


Memorandum

Florida Department of Environmental Protection

TO: Trina Vielhauer
THRU: Al Linero  9/6
FROM: Cindy Mulkey
DATE: September 6, 2005
SUBJECT: Florida Rock Industries (FRI) - Newberry
: Fuel and Fly Ash Projects
DEP File No. 0010087-0015-AC

Attached is the public notice package for the various fuel use and fly ash projects at the existing Florida Rock Industries Cement Plant in Newberry. The projects, as proposed include: petroleum coke use up to 40%; use of fly ash as fuel; natural gas use primarily in the raw mill air heater, but allowed in the kiln and calciner; increase in the coal sulfur content from 1.25 to 1.75%; and replacement of the main kiln burner.

FRI conducted emission testing while temporarily using petroleum coke/fly ash/coal blends as fuel. They have not installed the new kiln burner or tested using natural gas. Such tests would require the permanent installation of equipment that is requested by the present permit application.

No emissions limit increases were requested by FRI for the fuel use and fly ash project. Generally there were not short-term emission increases for any pollutant except for CO. This is a good indication that measured emission increases are not expected on an annual basis except for CO. However, the project would trigger PSD by the present general methodology (past actual to future potential emissions) for CO, NO_x, SO₂, and PM/PM₁₀.

The projects can be permitted without triggering PSD if the Department presumes that unit-specific allowable emissions for an emissions unit are equivalent to the actual emissions of the emissions unit. This procedure is provided by the rules as long as the limits are federally enforceable.

Petcoke use will be limited to 25% because CO emissions measured by in-stack tests were equal to the permitted emission limit when using a 30% petcoke blend and operating at 92% of the permitted production limit. We are increasing the present CO annual compliance testing requirement to quarterly demonstrations.

The emission limits in the permit are competitive for all pollutants, except for NO_x, with the recent BACT limits issued for FRI Kiln II and Rinker FCS Kiln II. The NO_x emissions are competitive with recent BACT determinations in other states and until this Spring, set the standard for Florida kilns. To meet lower values, it would be necessary for FRI to install an SNCR system. However, as detailed in the Technical Evaluation, actual NO_x emissions were marginally lower during the petroleum coke/fly ash test program.

We recommend your approval of the attached Intent to Issue.

AAL/cem

Attachments

SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY
<ul style="list-style-type: none"> ■ Complete items 1, 2, and 3. Also complete Item 4 if Restricted Delivery is desired. ■ Print your name and address on the reverse so that we can return the card to you. ■ Attach this card to the back of the mailpiece, or on the front if space permits. 	A. Signature <input checked="" type="checkbox"/> Agent <input type="checkbox"/> Addressee
1. Article Addressed to: <p style="text-align: center;">Mr. Chris Horner Florida Rock Industries, Inc. 4000 NW CR 235 Newberry, Florida 32669</p>	B. Received by (Printed Name) C. Date of Delivery Angel Horner 9/14/05 D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No
2. Article Number (Transfer from service label)	3. Service Type <input checked="" type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D. 4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes
7001 0320 0001 3692 2329	
PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540	

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Postage	\$	Postmark Here
Certified Fee		
Return Receipt Fee <small>(Endorsement Required)</small>		
Restricted Delivery Fee <small>(Endorsement Required)</small>		

Mr. Chris Horner
 Florida Rock Industries, Inc.
 4000 NW CR 235
 Newberry, Florida 32669

PS Form 3800, January 2001 See reverse for instructions

SENDER: COMPLETE THIS SECTION

RECIPIENT: COMPLETE THIS SECTION ON DELIVERY

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

1. Article Addressed to:

Ms. Cynthia Moore Chestnut
 Alachua County Board of County
 Commissioners
 Post Office Box 2877
 Gainesville, Florida 32602

A. Signature

X *J. Crow*

- Agent
- Addressee

B. Received by (Printed Name)

J. Crow

C. Date of Delivery

9-12-05

D. Is delivery address different from item 1?

Yes

If YES, enter delivery address below:

No

3. Service Type

- Certified Mail
- Registered
- Insured Mail
- Express Mail
- Return Receipt for Merchandise
- C.O.D.

4. Restricted Delivery? (Extra Fee)

Yes

2. Article Number
 (Transfer from service label)

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PS Form 3811, February 2004

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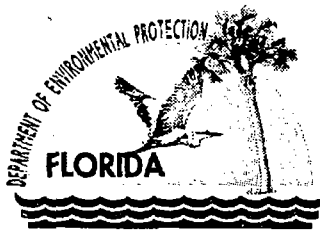
Postage	\$	
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		

Postmark
 Here

Ms. Cynthia Moore Chestnut
 Alachua County Board of County
 Commissioners
 Post Office Box 2877
 Gainesville, Florida 32602

PS Form 3800, June 2002

See Reverse for Instructions



Jeb Bush
Governor

Department of Environmental Protection

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

Colleen M. Castille
Secretary

September 7, 2005

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Chris Horner, Plant Manager
Florida Rock Industries, Inc.
4000 NW CR 235
Post Office Box 45
Newberry, Florida 32399

RE: DEP File No.: 0010087-015-AC
Fuel and Fly Ash Projects
Thompson S. Baker Cement Plant


Dear Mr. Horner:

Enclosed is one copy of the Draft Air Construction Permit for the proposed project at the Thompson S. Baker Cement Plant on County Road 235, in Newberry, Alachua County. The Department's Intent to Issue Air Construction Permit, the "Public Notice of Intent to Issue Air Construction Permit", and the Technical Evaluation and Preliminary Determination are also included.

The "Public Notice" must be published one time only as soon as possible in a newspaper of general circulation in the area affected, pursuant to the requirements Chapter 50, Florida Statutes. Proof of Publication, i.e. newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in denial of the permit modification. The Department reserves the right to publish the Public Notice at anytime. If the Department publishes the Public Notice, the applicant is relieved of this responsibility.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A.A. Linero, Program Administrator, at the letterhead address. If you have any questions regarding this matter, please call Cindy Mulkey at 850/921-8968 or Mr. Linero at 850/921-9523.

Sincerely,

 9/7/2005
for Trina L. Vielhauer, Chief
Bureau of Air Regulation

TLV/cm

Enclosures

"More Protection, Less Process"

Printed on recycled paper.

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

Florida Department of Environmental Protection
DEP File No.: 0010087-015-AC

Florida Rock Industries, Inc.
Thompson S. Baker Cement Plant - Newberry
Alachua County

The Florida Department of Environmental Protection (Department) gives notice of its intent to issue an Air Construction Permit to Florida Rock Industries, Inc. (FRI) for a number of fuel related projects at the Thompson S. Baker Cement Plant located 2.5 miles Northeast of Newberry on County Road 235 in Alachua County. The Department has determined that the project does not trigger the Prevention of Significant Deterioration (PSD) requirements of Paragraph 62-212.400, F.A.C. A new Best Available Control Technology (BACT) determination was not required. The applicant's name and address are: Florida Rock Industries, Inc., 4000 NW County Road 235, Post Office Box 45, Newberry, Florida 32699.

FRI presently uses coal with a maximum sulfur content of 1.25 percent (%) in the cement kiln and calciner. The company introduces whole tires at the kiln inlet. No. 2 fuel oil is used in the raw mill air heater to assist in drying of raw materials. FRI proposes to: add natural gas capability for the kiln, calciner, and raw mill air heater; replace and upgrade the main kiln burner; add fly ash and petroleum coke (up to 40% by heat input) to the calciner and kiln fuel slate; and increase the maximum coal sulfur content to 1.75%.

Fly ash is already used as a raw material additive for its calcium, iron, aluminum, and silica content and is introduced into the preheater with the feed (primarily finely ground limestone). Introduction into the kiln and calciner will also allow beneficial use of energy contained in the unburned carbon fraction of the fly ash.

The company requested no increases in allowable emission or production limits. A recent and publicly noticed permit allowed testing in order to evaluate emissions while co-firing petroleum coke and fly ash with coal. Test results showed no significant increases, with respect to the PSD rules, in emissions of nitrogen oxides (NO_x), particulate matter (PM), sulfur dioxide (SO₂), or volatile organic compound (VOC) emissions as a direct result of the combustion of these additional fuels. There was actually a small, but statistically significant decrease in NO_x emissions.

SO₂ is inherently "scrubbed" within the calciner. The plant currently has the lowest cement kiln SO₂ emission limit (0.16 pounds per ton of clinker) known to the Department and is equipped with a CEMS to demonstrate compliance with the SO₂ limit. FRI easily complied with the limit even while burning high sulfur petroleum coke. Therefore the Department will permit the increase in the coal sulfur content as requested. The plant also has low emissions limits and CEMS for NO_x, opacity and total hydrocarbons (conservative surrogate for VOC).

The calciner incorporates staged air combustion using hot tertiary air from the clinker cooler to promote CO burnout. There is a process CO monitor in the downcomer prior to the particulate control equipment. CO emissions determined by in-stack testing were marginally less than allowed by the present permit while burning 30 % petroleum coke and operating at 92 % of the daily clinker production limit. The Department will limit use of petroleum coke to 25% and require quarterly instead of annual in-stack compliance testing.

The new Mono Airduct System kiln burner is designed with an improved ability to make flame adjustments within the kiln. This will provide better process and emissions control with the expanded fuel slate.

The Department will issue the Final Permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions. The Department will accept written comments concerning the proposed permit issuance action for a period of fourteen (14) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit Modification. Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modification and require, if applicable, another Public Notice.

The Department will issue the permit modification with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions must be filed within fourteen (14) days of publication of this Public Notice of Intent to Issue Air Construction Permit. Under Section 120.60(3), F.S., however, petitions submitted by person(s) who asked the Department for notice of agency action must be filed within fourteen (14) days of receipt of that notice or the date of publication of the public notice whichever occurs first. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida, 32301
Telephone: (850) 488-0114
Fax: (850) 922-6979

Department of Environmental Protection
Northeast District Office
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590
Telephone: (904) 807-3233
Fax: (904) 448-4363

The complete project file includes the technical evaluation, Draft Air Construction Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Bureau of Air Regulation at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/921-8968, for additional information. The relevant documents can be viewed at www.dep.state.fl.us/air/permitting/construction/flock.htm

In the Matter of a
Permit Application by:

Florida Rock Industries, Inc.
4000 N.W. CR 235
Post Office Box 459
Newberry, Florida 32669

DEP File No. 0010087-015-AC
Fuel and Fly Ash Projects
Thompson S. Baker Cement Plant
Alachua County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed action, detailed in the Technical Evaluation and Preliminary Determination, for the reasons stated below.

The permittee, Florida Rock Industries (FRI), owns and operates the Thompson S. Baker Cement in Newberry, Alachua County. On May 9, 2005 the Department received an application from FRI for a construction permit to allow the use of petroleum coke and fly ash at the facility. On June 20, 2005 the Department received a response to a Request for Additional Information that included a request to increase the allowable sulfur limit of coal used at the facility. On July 29, 2005 the Department received an application from FRI that included requests to use natural gas at the facility and to replace the main kiln burner.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit is required to perform the described work and allow the use of the described fuels.

The Department intends to issue this air construction permit modification based on the belief that the applicant has provided reasonable assurances to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1, F.A.C, you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Construction Permit. The notice shall be published as soon as possible one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in Section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit action for a period of 14 (fourteen) days from the date of publication of Public Notice of Intent to Issue Air Construction Permit. Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57, F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

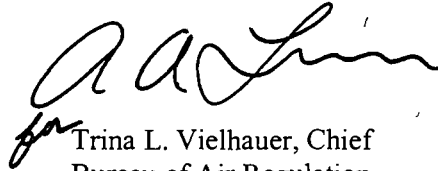
A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3), F.S., must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), F.S., however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

Executed in Tallahassee, Florida.

