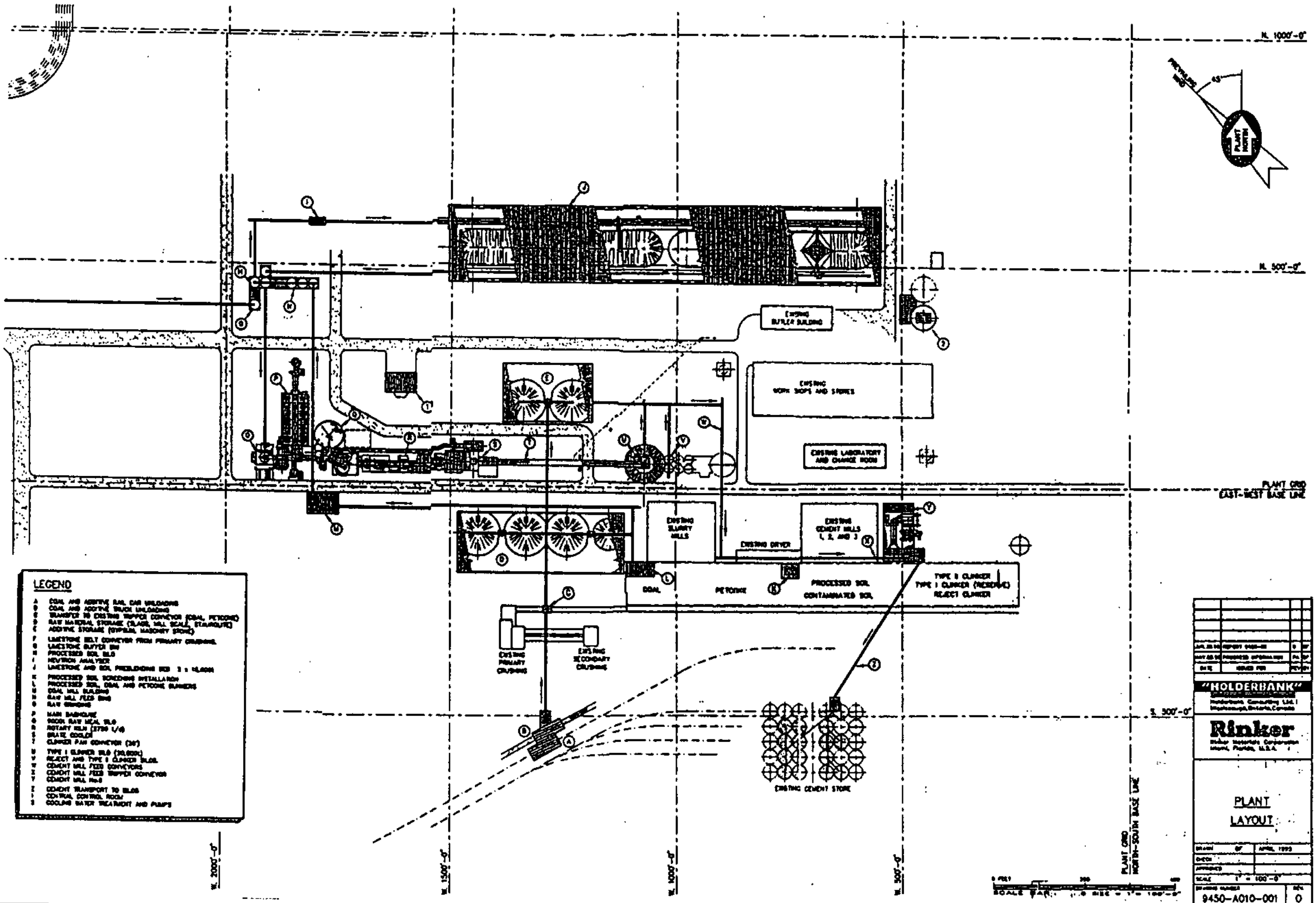


Figure 2-1
Site Location Map
Rinker Materials Corporation
Miami, Florida

ENVIRONMENTAL SERVICES



KOOGLER & ASSOCIATES