 9/7/2005
for Trina L. Vielhauer, Chief
Bureau of Air Regulation

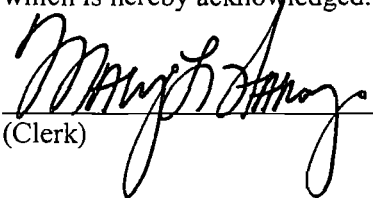
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 9/7/05 to the person(s) listed:

- Chris Horner, FRI*
- Henry Gotsch, FRI
- William Proses, P.E. Koogler & Associates
Chair, Alachua County Commission*
- Chris Bird, Alachua County EMD
- Jim Little, EPA
- Chris Kirts, DEP NED

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to §120.52, Florida Statutes,
with the designated Department Clerk, receipt of
which is hereby acknowledged.

 9/7/05
(Clerk) (Date)

PERMITTEE

Florida Rock Industries
4000 NW CR 235
Post Office Box 459
Newberry, Florida 32669

Permit No. 0010087-015-AC
Expires: December 31, 2006
Fuel and Fly Ash Projects

PROJECT AND LOCATION

This permit authorizes the replacement of the main kiln burner and use of natural gas, petroleum coke, fly ash, and coal with a maximum sulfur content of 1.75 % by weight at the existing Thompson S. Baker Cement Plant in Alachua County. The facility is on County Road 235 approximately 2.5 miles northeast of Newberry, Florida. The map coordinates are: UTM Zone 17, 346.8 km East and 3287.0 km North.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the work specified in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This permit supplements all other air construction and operation permits for the subject emissions unit and does not alter any requirements from such previously issued air permits.

APPENDICES

The following appendices are attached as part of this permit.

Appendix GC - Construction Permit General Conditions

Michael G. Cooke, Director
Division of Air Resources Management

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

Florida Rock Industries, Inc. (FRI) owns and operates the Thompson S. Baker Cement Plant in Newberry, Alachua County. The facility consists of raw material handling and storage, a raw mill system, kiln system, clinker handling, finish grinding operations, cement handling, loading, and bagging operations, and coal handling and grinding operations.

The kiln is presently permitted to produce 2,650 tons per day of clinker, 800,000 tons per year, with a peak hourly clinker production limit of 115 tons per hour (0010087-006-AC).

Fuels fired in the pyroprocessing system (kiln and precalciner) are presently limited to coal, whole tires, "unused No. 2" fuel oil, and propane with a total maximum heat input of 364 MMBtu/hr. The sulfur content of the coal is currently limited to 1.25 percent by weight.

PROJECT

The project as requested is to replace the main kiln burner and allow the use of natural gas, petroleum coke (up to 40 percent of the total kiln heat input) and fly ash (up to 5 percent of the total kiln heat input) as fuel. The project is also to raise the coal sulfur limit of 1.25 percent to 1.75 percent. Following is the description of the emission units affected by the modification:

ID No.	Emission Unit Description
003	Kiln system. The kiln system (or pyroprocessing system) includes the 156.5 foot kiln, a four-stage preheater tower, a 25,300 cubic foot multi-stage combustion (MSC) calciner, a tire feed system, two coal burners and ancillary equipment. Particulate emissions are controlled by an electrostatic precipitator.
007	Coal handling and Grinding. The coal handling and grinding operation includes the coal and petroleum coke mill (S-17) , and the pulverized coal, petroleum coke, and fly ash storage bin (S-21) . Fugitive emissions from the mill and storage bin are controlled by fabric filters <i>{Description changed to reflect additional authorized solid fuels }</i>

REGULATORY CLASSIFICATION

Regulatory classification and applicable requirements are listed in the applicable Title V Operation Permit and the previously-issued construction permit.

Title III HAPS: This facility has the potential to emit 10 tons per year or more of any one hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants, and is therefore considered a major source of hazardous air pollutants.

Title V: This facility emits or has the potential to emit more than 100 tons per year of carbon monoxide (CO), and nitrogen oxides (NO_x) and is therefore a Title V major source of air pollutants.

PSD: The project is located in an area designated as "attainment", "maintenance", or "unclassifiable" for each pollutant subject to a National Ambient Air Quality Standard. The facility is considered a "portland cement plant", which is one of the 28 Prevention of Significant Deterioration (PSD) source categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year. Therefore, the facility is classified as a PSD-major source of air pollution with respect to Rule 62-212.400 F.A.C., PSD.

NSPS: This facility is subject to 40 CFR 60, Subpart OOO (New Source Performance Standards For Nonmetallic Mineral Processing Plants) adopted and incorporated by reference in Rule 62-204.800, F.A.C.

SECTION I. FACILITY INFORMATION

This facility is subject to 40 CFR 60, Subparts A, F and Y (Standards of Performance for New Stationary Sources – General Provisions, Standards of Performance for Portland Cement Plants and Standards of Performance for Coal Preparation Plants) adopted and incorporated by reference in Rule 62-204.800, F.A.C. Certain requirements from Subpart F are replaced by requirements from 40 CFR 63, Subpart LLL.

NESHAP: This facility is subject to the "Existing Major Source" provisions of 40 CFR 63 Subparts A and LLL (National Emission Standards for Hazardous Air Pollutants – General Provisions; and National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry).

RELEVANT DOCUMENTS

- Original Air Construction Permit AC01-267311 (renumbered 0010087-001-AC) issued in December 1996 (as amended in August 2001). Also known as PSD-FL-228.
- Construction permit modification (PSD-FL-228B and 0010087-004-AC) issued on August 20, 2001, to extend the permit expiration date to December 31, 2001, install VOC monitor, and install multi-stage combustion (MSC) calciner.
- Current Title V Operation Permit 0010087-002-AV issued January 11, 2002.
- Construction Permit modification (PSD –FL-228C and 0010087-006-AC) issued on December 11, 2002.
- Application submitted by Florida Rock, received May 9, 2005.
- Report of Emission Tests submitted by Florida Rock, received on May 24, 2005.
- Revised application submitted by Florida Rock, received June 20, 2005.
- Application submitted by Florida Rock, received July 29, 2005.
- Technical Evaluation and Preliminary Determination issued on September 7, 2005.

SECTION II. ADMINISTRATIVE REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. **Permitting Authority:** All documents related to applications for permits to construct, modify or operate this emissions unit shall be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection ("Department"), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number 850/488-0114. Copies of these documents shall be submitted to the Compliance Authority.
2. **Compliance Authority:** All documents related to compliance activities such as reports, tests, and notifications should be submitted to the Northeast District Office at 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7590. The phone number is 904/807-3300 and the fax number is 904/448-4363.
3. **General Conditions:** The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403, F.S. [Rule 62-4.160, F.A.C.]
4. **Applicable Regulations, Forms and Application Procedures:** Unless otherwise indicated in this permit, the construction and operation of this project shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
5. **Permit Expiration:** For good cause, the permittee may request that this air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, and 62-210.300(1), F.A.C.]
6. **New or Additional Conditions:** For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
7. **Modifications:** No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]
8. **Title V Permit:** This permit authorizes construction of the proposed project and initial operation to determine compliance with Department rules. Upon completion of construction of this project, a Title V operation permit revision is required for regular operation of the new equipment. The permittee shall apply for a revised Title V operation permit prior to expiration of this permit. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

EU 003. KILN SYSTEM

This section of the permit addresses the following emissions unit:

ID No.	Emission Unit Description
003	Kiln system. The kiln system (or pyroprocessing system) includes the 156.5 foot kiln, a four-stage preheater tower, a 25,300 cubic foot multi-stage combustion (MSC) calciner, a tire feed system, two coal burners and ancillary equipment. Particulate emissions are controlled by an electrostatic precipitator.

ADMINISTRATIVE REQUIREMENTS

Previous Permit Conditions: This permit authorizes the replacement of the main kiln burner and the use of natural gas, petroleum coke and fly ash as fuel. This permit also authorizes the use of up to 1.75 percent sulfur coal. The following conditions are in addition to or replace those of the previous air construction permits. Unless otherwise specified, the emissions unit remains subject to all applicable conditions from previous air construction permits. [Rule 62-4.070(3), F.A.C.]

CONSTRUCTION ACTIVITIES

Fly Ash and Petroleum Coke Use in Kiln and Calciner: The permittee is authorized to upgrade and install equipment necessary to store, convey, grind, combine, and introduce petroleum coke and fly ash together with coal into the kiln and calciner. [Application]

Coal Sulfur Increase: No physical construction activities will be conducted in association with an increase in coal sulfur content. [Application]

Natural Gas: The permittee is authorized to construct the on-site portion of a nominal 6-inch natural gas pipeline and to connect natural gas to various process points. On-site construction will be conducted from the Northwest corner of the site and will be buried until it reaches the raw mill building. [Application]

SPECIFIC CONDITIONS

1. Fuels fired in the pyroprocessing system (kiln and calciner) shall not exceed a total maximum heat input of 364 MMBtu/hr and shall consist only of coal, (usage rate shall not exceed 14.0 TPH), whole tires, propane, **natural gas, petroleum coke, fly ash,** and unused No. 2 fuel oil which may also be fired in the Raw Mill Air Heater. All fuel usage shall be in compliance with the following limits and conditions:
[Rule 62-210.200, F.A.C. (Definition, Potential to Emit)]

{Permitting Note: The above condition authorizes fuels (bolded) in addition to the fuel slate previously authorized in Condition 4 of Permit 0010087-001-AC as amended by Permit 0010087-004-AC.}

- a. The maximum sulfur content of the coal fired in the pyroprocessing system shall not exceed 1.75% sulfur, by weight. The coal usage rate shall be determined using ASTM Method D-2234, D-3173, D-3176, D-3177 or D-4239.

{Permitting Note: The above condition authorizes use of coal with a greater maximum allowable sulfur content than previously authorized (1.25 % sulfur by weight) by Condition 4.a. of Permit 0010087-001-AC.}

- b. Whole tires may be used as an alternate fuel. Such tires shall be fed into the kiln system at the transition section between the base of the precalciner and the point where gases exit the kiln. The tire feeder mechanism shall have a double airlock, vertical and horizontal guillotine gates, and a ram. The permitted feed rate shall not exceed 109.2 MMBtu/hr (30% of total kiln fuel input) or 4.2 TPH (approximately 400 tires per hour) and 36.792 TPY. Before initiating tire firing, the gases exiting the

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

EU 003. KILN SYSTEM

kiln ahead of the calciner burner shall be maintained at a minimum of 1,440 degrees F for at least one hour.

{Permitting Note: No change. Repetition of Condition 4.b. of Permit 0010087-001-AC}

- c. No. 2 fuel oil fired shall not exceed a maximum sulfur content of 0.05% by weight (certified by fuel supplier) and usage shall not exceed 2,486,000 gallons per year for the Raw Mill Air Heater and 125,000 gallons per year for kiln startup.

{Permitting Note: No change. Repetition of Condition 4.c. of Permit 0010087-001-AC}

- d. The total of mercury compounds (as Hg) in all materials and fuel kiln system may not exceed 200 pounds per year. FRI will demonstrate compliance with this condition through monthly sampling and analysis of the raw mill feed. **coal, petroleum coke, fly ash, and tires.**

{Permitting Note: The above condition adds the additional authorized fuels (bolded) to the monthly sampling and analysis requirement. Mercury in Natural gas is approximately nil.}

- e. Petroleum coke may be used as a fuel. The permitted petroleum coke feed rate shall exceed neither 91 MMBtu/hr nor 25% percent of total kiln heat input.

{Permitting Note: New Condition}

- f. Fly ash may be used as a fuel. The permitted fly ash feed rate shall exceed neither 19 MMBtu nor 5% of total kiln heat input.

{Permitting Note: New Condition}

- g. Natural gas fired shall not exceed 364 MMBtu/hr.

{Permitting Note: New Condition}

2. CO in-stack emission compliance testing shall be performed on a quarterly basis using EPA Method 10. The quarterly CO test reports shall be filed with the Department in accordance with Rule 62-297.310(8), F.A.C.

{Permitting Note: The above new condition increases the frequency of the manual stack testing required for determination of compliance with the CO emission limits, and specifies method and reporting requirements.}

3. The manual stack tests required by Condition 2 above and by Permit AC01-267311 (renumbered 0010087-AC) and by the current Title V Operation Permit 0010087-009-AV shall be conducted while firing **both primary a representative mixture of fuels (0 to 100% coal, 0 to 25% petroleum coke, 0 to 30% tires, and 0 to 5% fly ash) at permitted capacity (70% coal and 30% tires)**, and while all continuous monitoring systems are functioning properly, and with all process units are operating at their permitted capacity. Permitted capacity is defined as 90-100% of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the units may be tested at less than 90% of the maximum operating rate allowed by the permit. In this case, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the units are so limited, then operation at higher capacities (with prior notification provided to the Department) is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.310(2)(b), F.A.C.]

If the kiln is tested while firing less than 25% petroleum coke, subsequent operation is limited to 110% the percentage of petroleum coke fired during the test, not to exceed 25% of the total kiln heat input. Once the kiln is so limited, then operation at a greater petroleum coke firing rate, with prior

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

EU 003. KILN SYSTEM

notification provided to the Department, is allowed for not more than 15 consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit.

If the kiln is tested while firing less than 5% fly ash, subsequent operation is limited to 110% the percentage of fly ash fired during the test, not to exceed 5% of the total kiln heat input. Once the kiln is so limited, then operation at a greater fly ash firing rate, with prior notification provided to the Department, is allowed for not more than 15 consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit.

{Permitting Note: The above condition (requirements bolded) adds the manual stack testing requirements and maximum firing rates for the additional fuels. For comparison, refer to the last paragraph of Condition 6 of Permit 0010087-001-AC.}

4. An operating log shall be established and maintained for the weight of tires fired. The log shall include the daily tire usage, a monthly running total of the tire usage, and a cumulative annual running total to ensure that the annual limit is not exceeded. The log shall be maintained on file for at least five (5) years and shall be made available to the Department upon request. Records of the quantity and analysis of coal, **petroleum coke, fly ash, natural gas, propane** and fuel oil consumed and invoices for all fuel purchases along with logs for all raw materials and products shall be kept for a minimum of 5 years. Periods of startup, shutdown, and process malfunctions shall be noted on the same logs used for tires.
[Rule 62-210.200 F.A.C.(Definitions, Potential-to-Emit)]

{Permitting Note: The above condition adds the additional authorized fuels (bolded) to the fuel quantity and quality record keeping requirements required by Condition 7 of Permit 0010087-001-AC as amended by Permit 0010087-004-AC.}

SECTION IV. EMISSIONS UNIT SPECIFIC CONDITIONS

EU 007. COAL HANDLING AND GRINDING

This section of the permit addresses the following emissions unit:

ID No.	Emission Unit Description
007	Coal handling and Grinding. The coal handling and grinding operation includes the coal and petroleum coke (S-17) , and the pulverized coal. petroleum coke, and fly ash storage bin (S-21). Fugitive emissions from the mill and storage bin are controlled by fabric filters. <i>{Description reflects additional authorized solid fuels.}</i>

1. The provisions of Rule 62-296.320(4)(c) F.A.C. shall apply to all sources of unconfined particulate 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. FRI shall follow the following protocol for the unconfined particulate matter (UPM, Fugitive 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
- **Petroleum Coke**
- **Fly Ash**

{Permitting Note: The above condition adds the additional authorized solid fuels (bolded) to the material handling activities covered by the fugitive emissions protocol requirements of Condition 10 of Permit 0010087-001-AC.}

2. Particulate emissions from coal, **petroleum coke, and fly ash** handling facilities shall be minimized by following the procedures listed in specific condition No. 10 and below: [Rule 62-296.320(4)(c), F.A.C.]
- a. All conveyers and transfer points shall be enclosed to preclude particulate emissions (except those directly associated with coal/**petroleum coke/fly ash** stacking/reclaiming).
 - b. Coal, **petroleum coke, and fly ash** storage piles shall be shaped, compacted and oriented to minimize wind erosion.

{Permitting Note: The above condition includes the petroleum coke and fly ash (bolded) handling facilities in the fugitive emissions control requirements of Condition 11 of Permit 0010087-001-AC.}

APPENDIX GC

CONSTRUCTION PERMIT GENERAL CONDITIONS [RULE 62-4.160, F.A.C.]

- G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
- (a) Have access to and copy and records that must be kept under the conditions of the permit;
 - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
 - (c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

- G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- (a) A description of and cause of non-compliance; and
 - (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

APPENDIX GC

CONSTRUCTION PERMIT GENERAL CONDITIONS [RULE 62-4.160, F.A.C.]

The permittee shall be responsible for any and all damages, which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

- G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
 - (a) Determination of Best Available Control Technology (not applicable to project);
 - (b) Determination of Prevention of Significant Deterioration (not applicable to project); and
 - (c) Compliance with New Source Performance Standards (not applicable to project).
- G.14 The permittee shall comply with the following:
 - (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - (c) Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law, which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

TABLE I

ALLOWABLE OPACITY LIMITATIONS

Stack #	Description	Grain Loading	OPACITY
Emission Unit 1: Raw Material Process Rate = 1,331,000 TPY Dry Feed			
Fugitive	Material Processing		10
Fugitive	Handling and Storage		10
Fugitive	Crusher		15
Emission Unit 2: Raw Mill System Process Rate = 255 TPH Recycle Dust plus Raw Meal (peak)			
E-28	Recycle dust + raw meal to homogenization silo	0.01 gr/dscf	5
G-07	Recycle dust + raw meal to homogenization silo	0.01 gr/dscf	5
H-08	Raw meal + recycle dust to preheater	0.01 gr/dscf	5
Emission Unit 3: Kiln System Process Rate = 364 MMBTU/hr heat input			
E-21	Kiln Operations (ESP)		10
E-21	In-process fuel: coal		10
E-21	In-process fuel: petroleum coke		10
E-21	In-process fuel: fly ash		10
E-21	In-process fuel: natural gas		
E-21	In-process fuel: tires		10
	Petroleum coke (25% of total heat input), tires (30% of total heat input), fly ash (5% of total heat input)		
Emission Unit 4: Clinker Handling 115 TPH Clinker (peak)			
L-03	Clinker Cooler Discharge and Breaker	0.01 gr/dscf	5
L-06	Clinker into Clinker Silos	0.01 gr/dscf	5
K-15	Clinker Cooler (ESP)		10
Emission Unit 5: Finish Grinding Operations Process Rate = 136 TPH Clinker			
M-08	Clinker to Finish Mill	0.01 gr/dscf	5
N-09	Finish Mill Air Separator	0.01 gr/dscf	5
N-12	Finish Mill	0.01 gr/dscf	5
N-19	Cement Handling in Finish Mill	0.01 gr/dscf	5
Q-25	Cement Storage Silos	0.01 gr/dscf	5
Q-26	Cement Storage Silos	0.01 gr/dscf	5
Emission Unit 6: Cement Handling Process Rate = 500 TPH Cement Unloading			
Q-14	Cement Silo Load-out	0.01 gr/dscf	5
Q-17	Cement Silo Load-out	0.01 gr/dscf	5
Q-21	Cement Silo Load-out	0.01 gr/dscf	5
R-12	Cement Bagging Operation	0.01 gr/dscf	5
Emission Unit 7: Coal Handling and Grinding Process Rate = 14 TPH Pulverized Coal, Petroleum Coke, and Fly Ash			
S-17	Coal and Petroleum Coke Mill	0.01 gr/dscf	5
S-21	Pulverized Coal and Petroleum Coke, and Fly Ash Storage Bin	0.01 gr/dscf	5
Fugitive	Coal, Petroleum Coke, Fly Ash Handling and Storage		5/20

TABLE II
ALLOWABLE EMISSIONS

Pollutant	BACT Emission Limit		Emission Rate*		Basis**
	lb/ton clinker	lb/ton dry feed	lb/hr	ton/yr	
PM (kiln)	0.23	0.14	25.9	94	BACT
PM ₁₀ (kiln)	0.20	0.12	22.1	80	BACT
PM (cooler)	0.14	0.08	15.4	56	BACT
PM ₁₀ (cooler)	0.12	0.07	13.0	47	BACT
SO ₂ (kiln) †	0.16	0.10	17.7	64	BACT
NO _x (kiln)**	2.45	1.50	271	980	BACT
H ₂ SO ₄ (kiln)	0.0025	0.0016	0.25	1	BACT
CO (kiln)	2.50	1.55	276	1000	BACT
VOC (kiln)	0.11	0.075	11.8	43	BACT

Notes:

- * The kiln emission rate includes fuel oil combustion emissions from the raw mill air heater.
- ** Represents revised NO_x limit (30-day rolling average) based on continuous monitoring data.
- + Represents revised SO₂ limit (24-hour rolling average) based on compliance tests and continuous monitoring data.
- ++ BACT values are representative of kiln permitted in 1996 and reflective of as-built configuration and not as a new kiln.