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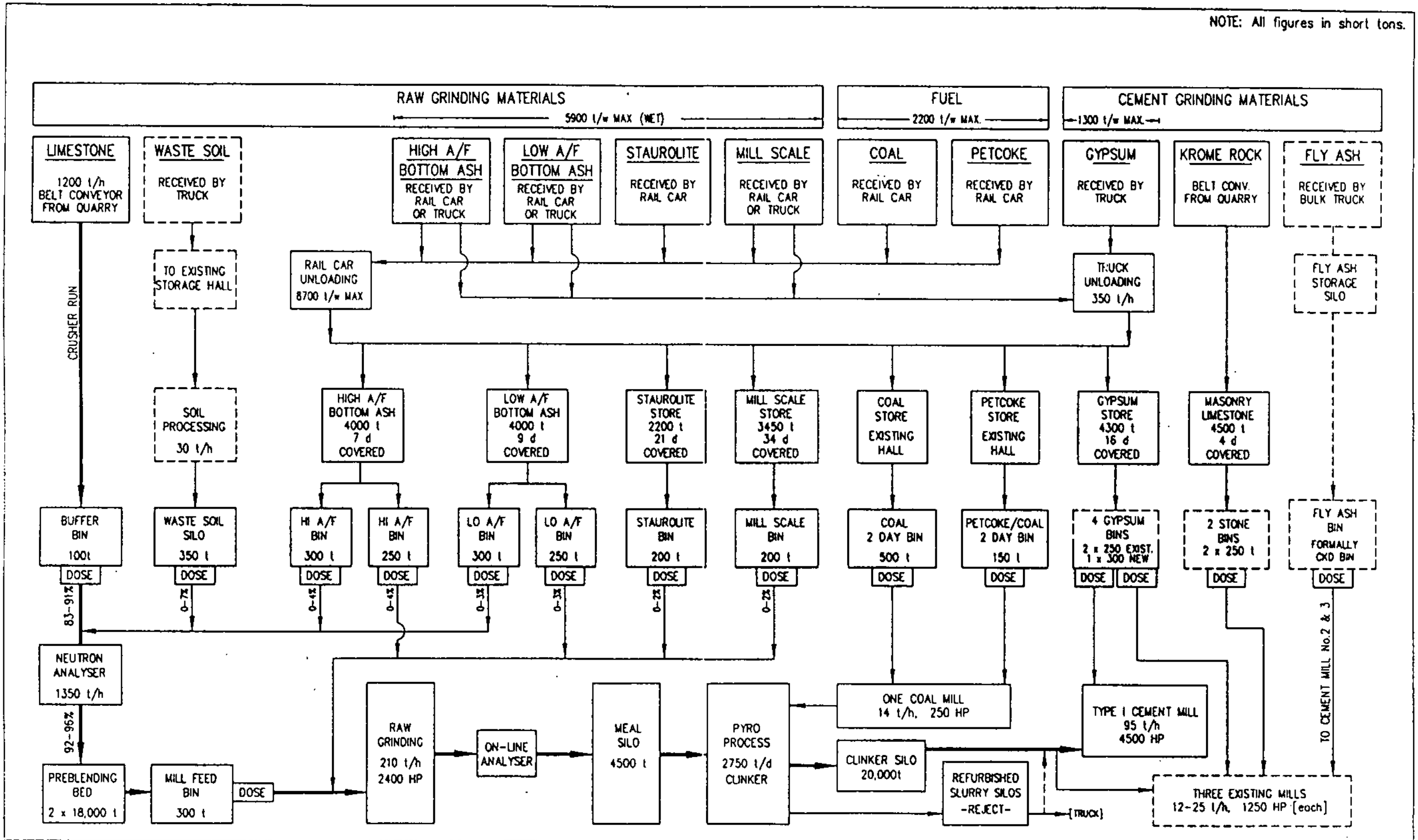
Figure 2-2
Site Plan
Rinker Materials Corporation
Miami, Florida