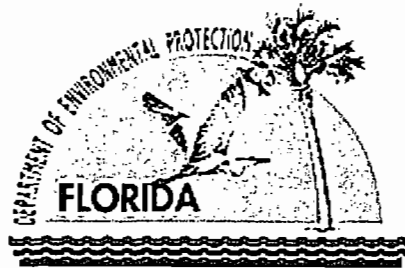
**TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION**

Florida Rock Industries, Inc.
Thompson S. Baker Cement Plant

Portland Cement Manufacturing Facility
Fuel Usage and Fly Ash Projects

Alachua County

DEP File No. 0010087-015-AC



Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation

September 7, 2005

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

I. APPLICATION INFORMATION

APPLICANT NAME AND ADDRESS

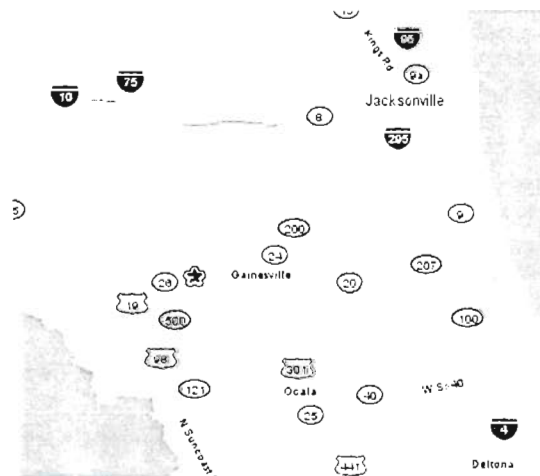
Florida Rock Industries, Inc
4000 NW CR 235
Newberry, Florida 32669
Authorized Representative: Chris Horner, Plant Manager

PROCESSING SCHEDULE

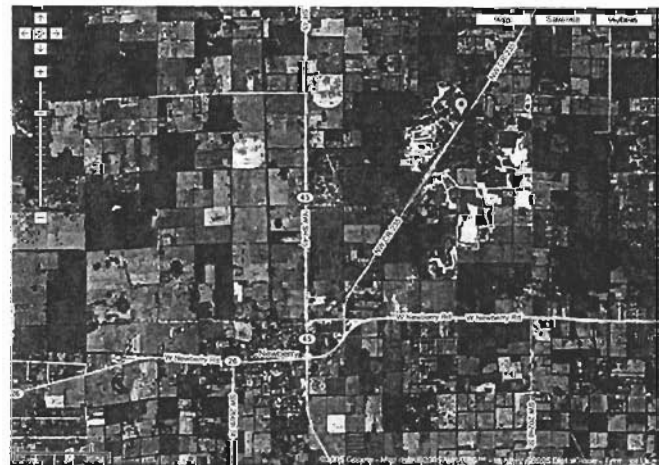
- Received Air Construction Permit Applications for Petcoke and Fly Ash Projects on May 9, 2005;
- Received Report of Emission Tests and Summary of Results on May 24, 2005;
- Received Fuel Analysis Report on June 3, 2005;
- Additional information requested June 7, 2005;
- Received Petcoke and Fly Ash Fueling Trial Fuel Summary Analyses June 3, 2005;
- Received additional information June 13, 2005;
- Received Revised Air Construction Permit application June 20, 2005;
- Received Revised Air Construction Permit application July 14, 2005;
- Received Air Construction Permit Application for Kiln Burner, Natural Gas, and Finishing Mill Projects on July 29, 2005;
- Received additional information August 2, 2005;
- Intent to Issue Air Construction Permit distributed September 7, 2005.

FACILITY DESCRIPTION AND LOCATION

Florida Rock Industries, Inc. (FRI) owns and operates the Thompson S. Baker Cement Plant on Alachua County Road 235, 2.5 miles northeast of Newberry, Alachua County. The plant has a current capacity of 2650 tons of clinker per day. A second kiln was approved in June 2005. The location of the Thompson S. Baker Cement Plant is shown in the figures below. The UTM coordinates of the Florida Rock facility are Zone 17, 346.8 km East and 3287.0 km North.



Location of Newberry



Location of Thompson S. Baker Cement Plant

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

FACILITY CLASSIFICATION CODE (SIC)

Major Group No. 32, Clay, Glass, and Concrete Products
Industry Group No. 324 Cement, Hydraulic
Industry No. 3241 Cement, Hydraulic

REGULATORY CATEGORIES

Regulatory classification and applicable requirements are listed in the Title V Operation Permit and the previously-issued construction permit.

Title III HAPS: The facility has the potential to emit 10 tons per year or more of any one hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants, and is therefore considered a major source of hazardous air pollutants.

Title IV: The facility does not operate any units subject to the Acid Rain provisions of the Clean Air Act.

Title V: The facility is a Title V or "Major Source" of air pollution because the potential emissions of at least one regulated pollutant exceed 100 tons per year or because it is a major source of HAPS. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), and volatile organic compounds (VOC). Rule 62-212.200, Florida Administrative Code (F.A.C.).

PSD: The project is located in an area designated as "attainment", "maintenance", or "unclassifiable" for each pollutant subject to a National Ambient Air Quality Standard. The facility is considered a "portland cement plant", which is one of the 28 Prevention of Significant Deterioration (PSD) source categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year. Therefore, the facility is classified as a PSD-major source of air pollution with respect to Rule 62-212.400 F.A.C., PSD. Per Table 212.400-2, "Regulated Air Pollutants – Significant Emission Rates", any further modifications at the facility resulting in emissions increases greater than 40 TPY of NO_x or SO₂, 7 TPY of sulfuric acid mist (SAM), 25/15 TPY of PM/PM₁₀, 3 TPY of fluorides, 1200 pounds per year (lb/yr) of lead or 200 lb/yr of mercury require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C.

NSPS: This facility is subject to 40 CFR 60, Subparts A, F, Y, and OOO (Standards of Performance for New Stationary Sources – General Provisions, Standards of Performance for Portland Cement Plants, and Standards of Performance for Coal Preparation Plants, and New Source Performance Standards For Nonmetallic Mineral Processing Plants) adopted and incorporated by reference in Rule 62-204.800, F.A.C. Certain requirements from Subpart F are replaced by requirements from 40 CFR 63, Subpart LLL.

NESHAP: This facility is subject to the "Existing Major Source" provisions of 40 CFR 63 Subparts A and LLL (National Emission Standards for Hazardous Air Pollutants – General Provisions; and National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry).

FRI must submit an application to revise the present Title V operation permit to incorporate the conditions of the proposed air construction permit prior to its expiration.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

II. EXISTING FACILITY

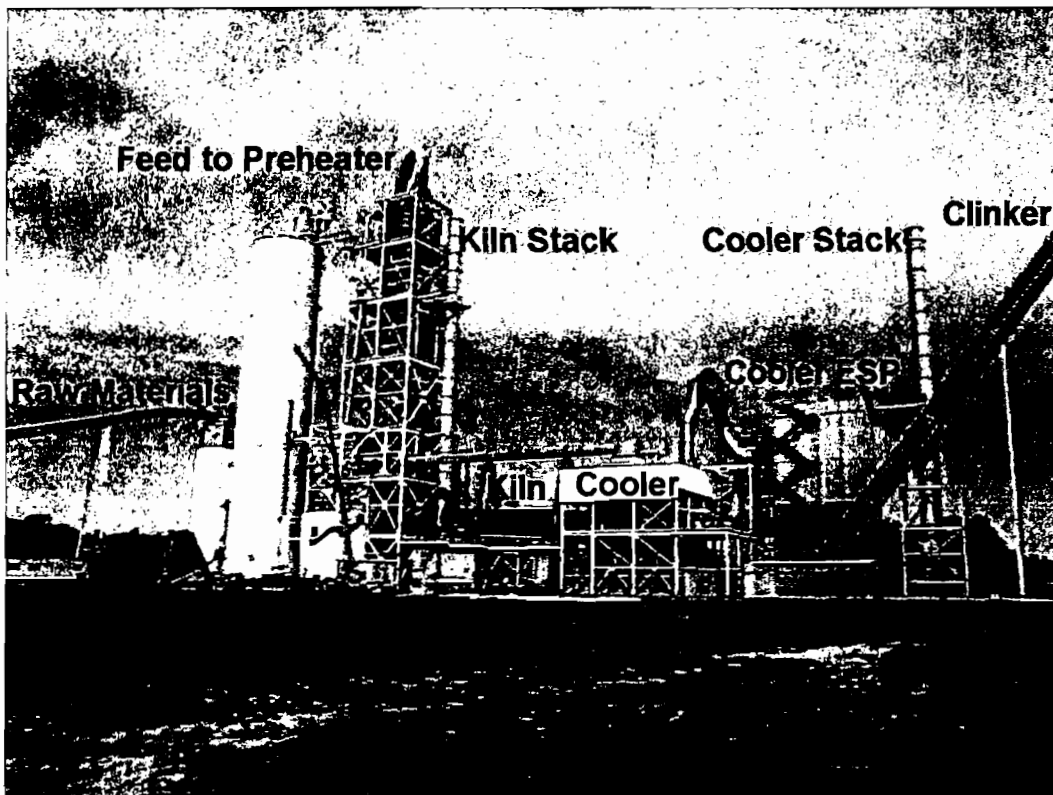
ORIGINAL PROJECT

The Florida Department of Environmental Protection (“Department”) issued a permit to FRI in December 1996 to construct the existing facility. The plant employs the modern dry process technology including a preheater and calciner along with indirect firing. The dry process preheater/calciner (PH/C) kiln is the most fuel-efficient cement pyroprocessing technology currently in use in the United States.

FRI completed construction of the basic plant in late Fall of 1999. The permit was modified in 2001 and 2002 to incorporate the final NO_x control plan, a VOC continuous emission monitoring system (CEMS), final emission limits and final production limits. The plant is presently permitted to make 2650 tons per day (TPD) of clinker with an hourly production rate of 110 TPH (115 TPH peak) and an annual production limit of 800,000 TPY.

The major equipment at the plant includes the PH/C kiln, a clinker cooler, raw mill, finish mill, silos, conveyers, and particulate control/dust collection and recycling equipment. The cement product is stored in silos and is shipped in bags or in bulk by rail or truck.

Following is a photograph of the constructed plant taken in 2001. Some additional components, visible on the ground, are related to a subsequent project to convert the calciner to a multi-stage combustion (MSC) calciner to facilitate NO_x control and tire introduction.



Florida Rock Industries' Cement Plant in Newberry, Florida

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

PRESENT EMISSION LIMITS

The following table lists the present emission limits for the pyroprocessing equipment.

Emissions – Florida Rock Industries, Newberry, Alachua County

Pollutant	Final BACT Emissions Limit	
	lb/ton clinker	TPY ¹
PM (kiln)	0.23	94
PM ₁₀ (kiln)	0.20	80
PM (cooler)	0.14	56
PM ₁₀ (cooler)	0.12	47
SO ₂ (kiln) ²	0.16	64
NO _x (kiln) ³	2.45	980
H ₂ SO ₄ (kiln)	0.0025	1
CO (kiln)	2.5	1000
VOC (kiln) ⁴	0.11	43

Notes:

¹ The kiln emission rate includes fuel oil combustion emissions from the raw mill air heater.

² SO₂ limit is on a 24-hour rolling average based on compliance tests and continuous monitoring data.

³ NO_x limit is on a 30-day rolling average based on continuous monitoring data

⁴ Total hydrocarbons (THC-a conservative estimate of VOC) are measured on a 30-day rolling average by a continuous emission monitoring system (CEMS). VOC tests are conducted annually or as indicated by THC CEMS.

A more complete project description of the requested production increase and final BACT limits was provided in the Technical Evaluation and Preliminary Determination issued for the project in November 2002.

III. APPLICANT REQUEST

No increases in permitted production rates or emissions limitations are requested with this application. Several individual requests were made as follows:

PETROLEUM COKE AND FLY ASH

The Department received an application from FRI on May 9, 2005 requesting the use of petroleum coke (petcoke) and fly ash as additional fuels to the kiln and calciner. The original application requested the use of up to 100 percent petcoke and up to 5 percent fly ash. The application was later revised (application revision, June 20, 2005) to request use of up to 40 percent petcoke. The fly ash request was unchanged.