KOOGLER & ASSOCIATES ENVIRONMENTAL SERVICES

Figure 2-3
Process Flow Diagram
Rinker Materials Corporation
Miami, Florida

3.0 PROJECT DESCRIPTION

This permitting action is to allow for an increase in the permitted short-term and annual VOC emission limits for the kiln/raw mill/cooler system; all three of which are exhausted through a common baghouse and stack identified as Emission Unit 018 of the 1.2 million ton per year (clinker) Portland cement plant operated by Rinker. The plant is currently permitted by Air Construction Permit No. 0250014-002-AC and Title V Permit No. 0250014-003-AV. The increase in VOC emissions will not result in any new construction or modifications to the existing plant, nor will it effect the permitted production limits, fuels or raw materials of the plant. The emission limits of no other pollutants will be affected by this permitting action.

As this action affects only Emission Unit 018, the kiln/raw mill and clinker cooler, brief descriptions of these units are provided for informational purposes.

3.1 Facility Description

The currently permitted Rinker facility consists of a quarry, limestone crushing system, material receiving facilities both by rail and truck, open short-term material storage piles, a storage building for intermediate raw material and clinker storage, a stone dryer, raw mill system, kiln feed slurry system, six finish mills, two packhouses, thirty-two cement silos, a rail and truck bulk loadout facility, and a liquid fuel tank farm. Recently Rinker replaced the existing two wet- process cement kilns and clinker coolers with a single dry-process kiln with preheater, precalciner and clinker cooler, capable of producing approximately 1,200,000 tons per year of clinker. The modernization project was permitted under FDEP Permit No. 0250014-002-AC. The facility is described in detail in the file associated with that permit and the proposed action neither modifies nor adds to any of the plant features described therein.

3.1.1 Raw Mill System

Preheater and clinker cooler exhaust gases are used in the raw mill for drying the raw material. The integrated kiln/cooler/mill exhaust system includes fans to enable the recirculating of preheater and cooler waste gases during mill operation. Particulate matter emissions are controlled by a single reverse air baghouse. When the roller mill is down, the kiln gases are cooled by spraying water in the downcomer duct prior to the reverse air baghouse.

3.1.2 Preheater/Precalciner/Kiln System

The raw meal is conveyed from the homogenization silo to a kiln feed bin which controls the flow of feed material to the top of a preheater tower. The material then travels through a five-stage suspension preheater followed by a precalciner prior to entering the kiln.

An in-line calciner (ILC) is utilized for several reasons. First, the tower dimensions are the smallest possible even though the calciner is installed in-line with the cyclone tower. Second, an ILC is very well suited for all fuel types, even low volatile fuels, as the combustion in the calciner takes place in hot atmospheric air (tertiary air). Finally, high material and gas retention times in the calciner are attained with moderate calciner dimensions.

3.1.3 Clinker Cooler

The clinker cooler contains the latest state-of-the-art grate systems. Two types of grates are proposed for the cooler. They are similar in appearance, but differ with respect to the introduction of cooling air into the clinker. For one type of grates, conventional means of supplying cooling air via pressurization of the undergrate area is used. For the second type of grates, cooling air is supplied directly by a special distribution system to groups consisting of two to four individual grate plates. The proposed cooler contains the first type of (CFG) grates in the entire first drive section and part of the second drive sections. The second type of (RFT) grates are used in the remaining part of the second drive section. Operators have the ability to control the quantity and distribution of air to at least every four grates via manual valves and undergrate fan dampers. This aids in reducing clinker fluidization and the presence of "Red Rivers" commonly found in conventional grate coolers, thereby reducing maintenance costs and downtime while contributing to increased cooler efficiency. Greater control of air distribution results in a reduced amount of cooling air compared to a conventional cooler, and consequently a smaller cooler vent volume and improved kiln fuel consumption.

4.0 PROJECT EMISSIONS

The only emissions affected by this permitting action are VOC emissions from the kiln/raw mill/cooler system (Emission Unit 018). No other emissions, process rates or fuel use rates are affected by this permitting action.

The VOC emissions associated with this permitting action are summarized in Table 4 -1. The baseline VOC emissions used for this permitting action are the same baseline emissions used for the original permitting of the plant in 1997. These emissions are used as Rinker has not yet established a two year operating record with the modernized plant.

TABLE 4-1
Proposed VOC Emission Rates

Rinker Materials Corporation
Miami, Florida

Pollutant	ANNUAL VOC EMISSIONS (TPY)					
	Baseline (1)	Contemporaneous Changes		Proposed Cement Plant Emissions (4)	Net Increase	PSD Threshold (5)
		Decrease (2)	Increase (3)			
VOC	46.1	46.1	20.5	72.0	46.4	40

(1) Baseline emissions are actual cement plant emissions during the 1995-96 operation period.
(2) Shut-down of existing wet-process kilns
(3) Permitting of SRU/Stone dryer
(4) Plant was originally permitted (0250014-002-AC issued 9/11/97) with an annual VOC emission limit of 60.0 tpy. This permitting action will increase the annual VOC emissions from the cement plant to 72.0 tpy (0.12 lb/ton clinker and 1.2 million tons of clinker per year).
(5) PSD threshold emissions increase pursuant to Rule 62-212.400, F.A.C.

5.0 RULE APPLICABILITY

This project is subject to preconstruction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The project is subject to the provisions of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), because it will result in an increase of VOC above the threshold defined in Table 212.400-2, F.A.C. This change is therefore subject to review for the PSD and a determination of Best Available Control Technology (BACT) in accordance with Rule 62-212.400, F.A.C. The facility is also subject to the following Federal New Source Performance Standards (NSPS):

Subpart F: Standards of Performance for Portland Cement Plants (40 CFR 60.60)
Subpart Y: Standards of Performance for Coal Preparation Plants (40 CFR 60.250)
Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR 60.670)

Additionally, the facility is subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP):

Subpart LLL: Standards of Performance for Portland Cement Plants (40 CFR 63.1340)

As this permitting action involves only an increase in permitted VOC emissions, the only NSPS or NESHAP Regulation that will be reviewed is the section of the NESHAP which limits VOC emissions from the pyro-processing system of Portland cements plants to 50 ppm (V/V, dry) as propane, corrected to 7 percent oxygen.

6.0 VOC CONTROL TECHNOLOGY

As the VOC emission increase addressed by this permitting action exceeds the threshold defined by Table 212.400-2, F.A.C., the control technology applicable to VOCs must satisfy the requirements of Best Available Control Technology (BACT).

6.1 Bact Determination Procedure

In accordance with Chapter 62-212, F.A.C., a BACT analysis for VOC is based on the maximum degree of reduction that 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. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency Determination of BACT pursuant to Section 169, 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 determination of any other state.
- The social and economic impact of the application of such technology .

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach, therefore, is to determine the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental or economic objections.

There are no promulgated emission limitations contained in 40 CFR 60, Subpart F - Standards of Performance for Portland Cement Plants (NSPS) that apply to VOC emissions from cement plants. The MACT (Maximum Achievable Control Technology) Standards at 40 CFR Part 61, Subpart LLL - National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Portland Cement Manufacturing Industry does include a VOC limit as a surrogate for organic HAPS from new Greenfield plants of 50 ppmvd (at 7% oxygen) as propane. Even though Rinker is not a Greenfield plant and is notsubject to this section of the MACT standard, the proposed VOC emission limit for Rinker is 60 percent lower than this MACT VOC limit.

6.2 BACT Control Options

Combustion Control/Materials Selection

VOC emissions from a dry-process precalciner Portland cement plant operating with raw materials typically found in Florida can be controlled at a level in the range of 0.10-0.15 pounds per ton of clinker, with no add-on control equipment, by proper combustion control at the kiln burner and at the precalciner burner and by the use of raw materials low in hydrocarbons.