The application was supported by tests and reports pursuant to DEP Permit No. 0010087-012 that allowed temporary use of petcoke and fly ash as fuels while collecting emission and operational data to assess the effects of these fuels.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

NATURAL GAS

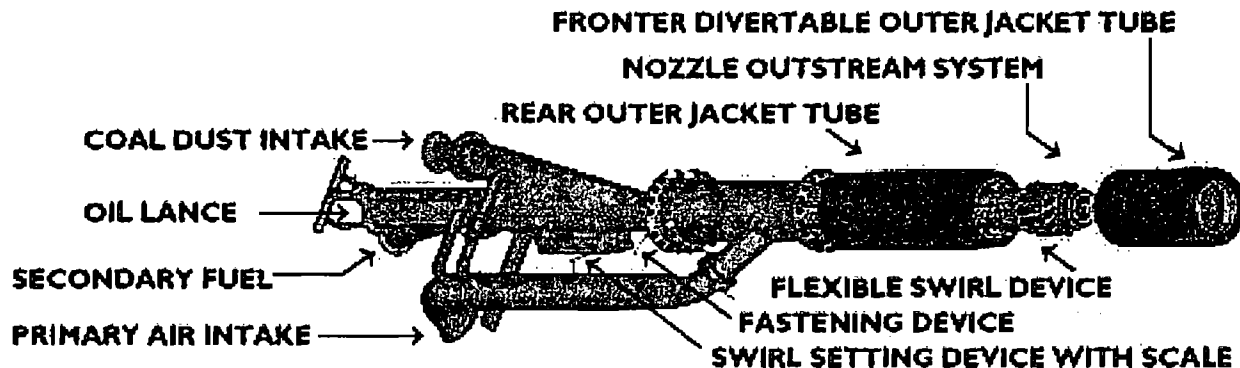
The Department received a subsequent application from FRI on July 29, 2005 requesting the use of up to 100% natural gas in the raw mill air heater, kiln and calciner. This request is being addressed in the current permitting action.

INCREASE IN COAL SULFUR LIMIT

In the revised June 20, 2005 permit application, Florida Rock also included a request to increase the coal sulfur limit from 1.25 percent to 1.75 percent by weight. FRI points out that the kiln is equipped with a CEMS for compliance with the SO₂ limit and has one of the lowest (if not the lowest) SO₂ limits in the country.

ROTARY KILN BURNER REPLACEMENT/UPGRADE

Included in the permit application received on July 29, 2005 was a request to replace the original Polysius model burner on the rotary kiln. The new burner will be a Unitherm Cemcon Mono Airduct System (MAS) rotary kiln burner. The flexible swirl device technology gives the operator further ability to adjust the size and shape of the main kiln flame. All primary air is introduced in the outer channel and then through the swirl nozzles to maximize momentum and to cool the burner jacket.



Unitherm Cemcon Mono Airduct System Rotary Kiln Burner (Source: www.unitherm.co.at)

Unitherm provided FRI with a guarantee that the burner will not increase NO_x emissions at the kiln inlet beyond their present values and provided a statement that they expect reduced NO_x emissions.¹ Basically the new kiln burner reduces kiln thermal NO_x entering the calciner.

IV. PETROLEUM COKE AND FLY ASH TRIALS PROJECT

The Thompson S. Baker Cement Plant was originally permitted to combust only coal, whole tires, and No. 2 fuel oil as fuels to the pyroprocessing system. No. 2 fuel oil is limited for use in the raw mill air heater, and during kiln startups. The use of propane has since been added, and is limited to startup in lieu of tires in the first stage of the multi-stage combustor.

In October 2004 FRI submitted a construction permit application requesting authorization to combust petcoke and fly ash in the kiln and calciner during a limited trial period. The requested trial was designed to evaluate the feasibility of utilizing petcoke and fly ash as fuels, in addition to coal. FRI hopes to reduce the facility's dependence on coal by co-firing high-carbon fly ash and petroleum coke with the coal in the kiln and calciner. FRI's request did not include changes to any previously permitted emissions or production rates.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

In December 2004, the Department issued a construction permit authorizing FRI to conduct the requested trials, and requiring the assessment of the impacts of the additional fuels on emissions. No emission standards were altered by that permit.

TRIAL DESCRIPTION

Trial burns were conducted, with various mixtures of coal, petcoke, and fly ash being introduced into the kiln and calciner, during a 2-month period beginning in mid February of 2005. During the trial, coal meeting the current sulfur limit of 1.25 percent by weight was utilized. However the blended petcoke/coal/fly ash fuel contained more than 2% sulfur. Details of the testing are summarized below as described in test reports supplied by FRI and their consultant.^{2 3}

High-carbon fly ash was supplied by various Florida electric power plants. The petcoke originated from regional sources such as refineries in other states. No combustion equipment modifications other than adjustments were made to accommodate the additional fuels. Petcoke and fly ash were co-fired utilizing the existing burners and fuel nozzles.

The objectives of the trials, according to FRI, were:

- To demonstrate the technical feasibility of introducing petcoke and high-carbon fly ash with coal in to the kiln and calciner;
- To assess the impact on clinker and cement quality;
- To demonstrate that regulated emissions would not be increased.

The trials were conducted in essentially three phases: Phase I (Petroleum Coke and Coal), Phase II (Fly Ash and Coal), and Phase III (Petroleum Coke, Fly Ash, and Coal). During all phases of testing, continuous data collection of key parameters was required including dry feed material to the preheater, fuel flow, fuel mix, and heat input rates to the kiln, and all CEMS and continuous opacity monitoring (COMS) data. During the trial, tires were burned at rates between 0.4 and 0.9 tons per hour for most of the period.

FRI was required to conduct stack tests for CO, PM, and dioxin/furans to determine compliance with applicable limits during the trial. All emission tests were performed during periods in which the highest achievable proportions of petcoke and fly ash were being fed into the kiln, and production rates were at least 90 percent. Sampling and analysis of all fuels were also required to determine heat values, moisture content, loss-on-ignition values, and nitrogen, sulfur, chloride, ash, petroleum hydrocarbons, ammonia, and carbon content.

Petcoke for the trials was received and stored at the coal storage bin and mixed proportionately with the coal before entering the coal mill for grinding. "Delayed" petcoke, which typically contains about 8 percent sulfur, was used for the trial. According to FRI, petcoke is harder to grind and is characterized by reduced reactivity and ignition when compared to regular coal. The coal mill was adjusted to produce a finer fuel to compensate for the differences.

Fly ash was held in storage vessels and fed to a hopper via a variable-speed rotary feeder that directly emptied into the coal mill. According to FRI, the quality of the fly ash declined during the course of the trial compared with the samples examined prior to the test program.⁴

Following is a brief description of each phase of the trial:

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Phase I - Petroleum Coke and Coal

During Phase I, petcoke was to be continually fed into the kiln and calciner along with the coal, in increasingly larger proportions until a maximum rate of approximately 30 percent of the total heat input was achieved. At several points during Phase I, petcoke fueling was interrupted due to plant shutdowns unrelated to fuel type, and late truck deliveries.

Phase II - Fly Ash and Coal

During Phase II of the trial, the plan was to continually feed fly ash into the kiln and calciner along with the coal, in increasingly larger proportions until a maximum rate of approximately 11 percent of the total heat input was achieved. However, because of the poor quality of the fly ash obtained during the trial, maximum proportions achieved were much lower than expected. Also, the duration of fly ash and coal only firing was limited. FRI reported a total of nine hours while firing only fly ash and coal.

Phase III - Petroleum Coke, Fly ash, and Coal

Mixtures of petcoke, fly ash, and coal were fed into the kiln and calciner during Phase III of the trial. Petcoke was first introduced and maintained at approximately 30 percent of total heat input. Fly ash was then added in varying amounts. As in Phase II above, the addition of fly ash was less than expected. FRI reports that the kiln-burner pipe was adjusted slightly during this phase in order to improve conditions for ignition.

TRIAL RESULTS

Test results for the trial period were submitted to the Department as required by permit. During the testing program, FRI was required to continually record all process data including dry material feed to the preheater, clinker production, and Portland cement production.

Continuous readings of NO_x, SO₂, total hydrocarbons (THC), and opacity were recorded using the existing CEMS and COMS at the facility. Emission rates were reported in pounds per hour and were also related to preheater feed and clinker production. In addition to CEMS data during the trial period, the Department also requested continuous readings of NO_x, SO₂, and THC for one month prior to and one month following the test period for comparison.

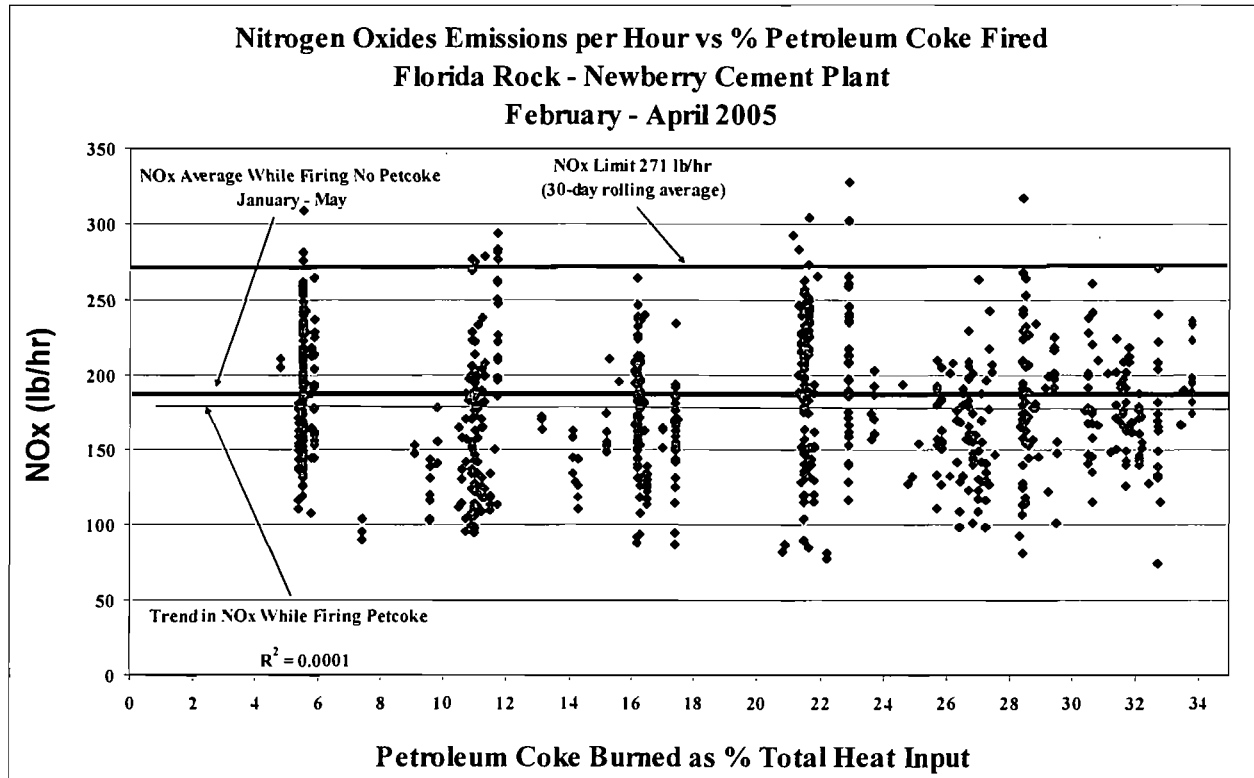
Stack tests were required for PM, CO, and dioxin/furans during the trials. Testing for these pollutants was conducted in April 2005 by Koogler and Associates. Emissions were recorded during the tests and are included in the Koogler report referenced above.

Sampling and analysis of all fuels utilized during the trials was required. Proportions of coal, petcoke, and fly ash as percent total heat input were recorded hourly. The maximum petcoke proportion obtained during the trial was 33.8 percent. One hourly reading of 4.9 percent fly ash was recorded. The second highest proportion of fly ash was 3.6 percent and the typical range was between 2.4 and 3.1 percent. Following are discussions of emissions of the various pollutants related to fuel content.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Nitrogen Oxides (NO_x)

The following graph includes all valid hourly NO_x readings during the trial in which some percentage of petcoke was being burned. Because only small amounts of fly ash were burned for short durations, these data also include periods during which both fly ash and petcoke were being added. The mean NO_x value while burning petcoke was 178 lb/hr. The present limit is 271 lb/hr on a 30-day rolling average. It can be seen that compliance with this limit was demonstrated throughout the trial period as very few single hourly readings exceeded the 30-day limit.