The combustion control is inherent in the design of modern Portland cement plants. Testing conducted by Koogler & Associates has demonstrated that THC levels at the exit of the pyro-processing system (at the base of the preheater tower) are typically non-detectible. Hydrocarbon compounds (THC and/or VOC) appearing in the stack gas of a well operated, modern dry-process Portland cement plant in Florida are the result of hydrocarbon compounds in feed materials that are volatilized, but not combusted, in the upper stages of the preheater tower.

Compared to other areas of the country, the raw materials available on-site or locally in Florida (i.e., limestone, sand and clay) generally contain very little organic material. Thus, the selection of materials imported as iron and aluminum sources is critical to the control of VOC emissions. With raw materials supplying iron and aluminum that are relatively free of hydrocarbon compounds, VOC emissions from modern, well operated dry-process Portland cement plants in Florida can be controlled to 0.10-0.15 pounds per ton of clinker with no additional add-on equipment.

This control option also has the advantage of introducing no new operating systems, generating no additional air pollutants, creating no liquid or solid waste streams and having no associated energy or cost penalty.

<u>Regenerative Thermal Oxidation (RTO)</u>

This control option exposes the gas stream to high temperatures to oxidize the VOCs to carbon dioxide and water. An auxiliary fuel is used to initially reach the high operating temperatures (1600-1700°F) required. A regenerative thermal oxidizer (RTO) typically uses ceramic materials to store a large thermal mass generated by thermal oxidation and then uses the fuel value of the inlet gas stream to maintain the oxidation process.

An oxidizer typically consists of a reinforced, insulated twin bed chamber filled with ceramic heat exchanger media. The gas flow is automatically controlled by a poppet valve mechanism that changes the direction of the gas flow at regular intervals via an integral programmable logic control system. An external burner is used for initial cold startup, which would typically be for one hour. With a sufficiently high concentration of VOCs in the incoming gas stream, the destruction of VOCs would be self-sustaining and no auxiliary heat would be required from the external burner. This is not the case for Portland cement plants in Florida where stack gas VOC concentrations are low; in the range of 10 - 15 ppm.

Thermal oxidation is technically feasible and commercially available. Texas Industries, Inc. (TXI), for example, has recently installed an RTO on a modernized Portland cement plant in Midlothian, Texas. TXI installed the RTO because of high levels of kerogens in feed material and a corporate decision to net out of PSD permitting. In the case of the Rinker project, the cost-effectiveness of an RTO for VOC control is in the range of $35,500 per ton; clearly not a cost-effective control alternative (See Section 6.4).

Catalytic Oxidation (CatOx)

CatOx technology passes the contaminated gas stream over a catalyst bed at a moderate temperature sufficient to oxidize the organic compounds to carbon dioxide and water. An auxiliary fuel is required to elevate the gas stream to the required temperature range. Ideally, once this temperature is reached and the oxidation process begins, there would be enough fuel value in the inlet gas stream so that only minor amounts of auxiliary fuel is required to maintain the operating temperature.

A heat exchanger may be added to preheat the inlet gas stream prior to oxidation (recuperative oxidation). Likewise, ceramic materials may be included in the design to store a large thermal mass generated by the oxidation in order to make use of the fuel value of the inlet gas stream to maintain the oxidation process (regenerative incineration). Both of these methods attempt to reduce the operating costs incurred by the combustion of an auxiliary fuel. Typically, the selection of a catalytic oxidizer depends on the exhaust gas volume and the concentration of the gas stream. At concentrations above 3,000 ppm, the selection of a catalytic oxidizer may be appropriate. This precludes the CatOx technology on Florida Portland cement plants as stack gas VOC concentrations are typically in the range of 10 - 15 ppm.

<u>Activated Carbon Absorption</u>

The captured gas stream is passed across a bed of activated carbon to absorb VOC/HAP. Activated carbon is generally used because its internal pore structure provides a very large surface area on which to absorb the volatile organic compounds. Once the carbon bed becomes saturated with organic compounds, hot air or steam is used to release the VOC for recovery or destruction and regenerate the bed for another cycle. For these systems, when one carbon bed is in operation, another carbon bed is being regenerated. Selection criteria depend on concentration and flow characteristics.

The carbon filter technology is included in the Polysus Environmental Technology (POLVITEC). Such a system was installed at the HCB Siggenthal Plant in Switzerland for multi-pollutant control from dried sewage sludge combustion. The project was feasible because the City of Zurich put of a portion of the capital cost of $15,000,000 for the installation and the plant recovers costs by burning a variety of other wastes. With this capital cost, the annualized cost-effectiveness for VOC control is estimated for the Rinker facility to be in excess of $50,000 per ton (See Section 6.4). This control cost is excessive based on Department guidelines.

Biofiltration

This relatively new technology has been used successfully to control odors from organic compounds. The VOC/HAP-laden gas stream is collected and passed under an active bed of soil containing microorganisms. As the air rises through the bed, the microorganisms consume the chemicals and convert them to carbon dioxide and water. Economics are not favorable for application to the cement industry because of the large volume of stack gas and the low initial stack gas VOC concentration (10 - 15 ppm).

Chemical Scrubber

Chemical scrubbers are absorption systems designed to dissolve a specific pollutant in a solvent, usually water, but based on the chemistry of the exhaust stream. Exhaust streams that include a variety of chemicals may also require a variety of solvents, adding complexity to the control system and potential disposal costs if recovery is not practical. Typically, a VOC concentration above 200 ppm is necessary to make chemical scrubbing practical. The low stack gas VOC concentrations plus the resulting waste water discharge problems eliminate this technology from further consideration.

Condensation

A condensation system includes refrigeration units to cool the exhaust stream and condense out the chemical contaminants. The condensate is collected and either separated for reuse or disposed of as a waste. For highly concentrated gas streams, these systems can be more than 95% efficient. However, the gas stream from the Rinker plant would be very dilute and the condensate would have little or no value for reuse. Therefore, a condensation system is not considered a viable option for this project.

6.3 Emerging Control Technologies

There appears to be no emerging technologies for VOC control applicable to the Portland cement industries.

6.4 Control Technology Review

The control options that appear viable are :

- Selection of raw materials low in hydrocarbons and combustion control at the main kiln burner and at the precalciner burner,
- Regenerative Thermal Oxidation, and
- Carbon Absorption.

Presently Rinker controls VOC emissions through the selection of raw materials and combustion control.

6.4.1 Material Selection/Combustion Control

Rinker currently controls VOC emissions from their dry-process, precalciner Portland cement plant by combustion technology at the main kiln burner and in the precalciner and through the selection of raw feed materials low in hydrocarbons.

Testing conducted by Koogler & Associates and reported to FDEP demonstrated that the pyro-processing system (the kiln and precalciner) in a modern dry-process Portland cement plant is extremely effective at combusting hydrocarbon compounds generated or introduced to that section of the system. Measurements made by Koogler & Associates have demonstrated the hydrocarbon concentration in the gas stream leaving the pyro-processing system and entering the preheater is essentially non-detectible.

Further testing by Koogler & Associates, also reported to the Department demonstrated, that hydrocarbons appearing in the gas stream at the top of the preheater tower and in the stack gas discharged from the pyro-processing system resulted from hydrocarbons in the feed material introduced to the preheater. It was found that hydrocarbons in the feed material would volatilize, but not combust, as the feed material was heated as it passed into the preheater.

Thus, the selection of raw materials low in hydrocarbons and other organics, coupled with the efficient combustion process inherent in modern precalciner Portland cement plants is a very effective and efficient control alternative for VOC emissions. This control alternative can reduce VOC emissions to the 0.10-0.15 pounds per ton of clinker range with:

- no add-on air pollution control equipment,
- the introduction of no new operating systems that plant operating personnel must become familiar with,
- no energy penalty,
- the generation of no secondary liquid or solid waste streams, and
- the generation of no secondary air pollutants.