The average NO_x value when firing no petcoke was 188 lb/hr. This includes all CEMS data one month prior to, during, and one month following the trial. When qualitative comparisons are made between the two data sets (with petcoke, without petcoke) it appears that NO_x emissions are approximately the same in either case. A statistical analysis performed on the data, however, shows that the two samples are actually different with 95 percent confidence. In fact, the mean of NO_x emissions measurements when burning petcoke is less than the mean when not burning petcoke. Comparisons were made with different levels of petcoke mixtures which yielded similar results.

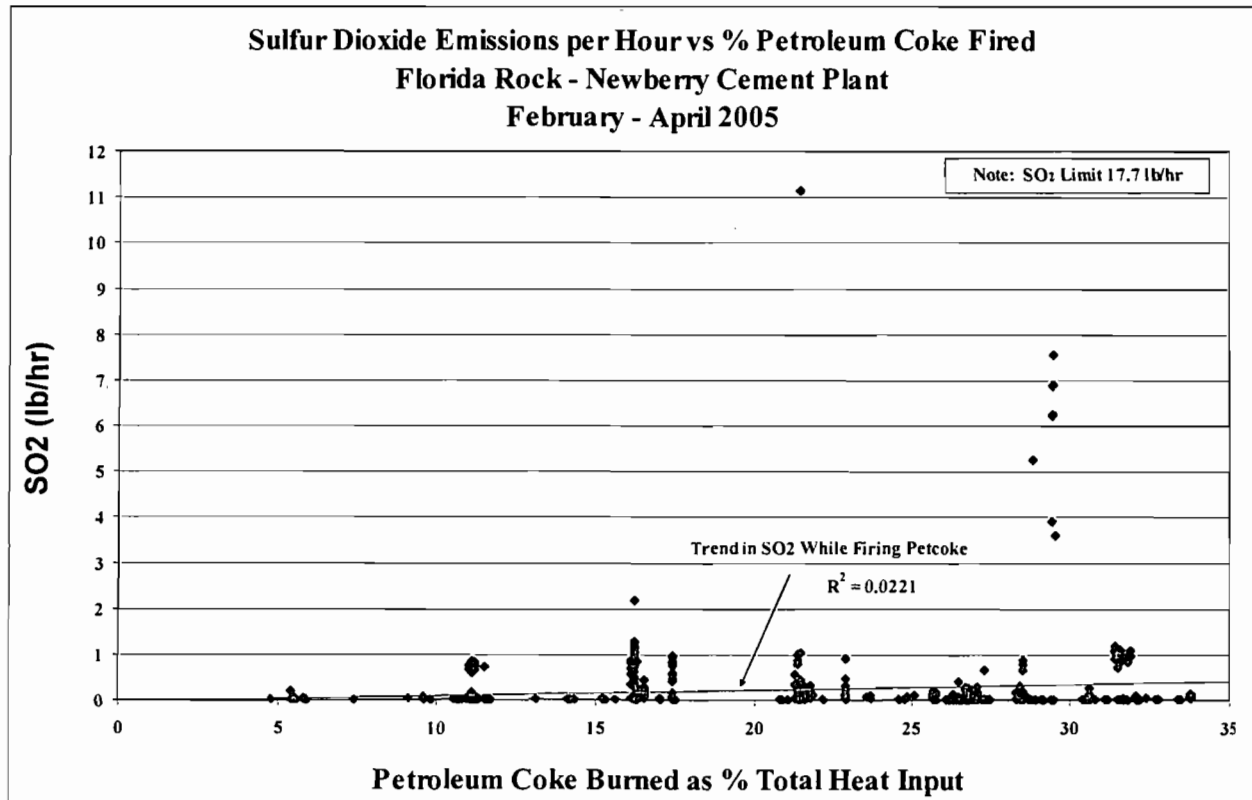
It should also be noted that there seems to be no correlation between the amounts of petcoke being combusted and emissions of NO_x. In other words, NO_x does not increase or decrease with an increase or decrease in petcoke (See graph trend line, Coefficient of Determination, R^2 value = 0.0001).

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Sulfur Dioxide (SO₂)

Following is a graph of all valid hourly SO₂ data while firing petcoke (including periods during which fly ash was used). It can be seen that all hourly readings were well within the current permitted limit of 17.7 lb/hr. The mean value of all SO₂ readings while firing petcoke was 0.19 lb/hr which is slightly higher than the average of 0.11 lb/hr while firing no petcoke. The increase was statistically significant but minimal compared with the applicable limit. The increase, if petcoke were used the entire year, equates to less than 0.5 tons of SO₂.

To summarize, SO₂ emissions never approached the very low limit. There is a single reading of 11.14 lb/hr. As seen on the chart, most readings were less than 2.0 lb/hr.



In a qualitative sense, it appears that at the highest petcoke usage rates, SO₂ emissions are occasionally greater compared to lower usage rates. It was not possible to establish a correlation between petcoke usage and SO₂ emissions. The trend line developed had a Coefficient of Determination (R^2) that was only equal to 0.0221.

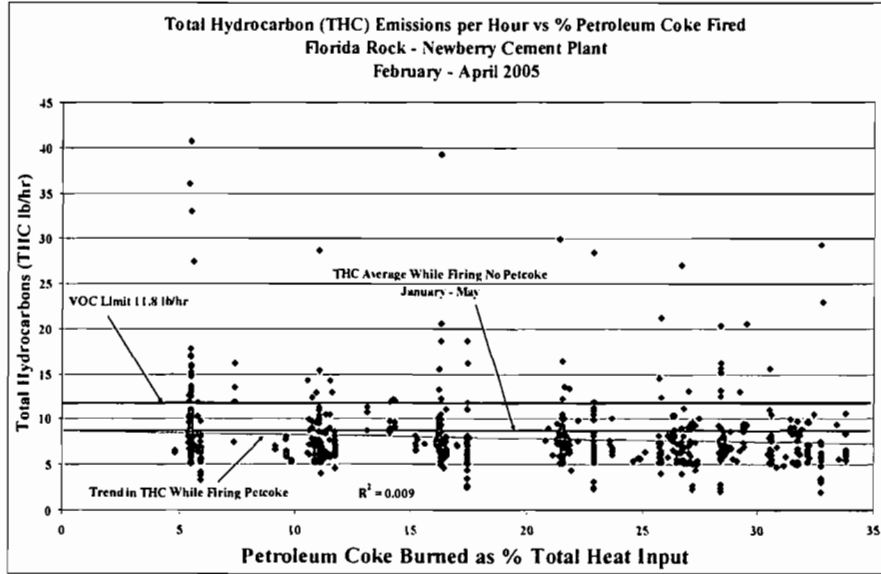
Volatile Organic Compounds (VOC)

FRI operates a CEMS to measure THC (as propane) to provide reasonable assurance that the facility's VOC limit is being met on a continual basis. The THC values measured by the CEMS include methane. They provide conservative (greater than actual) estimates of VOC emissions (that do not by definition include methane). FRI is required to report daily and 30-day averages of THC emissions to the district office on a quarterly basis.

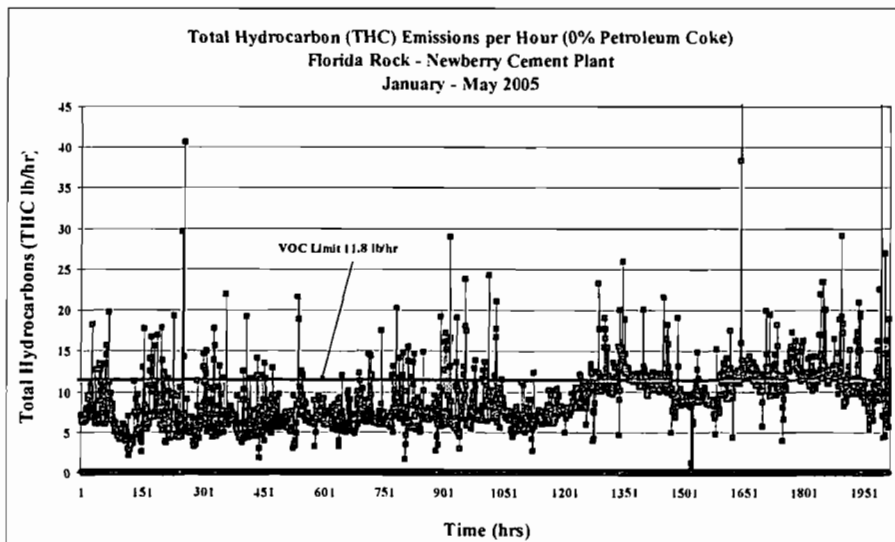
TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Hourly THC emissions while firing petcoke (including periods while also using fly ash) are shown in the following graph. The mean hourly THC value measured when co-firing with petcoke was 7.9 lb/hr and less than the VOC limit of 11.8 lb/hr. The mean THC value while firing no petcoke was 8.9 lb/hr. A comparison of the two data sets confirms that there is a statistically significant difference between THC measurements while firing and not firing petcoke.

The mean THC readings while firing petcoke were 1 lb/hr less than the mean THC readings while not firing petcoke. Generally petcoke has less volatile components than coal. Emissions of THC do not appear to be significantly affected by the degree to which the petcoke being burned was varied when considering the small Coefficient of Determination (R^2) value = 0.009.



Typical hourly readings of THC while not burning petcoke or fly ash are shown in the graph below. Qualitatively speaking there appears to have been some increases in THC emissions over time when petcoke was not used. The reasons are unknown, but could be related to variations in raw materials and their regular fuels, such as coal and tires.



TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Carbon Monoxide (CO)

Carbon monoxide testing was conducted on April 12, 2005. During the CO test, petcoke and fly ash were continually fed into the kiln and calciner along with the coal at rates of approximately 30 and 2.5 percent of the total heat input respectively. This is representative of the maximum sustainable rates achieved for petcoke and fly ash during the trial period. Waste tire derived fuel (WTDF) made up three percent of the total heat input. Tests were conducted at 92 percent of full production capacity.

Results of the recent CO tests while using petcoke and fly ash as fuel are compared with tests from the previous two years (when petcoke and fly ash were not used) in the table below. Each test consists of three runs. Qualitatively it appears that there was an increase in CO emissions when co-firing with petcoke and fly ash. However, there are too few runs to conduct a quantitative test and then reject the null hypothesis that emissions are equal.

Year	Test Result (lb CO/Ton of Clinker)	Limit (lb CO/Ton of Clinker)
2005 (petcoke, fly ash)	2.46	2.5
2004 (no petcoke, no fly ash)	2.23	2.5
2003 (no petcoke, no fly ash)	2.03	2.5

Other factors being equal, increases in CO emissions are expected when using petcoke because it contains less volatile matter and takes longer to burn out in the calciner and duct work leading to the bottom cyclone. The reported results indicate that the CO emission limit of 2.5 lb/ton of clinker was met, with no room to spare, when using 30% petcoke at 92% of permitted production capacity.

Other Pollutants (PM, Dioxin/Furan)

Particulate matter testing was conducted on April 6, 2005. During the testing, petcoke and fly ash made up approximately 27 and 2.7 percent, respectively, of the total heat input. WTDF made up 0.8 to 0.9 percent of the total heat input. The PM emissions ranged from 0.015 to 0.034 pounds per ton of preheater feed. Average PM emissions were 0.022 lb per ton of feed.

Dioxin/Furan emissions testing was conducted April 6 through April 8, 2005. Emissions were sampled with both the raw-mill operating and with the raw mill off. During these tests, petcoke input remained steady at approximately 27 percent total heat input. Fly ash input was 3 percent with the raw mill operating and 2.5 percent with the raw mill off. Waste tires were input at a rate of 9 percent with the raw mill operating and 7 percent with the raw mill off.

All tests conducted on the kiln/raw mill system indicated compliance by a substantial margin with applicable permitted limits. A summary of results are listed in the table below.

Pollutant	Permit Limit	Result
Dioxin/Furan (Raw Mill Up)	0.4 ng TEQ/dscm @ 7% O ₂	0.045 ng TEQ/dscm @ 7% O ₂
Dioxin/Furan (Raw Mill Down)	0.2 ng TEQ/dscm @ 7% O ₂	0.015 ng TEQ/dscm @ 7% O ₂
PM (Raw Mill Up)	0.14 lb/ton dry feed	0.022 lb/ton feed

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

V. POTENTIAL EFFECTS OF PROJECTS ON EMISSIONS

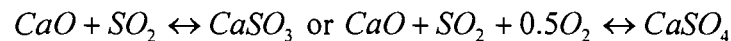
SULFUR DIOXIDE

In a foregoing section, it was demonstrated that petcoke and fly ash can be co-fired with 1.25 percent sulfur coal without meaningfully NO_x, SO₂ and VOC. The petcoke used in the trials contained significantly more sulfur (5-7%) than the permitted coal sulfur limit. The result is that as a practical matter, FRI has demonstrated that fuel sulfur can be increased with little or no effect on SO₂ emissions.

The technical underpinning follows:

Sulfur dioxide (SO₂) formed by burning fuel in the main kiln burner can be efficiently scrubbed out by reactions with alkali species (Na and K) or with CaO in the kiln to form stable sulfate compounds that are incorporated into the clinker.

Kiln SO₂ reaching the calciner and all SO₂ from burning fuel in the calciner are completely scrubbed out at the temperatures prevailing in the calciner as follows:⁵



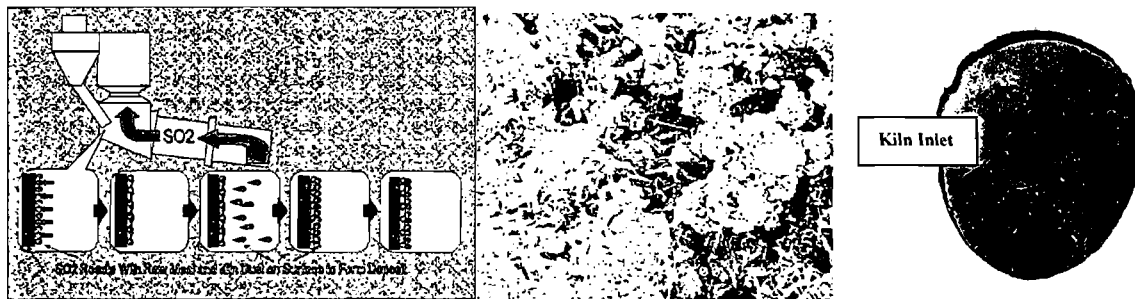
At 1,045°C, the formation and decomposition reactions for CaSO₄ are at equilibrium at normal excess oxygen levels. At higher temperatures, CaSO₄ will tend to decompose. As raw materials move through the high temperature regime in the kiln, the CaSO₄ can break down per the above reaction releasing the SO₂ or it can fuse/react with the alkali sulfates and other species to form stable compounds that depart with the clinker.

The concentrations and flows of SO₂ build up within the internal cycle of the kiln and calciner. One of the key design and operational objectives is to manage this cycle so that solid sulfur containing compounds do not form coatings and blockages. According to one author, "NO_x abatement rates of up to 50 percent can generally be achieved with staged combustion. However the processes are critical with high circulating sulfur and alkali systems in conjunction with the reducing mode of operation and the operation can be seriously affected by the formation of coating".⁶

If there is already insufficient alkali to balance the sulfur in the system, the recirculating flow of SO₂ is greater. The diagram and the microscopic photo in the following figure are from a Taiheiyo Cement presentation and depict the formation of coating that might result under such circumstances even if reducing conditions are not encountered in the calciner.⁷ The second photo is from an actual kiln inlet at a cement plant in Florida. Reducing conditions do not necessarily increase SO₂ emissions but can create considerable process problems due to sulfate deposits at the kiln inlet, in the riser duct, and cyclones.⁸ Creating a higher temperature near the kiln inlet to promote NO_x reduction would tend to release SO₂ per the above reactions or could cause sintering of the coatings. Also it could cause or aggravate coating tendencies in the riser and lower cyclones.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Coating Formation near Kiln Inlet and Microscope Photo. Nearly Choked Kiln Inlet.



Generally speaking, raw materials in Florida are low in both alkali and sulfur. Because of sulfur in the coal, there can easily be an imbalance between the two species. FRI can partially cope with coating problems by use of air cannon and cardox charges to free plugs and blockages caused by such coatings. They also employ use of raw material supplements (e.g. feldspar) that contain Na and K to retain the sulfur in the clinker as described above.

As a practical matter, high sulfur fuel use causes operational problems well before it causes substantial SO₂ emissions.

The Department concludes that use of petcoke, fly ash, and higher sulfur coal will not substantially affect SO₂ emissions. FRI did not test using natural gas, but it is obvious that its use would alleviate tendencies towards the described operational problems or conceivable SO₂ emissions. Use of natural gas will also reduce the amount of SO₂ from the air heater used to dry raw materials. Presently, No. 2 fuel oil is used for this purpose. Such SO₂ gets scrubbed by moist limestone in the raw mill, though not to the same degree as the scrubbing of kiln and calciner fuel emissions that occurs in the calciner.

The new burner also provides for better heat control near the kiln outlet and would probably reduce the tendency for evaporation of sulfur compounds and aggravation of the kiln internal sulfur cycle.

NITROGEN OXIDES

As previously discussed, use of petcoke and fly ash resulted in a small but statistically significant reduction in NO_x. The manufacturer's guarantee provides reasonable assurance that the new kiln burner will not cause increases in NO_x emissions. Use of natural gas in the main kiln burner can cause NO_x emissions because it can increase flame temperature. On the other hand, natural gas use in the calciner will produce less fuel NO_x in the calciner. There is also the possibility of using some natural gas as reburn fuel near the kiln inlet to reduce thermal NO_x formed in the kiln.

On balance, the Department expects no substantial changes in NO_x emissions due to the described projects.

CARBON MONOXIDE

CO stack tests were conducted while using petcoke (30%) and fly ash and operating at 92% of the permitted clinker production limit. Too few data were available to make statistical inferences with an acceptable degree of confidence. However the test results while using 30% petcoke indicated CO emissions nominally equal to the facility's current permitted limit. There is reason to expect CO emissions in excess of the permitted limit at greater petcoke use and permitted production.

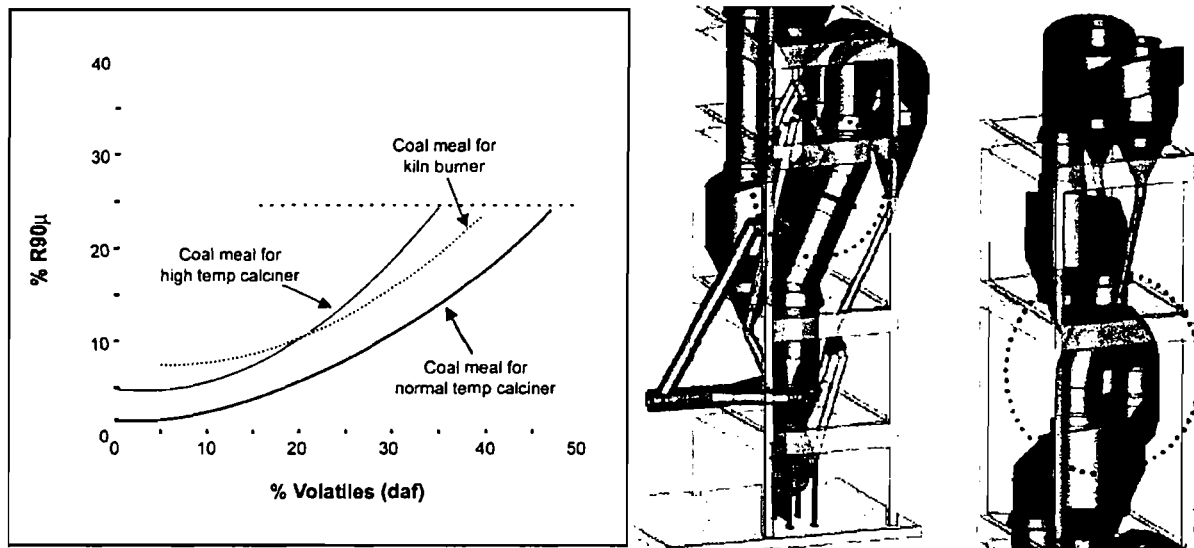
TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

From a strictly technical point of view, there is reason to expect an increase in CO when using petcoke other factors being equal. Petcoke has low volatile content and requires greater residence time to burn out completely. The issue is less pronounced in the very high temperature atmosphere near the kiln burner. In the calciner, char and CO burnout occur at the temperature of calcination and compete for heat with the raw meal. The result can be greater CO concentrations exiting the calciner.

Among the possible solutions are finer grinding, high momentum rotary kiln burner design and calciner design changes. The figure below (left) from F.L. Smidth shows the change in grinding requirements when using petcoke in an in-line calciner kiln.⁹ The more petcoke used, the lower the volatility is and the finer the grinding requirements.

FRI plans to install a high momentum kiln burner as part of the proposed project, but did not have it in place during the test program. There is at least some ability to grind the blend to improve burnout.