This control option is viable for Rinker and other operators in Florida because the raw materials produced on-site or locally (the limestone sand and clay) are generally very low in naturally occurring organic compounds. The selection of raw materials constituting the iron and aluminum sources which are low in organics and hydrocarbon compounds is all that is required to make this a very effective control technology.

6.4.2 Regenerative Thermal Oxidation

As discussed in Section 6.2, Regenerative Thermal Oxidizers (RTO) are technically feasible and commercially available for controlling VOC emissions from Portland cement plants. The RTO installed at the TXI Midlothian Portland cement plant is an eleven module system with a Purchase Equipment Cost (PEC) reported to be approximately $12 million. This system is designed for a stack gas flow rate of approximately 900,000 acfm.

The gas flow rate from the Rinker kiln and raw mill system is approximately 250,000 acfm with an additional 85,000 acfm added by the clinker cooler. If, for VOC control purposes, the gases from the kiln and raw mill only were directed to an RTO (250,000 acfm), three RTO modules would be required at Rinker ((250,000/900,0000) X 11 modules at TXI = 3 modules at Rinker). Based on the PEC at TXI of $12 million, the PEC for Rinker would be approximately $3.3 million. If it is estimated that the PEC is approximately 45 percent of the Total Capital Investment (TCI) and if a 15 percent multiplier is added for retrofit costs (placing the three RTO modules into an existing plant and reducting the clinker cooler exhaust gases), a TCI of $8.4 million is calculated for Rinker.

The annualized costs of an RTO is calculated by estimating the Direct Operating Cost (DOC) and Indirect Operating Cost (IOC) combined at 12.6 percent of the TCI and the Capital Recovery Cost (CRC) equal to 16.3 percent of the TCI (ten years @ 7% interest). The resulting Total Annual Cost is $2.43 million dollars.

If it is estimated that 95 percent of the total annual VOCs (95% of 72.0 tpy) are removed by the RTO, the cost-effectiveness is estimated to be approximately $35,500 per ton.

In addition to this total annual cost, there will be an associated energy penalty for the fuel required to operate the RTO and the NO_x emissions will increase by almost 50 tons per year. The NO_x increase is based on information provided to Koogler & Associates by Smith Engineering Company. Smith quoted (in a budget quote for an RTO for the citrus industry) that the NO_x concentration of gases passing through an RTO will increase by approximately 10 ppm (V/V, dry). Based on a gas flow rate of 250,000 acfm, a 10 ppm increase in the NO_x concentration will result in annual NO_x emissions of approximately 50 tons per year.

Based upon the cost-effectiveness of an RTO of approximately $35,500 per ton of VOC removed, the energy penalty, the increase in NO_X emissions and the introduction of a new operating system, the RTO is rejected as a viable control alternative.

6.4.3 Carbon Absorption

Activated carbon absorption is being used to control VOC emissions from the HCD Siggenthal Cement Plant in Switzerland. This plant is reportedly approximately the size of the Rinker plant and the capital cost of the carbon absorption system is reportedly in the range of $15 million. Without conducting a rigorous cost-effectiveness analysis, it can reasonably be estimated that the cost-effectiveness of a carbon absorption system for VOC will be in excess of $50,000 per ton.

This cost is estimated by comparing the capital cost (TCI) of the carbon absorption system at the Siggenthal Plant ($15 million) with the TCI of $8.4 million estimated for an RTO at the Rinker facility. The cost- effectiveness of the RTO was approximately $35,500 per ton. Based on a ratio of the TCIs, it is very reasonable to expect that the cost-effectiveness of carbon absorption will be well in excess of $50,000 per ton.

Based upon Department guidelines, this cost is considered excessive and carbon absorption is rejected as a viable VOC control alternative for the Rinker facility.

6.5 Proposed BACT

The VOC control option proposed by Rinker as Best Available Control Technology (BACT) is combustion control and raw material selection. The VOC emission limit proposed as BACT is 0.12 pounds per ton of clinker, 30-day rolling average, and 72.0 tons per year. This is equivalent to an hourly VOC emission rate of 16.6 pounds per hour, 30-day rolling average.