One possibility is to increase the retention time in the calciner to promote more complete burn out, but this is not proposed in the present project. According to FRI, the existing calciner has provisions for creation of hot zone(s) that operate in a reducing atmosphere for NO_x destruction and then an oxidizing atmosphere for CO burnout.¹⁰ The hot zone(s) is created by manipulation of the raw meal introduction into the calciner and the introduction of hot tertiary air from the kiln hood and clinker cooler. The figure below (right) shows the possible hot zone locations for a Polysius staged combustion calciner much like the calciner installed at FRI.¹¹



Grinding Requirements Versus Volatility

Hot Spot Between Raw Meal Injection Points

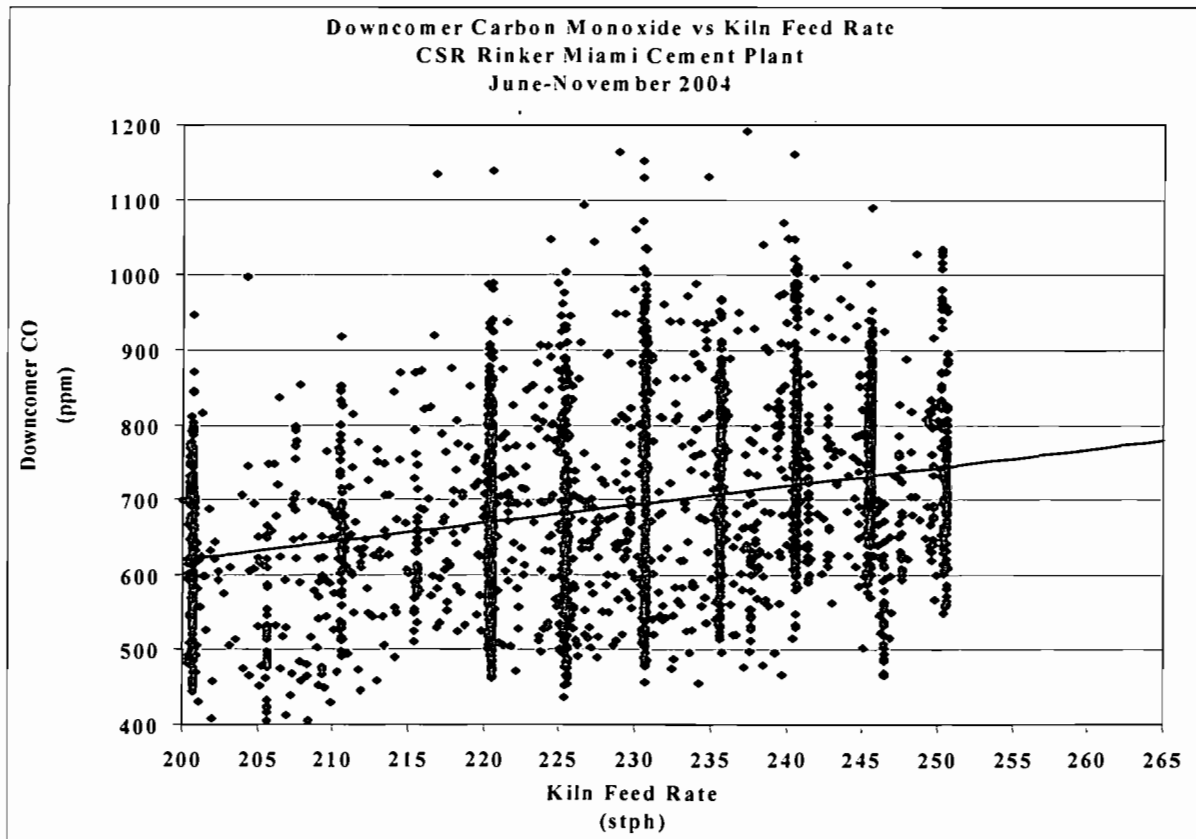
The original construction permit issued in 1996 required FRI to install a process monitor for measurement of CO. FRI installed one monitor at the kiln inlet where the values do not correlate well with stack emissions. A second process monitor is located in the downcomer duct prior to the air pollution control equipment. That monitor should correlate well with stack emissions. The Department requested that FRI provide the data from that monitor to study in greater detail the effect of petcoke use.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

FRI advised that the data are not saved. Additionally, the monitor is calibrated to indicate CO values for the purpose of safety in operation of the electrostatic precipitator (ESP) rather than environmental quality.

The stack test CO values when burning 30% petcoke and producing 100 TPH of clinker (~92% of permitted capacity) were nominally at the limit. FRI does not have a continuous monitor for the appropriate environmental range (100 – 1000 ppm). There is currently not reasonable assurance that the CO limit will be met continuously at greater petcoke use values (>30%) at the production level tested.

At a greater production rate (e.g. equal to the 110 TPH daily allowable average) one would expect higher lb CO/ton emission rates (factors) because of decreased residence time and less opportunity to complete the burn out of a fuel that is already difficult to burn out. Following is a graph of CO emissions in ppm (analogous to lb/ton) versus production at another dry process kiln in Florida.¹² While there is a lot of scatter in the data, the trend is clear. The relation is approximately linear in that an increase of 10% in production *tends* to be related to a 10% increase in CO, other factors being equal.



To avoid increases in CO concentrations or exceedances (given that CO emission test results were near the limit), the Department will limit petcoke use to 25%. The justification is “reasonable assurance” under Paragraph 62-4.070(3), F.A.C., Standards for Issuing and Denying Permits.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Natural gas use should not increase CO emissions. Although the Department will allow 100% natural gas use, mostly likely the use will be minimal and will not sufficiently counteract the increased CO effects of petcoke use.

VOLATILE ORGANIC COMPOUNDS

A small statistically significant decrease was noted in VOC emissions. Again, there is no reason to expect any VOC increases from natural gas use or the use of the proposed kiln burner. The qualitative increase over time noted in VOC when petcoke and fly ash were not used is theorized to result from variations in raw materials additives (including fly ash) when fed to the preheater.

In general both CO and VOC emissions should tend to decrease when fly ash is introduced into the calciner and kiln rather than the preheater.

PARTICULATE MATTER

As shown earlier, particulate tests conducted on the kiln/raw mill system while co-firing petcoke and fly ash with coal indicated compliance by a very substantial margin with applicable permitted PM limits. Generally the ash content of petcoke is less than the ash content of coal and an increase in PM emissions is not expected with this fuel. The fly ash used in the kiln and calciner will be introduced in proportionately small amounts. The likely result is that PM emissions will not change.

There is no reason to expect PM emissions increases caused by use of natural gas or by the use of the proposed kiln burner.

VI. METHOD OF ESTIMATING EMISSION INCREASES AND DECREASES

As a major source, a physical modification or change in method of operation of this facility resulting in **no significant net emissions increases** is not subject to PSD review and does not require a BACT determination. If there are significant increases however, then the facility is subject to PSD review. Co-firing with petcoke, fly ash and natural gas as well as the increase in coal sulfur content and the installation of a new kiln burner clearly constitute or require physical and operational changes.

The term “significant net emissions increase” is defined in Rule 62-212.400, F.A.C as follows:

*Significant Net Emissions Increase – A significant net emissions increase of a pollutant regulated under the Act is a **net emissions increase** equal to or greater than the applicable significant emission rate listed in Table 212.400-2, Regulated Air Pollutants – Significant Emission Rates.*

The significant emission rates are included in Table 3. The meaning of a net emissions increase is given in Rule 62-212.400, F.A.C. as:

*Net Emissions Increase - A modification to a facility results in a net emissions increase when, for a pollutant regulated under the Act, the sum of all of the contemporaneous creditable increases and decreases in the **actual emissions** of the facility, including the increase in emissions of the modification itself and any increases and decreases in quantifiable fugitive emissions, is greater than zero.*

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The definition of actual emissions is given in Rule 62-210.200, F.A.C. (definitions) as follows:

Actual Emissions - The actual rate of emission of a pollutant from an emissions unit as determined in accordance with the following provisions:

- (a) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during a two year period which precedes the particular date and which is representative of the normal operation of the emissions unit. The Department may allow the use of a different time period upon a determination that it is more representative of the normal operation of the emissions unit. Actual emissions shall be calculated using the emissions unit's actual operating hours, production rates and types of materials processed, stored, or combusted during the selected time period.
- (b) The Department may presume that unit-specific allowable emissions for an emissions unit are equivalent to the actual emissions of the emissions unit provided that, for any regulated air pollutant, such unit-specific allowable emissions limits are federally enforceable.
- (c) For any emissions unit (other than an electric utility steam-generating unit specified in subparagraph (d) of this definition) which has not begun normal operations on a particular date, actual emissions shall equal the potential emissions of the emissions unit on that date.

Under existing New Source Review (NSR) regulations, net emissions increase calculations for projects such as the present one are typically based on comparisons of past actual to future potential emissions. Past actual emissions are almost always less than permitted emissions because of the margin of safety needed to insure constant compliance and because of variations in production and demand. By paragraph (a) above, any operation will almost always show a net significant emission increase (SER) whether or not a physical or operational change is made.

Per the following table, the respective SER for each of several pollutants is exceeded, potentially triggering a PSD review for the FRI projects when adhering to the procedure in paragraph (a).

Pollutant	Current Allowable Emissions		Average Actual Emissions (2003-2004) ^a	Future Potential Minus Past Actual Emissions	SER
	lb/ton	TPY	TPY	TPY	TPY
PM	0.23	94	16	78	25
PM ₁₀	0.2	80	13	67	15
SO ₂	0.16	64	5	59	40
NO _x	2.45	980	708	272	40
SAM	0.0025	1	0.6	0.4	7
CO	2.5	1000	885 ^a / 780 ^b	115 ^a / 220 ^b	100
VOC	0.11	43	33	10	40

^a Average of FRI estimates reported in the 2003, 2004 Annual Operating Reports. Rounding employed.

^b Second CO estimates based on 2003-2004 stack tests and the clinker production reported by FRI.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The present case involves a plant that will not be making changes expected to increase actual (measured) emissions except for CO and SO₂ (< 1 ton per year). The requested modification involves no changes in current allowable emissions or increases in potential to emit. In fact, observed emissions of several regulated pollutants decreased based on test results and CEMS data collected during the trial period.

There is a CO process monitor in the downcomer prior to the electrostatic precipitator. It is not required to meet the quality assurance specifications of a CEMS. Based on the in-stack tests conducted, CO emissions apparently increased while burning petcoke/coal blends. FRI has the ability to reduce CO by operating the calciner in such a manner as to produce hot zones as described earlier. FRI can also minimize CO emissions through effective fuel choices, and raw material selection.

Installation of the new kiln burner should provide better control of NO_x formed in the kiln. This provides better opportunities to control both NO_x and CO in the calciner.

The BACT emission limits at FRI Kiln No. 1 were established in late 2002 and are still among the lowest in the country for all pollutants, including CO. For example, they are less than the BACT values issued for the largest greenfield cement plant permitted in the United States (Holcim Lee Island, MO, June 2004). Additionally, FRI is required to maintain continuous monitors for opacity, control equipment inlet temperature (for dioxin/furan), SO₂, NO_x, and VOC to demonstrate compliance with current limits of these pollutants.

In summary:

- The Department does not believe that the requested physical and operational changes will in the future cause measured annual emissions to increase substantially with the possible exception of CO.
- The Department considers that the kiln has proper and modern BACT emissions limits.
- The kiln is equipped with CEMS for monitoring SO₂, NO_x, and VOC, and COMS for opacity providing reasonable assurance that emissions limits of these pollutants will not be exceeded.
- The Department will limit petcoke use to nominally 25%, which is less than the test rate of 30% when conducting the CO tests or 34% petcoke use rate achieved during the trial.
- The Department will require quarterly in-stack CO compliance testing instead of the present annual requirement.

VII. PSD AND BACT APPLICABILITY DETERMINATION

The Department is authorized by Rule 62-210.200, F.A.C. [Definitions - Actual Emissions, paragraph (b)] to presume that the federally-enforceable unit-specific allowable emissions are equivalent to the actual emissions of the emissions unit. Thus the project will not cause a significant net emission increase requiring PSD review and a BACT determination.

Using the procedure in paragraph (b), the Department concludes that there will not be a net significant emissions rate increase associated with the proposed use of alternative fuels. The Department concludes that PSD does not apply and another BACT determination is not required.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The Department notes this PSD applicability determination applies strictly to this project and the exact circumstances and does not constitute guidance for any other project. The Department makes these determinations on a case-by-case basis.

VIII. CONCLUSION

The Department concludes that the proposed projects will not cause or contribute to a violation of ambient air quality standards or allowable increases.

Conditions incorporating the proposed changes are shown in the attached draft permit for this modification.

Cindy Mulkey, Permit Engineering Specialist

A. A. Linero P.E., Program Administrator

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

IX. REFERENCES

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