The proposed VOC emission limit is consistent with emission limits permitted as BACT or LAER for other recently permitted cement plants (See Table 6-1). The only VOC emission limit permitted as BACT that is significantly lower than the limit proposed by Rinker is the limit of 0.026 pounds of VOC per ton of clinker permitted for the aforementioned TXI plant in Midlothian, Texas. This limit was permitted based on the application of an RTO which has been demonstrated not to be cost-effective for the Rinker facility.

Also listed in Table 6-1 is the equivalent VOC emission rate of approximately 0.3 pounds per ton of clinker which is equivalent to the Maximum Achievable Control Technology (MACT) standard for new Greenfield Portland cement sites. This limit is based on the VOC limit established by MACT of 50 ppm (as propane), corrected to seven percent oxygen and reported on a dry-gas basis, and Rinker stack gas flow characteristics. The BACT limit proposed by Rinker is 60 percent lower than the equivalent MACT standard.

Control technology represented by Regenerative Thermal Oxidation and Carbon Absorption have both been rejected as viable control options for the Rinker facility. The cost-effectiveness of both of these control technologies far exceeds a "reasonable control cost" established by FDEP guidelines. Additionally, both of these alternatives will introduce energy penalties, introduce new operating systems and will either increase the emission rates of other pollutants or generate a secondary waste stream which will require disposal.

TABLE 6-1

Recently Permitted BACT and LAER Limits
for
Portland Cement Plants

Plant	Year	PSD?	VOC(lb/ton)	Technology
Rinker (proposed)	2001	Y	0.12	Process/Raw Materials
Rinker Miami	1997	N	0.10	Process/Combustion
Puerto Rican Cement	1997	Y	0.12	Process/Combustion
Florida Rock Newberry	1996	Y	0.12	Process/Combustion
FCS Brooksville	1995/97	Y	0.085	Process/Combustion
Holnam Midlothian	1997	N	0.70	Process/Combustion
TXI Midlothian	1998	N	0.026	RTO
Tarmac Miami	2000	N	0.19	Process/Combustion
Holnam Holly Hills	2000	Y	0.27	Process/Raw Materials
Suwannee American	2000	Y	0.12	Process/Combustion
St. Lawrence Cement	2001 (draft)	LAER	0.11	Process/Raw Materials
All Greenfield Plants	Future	MACT	~0.3 (1)	Process/Raw Materials

(1) Based on Rinker Operating Features

7.0 SOURCE IMPACT ANALYSIS

7.1 Air Quality Impact Analysis

The proposed permitting action will increase VOC emissions in excess of PSD threshold levels defined in Table 212.400-2, F.A.C. Therefore, an air quality impact analysis is potentially required by PSD regulations.

Although this action is potentially subject to a source impact analysis, it is exempt as the net increase in VOC emissions is less than 100 tons per year. As defined by Table 212.400-3, F.A.C., a VOC emission increase of less than 100 tons per year will result in a de minimis impact on ambient ozone levels. Hence, a source impact analysis is not required.

It should further be pointed out that the total VOC emissions from the entire Rinker facility are less than 100 tons per year (See Table 4-1).

7.2 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.

This permitting action affects only VOC emissions from the Rinker facility and no air quality standards have been promulgated for VOCs. The ambient impact of VOCs is considered only as it affects ozone, and the VOC emissions increase from this action is de minimis per Table 212.400-3, F.A.C.; *DeMinimus Ambient Impacts.*

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

7.3 Good Engineering Practice Stack Height

In accordance with Chapter 62-210, F.A.C., the degree of emission limitation required for control of any pollutant is not to be affected by a stack height that exceeds GEPP, or any other dispersion technique. GET 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:

H_g – GEP stack height,

H – Height of the structure or nearby structure, and

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

The Rinker stack was reviewed during the initial permitting of the plant (FDEP File No. 0250014-002-AC) and found to be in conformance with GEP criteria. Nothing associated with this permitting action will effect the kiln/raw mill/cooler stack.